

City of Albuquerque Integrated Waste Management Plan

Table of Contents for Technical Appendices II

TITLE	PAGE #
A / Cost Estimate for MRF (Materials Recovery Facility) Stage 1 (Residential Recyclables)	1
B / Yard Waste Supporting Data	8
C / Cerro Colorado Landfill Disposal Costs	9
D / Cerro Colorado Landfill Closure Costs	10
E / Cost of Service Report	14

This page intentionally left blank.

City of Albuquerque

MRF Analysis

What are the differences in cost, implementation, and processing for a private operator compared to the City of Albuquerque?

Estimation of Materials

The first step of the process was to access the amount of material that could be collected from the City of Albuquerque (CABQ) as well as the greater Albuquerque metropolitan area. From an economic perspective, it would be very expensive to limit such a facility to the processing of materials collected only within the CABQ. Several neighboring jurisdictions have recycling programs that are collecting tons which could be processed at the facility and would contribute to the return on the investment.

Total Municipal Solid Waste (MSW) tons for the metropolitan area were projected using the estimated population¹ for the metropolitan area combined with the US Environmental Protection Agency (EPA) waste generation data. Tons generated by person on a daily basis (4.62 pounds)² were multiplied by the area's 835,000 people and then annualized. Diversion percentages were then applied to the estimated waste generation. The table below details the projected annual diversion, in tons, used for this analysis:

Area	Diversion Percentage of MSW tons						
	10%	15%	20%	25%	30%	35%	40%
CABQ	43,698	65,547	87,396	109,245	131,094	152,943	174,792
ABQ metro.	70,413	105,620	140,826	176,033	211,239	246,446	281,653

Facility Design

Production

The parameters included the projection of both residential and commercial tons based on the current waste generation amounts. The conceptual design for the MRF would process 50 tons of material an hour: 24 tons of single stream residential mix and 26 tons of commercial materials. Assuming a 6.5 hours of productive time per shift, the facility could process up to 84,500 tons. As collected material amounts increase, production could be expanded from one shift up to three shifts. A second shift would increase processing production to 169,000 tons and a third shift would maximize production to 253,500 tons of recyclables.

Facility Size

The facility will require 75,000 square feet for the material drop off and sorting area, processing equipment, and storage area for baled materials. The minimum land needed is six acres with a rail spur or access to the rail. Ideally, the land will be zoned and in close proximity to the Solid Waste Division offices on Edith Boulevard. A current review of open land turned up a 14 acre site two blocks south on the west side of Edith Boulevard.

Facility Cost

The following table details the projected build cost for this facility in 2008 dollars.

¹ University of New Mexico's Bureau of Business and Economic Research

² Excludes construction and demolition waste

Rail Spur	1,000 feet	250,000
Scales (Inbound)	2 - 30' Scales	75,000
Scales (Outbound)	1 - 70' Scale	75,000
Building Structure	75,000 sq ft @ \$125 ft.	9,375,000
Permitting & Utilities		250,000
Processing Equipment	Two primary sort lines	5,860,000
Engineering & Design	10 % of build cost	1,563,500
Total Build Cost		\$17,448,500

Labor Force

The following table represents the general composition of the labor force necessary to staff the facility based on the flow of material and equipment configuration.

Staff	1 st Shift	2 nd Shift	3 rd Shift	Total
Material Sorters	21	21	21	63
Forklift Operator	3	3	3	9
Loader	2	2	2	6
Baler Operator	2	2	2	6
Maintenance Worker	1	1	1	1
Roll off Driver	1	1	1	3
Supervisor	1	1	1	3
Facility Manager	1			1
Administrative	2			2
Material Marketing	2			2
Total Staff	36	31	31	98

Facility Operational Cost

See MRF Stage 1 Cost worksheet for complete details.

Compare the ability to market materials, what are the advantages / disadvantages?

The main advantage of a private operator is their ability to market broad ranges of materials. Private operators with significant market standing are able to market materials which coming from a smaller public operation would be considered off-spec or contaminated. Chipboard contamination of OCC would be a clear example. RAA is able to market OCC bales with as much as 30% chipboard, while CABQ would be at best penalized and at worst rejected by the same mill. The private will also have longstanding relationships at mills for more challenging materials. Tin Cans exemplify this benefit. They can be very challenging for a small operation to market as most mills use exclusive supply agreements to control the flow of feedstocks. The small operator is rarely able to break through to direct mill marketing and therefore must rely on brokers, who in turn retain a percentage of the market value for themselves. Plastics are also subject to these limitations.

The virtue associated with public operation is the agency responsible for marketing can also apply social consideration in selecting markets. They can, for instance, choose to avoid exportation of recyclables to avoid the known pitfalls of worker and environmental exploitation in developing countries. While these criteria can also be codified in a public/private partnership agreement, the City would sacrifice direct control.

What is the difference, if quantifiable, between private processors and municipal processors?

The most apparent difference between public and private MRF operations relates to labor. Public operations typically have a higher cost of labor due to union contracts and general labor policies. This variation is due to several related factors;

- a. Redundancy of staff to cover leave obligations
- b. Increased costs related to expansive fringe benefits obligations
- c. In New Mexico, shorter work life as a result of 25 years to retirement

Another difference, and perhaps more important between private and public operations is experience and exposure to systems. The private processors generally brings a wealth of knowledge related to the recycling and processing from operations in other regions of the United States. From acquisition of appropriate equipment to the specialized maintenance requirements of these systems, the private has a great advantage. Public operators rarely have history managing and maintaining the complex processing systems which MRF's represent. This lack of experience invariably leads to higher system costs as reliance on third parties for maintenance and service. Albuquerque's experience with their current IPF exemplifies these challenges, specifically the costs associated with the Mozely baler.

Procurement processes also hamper the effectiveness of public MRF's. Consumables such as baling wire are compelled to be acquired through time consuming bid processes. This additional step, adds cost and delays purchases of essential materials. While rigorous procurement standards protect the public from potentially fraudulent activities, they also burden the public with increased administrative costs and inflexibility.

A final factor separating these two management schemes relates to the overall philosophy of management. Private sector operations are highly motivated to find efficiencies and limit costs. Public management focuses attention from a more socialistic perspective rather than financial. In other words, there is not a strong profit motive in the public sector, which sometimes causes public operations to act in ways contradictory to efficient and effective operations.

Public Facility Ownership with Private Contractor

A third option is the public ownership of the facility with the operations provided by a private contractor. This option maintains the City's control of the system and allows an experienced contractor the opportunity to run the daily operations of the processing and broker the recyclable materials. Here are a few of the pros and cons of this alternative.

Pros:

- a. City maintains control over the entire system
- b. Lower cost of capital for the facility construction
- c. Experienced company to reduce the operational and material revenue risks
- d. Private contractor would allow the MRF to operate as a regional facility
- e. Contracted operations allows all interested parties the equal opportunity to bid

Cons:

- a. City will need to fund the facility build cost into the rate base
- b. If the facility build costs are borne on the residential rate payer only, the cost is \$1.22 per customer per month.

Projected MRF Financial Performance

Material Revenue		2,386,396	3,168,623	3,168,623	4,772,792	6,337,247	6,337,247	7,159,189	9,505,870	9,505,870
Material Throughput Tons >>		84,500			169,000			253,500		
		CABQ	Private	CABQ-Contract	CABQ	Private	CABQ-Contract	CABQ	Private	CABQ-Contract
Operating Costs	Note									
Labor	A	881,296	667,222	667,222	1,781,936	1,353,789	1,353,789	2,692,248	2,050,027	2,050,027
Payroll & Benefit Costs	B	396,583	266,889	266,889	801,871	541,516	541,516	1,211,512	820,011	820,011
Vehicle Repairs & Maint.	C	25,000	25,000	25,000	35,000	35,000	35,000	40,000	40,000	40,000
Equipment & Other R&M	D	175,000	125,000	125,000	225,000	150,000	150,000	275,000	175,000	175,000
Vehicle Op Costs	E	50,000	50,000	50,000	75,000	75,000	75,000	100,000	100,000	100,000
Facility Operating Costs	F	350,000	275,000	275,000	400,000	325,000	325,000	450,000	450,000	450,000
Safety, Insurance & Claims	G	35,000	20,000	20,000	50,000	30,000	30,000	65,000	40,000	40,000
Disposal	H	63,544	113,386	63,544	127,088	226,773	127,088	190,632	340,159	190,632
Subcontract Costs	I	22,000	62,400	62,400	22,000	104,000	104,000	22,000	145,600	145,600
Other Ops Costs	J	50,000	25,000	25,000	75,000	35,000	35,000	100,000	45,000	45,000
Total Operating Costs	K	2,048,423	1,629,898	1,580,055	3,592,895	2,876,077	2,776,392	5,146,392	4,205,797	4,056,270
Gross Profit	L	337,973	1,538,726	1,588,568	1,179,897	3,461,170	3,560,854	2,012,797	5,300,073	5,449,600
S. G. & A. Costs										
Salaries	M	400,404	486,597	486,597	400,404	486,597	486,597	400,404	486,597	486,597
Professional Fees	N	150,000	50,000	50,000	150,000	50,000	50,000	150,000	50,000	50,000
Other Expense	O	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Allocation - SG&A	P	250,000	-	-	250,000	-	-	250,000	-	-
Gross Receipts Tax (6.75%)	Q			151,312			232,064			318,456
Total S.G.&A Costs	R	925,404	661,597	812,909	925,404	661,597	893,661	925,404	661,597	980,053
EBITDA	S	(587,431)	877,128	775,659	254,493	2,799,572	2,667,193	1,087,393	4,638,476	4,469,547
Depreciation & Amortization										
Depreciation Bldg	T		571,925			571,925			571,925	
Depreciation Equipment	U		601,000			601,000			601,000	
Amortized Interest Bldg	V		664,409			664,409			664,409	
Amortized Interest Equip	W		236,374			236,374			236,374	
Building Principal & Interest	X	1,914,099		1,914,099	1,914,099		1,914,099	1,914,099		1,914,099
Equipment Principal & Interest	Y	840,723		840,723	840,723		840,723	840,723		840,723
Total Dep. & Amort	Z	2,754,823	2,073,709	2,754,823	2,754,823	2,073,709	2,754,823	2,754,823	2,073,709	2,754,823
EBIT	AA	(3,342,254)	(1,196,580)	(1,979,163)	(2,500,329)	725,864	(87,630)	(1,667,430)	2,564,767	1,714,724
Cost per ton	BB	\$ (39.55)	\$ (14.16)	\$ (23.42)	\$ (14.79)	\$ 4.30	\$ (0.52)	\$ (9.87)	\$ 15.18	\$ 10.15
Cost per Resident per Month	CC	\$ 1.61	\$ -	\$ 0.95	\$ 1.21	\$ -	\$ 0.042	\$ 0.80	\$ -	\$ (0.83)

