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Comparison of Life-Cycle Costs for Low-Level Radioactive Waste Management in Texas: Disposal vs. Assured Isolation

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DISCLAIMER

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Comparison of Life-Cycle Costs for Low-Level Radioactive Waste Management in Texas: Disposal vs. Assured Isolation

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ABSTRACT

This report documents a comparison of life-cycle costs of an assured isolation facility in Texas versus the life-cycle costs for a traditional below-ground low-level radioactive waste disposal facility designed for the proposed site near Sierra Blanca, Texas.

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Comparison of Life-Cycle Costs for Low-Level Radioactive Waste Management in Texas: Disposal vs. Assured Isolation

1. INTRODUCTION

Under provisions of the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) and its predecessor law, states and congressionally-authorized compacts of states have sought over the past two decades to develop new low-level radioactive waste (LLRW) disposal facilities. Despite significant and expensive efforts in these endeavors, no such facility has been licensed and actually constructed under provisions of the LLRWPAA.

In 1995, the U.S. Department of Energy's National Low-Level Waste Management Program (the Program) described assured isolation as an alternative approach to safe long-term management of LLRW. The assured isolation concept involved placing LLRW in a licensed, engineered facility, from which the waste could be subsequently retrieved for other disposition, if necessary. The facility was described as remaining under license as long as radioactive materials were present at the facility. The conceptual facility relied on ongoing and continuing inspection, monitoring, and preventive maintenance. These assumptions contrasted the assumption for disposal facility licensing that institutional control would be lost at 100 years following disposal facility closure and that the facility must, thereafter, meet LLRW disposal performance objectives without reliance on ongoing active measures.

From 1996 through 1998, the Program sponsored a study to estimate the life-cycle costs and evaluate the economics of assured isolation relative to LLRW disposal. This investigation responded to a request from the State of Connecticut to assess the assured isolation concept's viability (Ch98). In that investigation, the characteristics of the assured isolation facility (AIF) and those of the LLRW disposal facility were constrained to be similar so the results would be comparable. No effort was made to optimize the AIF design characteristics in order to minimize life-cycle costs, although it was agreed that considerable design flexibility exists that could reduce estimated AIF life-cycle costs.

Early in 1999, the Texas Low-Level Radioactive Waste Disposal Authority (the Authority) requested the Program to sponsor an investigation to optimize principal design characteristics of the AIF concept and to estimate associated life-cycle costs. In this investigation, the objective was to consider the cost saving effects of design changes that could be implemented without compromising the ability of the AIF to satisfy regulations believed to be applicable (as described in Si98). The Authority sought life-cycle cost information that they could compare to life-cycle cost estimates for the Texas LLRW disposal facility (Ba99a).

The Program contracted with Rogers and Associates Engineering (RAE) to conduct the investigation the Authority had requested. The results of that investigation are contained in Ba99b.

This document compares the estimated costs of two LLRW management concepts – near-surface land disposal using below-ground modular concrete canisters in excavations and assured isolation, using modular concrete canisters in above-ground concrete structures. In this report, the principal features of these two management concepts are summarized and their cost differences identified and compared.

2. COMPARISON OF FACILITY FEATURES AND LIFE CYCLES

A concerted effort was made to prepare an optimized AIF conceptual design that was similar in its features and characteristics to those of the proposed Texas LLRW disposal facility. However, several conditions existed that precluded perfectly parallel facility features and life cycles. This chapter compares the features and life cycles of the AIF and the LLRW disposal facility

2.1 Physical Description

The proposed Texas LLRW disposal facility would be licensed under state regulations that are compatible with the Nuclear Regulatory Commission's regulations for land disposal of LLRW. Title 10 of the Code of Federal Regulations, Part 61 (10 CFR 61). Under 10 CFR 61, active measures of inspection and maintenance could not be counted upon for more than 100 years in demonstrating that the facility would meet its performance objectives during the licensing process. At some future date, when regulatory agencies might be satisfied that the facility is performing acceptably, the license might be terminated.

The disposal facility involved placing waste containers received into modular concrete canisters. Voids within these canisters would be backfilled with grout. The closed canisters would be emplaced in a shallow excavation such that the top of the canisters would be well below site grade. Voids between canisters would be backfilled with earthen materials and the entire excavation covered with an engineered, multi-layer earthen cover system. The disposal facility would rely primarily on natural features of the site where the facility was developed to isolate the waste. The facility would not rely on active ongoing measures beyond 100 years after facility closure to accomplish its containment functions.

The conceptual AIF design developed for the Program would be licensed as a radioactive materials facility under Title 10 of the Code of Federal Regulations, Parts 30, 40, and/or 70 (10 CFR 30, 40, and/or 70). As long as radioactive materials were present at the facility, the facility would remain under active license and its owners would be accountable to regulatory agencies to properly manage the facility.

The AIF would involve placing waste containers received into modular concrete canisters. Voids within these canisters would be backfilled with absorbent, granular material. The closed canisters would be emplaced in an above-grade concrete structure designed, constructed, operated, and maintained to contain the waste under license for hundreds of years. The facility would accomplish its containment function through reliance on engineered structures and active inspections and maintenance activities as long as radioactive materials were present at the facility.

A central concept of the AIF is the preservation of future management options. If LLRW were placed in an AIF, provisions would be made in advance for implementing management options in the future. Such management options might include recycling, retrieval and subsequent disposal, and continued management in the AIF.

The following table summarizes principal features of the LLRW disposal facility and of the AIF.

Characteristic	Disposal Facility	Assured Isolation Facility
Waste Package	Shipping Containers in Concrete Canisters	Shipping Containers in Concrete Canisters
Waste Management Unit	Earthen Excavation	Concrete Structure
Weather Protection	Engineered Earthen Cover System	Concrete Structure
Principal Component for Waste Isolation	Natural Site Features without Reliance on Ongoing Activities	Engineered Structure with Active Inspection, Maintenance, and Repairs as Needed
Monitoring Systems	Environmental Media	Facility Components such as Isolation Unit, Moisture Detection and Collection Systems

The annual waste receipts that would be managed at either facility were similar for the first 20 years of their lives. A total of just more than 1 million cubic feet of LLRW was estimated to require management in the facilities in the first 20 years of facility life. The annual waste receipt rate was estimated to range from about 31,000 to about 112,000 cubic feet per year, with an average of about 51,000 cubic feet per year during these 20 years. In the last 10 years of AIF life (see Section 2.2), the waste receipt rate was estimated to be about 78,000 cubic feet per year to bring the total amount of waste requiring management to about 1.8 million cubic feet.

2.2 Life Cycles

The life cycles of the two LLRW management facilities considered in this investigation were not identical. They are summarized below:

Life Cycle Period	Disposal Facility	Assured Isolation Facility
Pre-Operations	8 years	5 years
Operations	20 years	30 years
Inspection and Preventive Maintenance	No more than 100 years for licensing purposes	At least 300 years or as long as radioactive materials are present in the facility
Post-Institutional Control Custodial Maintenance	Centuries	None—Facility will remain under license as long as radioactive materials are present in the facility.

The shorter Pre-Operations period for the AIF is based on the expectation that disposal facility site characterization will take longer to complete. Furthermore, it is expected that public opposition to the development of the AIF will not be as active or intense as with the disposal facility.

2.3 Adjustments to Estimated Disposal Costs to Allow Comparison with AIF Cost Estimates

Estimated costs for the disposal facility differed from those for the AIF in at least two ways: pre-operating costs and liability insurance premiums. Adjustments were made to allow these two cost estimates to be compared. These adjustments are described in the following sections. The original cost estimate is summarized in Appendix A and its details are presented in Appendix B.

2.3.1 Pre-Operating Costs

In estimates of disposal facility operating costs, the costs needed to develop the disposal facility were not included. Since pre-operating costs were included in the AIF cost estimates, an adjustment was required before a reasonable comparison of life-cycle costs could be made.

The Authority incurred costs over an eight-year period from 1992 through 1999. For reasons stated in *Design Study and Cost Estimate for an Assured Isolation Facility in Texas* (Ba99b), a shorter development or pre-operating period for AIF was considered justifiable. The AIF pre-operating period was estimated to last only six years. The spending profile for AIF was assumed to be the same as that of the first five years of the disposal facility development. In the sixth year, costs to construct and startup the AIF were taken to be identical to the estimated costs to construct and startup the disposal facility. The profile of annual costs to develop the optimized AIF was thus estimated to be as follows:

Year	Site Development Costs ($000)	Facility Construction and Startup Cost ($000)
1	$1,555	
2	2,937	
3	1,357	
4	1.021	
5	1,961	
6		$7,913
TOTALS	$8,831	$7,913

The adjustment made to the earlier disposal facility cost estimate for pre-operating costs was taken to be the AIF profile of pre-operating costs. The estimated AIF pre-operating cost of $16.7 million was smaller than the historical disposal facility costs by about $1.7 million, which were the Authority's actual cost in years 6 and 7. The estimated AIF pre-operating costs are believed to be conservatively large.

Because the pre-operating costs are based on historical costs, their escalated costs are less and their present values are greater than their constant-dollar equivalents, contrary to expectations for costs incurred in the future. The escalated costs totaled $15.5 million, while present values totaled $19.1 million.

2.3.2 Liability Insurance

The disposal facility cost estimate made no allowance for liability insurance, as did the AIF cost estimate. To make the estimates comparable, the annual liability premium of $50,000 was added to the costs estimated earlier for the disposal facility. This added a total of about $1.5 million (constant dollars) over the disposal facility's 30-year life (or $1.0 million in constant dollars over the first 20 years of disposal facility life).

3. ECONOMIC COMPARISON

Several summary-level indicators of economic performance of the disposal facility and the AIF are summarized in Table 3-1. The principal comparison of this table is of the first 20 years of the AIF operating period. Costs for the full 30 years of AIF waste acceptance are included for continuity (Ba99b).

Table 3-1. Comparison of LLRW disposal facility and AIF costs.

Indicator	LLRW Disposal Facility 20-Year Costs	Assured Isolation Facility 20-Year Costs	AIF 20-Year Costs As Percent Of Disposal Facility 20-Year Costs	Assured Isolation Facility 30-Year Costs
Total Cost				
Constant Dollar	$160,000,000	$280,000,000	175%	$436,000,000
Escalated Dollar	$220,000,000	$370,000,000	168%	$640,000,000
Present Value	$150,000,000	$230,000,000	153%	$318,000,000
Total Volume (cf)	1,019,188	1,019,188		1,800,000
Escalated Dollar Unit Charge				
Initial	$136 per cf	$187 per cf	138%	$187 per cf
Minimum	$133 per cf	$187 per cf	140%	$187 per cf
Maximum	$344 per cf	$670 per cf	195%	$670 per cf
Escalated Cost Divided by Total Volume	$232 per cf	$362 per cf	156%	$358 per cf
Present Value Unit Charge				
Initial	$136 per cf	$187 per cf	138%	$187 per cf
Minimum	$96 per cf	$130 per cf	135%	$84 per cf
Maximum	$223 per cf	$420 per cf	189%	$420 per cf
Present Value Divided by Total Volume	$146 per cf	$230 per cf	158%	$177 per cf

This summary clearly shows that the various AIF total costs are estimated to be 50 to 75 percent greater than those of the disposal facility. AIF unit charges range from 135 to 195 percent of corresponding disposal facility unit charges.

A few important facts cause the estimated costs of the AIF to be more than those for the disposal facility. The single most significant fact is the requirement to accumulate a financial assurance fund of sufficient magnitude to ensure that (1) up to 300 years of inspection and preventive maintenance will be funded, and (2) waste can be retrieved and transferred to another facility after 100 years in the AIF. In the first year of AIF operation, this requirement adds about $5.6 million to the cost of facility operation. This increment alone increases the cost for that year by over 50 percent. This requirement continues in subsequent years to significantly increase the costs that must be recovered through facility revenues.

Other reasons AIF costs exceed those of disposal include:

- As permitted by rule, disposal facility life-cycle cost estimates include no allowance for retrieving and re-disposing of waste
- Increased construction costs (more costs for reinforced concrete structures, although less for excavation)
- Increased utility costs (because air inside the AIF must be conditioned)
- Assumed increased monitoring intensity (consistent with the AIF commitment to actively monitor and maintain the facility)

Since incentive payments to the host community (10 percent of total revenues) and contingency allowance (20 percent of estimated costs) are scaled from other costs, these items also contribute to the increased costs of the AIF, relative to those of disposal.

The 30-year values for AIF are taken from the AIF design report (Ba99b) to provide continuity between that report and this comparison. Because the 30-year volumes are greater than the 20-year volumes by 70 to 80 percent, the 30-year estimated costs, as expected, exceed the 20-year estimated costs.

4. REFERENCES

Ba99a Baird, R.D., B.C. Rogers, and P.L. Walter, "Life-Cycle Cost Study for a LLW Disposal Facility in Texas," DOE/LLW-256, Rogers and Associates Engineering Corporation for DOE's National Low-Level Waste Management Program, August 1999.

Ba99b Baird, R.D., N. Chau, and B.C. Rogers, "Design Study and Cost Estimate for an Assured Isolation Facility in Texas," DOE/LLW-254, Rogers and Associates Engineering Corporation for DOE's National Low-Level Waste Management Program, August 1999.

Ch98 N. Chau, A.A. Sutherland, and R.D. Baird, "Life-Cycle Costs for Disposal and Assured Isolation of Low-Level Radioactive Waste in Connecticut," DOE/LLW-246, Rogers and Associates Engineering Corporation for DOE's National Low-Level Waste Management Program, March 1998.

Si98 Silverman, Donald J., Michael A. Bauser, and Robert D. Baird, "Licensing an Assured Isolation Facility for Low-Level Radioactive Waste," DOE/LLW-250, Morgan, Lewis & Bockius LLP for DOE's National Low-Level Waste Management Program, July 1998.

Appendix A

"Texas Life-Cycle Cost Study"; Summary

Table A-1. Summary of estimated Texas disposal facility life-cycle costs.

Cost Component	Million of 1997 Dollars	Percent Subtotal
Class A Disposal Unit Costs	55.0	46.6
Payroll	22.8	19.3
Construction Equipment Lease/Purchase	13.7	11.6
Utilities and Consumables	5.6	4.8
Authority Administration	4.8	4.1
Post-Closure Maintenance Fund	4.5	3.8
Class B/C Disposal Unit Costs	4.4	3.7
All Others	7.2	6.1
Subtotal Costs	118.0	100.0
Contingency Allowance	11.4	9.7
Incentive Payments	12.9	10.9
Total Estimated 20-Year Cost	142.4	120.7

