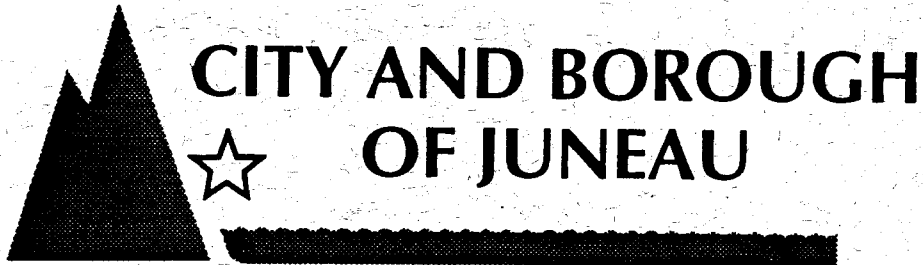

SOLID WASTE MANAGEMENT PLAN



**PHASE I REPORT
EVALUATION OF CHANNEL FACILITIES**

PRESENTATION TO THE ASSEMBLY

JULY 1991

**R.W. BECK
AND ASSOCIATES**



CITY/BOROUGH OF JUNEAU

CITY/BOROUGH OF JUNEAU

DISPOSAL OPTIONS

- Purchase Channel Facilities
- Contract For Disposal
- Status Quo
- Develop New Disposal Facilities



CITY/BOROUGH OF JUNEAU

PURCHASE CHANNEL FACILITIES

Pros:

- Provides the CBJ with the greatest degree of control over disposal in the shortest time frame.
- Provides the CBJ the greatest assurance that regulations and standards protecting human health and the environment will be complied with at the Channel facilities.
- Provides the greatest assurance of continuity of service in the short-term.
- Provides the opportunity to establish an environmental baseline, through a detailed environmental assessment, at the Channel site.

Cons:

- Requires a large capital expenditure by the CBJ and may not result in tipping fees that are any lower than those currently charged by Channel.
- Poses the highest risk of CBJ liability under CERCLA because of past disposal practices.
- Creates a high degree of uncertainty surrounding costs for future environmental compliance, CERCLA liability, and the possible need for future expanded incineration facilities.
- Acquisition through default would entail less risk for the CBJ under CERCLA.

Table 3-2

Liner/Cover Cost Estimate⁽¹⁾

Cap/Liner	Unit Cost	Unit	Quantity	Price
24-inch Foundation Layer	\$ 6.00	CY	20,000	\$ 60,000
Geotextile/Geogrid	2.50	SY		
60 ml HDPE Geomembrane	8.50	SY	58,100	494,000
12-inch Granular Layer	14.00	CY	20,000	280,000
Geotextile	2.50	SY	58,100	145,000
24-inch Operating Layer	14.00	CY	39,000	546,000
Leachate Collection 200 feet spacing 30,000 gal	20.00	LF	5,900	118,000
Leachate Holding Tank with Pump	75,000.00	EA	1	75,000
Gas Collection Trenches and wells 200 feet spacing	20.00	LF	59,000	118,000
Subtotal				1,836,000
Engineering @ 10%				185,000
Services During Construction @ 10%				185,000
Contingency @ 20%				<u>368,000</u>
Total				\$2,575,000

(1) Source: Draft "Closure Study Report - Channel Landfill," prepared by Sweet-Edwards/EMCON, dated June 1991.

Table 3-1

**Geomembrane Cover
Closure Cost Estimate⁽¹⁾**

Closure Cap	Unit Cost	Unit	Quantity	Price
12-inch Foundation Layer	\$ 6.00	CY	56,500	\$ 339,000
60 ml HDPE Geomembrane	8.50	SY	169,400	1,440,000
12-inch Granular Layer	14.00	CY	56,500	790,000
Goetextile	2.50	SY	169,400	424,000
12-inch vegetative layer	40.00	CY	56,500	2,260,000
Hydroseed	1,500.00	AC	35	53,000
Sediment Basin Excavation (2)	3.25	CY	4,000	13,000
Sediment Basin Outlet Structures	1,000.00	EA	2	2,000
Perimeter and Roadside ditches	15.00	LF	6,600	99,000
Gas Collection	20.00	LF	9,800	196,000
Gas/Flare Trenches and Wells	25,000.00	EA	1	25,000
Subtotal				\$5,641,000
Engineering @ 8%				451,000
Services During Construction @ 10%				564,000
Contingency @ 20%				<u>1,128,000</u>
Total				\$7,784,000

(1) Source: Draft "Closure Study Report - Channel Landfill," prepared by Sweet-Edwards/EMCON, dated June 1991.