Notes

Revenue is calculated based on the projected tons by material type . See the Facility Parameter tab for complete details

A: Labor costs are calculated on the labor tab

B: Benefits costs are calculated on the labor tab

C: Assumed the same for both enterprises

D: Lower cost for the private due to prior experience with similar facilities

E: Assumed the same for both enterprises

F: Lower cost for the private due to prior experience with similar facilities

G: Lower cost for the private due to prior experience with similar facilities

H: Disposal costs calculated on the Facility Parameter tab

I: Subcontract costs for private are higher for temporary labor

J : Lower cost for the private due to prior experience with similar facilities

K: Sum of items A through K

L: Revenue less Total Operating Costs

M: Overhead salaries calculated on the Labor Costs tab

N: Lower cost for the private due to prior experience with similar facilities

O: Assumed the same for both enterprises

P: City overhead costs allocated to MRF

Q: Gross Receipts Tax on contractor services at 6.75%

R: Sum of items N through Q

S: Gross profit less Total SG&A costs

T: Building cost depreciated over a 20 year life, see Cost Sum tab for details

U: Equipment cost depreciated over a 10 year life, see Cost Sum tab for details

V: Interest cost amortized over a 20 year life using the straight line method, see Cost Sum for details

W: Interest cost amortized over a 10 year life using the straight line method, see Cost Sum for details

X: Building Principal and Interest amortized on a straight line basis over 12 years

Y: Equipment principal and interest amortized on a straight line basis over 10 years

Z: Sum of items S through X

AA: EBITDA line less Total Depreciation and Amortization

BB: EBIT line divided by estimated material tons (84,500 or 169,000 or 253,500) delivered to the MRF

CC: EBIT line divided by 172,800 residential customers and then divided by 12 months

Projected MRF Financial Performance

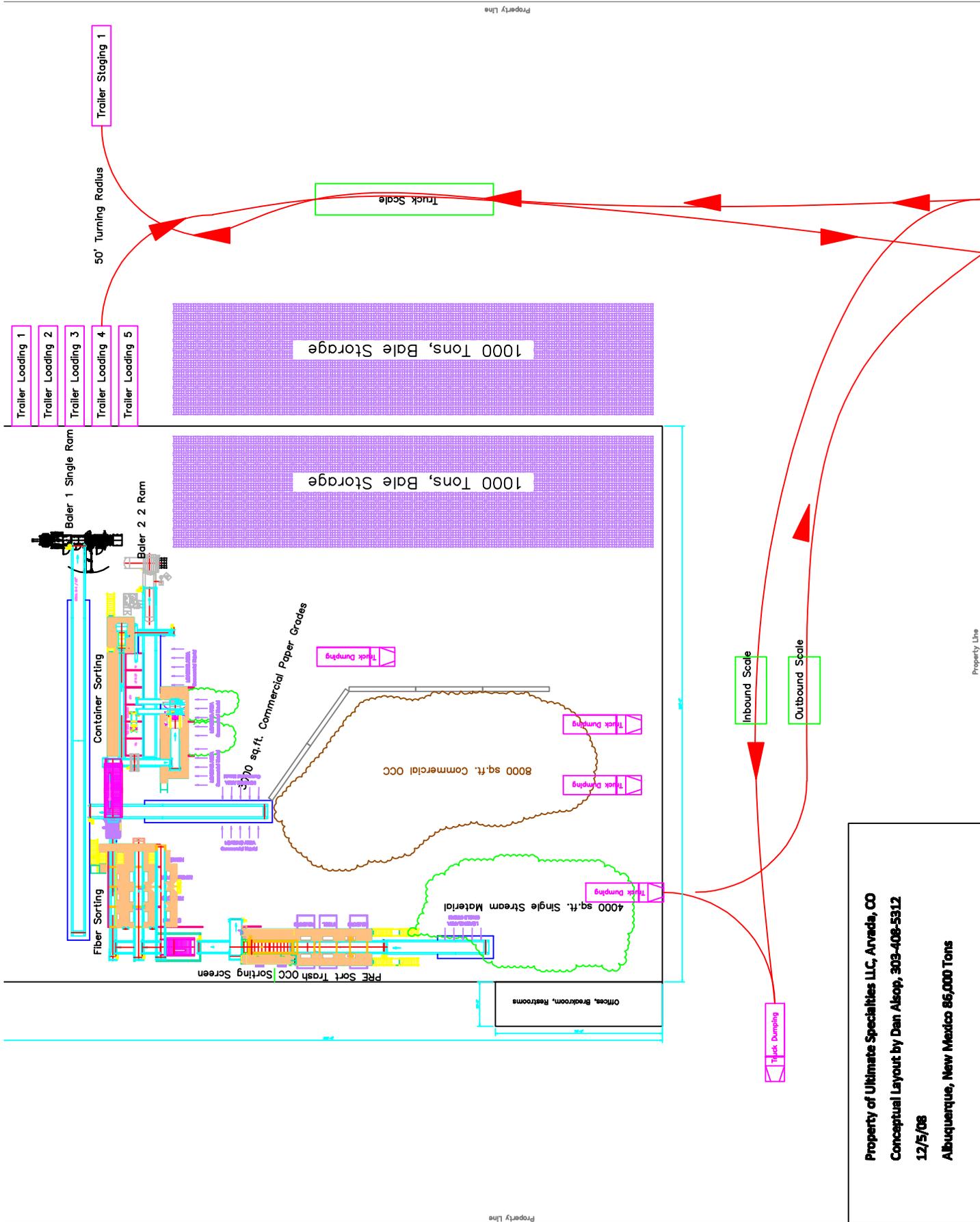
Material Revenue \$ 2,386,396 \$ 3,168,623 \$ 3,168,623 \$ 4,772,792 \$ 6,337,247 \$ 6,337,247 \$ 7,159,189 \$ 9,505,870 \$ 9,505,870

Material Throughput Tons >>

	Adjust	84,500			169,000			253,500		
		CABQ	Private	CABQ-Contract	CABQ	Private	CABQ-Contract	CABQ	Private	CABQ-Contract
Operating Costs										
Labor	3%	881,296	667,222	667,222	1,781,936	1,353,789	1,353,789	2,692,248	2,050,027	2,050,027
Payroll & Benefit Costs	5%	396,583	266,889	266,889	801,871	541,516	541,516	1,211,512	820,011	820,011
Vehicle Repairs & Maint.	0%	25,000	25,000	25,000	35,000	35,000	35,000	40,000	40,000	40,000
Equipment & Other R&M	0%	175,000	125,000	125,000	225,000	150,000	150,000	275,000	175,000	175,000
Vehicle Op Costs	0%	50,000	50,000	50,000	75,000	75,000	75,000	100,000	100,000	100,000
Facility Operating Costs	0%	350,000	275,000	275,000	400,000	325,000	325,000	450,000	450,000	450,000
Safety, Insurance & Claims	0%	35,000	20,000	20,000	50,000	30,000	30,000	65,000	40,000	40,000
Disposal	0%	63,544	113,386	63,544	127,088	226,773	127,088	190,632	340,159	190,632
Subcontract Costs	0%	22,000	62,400	62,400	22,000	104,000	104,000	22,000	145,600	145,600
Other Ops Costs	0%	50,000	25,000	25,000	75,000	35,000	35,000	100,000	45,000	45,000
Total Operating Costs		2,048,423	1,629,898	1,580,055	3,592,895	2,876,077	2,776,392	5,146,392	4,205,797	4,056,270
Gross Profit		337,973	1,538,726	1,588,568	1,179,897	3,461,170	3,560,854	2,012,797	5,300,073	5,449,600
S. G. & A. Costs										
Salaries	3%	400,404	486,597	486,597	400,404	486,597	486,597	400,404	486,597	486,597
Professional Fees	0%	150,000	50,000	50,000	150,000	50,000	50,000	150,000	50,000	50,000
Other Expense	0%	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Allocation - SG&A	0%	250,000	-	-	250,000	-	-	250,000	-	-
Gross Receipts Tax (6.75%)	0%	-	-	151,312	-	-	232,064	-	-	318,456
Total S.G.&A Costs		925,404	661,597	812,909	925,404	661,597	893,661	925,404	661,597	980,053
EBITDA		(587,431)	877,128	775,659	254,493	2,799,572	2,667,193	1,087,393	4,638,476	4,469,547
Depreciation & Amortization										
Depreciation Bldg	0%	-	571,925	-	-	571,925	-	-	571,925	-
Depreciation Equipment	0%	-	601,000	-	-	601,000	-	-	601,000	-
Amortized Interest Bldg	0%	-	664,409	-	-	664,409	-	-	664,409	-
Amortized Interest Equip	0%	-	236,374	-	-	236,374	-	-	236,374	-
Building Principal & Interest	0%	1,914,099	-	1,914,099	1,914,099	-	1,914,099	1,914,099	-	1,914,099
Equipment Principal & Interest	0%	840,723	-	840,723	840,723	-	840,723	840,723	-	840,723
Total Dep. & Amort		2,754,823	2,073,709	2,754,823	2,754,823	2,073,709	2,754,823	2,754,823	2,073,709	2,754,823
EBIT		(3,342,254)	(1,196,580)	(1,979,163)	(2,500,329)	725,864	(87,630)	(1,667,430)	2,564,767	1,714,724
Cost per ton		\$ (39.55)	\$ (14.16)	\$ (23.42)	\$ (14.79)	\$ 4.30	\$ (0.52)	\$ (6.58)	\$ 10.12	\$ 6.76
Cost per Resident per Month		\$ 1.61	\$ -	\$ 0.95	\$ 1.21	\$ -	\$ 0.04	\$ 0.80	\$ -	\$ (0.83)