A.1	CLASS A DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE	UNIT	QUANTITY	MATL	LABOR	EQUIP	BARE TOTAL	O&P TOTAL	CITY COST INDEX TOTAL	TOTAL COST	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
A.1.1	SURVEY CELLS	LF	7935	0.03	0.56	0.00	0.59	0.68	0.53	$4,199	$4,199	$4,199				$4,199	
A.1.2	DISPOSAL UNIT EXCAVATION	CY	179570	0.00	0.33	1.65	1.98	2.31	1.80	$323,549	$323,549	$323,549				$323,549	
A.1.3	DUMP TRUCK LOADING	CY	179570	0.00	0.05	0.25	0.30	0.35	0.27	$48,532	$48,532	$48,532				$48,532	
A.1.4	HAUL	CY	179570	0.00	0.69	1.73	2.42	2.97	2.32	$415,992	$415,992	$415,992				$415,992	
A.1.5	BOUNDARY FENCE	LF	2112	1.25	0.00	0.00	1.25	1.44	1.12	$2,368	$2,368						
A.1.6	REMOVE AND RESET CHAIN LINK FENCE	LF	2112	0.00	6.19	0.08	6.27	7.21	5.62	$11,878	$11,878	$11,878				$11,878	
A.1.7	CONSTRUCT RAMP																
A.1.8	COMPACT SUBGRADE	CY	507	0.00	0.23	0.42	0.65	0.82	0.64	$324	$324	$324				$324	
A.1.9	14" AGGREGATE BASE, COARSE	SY	1521	17.97	0.58	1.18	19.73	21.72	16.94	$25,764	$25,764	$25,764				$25,764	
A.1.10	6" AGGREGATE SURFACE, COARSE	SY	1521	7.70	0.35	0.71	8.76	9.75	7.61	$11,567	$11,567	$11,567				$11,567	
A.1.11	NEUTRON PROBE ASSEMBLY																
A.1.12	ALUMINUM TUBE FOR NEUTRON PROBE	LF	1932	9.35	7.40	9.20	25.95	33.19	25.89	$50,016	$50,016	$50,016				$50,016	
A.1.13	END CAP FOR ALUMINUM TUBE	EA	14	74.50	24.50	0.00	99.00	120.00	93.60	$1,310	$1,310	$1,310				$1,310	
A.1.14	CONCRETE COLLAR	CY	4.2	83.50	52.50	0.68	136.68	176.00	137.28	$577	$577	$577				$577	
A.1.15	GRADE CELL FLOOR TO SPECIFICATION	SY	7628	0.00	0.19	0.28	0.47	0.61	0.48	$3,629	$3,629	$3,629				$3,629	
A.1.16	COMPACT SUBGRADE (6" MIN)	CY	1271	0.00	0.23	0.42	0.65	0.82	0.64	$813	$813	$813				$813	
A.1.17	WATER MANAGEMENT (DUST CONTROL & HYDRATION)	AC	50	2.46	14.44	23.00	39.90	45.89	35.79	$1,790	$1,790	$1,790				$1,790	
A.1.18	PLACE AND COMPACT CELL SOIL LINER	CY	28970	0.25	1.76	4.07	6.08	6.99	5.45	$157,995	$157,995	$157,995				$157,995	
A.1.19	PLACE GEOTEXTILE, NON-WOVEN	SY	6633	0.63	0.45	0.03	1.11	1.11	1.11	$7,386	$7,386	$7,386				$7,386	
A.1.20	CONSTRUCT UNDER DRAIN																
A.1.21	EXCAVATE UNDER DRAIN	CY	950	0.00	1.93	1.44	3.37	4.56	3.56	$3,379	$3,379	$3,379				$3,379	
A.1.22	PLACE GEOTEXTILE, NON-WOVEN	SY	3079	0.63	0.45	0.03	1.11	1.11	1.11	$3,428	$3,428	$3,428				$3,428	
A.1.23	3/8" CRUSHED STONE FILL FOR UNDER DRAIN	CY	950	16.50	1.52	1.18	19.20	22.08	17.22	$16,361	$16,361	$16,361				$16,361	
A.1.24	CONCRETE SUMP ASSEMBLY																
A.1.25	HAND EXCAVATE AREA	CY	26.4	0.00	20.50	0.00	20.50	32.50	25.35	$669	$669	$669				$669	
A.1.26	FORMWORK	SFCA	311.5	0.83	4.70	0.00	5.53	7.20	5.62	$1,749	$1,749	$1,749				$1,749	
A.1.27	REBAR	TN	0.272	550.00	590.00	0.00	1140.00	1625.00	1267.50	$345	$345	$345				$345	
A.1.28	CONCRETE	CY	12	59.00	8.70	0.62	68.32	79.25	61.82	$742	$742	$742				$742	
A.1.29	8" PVC STANDPIPE	LF	504	4.26	4.25	0.84	9.35	12.25	9.56	$4,816	$4,816	$4,816				$4,816	
A.1.30	12" SLEEVE	EA	8	74.50	24.50	0.00	99.00	120.00	93.60	$749	$749	$749				$749	
A.1.31	CONCRETE COLLAR	CY	2.4	83.50	52.50	0.68	136.68	176.00	137.28	$329	$329	$329				$329	
A.1.32	2' MINIMUM CELL FLOOR GRAVELLY SAND	CY	8010	6.45	0.58	1.66	8.69	9.99	7.79	$62,437	$62,437	$62,437				$62,437	
A.1.33	6" CELL FLOOR CRUSHED 3/4" STONE BASE	SY	7300	7.70	0.35	0.71	8.76	9.75	7.61	$55,517	$55,517	$55,517				$55,517	
A.1.34	CANISTER PURCHASE	EA	1300	2500.00	0.00	0.00	2500.00	2500.00	2500.00	$3,250,000	$2,222,308	$2,859,483	$1,539,527	$966,607	$978,451	$909,158	$961,571
A.1.35	CANISTER PLACEMENT										$0	$0	$0	$0	$0	$0	$0
A.1.36	WASTE PLACEMENT - SLINGS	EA	60	45.00	0.00	0.00	45.00	45.00	45.00	$2,700	$1,846	$2,376	$1,279	$803	$813	$755	$799
A.1.37	BACKFILL VOIDS IN CANISTERS WITH GROUT	CF	122850	1.59	0.00	0.00	1.59	1.59	1.59	$195,650	$133,783	$172,141	$92,680	$58,190	$58,903	$54,731	$57,887
A.1.38	STEEL MATS OF #4 REINFORCING STEEL	TN	204	520.00	0.00	0.00	520.00	520.00	405.60	$82,742	$56,578	$72,800	$39,195	$24,609	$24,911	$23,146	$24,481
A.1.39	CONCRETE LID POUR (DELIVERY INCLUDED IN MATERIAL COST)	CY	2210	69.85	0.00	0.00	69.85	77.00	60.06	$132,733	$90,761	$116,784	$62,875	$39,477	$39,961	$37,131	$39,271
A.1.40	BRASS ID PLATE WITH ENGRAVINGS	EA	1300	15.00	0.00	0.00	15.00	15.00	11.70	$15,210	$10,400	$13,382	$7,205	$4,524	$4,579	$4,255	$4,500
A.1.41	BACKFILL AROUND CANISTERS,3/8" CRUSHED STONE	CY	42665	16.50	0.00	0.00	16.50	16.50	12.87	$549,099	$375,466	$483,119	$260,108	$163,312	$165,313	$153,605	$162,461
A.1.42	PLACE 2' GRAVELLY SAND	CY	9476	6.20	0.00	0.00	6.20	6.20	4.84	$45,826	$31,335	$40,320	$21,708	$13,629	$13,796	$12,819	$13,558
A.1.43	PLACE MINIMUM 2' OF SAT MATL - TEMP COVER	CY	17986	0.25	0.00	0.00	0.25	0.25	0.20	$3,507	$2,398	$3,086	$1,661	$1,043	$1,056	$981	$1,038
A.1.44	PLACE MINIMUM 7' 4" OF SATISFACTORY MATERIAL	CY	47450	0.25	1.76	4.07	6.08	6.99	5.45	$258,781		$258,781	$258,781				$258,781
A.1.45	BACKFILL ACCESS RAMP	CY	24950	0.25	1.76	4.07	6.08	6.99	5.45	$136,071		$136,071	$136,071				$136,071
A.1.46	COMPACT CLAY LINER (RAMP END OF CELL)	CY	3150	0.00	0.23	0.42	0.65	0.82	0.64	$2,015		$2,015	$2,015				$2,015
A.1.47	COVER ACCESS RAMP BACKFILL	CY	1875	0.25	1.76	4.07	6.08	6.99	5.45	$10,226		$10,226	$10,226				$10,226
A.1.48	COVER SYSTEM AND SECONDARY DRAINAGE DITCH INTERFACE																
A.1.49	COMPACT SUBGRADE	CY	1643	0.00	0.23	0.42	0.65	0.82	0.64	$1,051		$1,051	$1,051				$1,051
A.1.50	PLACE GEOTEXTILE, NON-WOVEN	SY	3989	0.63	0.45	0.03	1.11	1.11	1.11	$4,442		$4,442	$4,442				$4,442
A.1.51	RIPRAP	CY	2400	15.40	6.70	8.00	30.10	36.00	28.08	$67,392		$67,392	$67,392				$67,392
A.1.52	AMEND DITCH LINING WITH LIME	BCY	49	8.29	1.19	6.65	16.13	18.55	14.47	$713		$713	$713				$713
A.1.53	12" THICK LIME AMENDED DITCH LINING	CY	1643	0.25	1.76	4.07	6.08	6.99	5.45	$8,961		$8,961	$8,961				$8,961
A.1.54	GRADE AREA TO SPECIFICATION	SY	18250	0.00	0.19	0.28	0.47	0.61	0.48	$8,683		$8,683	$8,683				$8,683
A.1.55	APPLY LIQUID ASPHALT EMULSION TACK COAT	SY	18250	0.28	0.04	0.06	0.38	0.44	0.34	$6,221		$6,221	$6,221				$6,221
A.1.56	8" OF ASPHALT CONCRETE ABOVE SAT. MATERIAL	TN	8022	18.97	0.27	0.60	19.84	22.82	17.80	$142,763		$142,763	$142,763				$142,763
A.1.57	2" OF SURFACE COURSE ASPHALT CONCRETE	TN	2005	29.63	8.90	6.94	45.47	52.29	40.79	$81,777		$81,777	$81,777				$81,777
A.1.58	LIQUID ASPHALT EMULSION TACK COAT	SY	18250	0.35	0.04	0.06	0.45	0.52	0.40	$7,367		$7,367	$7,367				$7,367
A.1.59	GEOSYNTHETIC CLAY LINER OVER ASPHALT CONCRETE	SF	492750	0.35	0.15	0.01	0.51	0.51	0.51	$249,332		$249,332	$249,332				$249,332
A.1.60	4' 4" OF SATISFACTORY MATERIAL - INCLUDES 1' OF "TOPSOIL"	CY	27360	0.25	1.76	4.07	6.08	6.99	5.45	$149,215		$149,215	$149,215				$149,215
A.1.61	GRADE AREA TO SPECIFICATION	SY	24054	0.00	0.19	0.28	0.47	0.61	0.48	$11,445		$11,445	$11,445				$11,445
A.1.62	SEEDING, VEGETATIVE COVER (MULCHING, WATERING TRUCK)	AC	5	1708.75	37.13	59.11	1804.99	2075.74	1619.08	$8,095		$8,095	$8,095				$8,095
A.1.63	WATERING AND MAINTENACE OF VEGETATIVE COVER	AC	20	2.46	14.44	23.00	39.90	45.89	35.79	$716		$716	$716				$716
A.1.64	GRANITE MONUMENT	EA	1	1500.00	0.00	0.00	1500.00	1500.00	1500.00	$1,500		$1,500	$1,500				$1,500
A.1.65	SETTLEMENT MONITORS - 5 EACH	EA	5	52.34	71.78	6.67	130.79	150.41	117.32	$587		$587	$587				$587
										TOTALS:	$4,143,089	$6,136,686	$3,183,589	$1,272,194	$1,287,783	$2,412,428	$2,422,916

A.1	CLASS A DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	TOTAL
A.1.1	SURVEY CELLS		$4,199				$4,199		$4,199	$4,199		$4,199			$33,596
A.1.2	DISPOSAL UNIT EXCAVATION		$323,549				$323,549		$323,549	$323,549		$323,549			$2,588,394
A.1.3	DUMP TRUCK LOADING		$48,532				$48,532		$48,532	$48,532		$48,532			$388,259
A.1.4	HAUL		$415,992				$415,992		$415,992	$415,992		$415,992			$3,327,935
A.1.5	BOUNDARY FENCE														$2,368
A.1.6	REMOVE AND RESET CHAIN LINK FENCE		$11,878				$11,878		$11,878	$11,878		$11,878			$95,026
A.1.7	CONSTRUCT RAMP														
A.1.8	COMPACT SUBGRADE		$324				$324		$324	$324		$324			$2,594
A.1.9	14" AGGREGATE BASE, COARSE		$25,764				$25,764		$25,764	$25,764		$25,764			$206,114
A.1.10	6" AGGREGATE SURFACE, COARSE		$11,567				$11,567		$11,567	$11,567		$11,567			$92,538
A.1.11	NEUTRON PROBE ASSEMBLY														
A.1.12	ALUMINUM TUBE FOR NEUTRON PROBE		$50,016				$50,016		$50,016	$50,016		$50,016			$400,128
A.1.13	END CAP FOR ALUMINUM TUBE		$1,310				$1,310		$1,310	$1,310		$1,310			$10,483
A.1.14	CONCRETE COLLAR		$577				$577		$577	$577		$577			$4,613
A.1.15	GRADE CELL FLOOR TO SPECIFICATION		$3,629				$3,629		$3,629	$3,629		$3,629			$29,035
A.1.16	COMPACT SUBGRADE (6" MIN)		$813				$813		$813	$813		$813			$6,503
A.1.17	WATER MANAGEMENT (DUST CONTROL & HYDRATION)		$1,790				$1,790		$1,790	$1,790		$1,790			$14,316
A.1.18	PLACE AND COMPACT CELL SOIL LINER		$157,995				$157,995		$157,995	$157,995		$157,995			$1,263,963
A.1.19	PLACE GEOTEXTILE, NON-WOVEN		$7,386				$7,386		$7,386	$7,386		$7,386			$59,087
A.1.20	CONSTRUCT UNDER DRAIN														
A.1.21	EXCAVATE UNDER DRAIN		$3,379				$3,379		$3,379	$3,379		$3,379			$27,032
A.1.22	PLACE GEOTEXTILE, NON-WOVEN		$3,428				$3,428		$3,428	$3,428		$3,428			$27,428
A.1.23	3/8" CRUSHED STONE FILL FOR UNDER DRAIN		$16,361				$16,361		$16,361	$16,361		$16,361			$130,890
A.1.24	CONCRETE SUMP ASSEMBLY														
A.1.25	HAND EXCAVATE AREA		$669				$669		$669	$669		$669			$5,354
A.1.26	FORMWORK		$1,749				$1,749		$1,749	$1,749		$1,749			$13,996
A.1.27	REBAR		$345				$345		$345	$345		$345			$2,758
A.1.28	CONCRETE		$742				$742		$742	$742		$742			$5,934
A.1.29	8" PVC STANDPIPE		$4,816				$4,816		$4,816	$4,816		$4,816			$38,526
A.1.30	12" SLEEVE		$749				$749		$749	$749		$749			$5,990
A.1.31	CONCRETE COLLAR		$329				$329		$329	$329		$329			$2,636
A.1.32	2' MINIMUM CELL FLOOR GRAVELLY SAND		$62,437				$62,437		$62,437	$62,437		$62,437			$499,499
A.1.33	6" CELL FLOOR CRUSHED 3/4" STONE BASE		$55,517				$55,517		$55,517	$55,517		$55,517			$444,132
A.1.34	CANISTER PURCHASE	$973,415	$904,121	$881,921	$897,953	$832,847	$889,447	$1,007,970	$2,263,846	$2,100,282	$1,896,150	$1,610,881	$1,447,317	$1,243,185	$27,386,439
A.1.35	CANISTER PLACEMENT	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
A.1.36	WASTE PLACEMENT - SLINGS	$809	$751	$733	$746	$692	$739	$837	$1,881	$1,745	$1,575	$1,338	$1,202	$1,033	$22,752
A.1.37	BACKFILL VOIDS IN CANISTERS WITH GROUT	$58,600	$54,428	$53,092	$54,057	$50,137	$53,545	$60,680	$136,284	$126,437	$114,148	$96,975	$87,128	$74,840	$1,648,664
A.1.38	STEEL MATS OF #4 REINFORCING STEEL	$24,782	$23,018	$22,453	$22,861	$21,204	$22,645	$25,662	$57,636	$53,472	$48,274	$41,012	$36,848	$31,650	$697,237
A.1.39	CONCRETE LID POUR (DELIVERY INCLUDED IN MATERIAL COST)	$39,755	$36,925	$36,018	$36,673	$34,014	$36,326	$41,166	$92,457	$85,777	$77,440	$65,790	$59,110	$50,773	$1,118,484
A.1.40	BRASS ID PLATE WITH ENGRAVINGS	$4,556	$4,231	$4,127	$4,202	$3,898	$4,163	$4,717	$10,595	$9,829	$8,874	$7,539	$6,773	$5,818	$128,169
A.1.41	BACKFILL AROUND CANISTERS,3/8" CRUSHED STONE	$164,462	$152,754	$149,004	$151,712	$140,712	$150,275	$170,300	$382,485	$354,850	$320,361	$272,164	$244,529	$210,040	$4,627,032
A.1.42	PLACE 2' GRAVELLY SAND	$13,725	$12,748	$12,435	$12,661	$11,743	$12,541	$14,213	$31,921	$29,615	$26,736	$22,714	$20,408	$17,529	$386,157
A.1.43	PLACE MINIMUM 2' OF SAT MATL - TEMP COVER	$1,050	$976	$952	$969	$899	$960	$1,088	$2,443	$2,267	$2,046	$1,738	$1,562	$1,342	$29,554
A.1.44	PLACE MINIMUM 7' 4" OF SATISFACTORY MATERIAL			$258,781				$258,781		$258,781	$258,781		$258,781		$2,070,247
A.1.45	BACKFILL ACCESS RAMP			$136,071				$136,071		$136,071	$136,071		$136,071		$1,088,570
A.1.46	COMPACT CLAY LINER (RAMP END OF CELL)			$2,015				$2,015		$2,015	$2,015		$2,015		$16,118
A.1.47	COVER ACCESS RAMP BACKFILL			$10,226				$10,226		$10,226	$10,226		$10,226		$81,806
A.1.48	COVER SYSTEM AND SECONDARY DRAINAGE DITCH INTERFACE														
A.1.49	COMPACT SUBGRADE			$1,051				$1,051		$1,051	$1,051		$1,051		$8,407
A.1.50	PLACE GEOTEXTILE, NON-WOVEN			$4,442				$4,442		$4,442	$4,442		$4,442		$35,534
A.1.51	RIPRAP			$67,392				$67,392		$67,392	$67,392		$67,392		$539,136
A.1.52	AMEND DITCH LINING WITH LIME			$713				$713		$713	$713		$713		$5,705
A.1.53	12" THICK LIME AMENDED DITCH LINING			$8,961				$8,961		$8,961	$8,961		$8,961		$71,684
A.1.54	GRADE AREA TO SPECIFICATION			$8,683				$8,683		$8,683	$8,683		$8,683		$69,467
A.1.55	APPLY LIQUID ASPHALT EMULSION TACK COAT			$6,221				$6,221		$6,221	$6,221		$6,221		$49,766
A.1.56	8" OF ASPHALT CONCRETE ABOVE SAT. MATERIAL			$142,763				$142,763		$142,763	$142,763		$142,763		$1,142,107
A.1.57	2" OF SURFACE COURSE ASPHALT CONCRETE			$81,777				$81,777		$81,777	$81,777		$81,777		$654,217
A.1.58	LIQUID ASPHALT EMULSION TACK COAT			$7,367				$7,367		$7,367	$7,367		$7,367		$58,933
A.1.59	GEOSYNTHETIC CLAY LINER OVER ASPHALT CONCRETE			$249,332				$249,332		$249,332	$249,332		$249,332		$1,994,652
A.1.60	4' 4" OF SATISFACTORY MATERIAL - INCLUDES 1' OF "TOPSOIL"			$149,215				$149,215		$149,215	$149,215		$149,215		$1,193,719
A.1.61	GRADE AREA TO SPECIFICATION			$11,445				$11,445		$11,445	$11,445		$11,445		$91,559
A.1.62	SEEDING, VEGETATIVE COVER (MULCHING, WATERING TRUCK)			$8,095				$8,095		$8,095	$8,095		$8,095		$64,763
A.1.63	WATERING AND MAINTENACE OF VEGETATIVE COVER			$716				$716		$716	$716		$716		$5,726
A.1.64	GRANITE MONUMENT			$1,500				$1,500		$1,500	$1,500		$1,500		$12,000
A.1.65	SETTLEMENT MONITORS - 5 EACH			$587				$587		$587	$587		$587		$4,693
		$1,281,153	$2,405,798	$2,318,086	$1,181,834	$1,096,146	$2,386,484	$2,483,984	$4,195,392	$5,137,469	$3,652,957	$3,335,995	$3,062,228	$1,636,209	$55,032,423