Projected MRF Financial Performance

	Projected 2010 with 3% Labor Increase			Projected 2010 with 3% Labor Increase			Projected 2010 with 3% Labor Increase			
Material Revenue	\$ 2,386,396	\$ 3,168,623	\$ 3,168,623	\$ 4,772,792	\$ 6,337,247	\$ 6,337,247	\$ 7,159,189	\$ 9,505,870	\$ 9,505,870	
Material Throughput Tons >>	84,500			169,000			253,500			
	CABQ	Private	CABQ-Contract	CABQ	Private	CABQ-Contract	CABQ	Private	CABQ-Contract	
Operating Costs	Adjust									
Labor	3%	907,735	687,239	687,239	1,835,394	1,394,402	1,394,402	2,773,015	2,111,528	2,111,528
Payroll & Benefit Costs	5%	416,412	280,233	280,233	841,965	568,591	568,591	1,272,087	861,011	861,011
Vehicle Repairs & Maint.	0%	25,000	25,000	25,000	35,000	35,000	35,000	40,000	40,000	40,000
Equipment & Other R&M	0%	175,000	125,000	125,000	225,000	150,000	150,000	275,000	175,000	175,000
Vehicle Op Costs	0%	50,000	50,000	50,000	75,000	75,000	75,000	100,000	100,000	100,000
Facility Operating Costs	0%	350,000	275,000	275,000	400,000	325,000	325,000	450,000	450,000	450,000
Safety, Insurance & Claims	0%	35,000	20,000	20,000	50,000	30,000	30,000	65,000	40,000	40,000
Disposal	0%	63,544	113,386	63,544	127,088	226,773	127,088	190,632	340,159	190,632
Subcontract Costs	0%	22,000	62,400	62,400	22,000	104,000	104,000	22,000	145,600	145,600
Other Ops Costs	0%	50,000	25,000	25,000	75,000	35,000	35,000	100,000	45,000	45,000
Total Operating Costs		2,094,691	1,663,259	1,613,416	3,686,447	2,943,766	2,844,082	5,287,735	4,308,298	4,158,771
Gross Profit		291,705	1,505,364	1,555,207	1,086,346	3,393,480	3,493,165	1,871,454	5,197,571	5,347,098
S. G. & A. Costs										
Salaries	3%	412,416	501,195	501,195	412,416	501,195	501,195	412,416	501,195	501,195
Professional Fees	0%	150,000	50,000	50,000	150,000	50,000	50,000	150,000	50,000	50,000
Other Expense	0%	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Allocation - SG&A	0%	250,000	-	-	250,000	-	-	250,000	-	-
Gross Receipts Tax (6.75%)	0%			154,549			237,619			326,360
Total S.G.&A Costs		937,416	676,195	830,744	937,416	676,195	913,814	937,416	676,195	1,002,555
EBITDA		(645,711)	829,169	724,463	148,929	2,717,285	2,579,351	934,038	4,521,376	4,344,543
Depreciation & Amortization										
Depreciation Bldg	0%		571,925			571,925			571,925	
Depreciation Equipment	0%		601,000			601,000			601,000	
Amortized Interest Bldg	0%		664,409			664,409			664,409	
Amortized Interest Equip	0%		236,374			236,374			236,374	
Building Principal & Interest	0%	1,914,099		1,914,099	1,914,099		1,914,099	1,914,099		1,914,099
Equipment Principal & Interest	0%	840,723		840,723	840,723		840,723	840,723		840,723
Total Dep. & Amort		2,754,823	2,073,709	2,754,823	2,754,823	2,073,709	2,754,823	2,754,823	2,073,709	2,754,823
EBIT		(3,400,534)	(1,244,539)	(2,030,360)	(2,605,893)	643,576	(175,471)	(1,820,785)	2,447,668	1,589,721
Cost per ton		\$ (40.24)	\$ (14.73)	\$ (24.03)	\$ (15.42)	\$ 3.81	\$ (1.04)	\$ (7.18)	\$ 9.66	\$ 6.27
Cost per Resident per Month		\$ 1.64	\$ -	\$ 0.98	\$ 1.26	\$ -	\$ 0.08	\$ 0.88	\$ -	\$ (0.77)



Property of Ultimate Specialties LLC, Arvada, CO
 Conceptual Layout by Dan Alsop, 303-408-5312
 12/5/08
 Albuquerque, New Mexico 86,000 Tons

City of Albuquerque

Yard Waste Supporting Data

A Residential Customers	172,828
B Residential SW Tons	203,043
C Annual SW Pounds per Resident	2,350

Current Yard Debris Pilot

D Residential Customers	700
E Residential SW Tons	822
F 2008 YTD Weekly Set Out Percentage	24%
G Cart Weight per Set Out	28
H Projected Yard Debris Tons	121
I Annual Yard Debris Pounds per Resident	346

City Projection based on Waste Composition Studies

A Residential Customers	172,828
B Residential SW Tons	203,043
J Yard Debris as a % of waste	16.8%
K Projected Yard Debris Tons	34,064
L Annual Yard Debris Pounds per Resident	394
M Average of Item I and Item L	370

Notes

A: Reported residential customers as of June 2008
B: Reported total solid waste tons collected in FY 2007-08
C: Annual pounds was calculated by multiplying the total residential tons by 2,000 pounds per ton and dividing by the total residential customers (203,043 x 2,000) / 172,828
D: Households that are participating in the pilot study
E: Estimated garbage tons based on the 700 participating customers (700 x 2,350 pounds) / 2,000
F: Average set out percentage recorded in calendar year 2008
G: Average set out weight for each cart
H: Projected yard debris tons collected based on the pilot results ((700 customers x 24% set out rate) x 28.1 pounds per set out) / 2,000 pound per ton x 52 weeks
I: Projected annual weight of yard debris collected per pilot resident
J: The average percentage of yard debris in the residential waste stream. Three waste composition studies (City of Phoenix, Yakima County Washington (high desert terrain similar to Albuquerque), and US EPA) were used to calculate the percentage.
K: Total SW tons multiplied by the percentage of yard debris (203,043 x 16.8%)
L: Projected yard debris tons multiplied by 2,000 pound per ton and divided by the total residential customer base (34,064 x 2,000) / 172,828
M: Average of Item I and Item L

Material	Phoenix	Yakima	EPA	Average
Paper	18.3%	16.7%	34.1%	23.0%
Plastic	8.3%	12.7%	11.9%	11.0%
Glass	2.5%	4.3%	5.2%	4.0%
Metal	4.4%	10.9%	7.6%	7.6%
Hazardous Waste	0.4%	1.3%	0.0%	0.6%
C&D Wastes	7.3%	17.5%	5.7%	10.2%
Other Materials	14.0%	16.8%	10.7%	13.8%
Leaves and Grass	28.0%	9.2%	13.1%	16.8%
Food Wastes	16.8%	10.5%	11.7%	13.0%
Total Waste	100.0%	100.0%	100.0%	100.0%

Cerro Colorado Landfill Disposal Costs

FY 2009 Landfill Budget		Cost per Ton
Labor	1,580,311	
Operations	1,428,670	
IF transfers	103,369	
Truck R&M Expense	1,002,513	
Allocated Fund Transfers	2,223,809	
Administrative Expense	1,113,172	
Total Operational Costs	\$ 7,451,844	\$ 13.86
Capital Replacement Cost	\$ 932,725	\$ 1.74
Equipment (3 year av.)		
Cell 8 build costs (in 2011 \$)	\$ 1,976,433	\$ 1.82
Projected tons (2009 to 2011)	1,088,505	
Landfill Gas Recovery		\$ 0.21
Closure/Post Closure Costs		\$ 0.55
Total Disposal Cost per Ton		\$ 18.17

Landfilled Waste Tons

Year	Tons
2005	541,354
2006	563,567
2007	581,441
2008	605,207
2009	638,021
2010	537,533
2011	550,972
2012	564,746

Cerro Colorado Closure Costs

Regulator Requirement

The Cerro Colorado operating methods are documented in operating, closure, and post-closure plans as part of the landfill operation permit filed with the New Mexico Environment Department. The Cerro Colorado operates on a "cell" basis; that is, only a portion or cell of the landfill is used at a time. Certain materials and equipment used to contain the waste and monitor the environmental effect of landfill operations, such as liners and leachate collection systems, are installed before the cell is ready to receive waste in accordance with state and federal requirements. Final cover is applied to each cell once it is filled to capacity. Monitoring and collection systems are put into place only when the regulation requiring these systems comes into effect. A final cover might not be applied until the entire landfill stops accepting solid waste.

As owner of the Cerro Colorado Landfill, the City of Albuquerque is required to estimate these future liabilities and accrue the amounts necessary under the direction of Statement Number 18 of the Governmental Accounting Standards Board (GASB) released in August 1993. Statement Number 18 is commonly referred to as GASB 18 and is officially titled Accounting for Municipal Solid Waste Landfill Closure and Post-closure Care Costs. Page 2 of the pronouncement states:

Landfill owners and operators are required to incur a variety of costs to provide for protection of the environment both during the period of landfill operation and during the post-closure period. The estimated total current cost of landfill closure and post-closure care, based on applicable federal, state, or local laws or regulations, should include:

- a. The cost of equipment expected to be installed and facilities expected to be constructed (based on the landfill operating plan) near or after the date that the landfill stops accepting solid waste and during the post-closure period.*
- b. The cost of final cover (capping) expected to be applied near or after the date that the landfill stops accepting solid waste.*
- c. The cost of monitoring and maintaining the expected landfill area during the post-closure period. Post-closure care may include maintaining the final cover; monitoring groundwater; monitoring or collecting methane and other gases; collecting, treating, and transporting leachate; repairing or replacing equipment and facilities; and remediating or containing environmental hazards.*

*After the initial calculation of estimated total **current cost** of landfill closure and post-closure care, current cost should be adjusted each year for the effects of inflation or deflation. In addition, current cost should be adjusted when changes in the closure or post-closure care plan or landfill operating conditions increase or decrease estimated costs.*

In accordance with GASB 18 the City has completed regular landfill cost assessments with the last one completed in May of 2008 by Gordon Environmental. It is critical to understand that the engineer's report assumes all of the costs of closure and post closure would be incurred in one year; however, the expected lifespan of waste disposal for the Cerro Colorado landfill is 29 years (2038) and then it will require a minimum 30 years of monitoring after year 2038. The following table details the total current costs for what is expected to be over 60 years of required regulated activities.

Task	Schedule	Cost
Phase I & II Assessment	2 events	\$422,950
Landfill Closure Cover	3 phases	\$5,126,550
Post Closure Maintenance	30 yrs. (annual)	\$402,600
3.1 Gas Monitoring	30 yrs.(annual)	\$1,600
3.2 Mgmt & Maintenance	15 yrs.(every-other-year)	\$34,700
3.3 Landfill Decommission	1 time (1 st year of closure)	\$29,000
3.4 Ground Water Monitor minor.	24 yrs.(every year except full)	\$8,000
3.5 Ground Water Monitor full	6 yrs.(every 6 th year)	\$12,000
3.6 NPDES Monitor	30 yrs.(annual)	\$3,600

Cerro Colorado Closure

The Cerro Colorado Landfill is divided into three phases. Each phase has six separate cells. Phase I, cell six will reach capacity in the later part of 2010 with 10,345,917 tons of waste in place. The remaining cells in phase II and phase III are expected to reach capacity from 2010 to 2138 with 30,609,693 tons of waste in place. Closure for the landfill will be conducted in three phases starting in 2011 with closure of phase I and ceasing in 2038 with the closure of cell 18. Assuming the landfill was to close all 395 acres in 2008, which is the year the cost assessment, the total cost would be \$5,126,550. The closure cost per acre is \$12,979. Since the landfill will be closed in phases over the next 28 years, the cost to close each phase needs to be adjusted to account for inflation. In addition, phase I and phase II will require an engineer's assessment in conjunction with the closure. The following table summarizes the projected year of closure for each of the three phases and the closure cost adjusted for inflation.

Phase	Acres	Closure Year	Closure Cost	Assessment Cost	Total Closure & Assessment Costs
Phase I	99	2011	\$1,383,178	\$453,075	\$1,836,253
Phase II	123	2026	\$2,857,407	\$813,122	\$3,670,529
Phase III	<u>173</u>	2038	<u>\$6,083,232</u>	n/a	<u>\$6,083,232</u>
Totals	395		\$10,323,817	\$1,266,197	\$11,590,014

Although the estimated closure cost is \$5,126,550 in 2008 dollars, adjusting for inflation during the life of the landfill increases the cost of closure by 226% to \$11,590,014.

Post-Closure activities commence with the final cover of the landfill and have an expected life of at least 30 years. Again, the costs provided in the engineer's assessment assume all the costs will be incurred in the year of the estimate. The following table details the required activity by year and costs assuming a 3.5% CPI and starting in year 2039.

Appendix II-D: Cerro Colorado Closure Costs

Date	Closure Year	3.3 Landfill Decommission	Inspections	3.1 Gas Monitoring	3.2 Mgmt. & Maint.	3.4 Water Monitoring (short list)	3.5 Water Monitoring (full list)	3.6 NPDES Monitoring	Total Annual Cost
2039	Year 1	\$206,062	\$37,667	\$4,491		\$22,454		\$10,104	\$280,779
2040	Year 2		\$38,986	\$4,648	\$100,805	\$23,240		\$10,458	\$178,137
2041	Year 3		\$40,350	\$4,811		\$24,054		\$10,824	\$80,039
2042	Year 4		\$41,762	\$4,979	\$107,984	\$24,896		\$11,203	\$190,824
2043	Year 5		\$43,224	\$5,153		\$25,767		\$11,595	\$85,739
2044	Year 6		\$44,737	\$5,334	\$115,676	\$-	\$40,003	\$12,001	\$217,750
2045	Year 7		\$46,303	\$5,520		\$27,602		\$12,421	\$91,846
2046	Year 8		\$47,923	\$5,714	\$123,915	\$28,568		\$12,856	\$218,975
2047	Year 9		\$49,600	\$5,914		\$29,568		\$13,306	\$98,388
2048	Year 10		\$51,336	\$6,121	\$132,740	\$30,603		\$13,771	\$234,572
2049	Year 11		\$53,133	\$6,335		\$31,674		\$14,253	\$105,395
2050	Year 12		\$54,993	\$6,557	\$142,195	\$-	\$49,174	\$14,752	\$267,671
2051	Year 13		\$56,918	\$6,786		\$33,930		\$15,269	\$112,902
2052	Year 14		\$58,910	\$7,024	\$152,323	\$35,118		\$15,803	\$269,177
2053	Year 15		\$60,972	\$7,269		\$36,347		\$16,356	\$120,944
2054	Year 16		\$63,106	\$7,524	\$163,172	\$37,619		\$16,928	\$288,349
2055	Year 17		\$65,314	\$7,787		\$38,936		\$17,521	\$129,558
2056	Year 18		\$67,600	\$8,060	\$174,794	\$-	\$60,447	\$18,134	\$329,035
2057	Year 19		\$69,966	\$8,342		\$41,709		\$18,769	\$138,786
2058	Year 20		\$72,415	\$8,634	\$187,243	\$43,169		\$19,426	\$330,887
2059	Year 21		\$74,950	\$8,936		\$44,679		\$20,106	\$148,671
2060	Year 22		\$77,573	\$9,249	\$200,580	\$46,243		\$20,809	\$354,454
2061	Year 23		\$80,288	\$9,572		\$47,862		\$21,538	\$159,260
2062	Year 24		\$83,098	\$9,907	\$214,866	\$-	\$74,305	\$22,292	\$404,469
2063	Year 25		\$86,007	\$10,254		\$51,271		\$23,072	\$170,603
2064	Year 26		\$89,017	\$10,613	\$230,170	\$53,065		\$23,879	\$406,744
2065	Year 27		\$92,132	\$10,984		\$54,922		\$24,715	\$182,754
2066	Year 28		\$95,357	\$11,369	\$246,564	\$56,845		\$25,580	\$435,715
2067	Year 29		\$98,694	\$11,767		\$58,834		\$26,475	\$195,771
2068	Year 30		\$102,149	\$12,179	\$264,125	\$-	\$91,340	\$27,402	\$497,195
	Totals	\$206,062	\$1,944,480	\$231,831	\$2,557,151	\$948,974	\$315,270	\$521,619	\$6,725,387

Appendix II-D: Cerro Colorado Closure Costs

The required cost to close and monitor the Cerro Colorado is \$18,315,401, which is the sum of the closure cost (\$11,590,014) and the post-closure cost (\$ 6,725,387). The City has accrued closure costs for Cerro Colorado since the start of disposal operations with a current balance of \$1,580,708. The difference between the projected closure and post-closure costs and the current balance is the amount the City needs to collect over the remaining life of the landfill. Dividing this remaining amount by the remaining landfill tons (30,609,693) is the amount the City needs to collect on each ton of waste placed into the landfill. The following table summarizes the calculation of the per ton closure cost:

A	Cost to Cover 395 Acres	\$ 11,590,014
B	Post-Closure Costs (30 years)	\$ 6,725,387
C	Total Cost to Close (A + B = C)	\$18,315,401
D	Less Current Balance	\$(1,580,708)
E	Remaining Accrual (C – D = E)	\$16,734,692
F	Estimated Tons	30,609,693
G	Closure Cost per Ton (E / F = G)	\$0.55



1.0 Planning Context

The City's Solid Waste Management Department (the Department) contracted with Zia Engineering & Environmental Consultants and its sub consultants to prepare an Integrated Waste Management Plan. Part of this planning process involved evaluating the cost of providing collection and disposal services and to conclude if the fees charged impeded or enhanced the Department's and City's goals. The conclusion reached relative to the current fiscal position of the Department is that it is barely able to fund existing trash collection and disposal operations plus a marginally effective residential recycling program.

The current fiscal condition has become a primary barrier to implementation of the IWMP waste diversion initiatives. The Department is not in a position to construct a large-scale transfer station or recycling processing facility; upgrade and modernize the maintenance yard; expand residential recycling or undertake commercial recycling; carry out multi-faceted promotion / education activities to stimulate more waste diversion; hire related staff; or even replace aging equipment used for garbage collection and disposal.

The rates are imbedded in the Solid Waste Ordinance and are subject to final approval and authorization from the City Council. The City's solid waste management system is municipally controlled and vertically integrated – the Department collects all residential and commercial refuse, maintains public convenience centers, and operates a landfill. Thus it has access to a large rate base and various sources of revenue.

However, through successive administrations and City Councils the pattern has been for the technical and economic rationale justifying rate adjustments to be undermined by the inevitable political conflicts and considerations that characterize administration / City Council relationships. Inaction over the last four years by City Administration has depleted the Department's ability to maintain basic functions much less fund improvements. Past mayors, mayoral staff, and Council members have historically not wanted to be seen as responsible for raising rates.