Table B-2. CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE

A.2	CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE	UNIT	QUANTITY	MATL	LABOR	EQUIP	BARE TOTAL	O&P TOTAL	CITY COST INDEX TOTAL	TOTAL COST	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
A.2.1	SURVEY CELLS	LF	6039	0.03	0.56	0.00	0.59	0.68	0.53	$3,196	$3,196			$3,196				
A.2.2	DISPOSAL UNIT EXCAVATION	CY	56800	0.00	0.33	1.65	1.98	2.31	1.80	$102,342	$102,342			$102,342				
A.2.3	DUMP TRUCK LOADING	CY	56800	0.00	0.05	0.25	0.30	0.35	0.27	$15,351	$15,351			$15,351				
A.2.4	HAUL	CY	56800	0.00	0.69	1.73	2.42	2.97	2.32	$131,583	$131,583			$131,583				
A.2.5	BOUNDARY FENCE, 5' GALVANIZED	LF	1684	1.25	0.00	0.00	1.25	1.44	1.12	$1,888	$1,888							
A.2.6	REMOVE AND RESET CHAIN LINK FENCE	LF	1684	0.00	6.19	0.08	6.27	7.21	5.62	$9,471	$9,471			$9,471				
A.2.7	CONSTRUCT RAMP																	
A.2.8	COMPACT SUBGRADE	CY	488	0.00	0.23	0.42	0.65	0.82	0.64	$312	$312			$312				
A.2.9	14" AGGREGATE BASE, COARSE	SY	1463	17.97	0.58	1.18	19.73	21.72	16.94	$24,782	$24,782			$24,782				
A.2.10	6" AGGREGATE SURFACE, COARSE	SY	1463	7.70	0.35	0.71	8.76	9.75	7.61	$11,126	$11,126			$11,126				
A.2.11	NEUTRON PROBE ASSEMBLY																	
A.2.12	ALUMINUM TUBE FOR NEUTRON PROBE	LF	590	9.35	7.40	9.20	25.95	33.19	25.89	$15,274	$15,274			$15,274				
A.2.13	END CAP FOR ALUMINUM TUBE	EA	5	74.50	24.50	0.00	99.00	120.00	93.60	$468	$468			$468				
A.2.14	CONCRETE COLLAR	CY	1.5	83.50	52.50	0.68	136.68	176.00	137.28	$206	$206			$206				
A.2.15	GRADE CELL FLOOR TO SPECIFICATION	SY	1644	0.00	0.19	0.28	0.47	0.61	0.48	$782	$782			$782				
A.2.16	COMPACT SUBGRADE	CY	274	0.00	0.23	0.42	0.65	0.82	0.64	$175	$175			$175				
A.2.17	WATER MANAGEMENT (DUST CONTROL & HYDRATION)	AC	20	2.46	14.44	23.00	39.90	45.89	35.79	$716	$716			$716				
A.2.18	PLACE AND COMPACT CELL SOIL LINER	CY	12680	0.25	1.76	4.07	6.08	6.99	5.45	$69,154	$69,154			$69,154				
A.2.19	PLACE GEOTEXTILE, NON-WOVEN	SY	1416	0.63	0.45	0.03	1.11	1.11	1.11	$1,577	$1,577			$1,577				
A.2.20	CONSTRUCT UNDER DRAIN																	
A.2.21	EXCAVATE UNDER DRAIN	CY	280	0.00	1.93	1.44	3.37	4.56	3.56	$996	$996			$996				
A.2.22	GEOTEXTILE, NON-WOVEN	SY	1030	0.63	0.45	0.03	1.11	1.11	1.11	$1,147	$1,147			$1,147				
A.2.23	3/8" CRUSHED STONE FILL FOR UNDER DRAIN	CY	280	16.50	1.52	1.18	19.20	22.08	17.22	$4,822	$4,822			$4,822				
A.2.24	CONCRETE SUMP ASSEMBLY																	
A.2.25	HAND EXCAVATE AREA	CY	13.2	0.00	20.50	0.00	20.50	32.50	25.35	$335	$335			$335				
A.2.26	FORMWORK	SFCA	155.8	0.83	4.70	0.00	5.53	7.20	5.62	$875	$875			$875				
A.2.27	REBAR	TN	0.136	550.00	590.00	0.00	1140.00	1625.00	1267.50	$172	$172			$172				
A.2.28	CONCRETE	CY	6	59.00	8.70	0.62	68.32	79.25	61.82	$371	$371			$371				
A.2.29	8" PVC STANDPIPE	LF	180	4.26	4.25	0.84	9.35	12.25	9.56	$1,720	$1,720			$1,720				
A.2.30	12" SLEEVE	EA	4	74.50	24.50	0.00	99.00	120.00	93.60	$374	$374			$374				
A.2.31	CONCRETE COLLAR	CY	1.2	83.50	52.50	0.68	136.68	176.00	137.28	$165	$165			$165				
A.2.32	2' MINIMUM CELL FLOOR GRAVELLY SAND	CY	1731	6.45	0.58	1.66	8.69	9.99	7.79	$13,493	$13,493			$13,493				
A.2.33	PLACE 6" CELL FLOOR CRUSHED 3/4" STONE BASE	SY	1600	7.70	0.35	0.71	8.76	9.75	7.61	$12,168	$12,168			$12,168				
A.2.34	CANISTER PURCHASE	EA	135	2500.00	0.00	0.00	2500.00	2500.00	2500.00	$337,500	$202,972	$278,273	$124,801	$51,325	$51,437	$48,344	$50,058	$50,169
A.2.35	CANISTER PLACEMENT										$0	$0	$0	$0	$0	$0	$0	$0
A.2.36	WASTE PLACEMENT - SLINGS	EA	36	45.00	0.00	0.00	45.00	45.00	45.00	$1,620	$974	$1,336	$599	$246	$247	$232	$240	$241
A.2.37	BACKFILL VOIDS IN CANISTERS WITH GROUT	CF	12758	1.59	0.00	0.00	1.59	1.59	1.59	$20,318	$12,219	$16,753	$7,513	$3,090	$3,097	$2,910	$3,014	$3,020
A.2.38	STEEL MATS OF #4 REINFORCING STEEL	TN	21.2	520.00	0.00	0.00	520.00	520.00	405.60	$8,599	$5,171	$7,090	$3,180	$1,308	$1,310	$1,232	$1,275	$1,278
A.2.39	CONCRETE LID POUR (DELIVERY INCLUDED IN MATERIAL COST)	CY	229.5	69.85	0.00	0.00	69.85	77.00	60.06	$13,784	$8,290	$11,365	$5,097	$2,096	$2,101	$1,974	$2,044	$2,049
A.2.40	BRASS ID PLATE WITH ENGRAVINGS (6" X 6")	EA	135	15.00	0.00	0.00	15.00	15.00	11.70	$1,580	$950	$1,302	$584	$240	$241	$226	$234	$235
A.2.41	BACKFILL AROUND CANISTERS WITH 3/8" CRUSHED STONE	CY	6095	16.50	0.00	0.00	16.50	16.50	12.87	$78,443	$47,175	$64,677	$29,007	$11,929	$11,955	$11,236	$11,635	$11,660
A.2.42	PLACE 2' GRAVELLY SAND	CY	2593	6.20	0.00	0.00	6.20	6.20	4.84	$12,540	$7,541	$10,339	$4,637	$1,907	$1,911	$1,796	$1,860	$1,864
A.2.43	PLACE MINIMUM 2' OF SAT MATL - TEMP COVER	CY	4779	0.25	0.00	0.00	0.25	0.25	0.20	$932	$560	$768	$345	$142	$142	$133	$138	$139
A.2.44	PLACE MINIMUM 7' 4" OF SATISFACTORY MATERIAL	CY	13734	0.25	1.76	4.07	6.08	6.99	5.45	$74,902		$74,902			$74,902			
A.2.45	BACKFILL ACCESS RAMP	CY	15875	0.25	1.76	4.07	6.08	6.99	5.45	$86,578		$86,578			$86,578			
A.2.46	COMPACT CLAY LINER	CY	1075	0.00	0.23	0.42	0.65	0.82	0.64	$688		$688			$688			
A.2.47	COVER ACCESS RAMP BACKFILL	CY	2060	0.25	1.76	4.07	6.08	6.99	5.45	$11,235		$11,235			$11,235			
A.2.48	COVER SYSTEM AND SECONDARY DRAINAGE DITCH INTERFACE																	
A.2.49	COMPACT SUBGRADE	CY	1310	0.00	0.23	0.42	0.65	0.82	0.64	$838		$838			$838			
A.2.50	PLACE GEOTEXTILE, NON-WOVEN	SY	3181	0.63	0.45	0.03	1.11	1.11	1.11	$3,542		$3,542			$3,542			
A.2.51	PLACE RIPRAP	CY	1600	15.40	6.70	8.00	30.10	36.00	28.08	$44,928		$44,928			$44,928			
A.2.52	AMEND DITCH LINING WITH LIME	BCY	39	8.29	1.19	6.65	16.13	18.55	14.47	$569		$569			$569			
A.2.53	PLACE 12" THICK LIME AMENDED DITCH LINING	CY	1310	0.25	1.76	4.07	6.08	6.99	5.45	$7,144		$7,144			$7,144			
A.2.54	GRADE AREA TO SPECIFICATION	SY	7111	0.00	0.19	0.28	0.47	0.61	0.48	$3,383		$3,383			$3,383			
A.2.55	APPLY LIQUID ASPHALT EMULSION TACK COAT	SY	7111	0.28	0.04	0.06	0.38	0.44	0.34	$2,424		$2,424			$2,424			
A.2.56	PLACE 8" OF ASPHALT CONCRETE ABOVE SAT MATERIAL	TN	3146	18.97	0.27	0.60	19.84	22.82	17.80	$55,988		$55,988			$55,988			
A.2.57	PLACE 2" OF SURFACE COURSE ASPHALT CONCRETE	TN	787	29.63	8.90	6.94	45.47	52.29	40.79	$32,099		$32,099			$32,099			
A.2.58	APPLY LIQUID ASPHALT EMULSION TACK COAT	SY	7111	0.35	0.04	0.06	0.45	0.52	0.40	$2,870		$2,870			$2,870			
A.2.59	PLACE GEOSYNTHETIC CLAY LINER OVER ASPHALT CONCRETE	SF	191997	0.35	0.15	0.01	0.51	0.51	0.51	$97,150		$97,150			$97,150			
A.2.60	4' 4" OF SATISFACTORY MATERIAL - INCLUDES 1' OF "TOPSOIL"	CY	9200	0.25	1.76	4.07	6.08	6.99	5.45	$50,175		$50,175			$50,175			
A.2.61	GRADE AREA TO SPECIFICATION	SY	9834	0.00	0.19	0.28	0.47	0.61	0.48	$4,679		$4,679			$4,679			
A.2.62	SEEDING, VEGETATIVE COVER (MULCHING, WATERING TRUCK)	AC	2	1708.75	37.13	59.11	1804.99	2075.74	1619.08	$3,238		$3,238			$3,238			
A.2.63	WATERING AND MAINTENACE OF VEGETATIVE COVER	AC	8	2.46	14.44	23.00	39.90	45.89	35.79	$286		$286			$286			
A.2.64	GRANITE MONUMENT	EA	1	1500.00	0.00	0.00	1500.00	1500.00	1500.00	$1,500		$1,500			$1,500			
A.2.65	SETTLEMENT MONITORS	EA	5	52.34	71.78	6.67	130.79	150.41	117.32	$587		$587			$587			
										TOTALS:	$710,894	$876,705	$175,762	$495,437	$557,244	$68,084	$70,498	$70,655

Table B-2. CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPE

A.2	CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	TOTAL
A.2.1	SURVEY CELLS			$3,196										$9,588
A.2.2	DISPOSAL UNIT EXCAVATION			$102,342										$307,027
A.2.3	DUMP TRUCK LOADING			$15,351										$46,054
A.2.4	HAUL			$131,583										$394,749
A.2.5	BOUNDARY FENCE, 5' GALVANIZED													$1,888
A.2.6	REMOVE AND RESET CHAIN LINK FENCE			$9,471										$28,413
A.2.7	CONSTRUCT RAMP													
A.2.8	COMPACT SUBGRADE			$312										$936
A.2.9	14" AGGREGATE BASE, COARSE			$24,782										$74,345
A.2.10	6" AGGREGATE SURFACE, COARSE			$11,126										$33,378
A.2.11	NEUTRON PROBE ASSEMBLY													
A.2.12	ALUMINUM TUBE FOR NEUTRON PROBE			$15,274										$45,822
A.2.13	END CAP FOR ALUMINUM TUBE			$468										$1,404
A.2.14	CONCRETE COLLAR			$206										$618
A.2.15	GRADE CELL FLOOR TO SPECIFICATION			$782										$2,347
A.2.16	COMPACT SUBGRADE			$175										$526
A.2.17	WATER MANAGEMENT (DUST CONTROL & HYDRATION)			$716										$2,147
A.2.18	PLACE AND COMPACT CELL SOIL LINER			$69,154										$207,461
A.2.19	PLACE GEOTEXTILE, NON-WOVEN			$1,577										$4,730
A.2.20	CONSTRUCT UNDER DRAIN													
A.2.21	EXCAVATE UNDER DRAIN			$996										$2,988
A.2.22	GEOTEXTILE, NON-WOVEN			$1,147										$3,441
A.2.23	3/8" CRUSHED STONE FILL FOR UNDER DRAIN			$4,822										$14,467
A.2.24	CONCRETE SUMP ASSEMBLY													
A.2.25	HAND EXCAVATE AREA			$335										$1,004
A.2.26	FORMWORK			$875										$2,624
A.2.27	REBAR			$172										$517
A.2.28	CONCRETE			$371										$1,113
A.2.29	8" PVC STANDPIPE			$1,720										$5,160
A.2.30	12" SLEEVE			$374										$1,123
A.2.31	CONCRETE COLLAR			$165										$494
A.2.32	2' MINIMUM CELL FLOOR GRAVELLY SAND			$13,493										$40,479
A.2.33	PLACE 6" CELL FLOOR CRUSHED 3/4" STONE BASE			$12,168										$36,504
A.2.34	CANISTER PURCHASE	$47,076	$41,021	$41,569	$38,911	$41,061	$10,926	$42,958	$10,419	$10,966	$8,309	$10,459	$11,006	$1,172,058
A.2.35	CANISTER PLACEMENT	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
A.2.36	WASTE PLACEMENT - SLINGS	$226	$197	$200	$187	$197	$52	$206	$50	$53	$40	$50	$53	$5,626
A.2.37	BACKFILL VOIDS IN CANISTERS WITH GROUT	$2,834	$2,470	$2,503	$2,343	$2,472	$658	$2,586	$627	$660	$500	$630	$663	$70,561
A.2.38	STEEL MATS OF #4 REINFORCING STEEL	$1,199	$1,045	$1,059	$991	$1,046	$278	$1,094	$265	$279	$212	$266	$280	$29,861
A.2.39	CONCRETE LID POUR (DELIVERY INCLUDED IN MATERIAL COST)	$1,923	$1,675	$1,698	$1,589	$1,677	$446	$1,754	$426	$448	$339	$427	$450	$47,868
A.2.40	BRASS ID PLATE WITH ENGRAVINGS (6" X 6")	$220	$192	$195	$182	$192	$51	$201	$49	$51	$39	$49	$52	$5,485
A.2.41	BACKFILL AROUND CANISTERS WITH 3/8" CRUSHED STONE	$10,941	$9,534	$9,662	$9,044	$9,544	$2,539	$9,985	$2,422	$2,549	$1,931	$2,431	$2,558	$272,413
A.2.42	PLACE 2' GRAVELLY SAND	$1,749	$1,524	$1,544	$1,446	$1,526	$406	$1,596	$387	$407	$309	$389	$409	$43,548
A.2.43	PLACE MINIMUM 2' OF SAT MATL - TEMP COVER	$130	$113	$115	$107	$113	$30	$119	$29	$30	$23	$29	$30	$3,236
A.2.44	PLACE MINIMUM 7' 4" OF SATISFACTORY MATERIAL				$74,902									$224,706
A.2.45	BACKFILL ACCESS RAMP				$86,578									$259,735
A.2.46	COMPACT CLAY LINER				$688									$2,063
A.2.47	COVER ACCESS RAMP BACKFILL				$11,235									$33,704
A.2.48	COVER SYSTEM AND SECONDARY DRAINAGE DITCH INTERFACE													
A.2.49	COMPACT SUBGRADE				$838									$2,514
A.2.50	PLACE GEOTEXTILE, NON-WOVEN				$3,542									$10,626
A.2.51	PLACE RIPRAP				$44,928									$134,784
A.2.52	AMEND DITCH LINING WITH LIME				$569									$1,706
A.2.53	PLACE 12" THICK LIME AMENDED DITCH LINING				$7,144									$21,433
A.2.54	GRADE AREA TO SPECIFICATION				$3,383									$10,150
A.2.55	APPLY LIQUID ASPHALT EMULSION TACK COAT				$2,424									$7,272
A.2.56	PLACE 8" OF ASPHALT CONCRETE ABOVE SAT MATERIAL				$55,988									$167,963
A.2.57	PLACE 2" OF SURFACE COURSE ASPHALT CONCRETE				$32,099									$96,297
A.2.58	APPLY LIQUID ASPHALT EMULSION TACK COAT				$2,870									$8,611
A.2.59	PLACE GEOSYNTHETIC CLAY LINER OVER ASPHALT CONCRETE				$97,150									$291,451
A.2.60	4' 4" OF SATISFACTORY MATERIAL - INCLUDES 1' OF "TOPSOIL"				$50,175									$150,524
A.2.61	GRADE AREA TO SPECIFICATION				$4,679									$14,037
A.2.62	SEEDING, VEGETATIVE COVER (MULCHING, WATERING TRUCK)				$3,238									$9,714
A.2.63	WATERING AND MAINTENACE OF VEGETATIVE COVER				$286									$859
A.2.64	GRANITE MONUMENT				$1,500									$4,500
A.2.65	SETTLEMENT MONITORS				$587									$1,760
		$66,299	$57,772	$481,696	$539,604	$57,828	$15,387	$60,500	$14,673	$15,444	$11,701	$14,729	$15,500	$4,376,413

A.3	PAYROLL	UNIT	QUANTITY	LABOR	TOTAL/YEAR	20 YEAR TOTAL
	PERSONNEL (34% FRINGE BENEFITS)	YR	1	$850,032	$1,139,043	$22,780,857

A.4	EQUIPMENT LEASE/PURCHASE (CONSTANT DOLLAR)	UNIT	QUANTITY	MATERIAL	MAT. TOTAL	LIFE CYCLE	USAGE, HR/DAY	USAGE, DAY/YR	OP COST/HR	EQUIPMENT/YR	REPAIRS/YR
A.4.1	3 CY, 155 HP FRONT END WHEEL LOADER, KOMATSU WA 380	EA	1	185,000.00	185,000.00	10	8	150	9.06	$10,872	$4,625
A.4.2	180 HP MOTOR GRADER, GD670 KOMATSU	EA	1	235,000.00	235,000.00	10	8	150	14.40	$17,280	$5,875
A.4.3	10-12 CY 10-WHEEL END DUMP TRUCK, GMC C7H046	EA	2	215,000.00	430,000.00	10	8	150	16.90	$40,560	$10,750
A.4.4	5 TON OVERHEAD CRANE	EA	1	25,000.00	25,000.00	10	8	150	13.33	$15,996	$625
A.4.5	PORTABLE LIGHT TOWER, 2000 WATT	EA	3	12,300.00	36,900.00	10	8	150	1.50	$5,400	$923
A.4.6	MATERIAL HANDLING SYSTEM	EA	1	9,695.00	9,695.00	20				$0	$121
A.4.7	65 TON HYDRAULIC CRANE	EA	1	150,000.00	150,000.00	20	8	150	23.66	$28,392	$1,875
A.4.8	BULLDOZER CAT. D8	EA	2	198,500.00	397,000.00	10	8	150	10.65	$25,560	$9,925
A.4.9	BACKHOE CAT. 375	EA	1	549,000.00	549,000.00	10	8	150	7.10	$8,520	$13,725
A.4.10	WHEEL SCRAPER 623 F	EA	1	309,000.00	309,000.00	10	8	150	3.10	$3,720	$7,725
A.4.11	FORK LIFT, CLARK C500-100	EA	1	25,000.00	25,000.00	10	8	150	6.20	$7,440	$625
A.4.12	FORK LIFT, CLARK GCS-25	EA	2	20,000.00	40,000.00	10	8	150	6.20	$14,880	$1,000
A.4.13	REMOTE CONTROL PACKAGE FOR CRANE	EA	2	8,000.00	16,000.00	10	8	150		$0	$400
A.4.14	FARM TRACTOR, FORD 4630 4X4	EA	1	25,000.00	25,000.00	10	8	150	4.40	$5,280	$625
A.4.15	UTILITY TRAILER, ETNYGE 160000#	EA	1	12,800.00	12,800.00	20	8	150	1.35	$1,620	$160
A.4.16	REBAR CUTTER, MUBEA BS100	EA	1	217.65	217.65	5	4	150		$0	$11
A.4.17	REBAR BENDER MUBEA	EA	1	286.95	286.95	5	4	150		$0	$14
A.4.18	1 HP CONCRETE VIBRATOR MOTOR, 3 FT SHAFT AND HEAD	EA	1	587.60	587.60	10	4	150	0.30	$180	$15
A.4.19	MOBILE CONCRETE/GROUT PLANT	EA	1	110,000.00	110,000.00	20	4	150	31.52	$18,912	$1,375
A.4.20	GMC 4X4 PICK-UP TRUCK	EA	2	25,000.00	50,000.00	5	8	250	1.20	$4,800	$2,500
A.4.21	3/4 TON 4X4 SUBURBAN, GMC	EA	2	30,000.00	60,000.00	5	8	250	1.20	$4,800	$3,000
A.4.22	COMMUNICATIONS SYSTEM - CELLULAR TELEPHONES	EA	5	300.00	1,500.00	5	8	350		$0	$75
A.4.23	SMOOTH DRUM COMPACTOR CAT. CS563, 84 IN DRUM	EA	1	123,000.00	123,000.00	10	8	150		$0	$3,075
A.4.24	PUMP, 170 GPM	EA	3	1,000.00	3,000.00	5	8	75	0.50	$900	$150
A.4.25	PUMP, 50 GPM	EA	3	8,000.00	24,000.00	5	8	75	0.50	$900	$1,200
A.4.26	NEUTRON PROBE	EA	1	3,000.00	3,000.00	10	2	30		$0	$75
A.4.27	3300 GALLON WATER TRUCK	EA	1	25,000.00	25,000.00	20	4	150	7.88	$4,728	$313
A.4.28	LABORATORY EQUIPMENT	EA	1	35,000.00	35,000.00	10	0	0		$0	$875
A.4.29	MISCELLANEOUS EQUIPMENT LEASES	YR	1	5,000.00	5,000.00	1	0	0	0.00	$0	$1,250
A.4.30	GPS SYSTEM, ROVER AND BASE RECEIVER	EA	1	8,000.00	8,000.00	5	0	0	0.00	$0	$400
A.4.31	GPS COMPUTER SOFTWARE UPDATES	YR	1	200.00	200.00	1	0	0	0.00	$0	$50
	TOTALS:										

A.4	EQUIPMENT LEASE/PURCHASE (CONSTANT DOLLAR)	LEASE AMT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
A.4.1	3 CY, 155 HP FRONT END WHEEL LOADER, KOMATSU WA 380	$24,544	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041
A.4.2	180 HP MOTOR GRADER, GD670 KOMATSU	$31,177	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332
A.4.3	10-12 CY 10-WHEEL END DUMP TRUCK, GMC C7H046	$57,047	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357
A.4.4	5 TON OVERHEAD CRANE	$3,317	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938
A.4.5	PORTABLE LIGHT TOWER, 2000 WATT	$4,895	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218
A.4.6	MATERIAL HANDLING SYSTEM	$0	$121	$121	$121	$121	$121	$121	$121	$121	$121	$121	$121
A.4.7	65 TON HYDRAULIC CRANE	$12,552	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819
A.4.8	BULLDOZER CAT. D8	$52,669	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154
A.4.9	BACKHOE CAT. 375	$72,835	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080
A.4.10	WHEEL SCRAPER 623 F	$40,994	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439
A.4.11	FORK LIFT, CLARK C500-100	$3,317	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382
A.4.12	FORK LIFT, CLARK GCS-25	$5,307	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187
A.4.13	REMOTE CONTROL PACKAGE FOR CRANE	$0	$400	$400	$400	$400	$400	$400	$400	$400	$400	$400	$400
A.4.14	FARM TRACTOR, FORD 4630 4X4	$3,317	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222
A.4.15	UTILITY TRAILER, ETNYGE 160000#	$1,071	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851
A.4.16	REBAR CUTTER, MUBEA BS100	$0	$11	$11	$11	$11	$229	$11	$11	$11	$11	$229	$11
A.4.17	REBAR BENDER MUBEA	$0	$14	$14	$14	$14	$301	$14	$14	$14	$14	$301	$14
A.4.18	1 HP CONCRETE VIBRATOR MOTOR, 3 FT SHAFT AND HEAD	$0	$195	$195	$195	$195	$195	$195	$195	$195	$195	$782	$195
A.4.19	MOBILE CONCRETE/GROUT PLANT	$9,205	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492
A.4.20	GMC 4X4 PICK-UP TRUCK	$11,709	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009
A.4.21	3/4 TON 4X4 SUBURBAN, GMC	$14,051	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851
A.4.22	COMMUNICATIONS SYSTEM - CELLULAR TELEPHONES	$0	$75	$75	$75	$75	$1,575	$75	$75	$75	$75	$1,575	$75
A.4.23	SMOOTH DRUM COMPACTOR CAT. CS563, 84 IN DRUM	$16,318	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393
A.4.24	PUMP, 170 GPM	$0	$1,050	$1,050	$1,050	$1,050	$4,050	$1,050	$1,050	$1,050	$1,050	$4,050	$1,050
A.4.25	PUMP, 50 GPM	$5,620	$7,720	$7,720	$7,720	$7,720	$31,720	$7,720	$7,720	$7,720	$7,720	$31,720	$7,720
A.4.26	NEUTRON PROBE	$0	$75	$75	$75	$75	$75	$75	$75	$75	$3,075	$75	$75
A.4.27	3300 GALLON WATER TRUCK	$2,092	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132
A.4.28	LABORATORY EQUIPMENT	$4,643	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518
A.4.29	MISCELLANEOUS EQUIPMENT LEASES	$0	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250
A.4.30	GPS SYSTEM, ROVER AND BASE RECEIVER	$0	$400	$400	$400	$400	$8,400	$400	$400	$400	$400	$8,400	$400
A.4.31	GPS COMPUTER SOFTWARE UPDATES	$0	$250	$250	$250	$250	$250	$250	$250	$250	$250	$250	$250
	TOTALS:		$675,975	$675,975	$675,975	$675,975	$712,979	$675,975	$675,975	$675,975	$678,975	$713,567	$675,975

A.4	EQUIPMENT LEASE/PURCHASE (CONSTANT DOLLAR)	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	TOTAL
A.4.1	3 CY, 155 HP FRONT END WHEEL LOADER, KOMATSU WA 380	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$40,041	$800,811
A.4.2	180 HP MOTOR GRADER, GD670 KOMATSU	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$54,332	$1,086,639
A.4.3	10-12 CY 10-WHEEL END DUMP TRUCK, GMC C7H046	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$108,357	$2,167,143
A.4.4	5 TON OVERHEAD CRANE	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$19,938	$398,754
A.4.5	PORTABLE LIGHT TOWER, 2000 WATT	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$11,218	$224,359
A.4.6	MATERIAL HANDLING SYSTEM	$121	$121	$121	$121	$121	$121	$121	$121	$121	$2,424
A.4.7	65 TON HYDRAULIC CRANE	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$42,819	$856,378
A.4.8	BULLDOZER CAT. D8	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$88,154	$1,763,082
A.4.9	BACKHOE CAT. 375	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$95,080	$1,901,592
A.4.10	WHEEL SCRAPER 623 F	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$52,439	$1,048,787
A.4.11	FORK LIFT, CLARK C500-100	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$11,382	$227,634
A.4.12	FORK LIFT, CLARK GCS-25	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$21,187	$423,734
A.4.13	REMOTE CONTROL PACKAGE FOR CRANE	$400	$400	$400	$400	$400	$400	$400	$400	$400	$8,000
A.4.14	FARM TRACTOR, FORD 4630 4X4	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$9,222	$184,434
A.4.15	UTILITY TRAILER, ETNYGE 160000#	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$2,851	$57,022
A.4.16	REBAR CUTTER, MUBEA BS100	$11	$11	$11	$229	$11	$11	$11	$11	$229	$1,088
A.4.17	REBAR BENDER MUBEA	$14	$14	$14	$301	$14	$14	$14	$14	$301	$1,435
A.4.18	1 HP CONCRETE VIBRATOR MOTOR, 3 FT SHAFT AND HEAD	$195	$195	$195	$195	$195	$195	$195	$195	$195	$4,481
A.4.19	MOBILE CONCRETE/GROUT PLANT	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$29,492	$589,835
A.4.20	GMC 4X4 PICK-UP TRUCK	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$19,009	$380,176
A.4.21	3/4 TON 4X4 SUBURBAN, GMC	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$21,851	$437,012
A.4.22	COMMUNICATIONS SYSTEM - CELLULAR TELEPHONES	$75	$75	$75	$1,575	$75	$75	$75	$75	$1,575	$7,500
A.4.23	SMOOTH DRUM COMPACTOR CAT. CS563, 84 IN DRUM	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$19,393	$387,863
A.4.24	PUMP, 170 GPM	$1,050	$1,050	$1,050	$4,050	$1,050	$1,050	$1,050	$1,050	$4,050	$33,000
A.4.25	PUMP, 50 GPM	$7,720	$7,720	$7,720	$31,720	$7,720	$7,720	$7,720	$7,720	$31,720	$250,405
A.4.26	NEUTRON PROBE	$75	$75	$75	$75	$75	$75	$75	$75	$75	$4,500
A.4.27	3300 GALLON WATER TRUCK	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$7,132	$142,650
A.4.28	LABORATORY EQUIPMENT	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$5,518	$110,367
A.4.29	MISCELLANEOUS EQUIPMENT LEASES	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$6,250	$125,000
A.4.30	GPS SYSTEM, ROVER AND BASE RECEIVER	$400	$400	$400	$8,400	$400	$400	$400	$400	$8,400	$40,000
A.4.31	GPS COMPUTER SOFTWARE UPDATES	$250	$250	$250	$250	$250	$250	$250	$250	$250	$5,000
	TOTALS:	$675,975	$675,975	$675,975	$712,979	$675,975	$675,975	$675,975	$675,975	$712,979	$13,671,103