Until and unless the rate issue – that is, both the rate – setting mechanism and the rate levels themselves – is resolved, the waste diversion initiatives in the IWMP are nothing more than empty rhetoric...and will continue to remain so.

1.1 Cost of Service Rate Setting Approach

Setting rates based on actual cost of service is a practice that is not widely used in New Mexico. In the past, the Department budget was completed and if the projected revenues did not support the expenses, the additional revenue required in the rates was assessed and the increase was allocated as a flat percentage over the residential and commercial customers. The cost of service study was a thorough evaluation of each service provided by the Department. The adopted FY 2010 budget was the base line for the study costs. The Department budget is segregated into five divisions: Collection, Disposal, Recycling, Clean City, and Administration. Each division was evaluated to understand the various services, internal and external customers, fixed and variable costs, and sources of revenue. Performance and customer statistics were collected from numerous sources within the Department. These statistics were then used to assign costs to various services within the Department and to allocate costs to the specific customers. Actual costs that are incurred by a specific service, such as equipment replacement, were directly assigned.



The cost of capital repair and replacement is a separate cost component in each of the proposed rates. The future equipment needs for each division was analyzed based on the current level of service and the remaining useful lives of the assets in service. Replacement costs were researched and replacement schedules were completed based on the estimated useful life of each asset. To illustrate this method, the cost of replacing a residential collection truck today with a useful life of seven years is \$235,500. Because this truck has a seven year life, the Department needs to collect \$33,643 or 1/7 of the value of the truck every year for future replacement. The annual replacement cost for all capital assets which include trucks, carts, and commercial containers was then allocated to the customer base and added to the rate.

Repair to departmental facilities and buildings such as the convenience centers and administrative office were assigned based on 2% of the replacement value. These costs were also added to the respective services within the proposed rates.

To summarize this approach within the study, the cost of disposal is illustrated. Budgeted amounts from account 5415000 are the daily operational costs of the Cerro Colorado Landfill. The landfill is also a user of internal department services such as vehicle and equipment repair from account 5417000; therefore, a portion of the cost of this internal service fund was assigned to the landfill based on the value of the equipment. Administrative services from account 5418000 were also assigned using a similar approach. The sum of the three services is the total operational costs of the landfill. A capital repair and replacement schedule of costs for the landfill was completed as well as the cost of constructing a replacement cell in 2011. Plumbing the current cells to remove methane gas is a direct cost that was assigned to the landfill. Future landfill cost projections of closing and monitoring the landfill were also added to the current cost. Once the assignment of these internal and external costs was completed and summarized, the total cost of the landfill was allocated over future waste tons to calculate the cost per ton.



The standard approach to setting collection rates is to calculate the cost of providing the collection service and the disposal cost independently and then add the results together to arrive at the fee. Waste tons collected by service (residential, commercial, and roll off drop box) in 2009 were used to calculate the cost of disposal. In 2009, the Department collected 170,337.95 tons of solid waste from the City residential customers. The cost of disposal at the landfill was calculated at \$18.17 per ton, so the total disposal cost from residential collection was \$3,095,041 (170,337.95 tons x \$18.17). To calculate the cost in the rate, \$3,095,041 was divided over 12 months and then divided over the 175,162 residential customers to arrive at a monthly cost of \$1.47 per customer per month.

The following pages explain in detail the cost of service fee approach and the costs for each service components.



2.0 Department Expenses

The Solid Waste Management Department has five separate divisions that provide ten specific services, as portrayed in the first table below. Eight of these services are provided to the public and two are internal – Vehicle Maintenance and Central Services.

Vehicle Maintenance provides repair and maintenance to the entire fleet of collection and service vehicles plus the heavy equipment at the landfill and convenience centers. Central Services provides the administration, payroll, accounting, and reporting for the Department. The cost of Vehicle Maintenance is allocated to the eight public services whereas the cost of Central Services is allocated to collections and disposal.

Each division has its own budget. Approximately 75 % of the Department’s costs are incurred by the divisions. In addition to the divisional budgets, the Department incurs approximately 25 % of its annual costs in the form of inter–fund transfers to other departments within the City.

The following tables detail the division, service provided by each, and the 2009–2010 budgeted expenses and inter–fund transfers for the SWMD.

Division	Divisional Service	Amount	Expense %
Collections	Commercial Generators	\$ 10,210,858	18 %
Collections	Residential Generators	\$ 7,646,142	14 %
Disposal	Landfill	\$ 3,312,350	6 %
Disposal	Convenience Centers	\$ 2,862,650	5 %
Admin. Services	Vehicle Maintenance	\$ 3,768,547	7 %
Admin. Services	Central Services	\$ 4,114,453	7 %
Recycling	Curbside Residential Recycling	\$ 1,838,464	3 %
Recycling	Intermediate Processing Facility (IPF)	\$ 1,694,536	3 %
Clean City	Weed & Litter Removal	\$ 4,438,819	8 %
Clean City	Graffiti Removal	\$ 1,302,181	2 %
	Fund Transfers Out	\$ 14,789,000	26 %
	Total Expenses	\$ 55,978,000	100%



The table below shows the specific inter-fund transfers out of the Department:

Destination of Transfer	Reasons for Transfer	Amount
General Fund	Payment in lieu of taxes and overhead	\$ 2,976,000
Debt Service	Long – term debt on equipment	\$ 4,999,000
Capital Acquisition	Capital equipment purchases	\$ 3,818,000
Environmental Health Department	Household Hazardous Waste program, and Capital expenses	\$ 1,312,000
Animal Services	Dead animal pick-up	\$ 123,000
Water Department	Invoicing for collection services	\$ 997,000
Dept of Municipal Dev.	Security at solid waste facilities	\$ 436,000
Planning Department	Code enforcement (2 FTEs)	\$ 128,000
Total		\$ 14,789,000

The Department has a restricted cash account dedicated to the closure costs for the Cerro Colorado Landfill. Funds are annually allocated to this account to pay for the closure and post – closure costs of the landfill once it has reached capacity.

2.1 Costs for Disposal

Waste disposal costs are comprised of three primary expenses: landfill operations, landfill cell construction, and landfill closure costs. Daily operations at the landfill have an approximate cost of \$ 7.6 million per year or \$14.18 per ton of garbage disposed. These costs include labor, daily operation, equipment replacement, and administration of the activities at the Cerro Colorado Landfill. During fiscal year 2008 – 09, the landfill accepted approximately 534,000 tons of municipal solid waste and 170,000 tons of remediated soil. The active cell being used for disposal is projected to reach capacity in late 2011. For the current fiscal year it is estimated 538,000 tons of municipal solid waste will be disposed at the landfill. The table to the right summarizes past and projected tons disposed at Cerro Colorado Landfill.

Landfilled Waste Tons	
Year	Tons
2005	541,354
2006	563,567
2007	581,441
2008	605,207
2009	638,021
2010	537,533
2011	550,972
2012	564,746

Excavation of the new cell (Cell 8) has begun with an estimated completion of early 2011. The projected cost for Cell 8 at Cerro Colorado Landfill is \$ 2.0 million. Over the next two years, the City would need to collect an additional \$1.82 per ton of disposed waste above the existing tipping fee to pay for the new cell.

The costs to cover and monitor a closed landfill cell are known as closure and post – closure costs. While these costs will be incurred in the future the revenue needs to be collected now and encumbered in a separate account for this purpose. The estimated cost to close the current cells in 2010 (Cells 1 through 7) is \$ 1.6 million and the amount that needs to be in the bank in 2010 for the 30 years of post – closure care for the same cells is estimated at \$ 2.6 million. The amount of closure and post – closure costs to be collected today amounts to a charge of approximately \$0.55 per ton. The table below summarizes the current costs of disposal services for the Cerro Colorado Landfill.



Description	Notes	Data / Cost	
Estimated FY 2010 SW Tons	A	537,533	
FY 2009-10 Landfill Budget			
		Cost / Data	\$ per Ton
Operations Labor	B	\$ 1,580,311	
Operating Expense	C	\$ 1,428,670	
Interfund Expenses	D	\$ 103,369	
Truck R&M Expense	E	\$ 1,002,513	
Interfund Allocations	F	\$ 2,223,809	
Administrative Expense	G	\$ 1,113,172	
Total Operations Cost (Sum of Items B through G)	H	\$7,451,845	\$13.86
Capital Replacement Cost	I	\$932,725	\$1.74
Projected tons (2010 to 2011)	J	1,088,505	
Cell 8 build costs (in 2011 \$)	K	\$1,976,433	\$1.82
Landfill Gas Plumbing	L	\$225,000	\$0.21
Closure & Post Closure Costs	M		\$0.55
Total Disposal Cost per Ton	N		\$18.17

Table Notes and Calculations on the following page

A: Projected waste tons for the Cerro Colorado Landfill based on past disposal plus the increase in population for the City of Albuquerque. The cost per ton is the line item cost divided by the waste tons from Item A.

B: Landfill labor budget for FY 2009-10

C: Landfill (Cerro Colorado) operating budget for FY 2009-10

D: Landfill interfund transfer budgets for FY 2009-10

E: Vehicle and equipment repair and maintenance costs allocated to landfill operations.

F: Interfund transfers from the SW Division allocated to landfill.

G: SW Division administrative costs allocated to landfill.

H: Sum of Items B through Item G

I: Three year average equipment replacement cost

J: Projected waste tons disposed at Cerro Colorado from 2010 to 2011

K: Estimated cell 8 construction cost in 2011

L: Engineer's estimate to plumb cell divided by projected tons from 2010 to 2011.