A.4	EQUIPMENT LEASE/PURCHASE (ESCALATED COSTS)	UNIT	QUANTITY	MATERIAL	MAT. TOTAL	MAT. TOTAL, 8	LEASE AMT	MAT. TOTAL 13	LEASE AMT	MAT. TOTAL 18	LEASE AMT	LIFE CYCLE	USAGE, HR/DAY	USAGE, DAY/YR	OP COST/HR
A.4.1	3 CY, 155 HP FRONT END WHEEL LOADER, KOMATSU WA 380	EA	1	185,000.00	185,000.00			271,678.74	36,043.01			10	8	150	9.06
A.4.2	180 HP MOTOR GRADER, GD670 KOMATSU	EA	1	235,000.00	235,000.00			345,105.42	45,784.37			10	8	150	14.40
A.4.3	10-12 CY 10-WHEEL END DUMP TRUCK, GMC C7H046	EA	2	215,000.00	430,000.00			631,469.50	83,775.65			10	8	150	16.90
A.4.4	5 TON OVERHEAD CRANE	EA	1	25,000.00	25,000.00			36,713.34	4,870.68			10	8	150	13.33
A.4.5	PORTABLE LIGHT TOWER, 2000 WATT	EA	3	12,300.00	36,900.00			54,188.89	7,189.12			10	8	150	1.50
A.4.6	MATERIAL HANDLING SYSTEM	EA	1	9,695.00	9,695.00							20			
A.4.7	65 TON HYDRAULIC CRANE	EA	1	150,000.00	150,000.00							20	8	150	23.66
A.4.8	BULLDOZER CAT. D8	EA	2	198,500.00	397,000.00			583,007.88	77,346.36			10	8	150	10.65
A.4.9	BACKHOE CAT. 375	EA	1	549,000.00	549,000.00			806,225.01	106,960.07			10	8	150	7.10
A.4.10	WHEEL SCRAPER 623 F	EA	1	309,000.00	309,000.00			453,776.92	60,201.57			10	8	150	3.10
A.4.11	FORK LIFT, CLARK C500-100	EA	1	25,000.00	25,000.00			36,713.34	4,870.68			10	8	150	6.20
A.4.12	FORK LIFT, CLARK GCS-25	EA	2	20,000.00	40,000.00			58,741.35	7,793.08			10	8	150	6.20
A.4.13	REMOTE CONTROL PACKAGE FOR CRANE	EA	2	8,000.00	16,000.00			23,496.54	3,117.23			10	8	150	
A.4.14	FARM TRACTOR, FORD 4630 4X4	EA	1	25,000.00	25,000.00			36,713.34	4,870.68			10	8	150	4.40
A.4.15	UTILITY TRAILER, ETNYGE 160000#	EA	1	12,800.00	12,800.00							20	8	150	1.35
A.4.16	REBAR CUTTER, MUBEA BS100	EA	1	217.65	217.65							5	4	150	
A.4.17	REBAR BENDER MUBEA	EA	1	286.95	286.95							5	4	150	
A.4.18	1 HP CONCRETE VIBRATOR MOTOR, 3 FT SHAFT AND HEAD	EA	1	587.60	587.60							10	4	150	0.30
A.4.19	MOBILE CONCRETE/GROUT PLANT	EA	1	110,000.00	110,000.00							20	4	150	31.52
A.4.20	GMC 4X4 PICK-UP TRUCK	EA	2	25,000.00	50,000.00	63,338.50	14,832.39	73,426.69	17,194.80	85,121.65	19,933.49	5	8	250	1.20
A.4.21	3/4 TON 4X4 SUBURBAN, GMC	EA	2	30,000.00	60,000.00	76,006.20	17,798.86	88,112.02	20,633.76	102,145.98	23,920.18	5	8	250	1.20
A.4.22	COMMUNICATIONS SYSTEM - CELLULAR TELEPHONES	EA	5	300.00	1,500.00							5	8	350	
A.4.23	SMOOTH DRUM COMPACTOR CAT. CS563, 84 IN DRUM	EA	1	123,000.00	123,000.00			180,629.65	23,963.73			10	8	150	
A.4.24	PUMP, 170 GPM	EA	3	1,000.00	3,000.00							5	8	75	0.50
A.4.25	PUMP, 50 GPM	EA	3	8,000.00	24,000.00	30,402.48	7,119.54	35,244.81	8,253.50	40,858.39	9,568.07	5	8	75	0.50
A.4.26	NEUTRON PROBE	EA	1	3,000.00	3,000.00							10	2	30	
A.4.27	3300 GALLON WATER TRUCK	EA	1	25,000.00	25,000.00							20	4	150	7.88
A.4.28	LABORATORY EQUIPMENT	EA	1	35,000.00	35,000.00			51,398.68	6,818.95			10	0	0	
A.4.29	MISCELLANEOUS EQUIPMENT LEASES	YR	1	5,000.00	5,000.00							1	0	0	0.00
A.4.30	GPS SYSTEM, ROVER AND BASE RECEIVER	EA	1	8,000.00	8,000.00							5	0	0	0.00
A.4.31	GPS COMPUTER SOFTWARE UPDATES	YR	1	200.00	200.00							1	0	0	0.00
	TOTALS:														

A.5	BUILDING AND FACILITY MAINTENANCE	UNIT	QUANTITY	TOTAL/YEAR	20 YEAR TOTAL
A.5.1	BUILDING MAINTENANCE	YR	1	$17,820	$356,400
A.5.2	FACILITY MAINTENANCE	YR	1	$25,450	$509,000
			TOTALS:	$43,270	$865,400

A.6	UTILITIES AND CONSUMABLES	UNIT	QUANTITY	MATERIAL	TOTAL/YEAR	20 YEAR TOTAL
A.6.1	ELECTRICITY	MO	12	18,531.60	$222,379	$4,447,584
A.6.2	TELEPHONE	MO	12	800.00	$9,600	$192,000
A.6.3	DATA LINES	MO	12	300	$3,600	$72,000
A.6.4	WATER	MO	12	74.25	$891	$17,820
A.6.5	OFFICE SUPPLIES	MO	12	300.00	$3,600	$72,000
A.6.6	MAINTENANCE/SHOP	MO	12	700.00	$8,400	$168,000
A.6.7	LABORATORY SUPPLIES	MO	12	500.00	$6,000	$120,000
A.6.8	SAFETY EQUIPMENT (SAFETY GLASSES AND HARD HATS)	EA	50	21.61	$1,081	$21,610
A.6.9	LEVEL D CLOTHING (GLOVES, COVERALLS, STEEL-TOED BOOTS)	EA	50	102.05	$5,103	$102,050
A.6.10	LEVEL C HALF-FACE RESPIRATOR AND CARTRIDGES	EA	60	22.36	$1,342	$26,832
A.6.11	TYVEK COVERALLS AND BOOT COVERS, 10 WORKERS, 2 PER DAY	MO	200	6.66	$15,984	$319,680
				TOTALS:	$277,979	$5,559,576

A.7	OFFICE EQUIPMENT	UNIT	QUANTITY	MATL	BARE TOTAL	O&P TOTAL	TOTAL COST	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
A.7.1	FAX MACHINE (6 YR REPLACEMENT)	EA	3	600.00	600.00	600.00	$1,800						$1,800	
A.7.2	COMPUTER (4 YR REPLACEMENT)	EA	12	2500.00	2500.00	2500.00	$30,000				$30,000			
A.7.3	PRINTER (4 YR REPLACEMENT)	EA	3	1500.00	1500.00	1500.00	$4,500				$4,500			
A.7.4	COPY MACHINE (6 YR REPLACMENT)	EA	3	6500.00	6500.00	6500.00	$19,500						$19,500	
A.7.5	MICROWAVE (10 YR REPLACEMENT)	EA	2	200.00	200.00	200.00	$400							
A.7.6	TELEVISION / VCR (10 YR REPLACEMENT)	EA	2	1000.00	1000.00	1000.00	$2,000							
A.7.7	OTHER (5 YR REPLACEMENT)	LS	1	10000.00	10000.00	10000.00	$10,000					$10,000		
							TOTALS:	$0	$0	$0	$34,500	$10,000	$21,300	$0

A.8	TRAINING	UNIT	QUANTITY	MATERIAL	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
A.8.1	EMERGENCY EXERCISE TRAINING FOR SITE, EVERY 3 YEARS BEGINNING AT YEAR 0	EA	1	35,000.00			$35,000			$35,000			$35,000
A.8.2	MISCELLANEOUS TRAINING (2% OF PAYROLL)	YR	1	22,780.86	$22,781	$22,781	$22,781	$22,781	$22,781	$22,781	$22,781	$22,781	$22,781
A.8.3	OSHA 40-HOUR HEALTH AND SAFETY TRAINING, 30, 10% TURNOVER	EA	1	425.00	$1,275	$1,275	$1,275	$1,275	$1,275	$1,275	$1,275	$1,275	$1,275
A.8.4	OSHA 8-HOUR HEALTH AND SAFETY TRAINING - SUPERVISOR, 9, 5 TURNOVERS IN 30 YEARS	EA	1	125.00						$125			
A.8.5	OSHA 8-HOUR HEALTH AND SAFETY TRAINING REFRESHER, 27 (30-10%)	EA	1	110.00	$2,970	$2,970	$2,970	$2,970	$2,970	$2,970	$2,970	$2,970	$2,970
				TOTALS:	$27,026	$27,026	$62,026	$27,026	$27,026	$62,151	$27,026	$27,026	$62,026

A.9	MONITORING	UNIT	QUANTITY	MATERIAL	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
A.9.1	AMBIENT AIR MONITORS (5 YR)	EA	7	1,841.98					$12,894					$12,894
A.9.2	AIR PARTICULATE ANALYSES (7 LOCATIONS)													
A.9.3	GROSS ALPHA AND BETA	YR	28	92.10	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579
A.9.4	TSS	YR	28	132.01	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696
A.9.5	ADDITIONAL AIR SAMPLING	YR	5	700.00	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500
A.9.6	WELL MAINTENANCE EQUIPMENT	YR	11	3,000.00	$33,000			$33,000			$33,000			$33,000
A.9.7	GROUNDWATER SAMPLING MATERIALS (5YR)	EA	1	150.00					$200					$200
A.9.8	GROUNDWATER ANALYSES (11 LOCATIONS)													
A.9.9	GROSS ALPHA AND BETA	YR	44	50.00	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200
A.9.10	GAMMA	YR	44	70.00	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080
A.9.11	H-3	YR	44	65.00	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860
A.9.12	C-14	YR	44	125.00	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500
A.9.13	RADON 222	YR	44	50.00	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200
A.9.14	CHEMISTRY	YR	20	700.00	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000
A.9.15	SURFACE WATER SAMPLING MATERIALS (5 YR)	EA	1	192.00					$192					$192
A.9.16	SURFACE WATER ANALYSES (6 LOCATIONS)													
A.9.17	GROSS ALPHA AND BETA	YR	30	50.00	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500
A.9.18	GAMMA	YR	30	70.00	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100
A.9.19	H-3	YR	30	65.00	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950
A.9.20	C-14	YR	30	125.00	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
A.9.21	CHEMISTRY	YR	20	700.00	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000
A.9.22	SOIL SAMPLING EQUIPMENT (5 YR)	EA	1	318.17					$318					$318
A.9.23	SOIL ANALYSES (7 LOCATIONS)													
A.9.24	GAMMA	YR	28	75.00	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100
A.9.25	SEDIMENT SAMPLING EQIPMENT (5 YR)	EA	1	418.52					$419					$419
A.9.26	SEDIMENT ANALYSES (8 LOCATIONS)													
A.9.27	GAMMA	YR	32	75.00	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400
A.9.28	VEGETATION ANALYSES (9 LOCATIONS)													
A.9.29	GROSS ALPHA AND BETA	YR	18	55.00	$990	$990	$990	$990	$990	$990	$990	$990	$990	$990
A.9.30	GAMMA	YR	18	70.00	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260
A.9.31	H-3	YR	18	75.00	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350
A.9.32	C-14	YR	18	150.00	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700
A.9.33	MAMMAL SAMPLING EQUIPMENT (5 YR)	EA	1	123.00					$123					$123
A.9.34	MAMMAL TISSUE ANALYSES													
A.9.35	GROSS ALPHA AND BETA	YR	2	85.00	$170	$170	$170	$170	$170	$170	$170	$170	$170	$170
A.9.36	GAMMA	YR	2	75.00	$150	$170	$170	$170	$170	$170	$170	$170	$170	$170
A.9.37	H-3	YR	2	75.00	$150	$170	$170	$170	$170	$170	$170	$170	$170	$170
A.9.38	C-14	YR	2	135.00	$270	$170	$170	$170	$170	$170	$170	$170	$170	$170
A.9.39	RADON (8 LOCATIONS)	YR	100	18.00	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800
A.9.40	TLD ENVIRONMENTAL	YR	180	20.00	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600
A.9.41	TLD PERSONNEL AND VISITORS	YR	200	20.00	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000
A.9.42	BIOASSAYS (BIANNUAL, 40 PEOPLE)	YR	80	184.2	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736
A.9.43	SAMPLE SHIPMENTS	YR	5	500.00	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500
A.9.44	ADDITIONAL EQUIPMENT	YR	1	200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200
				TOTALS:	$134,291	$101,231	$101,231	$134,231	$115,377	$101,231	$134,231	$101,231	$101,231	$148,377

A.9	MONITORING	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	TOTAL
A.9.1	AMBIENT AIR MONITORS (5 YR)					$12,894					$12,894	$51,575
A.9.2	AIR PARTICULATE ANALYSES (7 LOCATIONS)											
A.9.3	GROSS ALPHA AND BETA	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$2,579	$51,576
A.9.4	TSS	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$3,696	$73,926
A.9.5	ADDITIONAL AIR SAMPLING	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$70,000
A.9.6	WELL MAINTENANCE EQUIPMENT			$33,000			$33,000			$33,000		$231,000
A.9.7	GROUNDWATER SAMPLING MATERIALS (5YR)					$200					$200	$800
A.9.8	GROUNDWATER ANALYSES (11 LOCATIONS)											
A.9.9	GROSS ALPHA AND BETA	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$44,000
A.9.10	GAMMA	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$3,080	$61,600
A.9.11	H-3	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$2,860	$57,200
A.9.12	C-14	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500	$110,000
A.9.13	RADON 222	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$44,000
A.9.14	CHEMISTRY	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$280,000
A.9.15	SURFACE WATER SAMPLING MATERIALS (5 YR)					$192					$192	$768
A.9.16	SURFACE WATER ANALYSES (6 LOCATIONS)											
A.9.17	GROSS ALPHA AND BETA	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$30,000
A.9.18	GAMMA	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$42,000
A.9.19	H-3	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$1,950	$39,000
A.9.20	C-14	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$75,000
A.9.21	CHEMISTRY	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$14,000	$280,000
A.9.22	SOIL SAMPLING EQUIPMENT (5 YR)					$318					$318	$1,273
A.9.23	SOIL ANALYSES (7 LOCATIONS)											
A.9.24	GAMMA	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$42,000
A.9.25	SEDIMENT SAMPLING EQIPMENT (5 YR)					$419					$419	$1,674
A.9.26	SEDIMENT ANALYSES (8 LOCATIONS)											
A.9.27	GAMMA	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$48,000
A.9.28	VEGETATION ANALYSES (9 LOCATIONS)											
A.9.29	GROSS ALPHA AND BETA	$990	$990	$990	$990	$990	$990	$990	$990	$990	$990	$19,800
A.9.30	GAMMA	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$25,200
A.9.31	H-3	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$27,000
A.9.32	C-14	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$2,700	$54,000
A.9.33	MAMMAL SAMPLING EQUIPMENT (5 YR)					$123					$123	$492
A.9.34	MAMMAL TISSUE ANALYSES											
A.9.35	GROSS ALPHA AND BETA	$170	$170	$170	$170	$170	$170	$170	$170	$170	$170	$3,400
A.9.36	GAMMA	$170	$170	$170	$170	$170	$170	$170	$170	$170	$170	$3,380
A.9.37	H-3	$170	$170	$170	$170	$170	$170	$170	$170	$170	$170	$3,380
A.9.38	C-14	$170	$170	$170	$170	$170	$170	$170	$170	$170	$170	$3,500
A.9.39	RADON (8 LOCATIONS)	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$36,000
A.9.40	TLD ENVIRONMENTAL	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$72,000
A.9.41	TLD PERSONNEL AND VISITORS	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$80,000
A.9.42	BIOASSAYS (BIANNUAL, 40 PEOPLE)	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$14,736	$294,720
A.9.43	SAMPLE SHIPMENTS	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$50,000
A.9.44	ADDITIONAL EQUIPMENT	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$4,000
		$101,231	$101,231	$134,231	$101,231	$115,377	$134,231	$101,231	$101,231	$134,231	$115,377	$2,312,264

A.10	REGULATORY COSTS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
A.10.1	INSPECTIONS/MONITORING	$127,098	$82,212	$82,212	$82,212	$82,212	$127,098	$82,212	$82,212	$82,212	$82,212	$127,098
A.10.2	LICENSING (CLOSURE AND TRANSFER)											
A.10.3	ARCHIVING OF RECORDS	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200
	TOTALS:	$127,298	$82,412	$82,412	$82,412	$82,412	$127,298	$82,412	$82,412	$82,412	$82,412	$127,298

Appendix B

"Texas Life-Cycle Cost Study";
Cost Estimate Spreadsheets

	A	B	C	D	E	G	H	I	J	K	L	M	N	O
1	**C9733/1 TEXAS LLW DISPOSAL FACILITY LIFE CYCLE COST STUDY**													
2														
3														
4														
5	**CITY COST INDEX (EL PASO - 798, 799, 885) = 78.0% MATERIALS, LABOR, AND EQUIPMENT FOR ALL CONSTRUCTION CATEGORIES (RS MEANS)**													
6	**M = RS MEANS 1998 BUILDING CONSTRUCTION COST DATA**													
7	**E = ECHOS 1997 ENVIRONMENTAL RESTORATION UNIT COST BOOK**													
8														
9		**15%**	**<==O & P % IF NOT PROVIDED**											
10		**78%**	**<==CITY COST INDEX**											
11														
12														
13	**REFERENCES**													
14		RDR1 - RADIAN DESIGN REPORT FOR OPERATION OF DISPOSAL CELLS												
15		RDR2 - RADIAN DESIGN REPORT FOR CONSTRUCTION AND CLOSURE OF DISPOSAL CELLS												
16		RCE - RADIAN COST ESTIMATE												
17		APP - TLLRWD APPLICATION												
18		RAE - PRELIMINARY COST ESTIMATE FOR TX												
19														
20														
21	**1-2:**			**DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE**	**UNIT**	**MATL**	**LABOR**	**EQUIP**	**BARE TOTAL**	**O & P TOTAL**	**O&P %**	**REFERENCE**	**TYPE A QTY REF**	**TYPE B/C QTY REF**
22				SURVEY CELLS (USE 3X CELL PERIMETER)	LF	0.03	0.56		0.59	0.68	15.0%	M-013-306-0800	C-27	C-28
23				DISPOSAL UNIT EXCAVATION (BACKHOE, HYDRAULIC, CRAWLER MTD., 3 CY CAP., 160 CY/HR)	CY		0.33	1.65	1.98	2.31	16.7%	M-022-238-0300	RDR2-3	RDR2-3
24				DUMP TRUCK LOADING (15 % OF EXCAVATION NUMBERS)	CY		0.05	0.25	0.30	0.35	16.7%	M-022-238-0020	RDR2-3	RDR2-3
25				HAUL (12 CY DUMP TRUCK, 0.5 MILE RT, 3.2 LOADS/HR)	CY		0.69	1.73	2.42	2.97	22.7%	M-022-266-0320	RDR2-3	RDR2-3
26				BOUNDARY FENCE, 5' GALVANIZED	LF	1.25			1.25	1.44	15.0%	E-18-04-0105	C-24	C-25
27				REMOVE AND RESET CHAIN LINK FENCE	LF		6.19	0.08	6.27	7.21	15.0%	E-17-02-0701	C-24	C-25
28				CONSTRUCT RAMP										
29				COMPACT SUBGRADE	CY		0.23	0.42	0.65	0.82	26.2%	M-022-222-0300	C-24	C-25, 26
30				14" AGGREGATE BASE, COARSE (INCREASED MATERIAL COST BY 16.7% - 12" TO 14")	SY	17.97	0.58	1.18	19.73	21.72	10.1%	M-022-308-0300	C-24	C-25, 26
31				6" AGGREGATE SURFACE, COARSE	SY	7.70	0.35	0.71	8.76	9.75	11.3%	M-022-308-0100	C-24	C-25, 26
32				NEUTRON PROBE ASSEMBLY (A - 14 EACH)										
33				ALUMINUM TUBE FOR NEUTRON PROBE (MATERIAL REF. 3" DIAMETER - M-160-205-1100)	LF	9.35	7.40	9.20	25.95	33.19	27.9%	M-020-123-0650	DHO	DHO
34				END CAP FOR ALUMINUM TUBE (FOOTNOTE #9, C-25)	EA	74.50	24.50		99.00	120.00	21.2%	M-152-610-3560	DHO	DHO
35				CONCRETE COLLAR (FOOTNOTE #9, C-25)	CY	83.50	52.50	0.68	136.68	176.00	28.8%	M-033-130-5900	DHO	DHO
36				GRADE CELL FLOOR TO SPECIFICATION	SY		0.19	0.28	0.47	0.61	29.8%	M-025-122-0100	C-24, 27	C-25
37				COMPACT SUBGRADE (6" MIN) (RCE 16-2) (C-26)	CY		0.23	0.42	0.65	0.82	26.2%	M-022-222-0300	C-24, 27	C-25
38				WATER MANAGEMENT (DUST CONTROL & HYDRATION)	AC	2.46	14.44	23.00	39.90	45.89	15.0%	E-18-05-0413		
39				PLACE AND COMPACT SOIL LINER (*1 MILE HAUL, SEE E-17-03-0425-02225-3107, C-26)	CY	0.25	1.76	4.07	6.08	6.99	15.0%	E-17-03-0429*	C-24, 27	C-25
40				PLACE GEOTEXTILE, NON-WOVEN	SY	0.63	0.45	0.03	1.11	1.11		FALCON ENV. LIN. SYS	C-24, 27	C-25
41				CONSTRUCT UNDER DRAIN (C-41,42)										
42				EXCAVATE UNDER DRAIN	CY		1.93	1.44	3.37	4.56	35.3%	M-022-254-0060	C-24, 27	C-25, 41
43				PLACE GEOTEXTILE, NON-WOVEN (WRAP AROUND GRAVEL)	SY	0.63	0.45	0.03	1.11	1.11		FALCON ENV. LIN. SYS	C-24, 27	C-25, 41
44				3/8" CRUSHED STONE FILL FOR UNDER DRAIN (REF M-022-212-0360 FOR MATERIAL COST)	CY	16.50	1.52	1.18	19.20	22.08	15.0%	M-022-254-3040	C-24, 27	C-25, 41
45				CONCRETE SUMP ASSEMBLY (C-41,42)										
46				HAND EXCAVATE AREA	CY		20.50		20.50	32.50	58.5%	M-022-246-0010	DHO	DHO
47				FORMWORK	SFCA	0.83	4.70		5.53	7.20	30.2%	M-031-146-0150	DHO	DHO
48				REBAR	TN	550.00	590.00		1140.00	1625.00	42.5%	M-032-107-0200	DHO	DHO
49				CONCRETE	CY	59.00	8.70	0.62	68.32	79.25	16.0%	M-033-172-1900	DHO	DHO
50				8" PVC STANDPIPE	LF	4.26	4.25	0.84	9.35	12.25	31.0%	M-026-686-2950	DHO	DHO
51				12" SLEEVE	EA	74.50	24.50		99.00	120.00	21.2%	M-157-610-3560	DHO	DHO
52				CONCRETE COLLAR	CY	83.50	52.50	0.68	136.68	176.00	28.8%	M-033-130-3900	DHO	DHO
53				PLACE 2' CELL FLOOR GRAVELLY SAND (C-26)	CY	6.45	0.58	1.66	8.69	9.99	15.0%	E-17-03-0426	C-24, 27	C-25
54				PLACE 6" CELL FLOOR CRUSHED 3/4" STONE BASE (C-26)	SY	7.70	0.35	0.71	8.76	9.75	11.3%	M-022-308-0100	C-24, 27	C-25
55				CANISTER PURCHASE	EA	2500.00			2500.00	2500.00	0.0%	RCE AREA 15-2	RDR1-2	RDR1-2
56				CANISTER PLACEMENT										
57				WASTE PLACEMENT - SLINGS	EA	45.00			45.00	45.00		HERCULES WIRE, ROPE & SLING CO.		
58				BACKFILL VOIDS IN CANISTERS WITH GROUT (3.5 CY = 94.5 CF GROUT/CANISTER)	CF	1.59			1.59	1.59		GENERAL SUPPLY CO	RDR1-2	RDR1-2
59				STEEL MATS OF #4 REINFORCING STEEL (2 PER CANISTER LID)	TN	520.00			520.00	520.00		M-032-107-0500	0.157 TN/LID	0.157 TN/LID
60				CONCRETE LID POUR (1.7 CY/LID) (MATERIAL COSTS M-033-126-0400 & -1000 - DELIVERED TO SITE)	CY	69.85			69.85	77.00	10.2%	M-033-126-0400	RDR1-2	RDR1-2
61				BRASS ID PLATE WITH ENGRAVINGS (6" X 6")	EA	15.00			15.00	15.00		ENGRAVER	RDR1-2	RDR1-2
62				BACKFILL AROUND CANISTERS WITH 3/8" CRUSHED STONE	CY	16.50			16.50	16.50		M-022-212-0360	RDR1-13	RDR1-13
63				PLACE 2' GRAVELLY SAND - *NO COMPACTION (RCE-14, C-26)	CY	6.20			6.20	6.20		E-17-03-0426*	RDR1-13	RDR1-13
64				PLACE 2' OF SAT MATL - TEMP COVER (EXCAVATED MATERIAL - *1 MILE HAUL - SEE E-17-03-0425-02225-3107)	CY	0.25			0.25	0.25		E-17-03-0429*	RDR2-10	RDR2-11
65				PLACE 7' 4" OF SATISFACTORY MATERIAL (EXCAVATED MATERIAL - *1 MILE HAUL - SEE E-17-03-0425-02225-3107)	CY	0.25	1.76	4.07	6.08	6.99	15.0%	E-17-03-0429*	RDR2-14	RDR2-15
66				BACKFILL ACCESS RAMP (EXCAVATED MATERIAL - *1 MILE HAUL - SEE E-17-03-0425-02225-3107)	CY	0.25	1.76	4.07	6.08	6.99	15.0%	E-17-03-0429*	RDR2-10	RDR2-11

	A	B	C	D	E	G	H	I	J	K	L	M	N	O
21	1-2:			DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE	UNIT	MATL	LABOR	EQUIP	BARE TOTAL	O & P TOTAL	O&P %	REFERENCE	TYPE A QTY REF	TYPE B/C QTY REF
67				COMPACT CLAY LINER (RAMP END OF CELL)	CY		0.23	0.42	0.65	0.82	26.2%	M-022-222-0300	RDR2-10	RDR2-11
68				COVER ACCESS RAMP BACKFILL	CY	0.25	1.76	4.07	6.08	6.99	15.0%	E-17-03-0429*	RDR2-10	RDR2-11
69				COVER SYSTEM AND SECONDARY DRAINAGE DITCH INTERFACE (C-42)										
70				COMPACT SUBGRADE	CY		0.23	0.42	0.65	0.82	26.2%	M-022-222-0300	C-33, 42	C-33, 42
71				PLACE GEOTEXTILE, NON-WOVEN	SY	0.63	0.45	0.03	1.11	1.11		FALCON ENV. LIN. SYS	C-33, 42	C-33, 42
72				PLACE RIPRAP	CY	15.40	6.70	8.00	30.10	36.00	19.6%	M-022-712-0100	RDR2-11	RDR2-11
73				AMEND DITCH LINING (NATIVE SOIL?) WITH LIME	BCY	8.29	1.19	6.65	16.13	18.55	15.0%	E-17-03-0601	3% DHO	3% DHO
74				PLACE 12" THICK LIME AMENDED DITCH LINING (C-42)	CY	0.25	1.76	4.07	6.08	6.99	15.0%	E-17-03-0429*	C-33, 42	C-33, 42
75				GRADE AREA TO SPECIFICATION	SY		0.19	0.28	0.47	0.61	29.8%	M-025-122-0100	RDR2-14	RDR2-15
76				APPLY LIQUID ASPHALT EMULSION TACK COAT - *MULTIPLIED APP RATE BY 2 TO GET 0.2 GAL/SY FOR MATERIAL COST	SY	0.28	0.04	0.06	0.38	0.44	15.0%	E-18-01-0311*	RDR2-14	RDR2-15
77				PLACE 8" OF ASPHALT CONCRETE ABOVE SATISFACTORY MATERIAL - 8" BASE	TN	18.97	0.27	0.60	19.84	22.82	15.0%	E-18-01-0105	RDR2-14	RDR2-15
78				PLACE 2" OF SURFACE COURSE ASPHALT CONCRETE	TN	29.63	8.90	6.94	45.47	52.29	15.0%	E-18-01-0312	RDR2-14	RDR2-15
79				APPLY LIQUID ASPHALT EMULSION TACK COAT - *MULTIPLIED APP RATE BY 2.5 TO GET 0.25 GAL/SY FOR MATERIAL COST	SY	0.35	0.04	0.06	0.45	0.52	15.0%	E-18-01-0311*	RDR2-14	RDR2-15
80				PLACE GEOSYNTHETIC CLAY LINER OVER ASPHALT CONCRETE	SF	0.35	0.15	0.01	0.51	0.51		FALCON ENV. LIN. SYS	RDR2-14	RDR2-15
81				4' 4" OF SATISFACTORY MATERIAL - INCLUDES 1' OF "TOPSOIL" (EXCAVATED MATERIAL - *1 MILE HAUL - SEE E-17-03-0425-02225-310	CY	0.25	1.76	4.07	6.08	6.99	15.0%	E-17-03-0429*	RDR2-10	RDR2-11
82				GRADE AREA TO SPECIFICATION	SY		0.19	0.28	0.47	0.61	29.8%	M-025-122-0100	C-24, 27	C-28
83				SEEDING, VEGETATIVE COVER (INCLUDES MULCHING AND WATERING TRUCK)	AC	1708.75	37.13	59.11	1804.99	2075.74	15.0%	E-18-05-0402	C-24, 27	C-28
84				WATERING AND MAINTENACE OF GRASS SEED (3000 GAL TANK TRUCK, PER PASS, 1 KGAL/AC)	AC	2.46	14.44	23.00	39.90	45.89	15.0%	E-18-05-0413	4X	4X
85				RADIOACTIVE WASTE GRANITE MONUMENT (4' X 2.5' X 6")	EA	1500.00			1500.00	1500.00		WALKER MONUM.	DHO	DHO
86				SETTLEMENT MONITORS - 5 EACH (C-27, C-43) - EMPLACED AT SAME TIME AS COVER, BACKFILL WITH COVER DESIGN	EA	52.34	71.78	6.67	130.79	150.41	15.0%	M-033-130-0800	C-24, 27	C-25
87				COLUMN (0.154 CY)	CY	176.00	325.00	41.50	542.50	765.00		M-033-130-0800		
88				BASE (0.2917 CY)	CY	86.50	74.50	0.97	161.97	215.00		M-033-130-3800		
89														
90														
91														
92	3:			OFFICE EQUIPMENT (REPLACEMENT)	UNIT	MATL	LABOR	EQUIP	BARE TOTAL	O & P TOTAL	O&P %	REFERENCE		
93				FAX MACHINE (6 YEAR)	EA	600.00			600.00	600.00		CATALOG		
94				COMPUTER (4 YEAR)	EA	2500.00			2500.00	2500.00		CATALOG		
95				PRINTER (4 YEAR)	EA	1500.00			1500.00	1500.00		CATALOG		
96				COPY MACHINE (6 YEAR)	EA	6500.00			6500.00	6500.00		CATALOG		
97				MICROWAVE (10 YEAR)	EA	200.00			200.00	200.00		CATALOG		
98				TELEVISION / VCR (10 YEAR)	EA	1000.00			1000.00	1000.00		ESTIMATE		
99				OTHER	LS	10000.00			10000.00	10000.00		ESTIMATE		
100														
101	A,B.4:			BUILDING AND FACILITY MAINTENANCE DURING OPERATIONS	UNIT	MATL	LABOR	EQUIP	BARE TOTAL	O & P TOTAL	O&P %	REFERENCE		
102				FACILITY MAINTENANCE										
103				ROADS (1/3 ROADS EVERY 5 YRS)	LS					21450.00				
104				FENCE (200' EVERY YEAR)	LS					3000.00				
105				LANDSCAPE	LS					1000.00				
106				SUBTOTAL						25450.00				
107				BUILDING MAINTENANCE										
108				GARBAGE COLLECTION	LS					600.00				
109				PAINTING	LS					1000.00				
110				FLOORING (688 SY CARPET @ $25/SY IN ADMIN BLDG REPLACE AT 10 YRS + 500/YR CLEAN)	LS					2220.00				
111				PLUMBING	LS					2000.00				
112				ELECTRICAL	LS					2000.00				
113				MECHANICAL ITEMS	LS					5000.00				
114				HVAC (REPAIR, FILTERS, ETC)	LS					5000.00				
115				SUBTOTAL						17820.00				
116				TOTAL						43270.00				
117														
118	C.4:			BUILDING AND FACILITY MAINTENANCE DURING POSTCLOSURE	UNIT	MATL	LABOR	EQUIP	BARE TOTAL	O & P TOTAL	O&P %	REFERENCE		
119				LUMP SUM	LS					4327.00		ESTIMATE		
120				(EROSION CONTROL, TREE REMOVAL, FENCE REPAIR, TRAILER MAINTENANCE ETC.)										
121														
122	C.5:			SITE CLOSURE	UNIT	MATL	LABOR	EQUIP	BARE TOTAL	O & P TOTAL	O&P %	REFERENCE		
123				BUILDING DEMOLITION - STEEL (INCLUDES HAUL)	CF		0.07	0.10	0.17	0.22	29.4%	M-020-604-0012		
124				DEMOLISH ROADS WITH POWER EQUIPMENT	CY		8.06	4.41	12.47	14.34	15.0%	E-17-02-0201		
125				DUMP CHARGES FOR BUILDING CONSTRUCTION MATERIAL	CY	18.42			18.42	21.18	15.0%	E-17-02-0403		
126				HAZARDOUS LANDFILL DISPOSAL	CY	43.29			43.29	49.78	15.0%	E-16-02-9024 (1995)		
127				BACKFILL	CY		0.46	1.26	1.72	2.09	21.5%	M-022-208-4440		