M: Closure and post-closure cost per ton

N: Sum of Item H + Item I + Item K + Item L + Item M



2.2 Costs of the Intermediate Processing Facility (IPF)

Recyclable materials dropped off at the City’s recycling depots and recovered through the curbside residential recycling program are delivered to the IPF for sorting, storage, and eventual sale. The IPF is limited in design to handle the current number of material tons delivered. Therefore approximately 25 % of the commingled loads are baled and wholesaled as “super mix” to other regional processors. For example, in fiscal year 2008-09 the IPF processed 12,065 tons of curbside recyclables and 6,891 tons of depot materials. There were 5,855 tons of curbside materials shipped to regional processors including 5,607 tons to the Friedman facility in Phoenix, 237 tons shipped to the BuRRT in Santa Fe, and 11 tons to Masters Fibers in Albuquerque. The following table details the costs of operating the IPF and the per ton cost of processing materials.



Description	Notes	Cost / Data
Estimated FY 2010 Material Tons	A	21,400
Residual Waste	B	14%
FY 2009-10 Landfill Budget		
Operations Labor	C	\$ 1,165,664
Operating Expense	D	\$ 491,699
Interfund Expenses	E	\$ 37,173
Truck R&M Expense	F	\$ 36,569
Fund Transfers Out	G	\$ 165,844
Disposal Costs	H	\$ 56,030
Facility Replacement	I	\$114,000
Equipment Replacement	J	\$159,861
Total IPF Processing Cost (Sum of Items C through J)	K	\$2,226,841
Operational Cost per Recycle Ton	L	\$104.06
Operations	M	\$1,896,950
Equipment & Facility	N	\$273,861
Disposal Expense on Residual Waste	O	\$ 56,030
Less Material Value	P	\$(840,658)
Total Cost	Q	\$1,386,183
Cost per Ton	R	\$64.77

Table Notes and Calculations

- A:** Prior year material tons processed at the IPF
- B:** Residual waste (garbage separated from the recycle stream) is based on prior years results of 14%.
- C:** IPF labor budgets for FY 2009-10
- D:** IPF operating budgets for FY 2009-10
- E:** IPF interfund transfer budgets for FY 2009-10
- F:** Vehicle and equipment repair and maintenance costs allocated to the IPF.
- G:** Interfund transfers from the SW Division allocated to the IPF.
- H:** Estimated waste tons (Item A) multiplied by residual waste percentage (Item B) then multiplied by the cost of disposal from the Landfill Disposal Cost tab.
- I:** Facility repair and

replacement costs (2% of the replacement cost for each facility).

J: Convenience center equipment repair and replacement cost (10% of the equipment replacement cost).

K: Sum of Items C through J.

L: Total IPF Processing Cost (Item K) divided by Material Tons (Item A).

M: Operations cost (sum of Items C through G)

N: Equipment replacement costs (Items I+ and J).

O: Disposal Expense (Item H).

P: Less budgeted reveue from the sale of recyclable materials

Q: Sum of Items M through P. Allocated 75% to residential and 25% to commercial

R: Total Cost (Item Q) divided by Material Tons (Item A).



2.3 Costs for Convenience Centers

The operations of the three centers as well as subsequent transport and disposal of the refuse delivered to them are the primary costs of these facilities. The convenience centers cater to the residential and small commercial self – haul customer. None of the sites have scales to weigh inbound waste loads, so each residential customer pays a flat \$ 3.47 per load and commercial customers are charged \$ 9.08 per load. In the previous fiscal year over 257,000 trips were made by both residents and non-residents of Albuquerque to the facilities. Total waste disposed was 51,363 tons or approximately 391 pounds per visit. The table below summarizes the current service costs for the convenience centers.



The Average Cost per Customer Visit assumes that every customer is dropping off 391 pounds of waste for disposal at a cost of \$ 102.03 per ton (Item M). The operational cost per ton includes disposal at Cerro Colorado at \$ 18.17 / ton. The cost of operating the facilities and transporting waste to Cerro Colorado Landfill is \$ 83.58 per ton (\$ 101.75 - \$18.17). The budgeted revenue from the fees assessed at the convenience centers is \$ 885,000, which only covers 15 % of the operations costs for the facilities. The revenue shortfall for the current fiscal year is therefore \$ 5,103,000. Bluntly stated, the convenience centers are places where “anyone can throw away anything for practically nothing”. As well, it should be emphasized that residents from outside Albuquerque enjoy the same low rates for disposal at the convenience centers as City residents do.

Description	Note	Cost
Estimated FY 2010 Customers	A	263,000
Estimated FY 2010 Waste Tons		58,400
Less Rat Pak Route Truck Tons		(619)
Less Clean City Tons		(94)
Less R/O Waste Tons		(6,323)
Net Self Haul Waste Tons	B	51,363
FY 2009-10 Landfill Budget		
Operations Labor	C	\$ 2,259,741
Operating Expense	D	\$ 445,940
Interfund Expenses	E	\$ 156,969
Truck R&M Expense	F	\$ 313,396
Interfund Allocations	G	\$ 636,433
Administrative Expense	H	\$ 455,632
Disposal Costs	I	\$ 933,139
Facility Replacement Costs	J	\$ 250,643
Facility Equipment Replacement	K	\$ 490,582
Total Operations Cost (Sum of Items C through K)	L	\$ 5,942,475
Operational Cost per Waste Ton	M	\$ 101.75
Operational Cost per Customer	N	\$ 22.59
Current Residential Rate	O	\$ 3.47
Current Commercial Rate	P	\$ 9.08
Average Pounds Disposed per Visit	Q	391
Revenue at the Cost of Service	R	\$ 5,942,475
Revenue at \$9.00 per customer	S	\$ 2,367,000

covers 15 % of the operations costs for the facilities. The revenue shortfall for the current fiscal year is therefore \$ 5,103,000. Bluntly stated, the convenience centers are places where “anyone can throw away anything for practically nothing”. As well, it should be emphasized that residents from outside Albuquerque enjoy the same low rates for disposal at the convenience centers as City residents do.

Table Notes and Calculations

- A:** Prior year customer count increased by 2%
- B:** 2009 reported tonnage increased by 2% less waste tons collected on route and transferred to the landfill via the Convenience Centers.
- C:** Convenience Center labor budgets for FY 2009-10
- D:** Convenience Center operating budgets for FY 2009-10



- E:** Convenience Center interfund transfer budgets for FY 2009-10
- F:** Vehicle and equipment repair and maintenance costs allocated to the convenience centers.
- G:** Interfund transfers from the SW Division allocated to the convenience centers.
- H:** SW Division administrative and vehicle maintenance costs allocated to the convenience centers.
- I:** Estimated waste tons from Item B multiplied by the cost of disposal
- J:** Facility repair and replacement costs (2% of the replacement cost for each facility).
- K:** Convenience center equipment repair and replacement cost (10% of the equipment replacement cost).
- L:** Sum of Items C through K.
- M:** Total Cost from Item L divided by Estimated Tons from Item B
- N:** Total Cost from Item L divided by the Estimated Customers from Item A
- O:** Current rate assessed at the convenience centers
- P:** Current commercial rate assessed at the convenience centers
- Q:** Net waste tons (Item B) multiplied by 2,000 pounds per ton divided by estimated 2010 customers (Item A).
- R:** Estimated 2010 customers (Item A) multiplied by the Cost per Customer (Item N)
- S:** Estimated 2010 customers (Item A) multiplied by \$ 9.00.

2.4 Costs for Clean City Program – Weed, Litter and Graffiti Removal

The Clean City Division employs 36 people for the weed and litter patrols and another 20 for graffiti removal. In addition to City staffing there are also alternative sources of labor from community service providers and inmate work crews. The Division is responsible for keeping the major thoroughfares within the City clear of litter and weeds. The Division also responds to clean-up requests from Zoning Enforcement personnel, cleans illegal dumpsites, and organizes neighborhood clean-up events. As well, Clean City workers are responsible for removal of graffiti from public and private property.

The annual costs of these services (FY 2009–10) are \$ 5.3 million for weed / litter removal and \$ 1.6 million for graffiti removal. That funding has been steadily cut back. Clean City activities are not invoiced to residential or commercial customers. Instead the Department has provided supplemental funds by shifting money designated for equipment replacement to ongoing operations. The cost of the program has been allocated evenly to residential and commercial collections. The following table summarizes the cost of the Clean City Program.

	Weed & Litter	Graffiti	Total
Service Cost	\$ 5,315,447	\$ 1,595,139	\$ 6,910,586
Disposal Cost	\$ 9,035	-	\$ 9,035
Asset Replacement	\$ 415,249	\$ 68,375	\$ 483,624
Total	\$ 5,739,731	\$ 1,663,514	\$ 7,403,245



2.5 Costs for Collection of Residential Trash and Recyclables

The Solid Waste Department services approximately 175,200 residential customers with solid waste and recycling collection. The monthly costs per residential account for this service are comprised of six elements – collection, disposal, recyclable material processing, collection equipment replacement costs (trucks and carts), the Clean City Program, and Clean City Special Reserve are also included in the monthly rate. The table on the following page details the cost calculation of the residential collection rate.