	A	B	C	D	E	G	H	I	J	K	L	M	N	O
21	1-2:			DISPOSAL UNIT CONSTRUCTION, OPERATION, AND CLOSURE	UNIT	MATL	LABOR	EQUIP	BARE TOTAL	O & P TOTAL	O&P %	REFERENCE	TYPE A QTY REF	TYPE B/C QTY REF
128				COMPACTION	CY		0.23	0.42	0.65	0.82	26.2%	M-022-222-0300		
129				MONUMENTING OF SITE BOUNDARIES	EA	16.00	56.00		72.00	104.00	44.4%	M-013-306-0600		

Table B-S. Summary of TLLRWDA Disposal Facility Operating Costs

Assumed Cost Escalation Rate (per year)	3.0%
Assumed Cost of Capital (per year)	5.0%
Assumed Effective Cost of Capital (per year)	1.9%
Contingency Percent	10.0%

	FUNCTIONAL AREA - PREOPERATIONS	1992 YEAR 1	1993 YEAR 2	1994 YEAR 3	1995 YEAR 4	1996 YEAR 5	1997 YEAR 6	1998 YEAR 7
A.1	PREOPERATIONS (SITE CHARACTERIZATION, DESIGN, ETC.)	$1,555,500	$2,937,000	$1,357,000	$1,020,000	$1,961,000	$700,000	$1,000,000
A.2	AIF CONSTRUCTION & STARTUP							
	TOTAL							
	PRESENT VALUE COSTS - PREOPERATIONAL ACTIVITIES (YEAR 2000)	**$2,298,182**	**$4,132,654**	**$1,818,510**	**$1,301,807**	**$2,383,608**	**$810,338**	**$1,102,500**

	FUNCTIONAL AREA	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
A.1	CLASS A DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSURE	$4,143,089	$6,136,686	$3,183,589	$1,272,194	$1,287,783	$2,412,428	$2,422,916
A.2	CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSURE	$710,894	$876,705	$175,762	$495,437	$557,244	$68,084	$70,498
A.3	PAYROLL	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043
A.4	CONSTRUCTION EQUIPMENT LEASE/PURCHASE	$675,975	$675,975	$675,975	$675,975	$712,979	$675,975	$675,975
A.5	BUILDING AND FACILITY MAINTENANCE	$43,270	$43,270	$43,270	$43,270	$43,270	$43,270	$43,270
A.6	UTILITIES AND CONSUMABLES	$277,979	$277,979	$277,979	$277,979	$277,979	$277,979	$277,979
A.7	OFFICE EQUIPMENT	$0	$0	$0	$34,500	$10,000	$21,300	$0
A.8	TRAINING	$27,026	$27,026	$62,026	$27,026	$27,026	$62,151	$27,026
A.9	MONITORING	$134,291	$101,231	$101,231	$134,231	$115,377	$101,231	$134,231
A.10	REGULATORY COSTS	$127,298	$82,412	$82,412	$82,412	$82,412	$127,298	$82,412
A.11	AUTHORITY ADMINISTRATION	$240,000	$240,000	$240,000	$240,000	$240,000	$240,000	$240,000
A.12	LEGAL FEES	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000
A.13	FINANCIAL ASSURANCE -- POST-CLOSURE MAINTENANCE FUND	$222,553	$222,553	$222,553	$222,553	$222,553	$222,553	$222,553
A.14	CONTINGENCIES	$754,886	$963,033	$601,129	$445,207	$452,311	$519,876	$514,335
	GROSS REVENUE REQUIREMENTS	$8,526,304	$10,815,913	$6,834,968	$5,119,826	$5,197,976	$5,941,187	$5,880,238
	INCENTIVE PAYMENTS (10% OF GROSS REVENUE REQUIREMENTS)	$852,630	$1,081,591	$683,497	$511,983	$519,798	$594,119	$588,024
	TOTALS (1997 $)	$9,378,935	$11,897,504	$7,518,465	$5,631,809	$5,717,774	$6,535,306	$6,468,262
	ESCALATED COSTS (BEGINNING IN YEAR 2000)	$10,165,297.22	$13,296,200.02	$8,600,407.65	$6,587,613.43	$6,850,617.52	$8,105,072.37	$8,242,455.97
	VOLUME DISPOSED (CF)	86,553	111,979	59,396	36,328	36,754	34,171	36,103
	ESCALATED COST PER CUBIC FOOT	$117	$119	$145	$181	$186	$237	$228
	PRESENT VALUE COSTS (YR 2000)	**$10,165,297**	**$12,663,048**	**$7,800,823**	**$5,690,628**	**$5,636,020**	**$6,350,536**	**$6,150,648**
	Present Value Per cubic foot	**$117**	**$113**	**$131**	**$157**	**$153**	**$186**	**$170**
	LLC TOTAL - PRESENT VALUE COSTS (YR 2000)							
	CURRENT VALUE OF POST-CLOSURE MAINTENANCE FUND	$222,553	$456,234	$701,599	$959,232	$1,229,746	$1,513,787	$1,812,029

Table B-S. Summary of TLLRWDA Disposal Facility Operating Costs

Assumed Cost Escalation Rate (per year)
Assumed Cost of Capital (per year)
Assumed Effective Cost of Capital (per year)
Contingency Percent

	FUNCTIONAL AREA - PREOPERATIONS	1999 YEAR 8	TOTAL
A.1	PREOPERATIONS (SITE CHARACTERIZATION, DESIGN, ETC.)		$10,530,500
A.2	AIF CONSTRUCTION & STARTUP	$7,913,243	$7,913,243
	TOTAL		$18,443,743
	PRESENT VALUE COSTS - PREOPERATIONAL ACTIVITIES (YEAR 2000)	**$8,308,905**	**$22,156,504**

	FUNCTIONAL AREA	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14
A.1	CLASS A DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSURE	$1,281,153	$2,405,798	$2,318,086	$1,181,834	$1,096,146	$2,386,484	$2,483,984
A.2	CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSURE	$70,655	$66,299	$57,772	$481,696	$539,604	$57,828	$15,387
A.3	PAYROLL	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043
A.4	CONSTRUCTION EQUIPMENT LEASE/PURCHASE	$675,975	$678,975	$713,567	$675,975	$675,975	$675,975	$675,975
A.5	BUILDING AND FACILITY MAINTENANCE	$43,270	$43,270	$43,270	$43,270	$43,270	$43,270	$43,270
A.6	UTILITIES AND CONSUMABLES	$277,979	$277,979	$277,979	$277,979	$277,979	$277,979	$277,979
A.7	OFFICE EQUIPMENT	$34,500	$0	$12,400	$0	$55,800	$0	$0
A.8	TRAINING	$27,026	$62,026	$27,026	$27,026	$62,151	$27,026	$27,026
A.9	MONITORING	$101,231	$101,231	$148,377	$101,231	$101,231	$134,231	$101,231
A.10	REGULATORY COSTS	$82,412	$82,412	$82,412	$127,298	$82,412	$82,412	$82,412
A.11	AUTHORITY ADMINISTRATION	$240,000	$240,000	$240,000	$240,000	$240,000	$240,000	$240,000
A.12	LEGAL FEES	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000
A.13	FINANCIAL ASSURANCE -- POST-CLOSURE MAINTENANCE FUND	$222,553	$222,553	$222,553	$222,553	$222,553	$222,553	$222,553
A.14	CONTINGENCIES	$400,324	$512,703	$508,993	$432,535	$434,361	$509,425	$511,631
	GROSS REVENUE REQUIREMENTS	$4,626,121	$5,862,289	$5,821,477	$4,980,440	$5,000,524	$5,826,226	$5,850,491
	INCENTIVE PAYMENTS (10% OF GROSS REVENUE REQUIREMENTS)	$462,612	$586,229	$582,148	$498,044	$500,052	$582,623	$585,049
	TOTALS (1997 $)	$5,088,734	$6,448,518	$6,403,625	$5,478,484	$5,500,576	$6,408,849	$6,435,540
	ESCALATED COSTS (BEGINNING IN YEAR 2000)	$6,617,468.10	$8,675,807.65	$8,985,786.65	$7,906,468.78	$8,154,001.84	$9,790,602.49	$10,104,074.80
	VOLUME DISPOSED (CF)	36,529	33,946	32,938	33,529	31,111	33,208	36,362
	ESCALATED COST PER CUBIC FOOT	$181	$256	$273	$236	$262	$295	$278
	PRESENT VALUE COSTS (YR 2000)	**$4,702,911**	**$5,872,128**	**$5,792,318**	**$4,853,886**	**$4,767,476**	**$5,451,774**	**$5,358,407**
	Present Value Per cubic foot	**$129**	**$173**	**$176**	**$145**	**$153**	**$164**	**$147**
	LLC TOTAL - PRESENT VALUE COSTS (YR 2000)							
	CURRENT VALUE OF POST-CLOSURE MAINTENANCE FUND	$2,125,183	$2,453,996	$2,799,249	$3,161,764	$3,542,405	$3,942,079	$4,361,736

Table B-S. Summary of TLLRWDA Disposal Facility Operating Costs

Assumed Cost Escalation Rate (per year)
Assumed Cost of Capital (per year)
Assumed Effective Cost of Capital (per year)
Contingency Percent

	FUNCTIONAL AREA - PREOPERATIONS
A.1	PREOPERATIONS (SITE CHARACTERIZATION, DESIGN, ETC.)
A.2	AIF CONSTRUCTION & STARTUP
	TOTAL

PRESENT VALUE COSTS - PREOPERATIONAL ACTIVITIES (YEAR 2000)

	FUNCTIONAL AREA	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	TOTAL
A.1	CLASS A DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSURE	$4,195,392	$5,137,469	$3,652,957	$3,335,995	$3,062,228	$1,636,209	$55,032,423
A.2	CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSURE	$60,500	$14,673	$15,444	$11,701	$14,729	$15,500	$4,376,413
A.3	PAYROLL	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$1,139,043	$22,780,857
A.4	CONSTRUCTION EQUIPMENT LEASE/PURCHASE	$712,979	$675,975	$675,975	$675,975	$675,975	$712,979	$13,671,103
A.5	BUILDING AND FACILITY MAINTENANCE	$43,270	$43,270	$43,270	$43,270	$43,270	$43,270	$865,400
A.6	UTILITIES AND CONSUMABLES	$277,979	$277,979	$277,979	$277,979	$277,979	$277,979	$5,559,576
A.7	OFFICE EQUIPMENT	$10,000	$34,500	$0	$21,300	$0	$46,900	$281,200
A.8	TRAINING	$62,026	$27,026	$27,026	$62,151	$27,026	$27,026	$750,892
A.9	MONITORING	$115,377	$134,231	$101,231	$101,231	$134,231	$115,377	$2,312,264
A.10	REGULATORY COSTS	$82,412	$127,298	$82,412	$82,412	$582,412	$332,412	$2,577,784
A.11	AUTHORITY ADMINISTRATION	$240,000	$240,000	$240,000	$240,000	$240,000	$240,000	$4,800,000
A.12	LEGAL FEES	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$600,000
A.13	FINANCIAL ASSURANCE -- POST-CLOSURE MAINTENANCE FUND	$222,553	$222,553	$222,553	$222,553	$222,553	$222,553	$4,451,061
A.14	CONTINGENCIES	$696,898	$788,146	$628,534	$602,106	$622,689	$461,670	$11,360,791
	GROSS REVENUE REQUIREMENTS	$7,888,428	$8,892,163	$7,136,423	$6,845,716	$7,072,135	$5,300,918	$129,419,765
	INCENTIVE PAYMENTS (10% OF GROSS REVENUE REQUIREMENTS)	$788,843	$889,216	$713,642	$684,572	$707,214	$530,092	$12,941,976
	TOTALS (1997 $)	$8,677,271	$9,781,379	$7,850,065	$7,530,287	$7,779,349	$5,831,010	$142,361,741
	ESCALATED COSTS (BEGINNING IN YEAR 2000)	$14,054,930.98	$16,375,972.32	$13,457,382.77	$13,260,251.45	$14,098,088.50	$10,693,609.63	$204,022,110
	VOLUME DISPOSED (CF)	82,325	75,326	68,061	57,785	52,025	44,759	1,019,188
	ESCALATED COST PER CUBIC FOOT	$171	$217	$198	$229	$271	$239	$200
	PRESENT VALUE COSTS (YR 2000)	**$7,098,695**	**$7,877,123**	**$6,164,982**	**$5,785,404**	**$5,858,047**	**$4,231,824**	**$128,271,975**
	Present Value Per cubic foot	**$86**	**$105**	**$91**	**$100**	**$113**	**$95**	**$126**
	LLC TOTAL - PRESENT VALUE COSTS (YR 2000)							**$150,428,479**
								$148
	CURRENT VALUE OF POST-CLOSURE MAINTENANCE FUND	$4,802,375	$5,265,047	$5,750,853	$6,260,948	$6,796,549	$7,358,929	

PROJECTION OF CURRENT COLLECTIONS FOR GENERATING POST-CLOSURE FUND

Annual Inflation			3%														
year			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
index			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Year of Ops							1	2	3	4	5	6	7	8	9	10	11
1995$ total in year 25		5,160,000															
1995$ total in year 20		4,451,061	=$5.16MM/(1+inf)^5														
1995$ Contributions	=1995$ total in year 25/20 yr						222,553	222,553	222,553	222,553	222,553	222,553	222,553	222,553	222,553	222,553	222,553
Escalation Factor	=1995$ Contribs*(1+inf)^(YR-1995)						1.1255	1.1593	1.1941	1.2299	1.2668	1.3048	1.3439	1.3842	1.4258	1.4685	1.5126
Current$ Contributions	=(1995$ total in year 20)*(esc fact)/(sum of esc fact)						165,649	170,619	175,737	181,010	186,440	192,033	197,794	203,728	209,840	216,135	222,619

CONTINUATION

year	
index	
Year of Ops	
1995$ total in year 25	
1995$ total in year 20	
1995$ Contributions	
Escalation Factor	
Current$ Contributions	

Year	Projected Dispo Volume (cf)	Variable Const $ Costs	Fixed Const $ Costs	Total Constant Dollar Costs
2,000	86,553	$6,751,112	$3,108,455	$9,859,567
2,001	111,979	$8,734,392	$3,108,455	$11,842,847
2,002	59,396	$4,632,893	$3,108,455	$7,741,348
2,003	36,328	$2,833,562	$3,108,455	$5,942,017
2,004	36,754	$2,866,842	$3,108,455	$5,975,297
2,005	34,171	$2,665,343	$3,108,455	$5,773,798
2,006	36,103	$2,816,012	$3,108,455	$5,924,467
2,007	36,529	$2,849,292	$3,108,455	$5,957,747
2,008	33,946	$2,647,793	$3,108,455	$5,756,248
2,009	32,938	$2,569,142	$3,108,455	$5,677,597
2,010	33,529	$2,615,292	$3,108,455	$5,723,747
2,011	31,111	$2,426,663	$3,108,455	$5,535,118
2,012	33,208	$2,590,202	$3,108,455	$5,698,657
2,013	36,362	$2,836,242	$3,108,455	$5,944,697
2,014	82,325	$6,421,321	$3,108,455	$9,529,776
2,015	75,326	$5,875,438	$3,108,455	$8,983,893
2,016	68,061	$5,308,731	$3,108,455	$8,417,186
2,017	57,785	$4,507,245	$3,108,455	$7,615,700
2,018	52,025	$4,057,927	$3,108,455	$7,166,382
2,019	44,759	$3,491,219	$3,108,455	$6,599,674
20 Yr Total	**1,019,188**	**$79,496,664**	**$62,169,100**	**$141,665,764**
			Actual ==>	**$142,361,741**

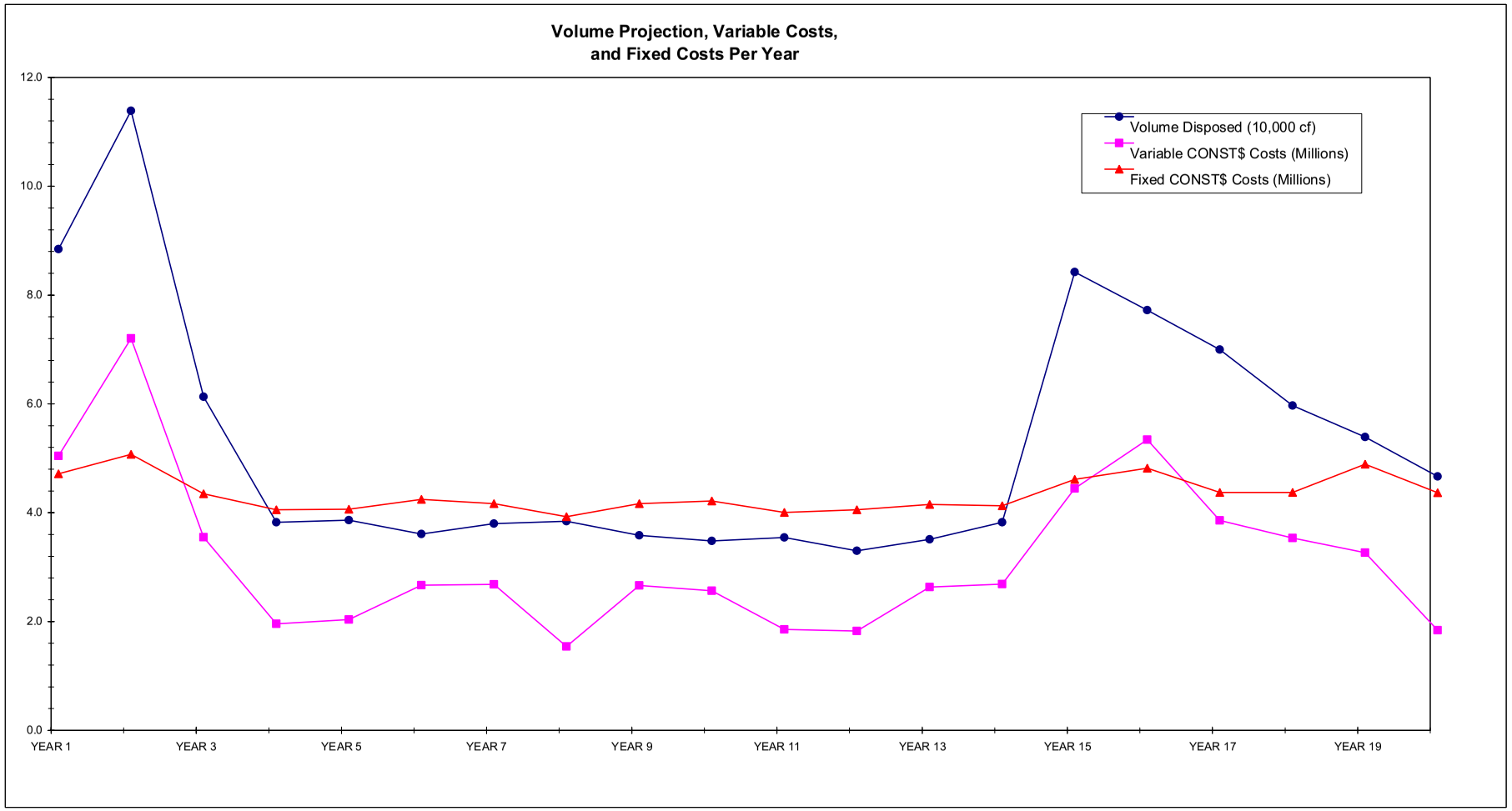
PERCENTAGE OF SUBTOTAL - VARIABLE ANNUAL DISPOSAL RATE

TLLRWDF SUMMARY OF OPERATIONAL PERCENTAGES

	Percentages of Subtotal	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	TOTAL
A.1	CLASS A DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSURE	53%	62%	51%	27%	27%	44%	45%	30%	45%	44%	26%	24%	45%	47%	58%	63%	56%	53%	47%	34%	47%
A.2	CLASS B/C DISPOSAL UNIT CONSTRUCTION, OPERATION, & CLOSUF	9%	9%	3%	11%	12%	1%	1%	2%	1%	1%	11%	12%	1%	0%	1%	0%	0%	0%	0%	0%	4%
A.3	PAYROLL	15%	12%	18%	24%	24%	21%	21%	27%	21%	21%	25%	25%	21%	21%	16%	14%	18%	18%	18%	24%	19%
A.4	CONSTRUCTION EQUIPMENT LEASE/PURCHASE	9%	7%	11%	14%	15%	12%	13%	16%	13%	13%	15%	15%	13%	13%	10%	8%	10%	11%	10%	15%	12%
A.5	BUILDING AND FACILITY MAINTENANCE	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
A.6	UTILITIES AND CONSUMABLES	4%	3%	4%	6%	6%	5%	5%	7%	5%	5%	6%	6%	5%	5%	4%	3%	4%	4%	4%	6%	5%
A.7	OFFICE EQUIPMENT	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%
A.8	TRAINING	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	1%	0%	1%	1%
A.9	MONITORING	2%	1%	2%	3%	2%	2%	3%	2%	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
A.10	REGULATORY COSTS	2%	1%	1%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	1%	2%	1%	1%	9%	7%	2%
A.11	AUTHORITY ADMINISTRATION	3%	2%	4%	5%	5%	4%	4%	6%	4%	5%	5%	5%	5%	4%	3%	3%	4%	4%	4%	5%	4%
A.12	LEGAL FEES	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	1%	1%
A.14	FINANCIAL ASSURANCE – POST-CLOSURE MAINTENANCE FUND	3%	2%	4%	5%	5%	4%	4%	5%	4%	4%	5%	5%	4%	4%	3%	3%	3%	4%	3%	5%	4%
	TOTALS:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%

DISPOSAL UNIT	**$A**	**%A**	**$B/C**	**%B/C**
CONSTRUCTION	$9,729,127	18%	$1,271,347	29.0%
EXCAVATION	$6,304,588	11%	$747,829	17.1%
OPERATION	$36,044,486	65%	$1,650,656	37.7%
CANISTERS	$27,386,439	50%	$1,172,058	26.8%
CLOSURE	$9,258,810	17%	$1,454,410	33.2%

Annual Disposal Rate (cf)	Disposal Unit Variable Costs	Fixed-Variable Costs	Variable Costs	Operations Worker	Heavy Eq Operator	Mechanic	Variable Payroll	Variable Equipment	Variable Maintenance	Variable Training	All Other Fixed Costs	Variable Cost Equation	Other Fixed + Fixed Base
0	$0	**$1,878,539**	**$1,878,539**	**2**	**1**	**1**	**$1,260,197**	**$560,006**	**$26,402**	**$31,933**	**$1,220,723**		**$3,099,263**
2,000	$141,063	$9,768	$150,831	2	1	1	$0	$8,903	$865	$0	$1,220,723	$134,000	**$3,099,263**
4,000	$282,125	$19,537	$301,662	2	1	1	$0	$17,806	$1,730	$0	$1,220,723	$268,000	
6,000	$423,188	$29,305	$452,493	2	1	1	$0	$26,710	$2,595	$0	$1,220,723	$402,000	
8,000	$564,251	$39,073	$603,324	2	1	1	$0	$35,613	$3,461	$0	$1,220,723	$536,000	
10,000	$705,313	$48,842	$754,155	2	1	1	$0	$44,516	$4,326	$0	$1,220,723	$670,000	
12,000	$846,376	$58,610	$904,986	2	1	1	$0	$53,419	$5,191	$0	$1,220,723	$804,000	
14,000	$987,439	$68,378	$1,055,817	2	1	1	$0	$62,322	$6,056	$0	$1,220,723	$938,000	
16,000	$1,128,501	$78,147	$1,206,648	2	1	1	$0	$71,225	$6,921	$0	$1,220,723	$1,072,000	
18,000	$1,269,564	$87,915	$1,357,479	2	1	1	$0	$80,129	$7,786	$0	$1,220,723	$1,206,000	
20,000	$1,410,627	$97,683	$1,508,310	2	1	1	$0	$89,032	$8,652	$0	$1,220,723	$1,340,000	
22,000	$1,551,689	$107,452	$1,659,141	2	1	1	$0	$97,935	$9,517	$0	$1,220,723	$1,474,000	
24,000	$1,692,752	$117,220	$1,809,972	2	1	1	$0	$106,838	$10,382	$0	$1,220,723	$1,608,000	
26,000	$1,833,815	$210,267	$2,044,081	3	2	1	$80,376	$115,741	$11,247	$2,902	$1,220,723	$1,742,000	
28,000	$1,974,877	$220,035	$2,194,912	3	2	1	$80,376	$124,645	$12,112	$2,902	$1,220,723	$1,876,000	
30,000	$2,115,940	$229,803	$2,345,743	3	2	1	$80,376	$133,548	$12,977	$2,902	$1,220,723	$2,010,000	
32,000	$2,257,003	$239,572	$2,496,574	3	2	1	$80,376	$142,451	$13,842	$2,902	$1,220,723	$2,144,000	
34,000	$2,398,065	$249,340	$2,647,405	3	2	1	$80,376	$151,354	$14,708	$2,902	$1,220,723	$2,278,000	
36,000	$2,539,128	$259,108	$2,798,236	3	2	1	$80,376	$160,257	$15,573	$2,902	$1,220,723	$2,412,000	
38,000	$2,680,191	$268,877	$2,949,067	3	2	1	$80,376	$169,160	$16,438	$2,902	$1,220,723	$2,546,000	
40,000	$2,821,253	$278,645	$3,099,898	3	2	1	$80,376	$178,064	$17,303	$2,902	$1,220,723	$2,680,000	
42,000	$2,962,316	$288,413	$3,250,729	3	2	1	$80,376	$186,967	$18,168	$2,902	$1,220,723	$2,814,000	
44,000	$3,103,379	$298,182	$3,401,560	3	2	1	$80,376	$195,870	$19,033	$2,902	$1,220,723	$2,948,000	
46,000	$3,244,441	$307,950	$3,552,391	3	2	1	$80,376	$204,773	$19,898	$2,902	$1,220,723	$3,082,000	
48,000	$3,385,504	$317,718	$3,703,222	3	2	1	$80,376	$213,676	$20,764	$2,902	$1,220,723	$3,216,000	
50,000	$3,526,567	$366,556	$3,893,122	4	2	1	$118,044	$222,580	$21,629	$4,303	$1,220,723	$3,350,000	
52,000	$3,667,630	$376,324	$4,043,953	4	2	1	$118,044	$231,483	$22,494	$4,303	$1,220,723	$3,484,000	
54,000	$3,808,692	$386,092	$4,194,784	4	2	1	$118,044	$240,386	$23,359	$4,303	$1,220,723	$3,618,000	
56,000	$3,949,755	$395,861	$4,345,615	4	2	1	$118,044	$249,289	$24,224	$4,303	$1,220,723	$3,752,000	
58,000	$4,090,818	$405,629	$4,496,446	4	2	1	$118,044	$258,192	$25,089	$4,303	$1,220,723	$3,886,000	
60,000	$4,231,880	$415,397	$4,647,277	4	2	1	$118,044	$267,095	$25,955	$4,303	$1,220,723	$4,020,000	
62,000	$4,372,943	$425,166	$4,798,108	4	2	1	$118,044	$275,999	$26,820	$4,303	$1,220,723	$4,154,000	
64,000	$4,514,006	$434,934	$4,948,939	4	2	1	$118,044	$284,902	$27,685	$4,303	$1,220,723	$4,288,000	
66,000	$4,655,068	$444,702	$5,099,770	4	2	1	$118,044	$293,805	$28,550	$4,303	$1,220,723	$4,422,000	
68,000	$4,796,131	$454,471	$5,250,601	4	2	1	$118,044	$302,708	$29,415	$4,303	$1,220,723	$4,556,000	
70,000	$4,937,194	$464,239	$5,401,432	4	2	1	$118,044	$311,611	$30,280	$4,303	$1,220,723	$4,690,000	
72,000	$5,078,256	$474,007	$5,552,263	4	2	1	$118,044	$320,514	$31,145	$4,303	$1,220,723	$4,824,000	
74,000	$5,219,319	$567,054	$5,786,373	5	3	1	$198,420	$329,418	$32,011	$7,205	$1,220,723	$4,958,000	
76,000	$5,360,382	$576,822	$5,937,204	5	3	1	$198,420	$338,321	$32,876	$7,205	$1,220,723	$5,092,000	
78,000	$5,501,444	$586,590	$6,088,035	5	3	1	$198,420	$347,224	$33,741	$7,205	$1,220,723	$5,226,000	
80,000	$5,642,507	$596,359	$6,238,866	5	3	1	$198,420	$356,127	$34,606	$7,205	$1,220,723	$5,360,000	
82,000	$5,783,570	$606,127	$6,389,697	5	3	1	$198,420	$365,030	$35,471	$7,205	$1,220,723	$5,494,000	
84,000	$5,924,632	$615,895	$6,540,528	5	3	1	$198,420	$373,934	$36,336	$7,205	$1,220,723	$5,628,000	
86,000	$6,065,695	$625,664	$6,691,359	5	3	1	$198,420	$382,837	$37,201	$7,205	$1,220,723	$5,762,000	
88,000	$6,206,758	$635,432	$6,842,190	5	3	1	$198,420	$391,740	$38,067	$7,205	$1,220,723	$5,896,000	
90,000	$6,347,820	$645,200	$6,993,021	5	3	1	$198,420	$400,643	$38,932	$7,205	$1,220,723	$6,030,000	
92,000	$6,488,883	$654,969	$7,143,852	5	3	1	$198,420	$409,546	$39,797	$7,205	$1,220,723	$6,164,000	
94,000	$6,629,946	$664,737	$7,294,683	5	3	1	$198,420	$418,449	$40,662	$7,205	$1,220,723	$6,298,000	
96,000	$6,771,008	$674,505	$7,445,514	5	3	1	$198,420	$427,353	$41,527	$7,205	$1,220,723	$6,432,000	
98,000	$6,912,071	$806,621	$7,718,692	6	4	2	$316,465	$436,256	$42,392	$11,508	$1,220,723	$6,566,000	
100,000	$7,053,134	$816,389	$7,869,523	6	4	2	$316,465	$445,159	$43,258	$11,508	$1,220,723	$6,700,000	
102,000	$7,194,196	$826,158	$8,020,354	6	4	2	$316,465	$454,062	$44,123	$11,508	$1,220,723	$6,834,000	
104,000	$7,335,259	$835,926	$8,171,185	6	4	2	$316,465	$462,965	$44,988	$11,508	$1,220,723	$6,968,000	
106,000	$7,476,322	$845,694	$8,322,016	6	4	2	$316,465	$471,869	$45,853	$11,508	$1,220,723	$7,102,000	
108,000	$7,617,384	$855,463	$8,472,847	6	4	2	$316,465	$480,772	$46,718	$11,508	$1,220,723	$7,236,000	
110,000	$7,758,447	$865,231	$8,623,678	6	4	2	$316,465	$489,675	$47,583	$11,508	$1,220,723	$7,370,000	
112,000	$7,899,510	$874,999	$8,774,509	6	4	2	$316,465	$498,578	$48,448	$11,508	$1,220,723	$7,504,000	
114,000	$8,040,572	$884,768	$8,925,340	6	4	2	$316,465	$507,481	$49,314	$11,508	$1,220,723	$7,638,000	
116,000	$8,181,635	$894,536	$9,076,171	6	4	2	$316,465	$516,384	$50,179	$11,508	$1,220,723	$7,772,000	
118,000	$8,322,698	$904,304	$9,227,002	6	4	2	$316,465	$525,288	$51,044	$11,508	$1,220,723	$7,906,000	
120,000	$8,463,760	$914,073	$9,377,833	6	4	2	$316,465	$534,191	$51,909	$11,508	$1,220,723	$8,040,000	



	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20
Volume Disposed (10,000 cf)	8.7	11.2	5.9	3.6	3.7	3.4	3.6	3.7	3.4	3.3	3.4	3.1	3.3	3.6	8.2	7.5	6.8	5.8	5.2	4.5
Variable Escalated Costs (Millions)	$4.9	$7.0	$3.4	$1.8	$1.8	$2.5	$2.5	$1.4	$2.5	$2.4	$1.7	$1.6	$2.4	$2.5	$4.3	$5.2	$3.7	$3.3	$3.1	$1.7
Fixed Escalated Costs (Millions)	$4.5	$4.9	$4.2	$3.9	$3.9	$4.1	$4.0	$3.7	$4.0	$4.0	$3.8	$3.9	$4.0	$3.9	$4.4	$4.6	$4.2	$4.2	$4.7	$4.2