		Collection Cost			Cost per Customer per Month		
Residential Customers:	Notes						
175,162	A	Garbage	Recycling	Total	Garbage	Recycling	Total
Collection Labor	B	\$ 4,141,579	\$ 1,277,902	\$ 5,419,481	\$ 1.97	\$ 0.61	\$ 2.58
Operating Expense	C	\$ 2,653,959	\$ 524,933	\$ 3,178,892	\$ 1.26	\$ 0.25	\$ 1.51
Interfund Expenses	D	\$ 850,604	\$ 35,629	\$ 886,233	\$ 0.40	\$ 0.02	\$ 0.42
Truck R&M Expense	E	\$ 902,507	\$ 225,627	\$ 1,128,134	\$ 0.43	\$ 0.11	\$ 0.54
Interfund Allocations	F	\$ 3,012,549	\$ 391,919	\$ 3,404,467	\$ 1.43	\$ 0.19	\$ 1.62
Administrative Expense	G	\$ 1,458,137		\$ 1,458,137	\$ 0.69		\$ 0.69
Total Collection Cost	H	\$13,019,334	\$2,456,010	\$15,475,344	\$6.19	\$1.17	\$7.36
Disposal Cost	I	3,095,041		\$ 3,095,041	\$ 1.47		\$ 1.47
Material Processing	J		\$ 1,039,637	\$ 1,039,637		\$ 0.49	\$ 0.49
Total Disposal Cost	K	\$3,095,041	\$1,039,637	\$4,134,677	\$1.47	\$0.49	\$1.97
Daily Collection Routes	L	48	12				
Required Trucks	M	56	14				
Annual Truck Replace (7 yr.)	N	\$ 1,650,200	\$ 593,526				
Annual Cart Replace (10 yr.)	O	\$ 765,000					
Annual Capital Cost	P	\$2,415,200	\$593,526	\$3,008,726	\$1.15	\$0.28	\$1.43
Clean City Allocation Cost	Q	\$3,455,293		\$ 3,455,293	\$1.64		\$1.64
Clean City Asset Replace	Q	\$241,812			\$0.12		\$0.12
Cost to Collect (H+K+P+Q)	R	\$22,226,680	\$4,089,172	\$26,315,852	\$10.57	\$1.95	\$12.52
Clean City Special Reserve (1.5% of Item R)	S	\$333,400	\$61,338	\$394,738	\$0.16	\$0.03	\$0.19
Total Collection Rate (R+S)	T						\$12.71
Current Rate	U						\$10.75
Increase for Cost of Service	V						\$1.96
% Increase	W						18.21%

**Table Notes and Calculations**

Per customer per month cost is calculated by dividing the total budgeted or allocated cost by 12 months and then by the customer count.

A: Residential collection customers from August 2009 billing report.

B: Residential garbage and curbside collection labor budgets for FY 2009-10

C: Residential garbage and curbside collection operating budgets for FY 2009-10

D: Residential garbage and curbside interfund transfer budgets for FY 2009-10

E: Vehicle repair and maintenance costs allocated to residential collection.

F: Interfund transfers from the SW Division allocated to residential collection.

G: SW Division administrative costs allocated to residential collection.

H: Sum of Items B through Item G

I: Waste tons collected in CY 2009 multiplied by the disposal cost per ton.

J: IPF department costs are 75% of those cost allocated to residential recycling.

K: Sum of item I + Item J

L: Reported collection routes.

M: Collection routes plus one back up per 6 collection routes.

N: Annual cost to replace residential collection trucks.

O: Annual cost to replace residential roll carts.

P: Annual amount to accrue for truck and cart replacement.

Q: Half of the annual cost of the Clean City program is allocated to residential collection.

R: Sum of Item H + Item K + Item P + Item Q.

S: Additional amount to accrue to fund the clean city special reserve.

T: Sum of Item R (Total Cost per Customer per Month) plus Item S (Fund Reserve Cost).

U: Current monthly residential collection rate.

V: Difference between cost of service (Item T) and Current Rate (Item U).

W: Percentage change from Current Rate to the cost of service.



2.6 Costs for Commercial Collection

There are approximately 9,300 commercial customers with the City that are serviced by a variety of collection options: front or rear load containers, front load compactors, roll off drop boxes, or roll off compactors. The frequency of collection service varies from once a month to six times a week. Budgeted costs for container and roll off collection were allocated based on route performance. The following table summarizes the allocation method and the percentage used to allocate the costs:

Direct Costs	Allocation	Container Allocation %	Roll Off Allocation %
Labor Expense	Labor Hrs	71%	29%
Operating Expenses	Routes	65%	35%
Interfund Transfers	Labor Hrs	71%	29%
Fund Transfers Out	Revenues	75%	25%
Vehicle Maintenance	Trucks	64%	36%
Central Services	Revenues	75%	25%

Once the method of allocation was determined, budgeted costs were then allocated to either container collection or roll off. The table below is the second step of the allocation of costs for the purpose of determining the cost of service and thus setting the appropriate rate.

Direct Costs	Allocation	Total Commercial	Container	Roll Off
Labor Expense	Labor Hrs	\$ 5,643,780	\$ 4,033,052	\$ 1,610,728
Operating Expenses	Routes	\$ 3,377,520	\$ 2,205,254	\$ 1,172,266
Interfund Transfers	Labor Hrs	\$ 1,190,009	\$ 850,382	\$ 339,627
Fund Transfers Out	Revenues	\$ 3,095,435	\$ 2,318,169	\$ 777,266
Vehicle Maintenance	Trucks	\$ 1,315,511	\$ 845,686	\$ 469,825
Central Services	Revenues	\$ 1,661,361	\$ 1,244,192	\$ 417,169
Total Costs		\$16,283,616	\$11,496,735	\$4,786,881



2.7 Costs for Roll-off Drop Box and Compactor Collection

The rates for drop box service trend in an illogical progression when compared to other waste services: the greater the amount disposed, the lower the rate. The fees proposed for drop box service are the cost of providing drop box service plus disposal. If the customer utilizes a City owned drop box, then there is an additional rental charge. The service fee is based on the average time to provide the service multiplied by the cost per hour. The average time per pull is one hour and 20 minutes and the operational cost per hour is \$112. The table on the following page details the rate method.

Direct Costs	Drop Box / Compactor	Notes
Labor Expense	\$ 1,610,728	A
Operating Expenses	\$ 1,172,266	B
Interfund Transfers	\$ 339,627	C
Fund Transfers Out	\$ 777,266	D
Vehicle Maintenance	\$ 469,825	F
Central Services	\$ 417,169	G
Total Costs (Sum of A through G)	\$ 4,786,881	H
Equipment Replacement	\$ 497,567	I
Estimated Truck Hours	47,268	J
Annual Pulls	28,600	
Operational Cost per Truck Hour	\$ 84.83	K
Fund Transfers Out Cost per Hr	\$ 16.44	L
Equipment Replacement	\$ 10.53	M
Total Cost per Truck Hour	\$ 111.80	N
Average Time per Pull: 1 hour, 20 minutes	1.3	O
Exchange / Compactor Service	\$ 145	P
Assumes 1 hour and 20 minutes per pull		
Delivery Charge	\$ 74.50	Q
Assumes 40 minutes		
30 Yard Drop Box Rental (per month)	\$ 68	R

Table Notes and Calculations

- A:** Commercial collection labor budgets for FY 2009-10
- B:** Commercial collection operating budgets for FY 2009-10
- C:** Commercial interfund transfer budgets for FY 2009-10
- D:** Interfund transfers from the SW Division allocated to commercial collection.
- F:** Vehicle repair and maintenance costs allocated to commercial collection.
- G:** SW Division administrative costs allocated to commercial collection.
- H:** Sum of Items A through G
- I:** Truck and equipment replacement costs (2% of the replacement cost).
- J:** Estimated time spent servicing and dumping drop boxes over a 12 month period
- K:** Operational costs divided by truck hours: Sum of Items A+B+C+F+G divided by Truck Hours (Item J)
- L:** Fund transfers out of the SW Department (Items D and E) divided by Truck Hours (Item J).
- M:** Equipment Replacement costs (Item I) divided by Truck Hours (Item J)
- N:** Sum of Items K through M



- O:** This is the average time to service one box or compactor
- P:** Assumes a drop box pull will take one hour and 20 minutes; therefore, the rate is set at the cost of providing service is the same as Item O x Item N.
- Q:** Assumes the delivery of a drop box is 40 minutes; therefore, Item N is multiplied by 66%.
- R:** Monthly cost of a drop box over a 7year life at 4%

Disposal Costs for open top drop boxes and compactors were calculated based on the averages box weights multiplied by the current disposal fee. All



special open box waste tons delivered to the landfill in 2009 were collected in City owned 30 yard drop boxes. During the year, there were 2,259 trips to the landfill to deliver 8,626 tons of waste. The average weight per yard of waste was 255 pounds ((8,626 tons x 2,000 pounds) / 2,259 pulls / 30 yards per box). An adjustment of 10% was added to open top pulls to account for heavier summer pulls. Specific weight data for roll off compactors was not collected by the Department; therefore, compactor weights from previous audit was used for the 462 pounds per yard assumption for compactor disposal. The table below summarizes the disposal calculations for both services followed by a rate comparison of current and proposed rates:

Description	Open Top	Compactor
Average pounds per yard (30 yd box)	254.56	461.88
Disposal Cost per Ton	\$ 18.17	\$ 18.17
Seasonality Adjustment	10%	0%
Disposal Cost per Drop Box Yard	\$ 2.54	\$ 4.20

Service	Current Rate	Proposed Rate	Change	% ▲
30 yard open top 1x per week	\$ 910	\$ 1,042	\$ 132	15%
20 yd compactor 1x per week	\$ 793	\$ 1,008	\$ 216	27%
30 yd compactor 1x per week	\$ 863	\$ 1,193	\$ 330	38%
34 yd compactor 2x per week	\$ 1,783	\$ 2,533	\$ 751	42%

2.8 Costs for Solid Waste Container Collection

In the same manner as drop box service, the rates for commercial container collection service trend in an illogical progression: the greater the amount disposed, the lower the rate. Container collection service has the largest combination of collection rates because the City has six classes of service with containers varying in size from 32 gallons to 8 yards. Rates for each service class are comprised of the six components and allocated on a specific service parameter.

1. Truck Costs were allocated on the frequency a container was picked up for disposal
2. Labor and Operational Cost were allocated on the number of container yards collected
3. Asset Replacement Cost is allocated on the frequency a container is picked up for disposal
4. IPF Cost is allocated on the number of container yards collected
5. Clean City Cost is allocated on the number of container yards collected
6. Disposal Cost is allocated on the number of container yards collected

Additional costs include a 1.5% Convenience Center and Contingency program and rent if the container is furnished by the City. The table on the following page details the calculation of the rate components:





Direct Costs	Total Container	Single Driver	Crew Served	Notes
Labor Expense	\$ 4,033,052	\$ 2,809,325	\$ 1,223,728	A
Operating Expenses	\$ 2,205,254	\$ 1,648,137	\$ 557,117	B
Interfund Transfers	\$ 850,382	\$ 592,355	\$ 258,027	C
Fund Transfers Out	\$ 2,318,169	\$ 1,710,721	\$ 607,447	D
Vehicle Maintenance	\$ 845,686	\$ 709,772	\$ 135,914	E
Central Services	\$ 1,244,192	\$ 918,167	\$ 326,025	F
Total Costs (Sum of A through F)	\$ 11,496,735	\$ 8,388,477	\$ 3,108,258	G
Equipment Replacement	\$ 1,118,275			H
Estimated Truck Hours	93,574			I
Operational Cost per Truck Hour	\$ 98.09			J
Fund Transfers Out Cost per Hr	\$ 24.77			K
Equipment Replacement	\$ 11.95			L
Total Cost per Truck Hour	\$ 134.81			M
Annual Lifts	977,028	785,867	191,161	N
Annual Yards	5,085,909	4,151,788	934,121	O
Commercial Customers	9,335			P
Truck Cost per Lift	\$ 3.12	\$ 3.75	\$ 4.98	Q
Operational Cost per Yard	\$ 1.42	\$ 1.03	\$ 1.87	R
Central Services Cost per Customer	\$ 11.11	\$ 11.11	\$ 11.11	S
Equipment Replacement per Lift	\$ 1.14			T
IPF Allocated Cost per Yard		\$ 0.07	\$ 0.07	t
Clean City Costs	\$ 6,910,586			U
Clean City Asset Replacement	\$ 483,624			V
Commercial Allocation (50%)	\$ 3,697,105			W
Clean City per Container Yard	\$ 0.73	\$ 0.73	\$ 0.73	X
Weight per Container Yard	110			Y
Disposal Cost per SW Ton	\$ 18.17			Z
Disposal Cost per Container Yard	\$ 1.00			AA

Table Notes and Calculations

- A:** Commercial collection labor budgets for FY 2009-10 (Accts 510400 to 516400).
B: Commercial collection operating budgets for FY 2009-10 (Accts 520500 to 589000).
C: Commercial interfund transfer budgets for FY 2009-10 (Accts 571100 to 572300).
D: Interfund transfers from the SW Division allocated to commercial collection.
E: Vehicle repair and maintenance costs allocated to commercial collection.
F: SW Division administrative costs allocated to commercial collection.
G: Sum of Items A through F

Allocations are from reported operations

- H:** Truck and equipment replacement costs (see separate schedule for details).
I: Estimated time spent collecting commercial waste over a 12 month period
J: Operational costs divided by truck hours: Sum of Items A+B+C+E+F divided by Truck Hours (Item I)



- K:** Fund transfers out of the SW Department (Items D) divided by Truck Hours (Item I).
- L:** Equipment Replacement costs (Item H) divided by Truck Hours (Item I)
- M:** Sum of Items J through L
- N:** Annual container lifts segregated by regular routes and routes requiring two person crews
- O:** Annual container yards segregated by regular routes and routes requiring two person crews
- P:** Reported commercial customers in November 2009
- Q:** Truck costs (Item B +Item C + Item E) divided by annual lifts
- R:** Operational costs (Item A + Item D) divided by annual container yards
- S:** Central services costs divided by 12 months and then divided by the customer count
- T:** Equipment replacement cost (Item H) divided by Annual Lifts (Item N)
- t:** IPF allocated cost \$346,546 (25% of total IPF costs) divided by Annual Yards (Item O)
- U:** Clean City Program costs
- V:** Clean City asset replacement costs
- W:** Half of the cost of the Clean City program is allocated to commercial customers
- X:** Clean City allocation (Item W) divided by Annual Container Yards (Item O).
- Y:** Weight per container yard is 110 pounds
- Z:** Disposal cost per ton
- AA:** Cost per yard (110/2000) x \$18.17

Here is the method for setting the rate on a 2 yard front load container owned by the City and collected weekly:

Component	Cost	Lifts	Yards	Total Costs
Truck	\$ 3.75	4.33		\$ 16.24
Labor	\$ 1.03		8.66	\$ 8.92
Asset	\$ 1.14	4.33		\$ 4.94
IPF	\$ 0.07		8.66	\$ 0.61
Clean City	\$ 0.73		8.66	\$ 6.32
Disposal	\$ 1.00		8.66	\$ 8.66
Container				\$ 5.50
Total of Rate Costs				\$ 51.19
Convenience Center and Contingency @ 1.5%				\$ 0.77
Collection Rate (Rate Cost + 1.5%)				\$ 51.96



3.0 Department Revenues

The primary sources of revenue for the Solid Waste Department come from residential and commercial collection services. The following table shows the budgeted revenue for the Department by source for fiscal year 2009 – 10:

Source	Amount	Revenue %
Commercial Collection	\$ 23,776,885	45 %
Residential Collection	\$ 22,941,516	43 %
Landfill Disposal	\$ 1,085,871	2 %
Convenience Centers	\$ 885,327	2 %
Recycling (a)	\$ 1,840,586	3 %
Other / Fuel Surcharge	\$ 1,388,756	3 %
Inter – fund Transfer (b)	\$ 1,000,000	2 %
Total	\$ 52,918,941	100 %

- (a) Recycling revenues are from two sources – the recycling service charge for multi – family dwellings (\$956,453) and projected sales of recyclable materials (\$ 884,133). Actual sales revenues for FY 2009–10 may be greater or lesser than what was projected.
- (b) Although the interfund transfer was budgeted, the payment from the General Fund to the SW Fund was suspended in mid FY 2010 due to the shortage of resources.

The preceding table shows that nearly 90 % of the SWMD revenue is derived from rates for residential and commercial refuse collection even though ten distinct services are offered by the Department (see expense table in Section 2.0). Clearly most of the operational units are not self-sustaining enterprises but are instead being largely subsidized by residential and commercial rate payers.

Furthermore, by contrasting the expense table in Section 2.0 with the revenue table above, it is also clear that for fiscal year 2009–10 the expenses exceed the budgeted revenue by \$ 3,059,059 or 5 % of expenses. The budget deficit will draw down the operational reserve balance to about 4 % of operational expenses (4 % x \$55,000,000 = \$ 2,200,000). This provides the Department with 15 days of operational cash. A best practice for municipal enterprise operations is 60 days of cash, or approximately 15 % of the projected fund expenditures (15 % x \$ 55,000,000 = \$ 8,250,000). It should be noted that if revenues from the sale of recyclable materials are less than projected, as it appears they will be at this point in time, the budget deficit will increase.

The reason for the shortfall is escalating costs without a comparable increase in collection and disposal fees. Rates were last adjusted in May 2006. Some of the larger expenses that have been incurred by the SWMD over the past four years are described below:

- **Clean City Program** – Partial funding of the program followed from the General Fund but most of the costs were not considered in early 2006 when rates were last adjusted. The burden of funding this program has come at the expense of asset replacement within the Department. For the current fiscal year the \$ 5.7 million program cost was not offset by a budgeted \$ 1 million transfer from the General Fund. This transfer was scheduled to end in the 2010 – 11 fiscal year.



- **Refuse Vehicles** – Collection trucks have increased in costs due to new EPA clean engine requirements as well as steel price increases. In May 2006 the Department purchased seven automated trucks used for residential collection at a cost of \$ 181,956 each. In August 2008 six replacement trucks for the residential fleet were purchased. The cost of a comparably equipped automated truck rose to \$ 225,200, an increase of \$ 43,214 or 24 %. The price of a diesel truck will increase by approximately \$ 9,600 in 2010 for the additional emission controls required by the US EPA.
- **Collection Personnel** – Collection labor costs have increased by 13.6%, from \$14.61 in 2006 to \$16.59 in 2010 plus the cost of benefits such as medical and retirement.

4.0 Revised Rate Setting Process

For the SWMD to function as a true enterprise fund it is essential to set rates that pay for service delivery costs, both ongoing and anticipated. This has proven to be difficult in Albuquerque because rate setting has historically been unduly influenced by political factors. A better approach would be to reduce the exposure of the rate setting process to the political arena and redefine it as an annual administrative function of the Solid Waste Management Department conducted with structured input from the City administration and the Budget Office. A primary process of the annual rate review would be to assess the performance of the Department by establishing benchmarks.

Benchmarking has been widely embraced by both the private and public sectors as an essential business measurement practice for continuous performance improvement. Managers rely on benchmarking data to objectively measure the quality and levels of the services they provide and to identify and implement best practices that will enable the management of costs and improve services. Operational benchmarks should accurately reflect whether the SW Department is providing the desired services in a cost-effective manner. If performance benchmarks are not achieved and costs are higher than necessary, then the consequence would be to freeze the rate until the desired outcome is attained.

The costs to provide current levels of service would be calculated and the rates for each of the ten lines of business conducted by the Department would be adjusted annually based on controllable and uncontrollable expenses. New programs or significant program changes could be reviewed and approved by City administration and City Council before implementation. Once the new or amended program was approved the rates would be adjusted accordingly. To assure the integrity of the process the rates and the adjustment method could also be reviewed by the City's Office of Management and Budget which is independent of the Solid Waste Department.

It is essential all involved parties understand and agree that fees have to be adjusted on a regular basis to continue the existing level of service delivery and replace aging equipment. Regular but measured rate increases are particularly critical if the Department is going to pursue new initiatives that are capital – intensive and / or represent major changes in policy direction. The SW Department has to be financially solvent to implement future programs that will increase waste diversion and increase collection efficiency that will require an initial investment for future benefits. The SW Department has to be financially solvent It makes no sense at all to commit to programs, infrastructure, and operations designed to achieve those initiatives / policies when the resources necessary for implementation and support are not available. In such a situation the accountability and credibility of the Albuquerque City government suffers.