Table 3-3

Annual Post-Closure Maintenance Estimate⁽¹⁾

	Unit Cost	Unit	Quantity	Price
Final Cover Maintenance	\$1,000	AC	35	
Annual mowing, fertilizer, ditch cleaning, and culvert cleaning				
Cover Repair and sediment pond cleaning	5,000	EA	1	\$ 40,000
Monthly Inspection				
16 hours/month	100	HRS	192	19,000
Quarterly Water Sampling and Testing				
Surface Water Sampling	100	HRS	16	
Ground Water Sampling	100	HRS	32	
Water Quality Analysis	1,500	EA	7	
Report Preparation	2,800	EA	4	58,000
LF Gas System Operations and Maintenance				
8 hrs/week @ 100/hr				
\$2,500/year parts				44,000
Annual Subtotal Range				\$161,000
Contingency @ 20%				<u>32,000</u>
Annual Total Range				\$193,000
NOTE:	Under the cover/liner alternative for expansion, between 13 million and 35 million gallons of leachate per year will require treatment, at an estimated additional cost of between \$650,000 and \$1,750,000 annually.			

(1) Source: Draft "Closure Study Report - Channel Landfill," prepared by Sweet-Edwards/EMCON, dated June 1991.

Table A-3

OPERATION & MAINTENANCE COST ESTIMATE
Channel Incinerators

ITEM	COST (1991 \$)	COMMENT
Personnel (per year)	\$ 265,000 - 475,000	11 - 17 people total, 6-dpw 24 hpd operations 6-dpw, 16 hpd scale open 15% benefits, 15% OT
Maintenance and Repair	78,800	\$3.50/TPY MSW (22,500 TPY MSW - Est.)
Freight	15,800	Assumed 20% of maint./repair
Rolling Stock	25,000	Based on historical data
Contingency: Extraordinary Maintenance	45,000	\$2/Ton (in-house data)
Contract Services	12,000	Assumed \$1,000/month
Supplies/Consumables	67,500	\$3/Ton (in-house data)
Insurance	400,000	.005* Assumed replacement cost
Aux. Fuel	13,500	1% AGHI @ \$6/mm Btu
Utilities	95,000	\$6,000 elec./month \$1,500 water-sewer/month \$ 350 phone/month
Replacement Fund	45,000	\$2/ton @ 22,500 TPY
TOTAL	<u>\$1,018,000 -</u> <u>1,270,000</u>	

TABLE A-4

INITIAL IMPROVEMENTS
 Replace Existing Ductwork/ID Fan/Screw Cover
 Planning - Level Estimate

ITEM	DESCRIPTION	QTY	UNIT	<---1991 UNIT COST---			<---1991 TOTAL COST---		
				MAT'L	LABOR	TOTAL	MAT'L	LABOR	TOTAL
1	Remove Existing Duct (assume 150lf 30" x 48")	200	E.F.	Incl'd	6	6	0	1,200	1,200
2	Remove Existing ID Fan	2	TON	Incl'd	700	700	0	1,400	1,400
3	Replace with High Temp Ductwork	200	E.F.	36	Incl'd	36	7,200	0	7,200
4	Replace ID Fan	1	L.S.	15,200	Incl'd	15,200	15,200	0	15,200
5	Misc. Mechanical Work	1	L.S.	3,000	2,000	5,000	3,000	2,000	5,000
6	Misc. Electrical Work	1	L.S.	3,000	2,000	5,000	3,000	2,000	5,000
7	Misc. Insulation Work - Weatherproof	8,000	S.F.	10	Incl'd	10	83,200	0	83,200
8	Ductwork Tie-Ins	1	L.S.	Incl'd	5,800	5,800	0	5,800	5,800
9	Remove Screw Conveyor Cover	1	L.S.	Incl'd	1,000	1,000	0	1,000	1,000
10	Replace Screw Conveyor Cover	1	L.S.	3,900	1,000	4,900	3,900	1,000	4,900
11	Clean Up & Haul Off	1	L.S.	2,000	2,900	4,900	2,000	2,900	4,900
	SUBTOTAL						118,000	17,000	130,000
	PRICING & CONSTRUCTION ALLOWANCE	20%							30,000
	SUBTOTAL - INDIRECTS (includes Engineering, spare parts, Project Management, Legal, Taxes, etc.)	15%							20,000
	TOTAL								<u>180,000</u>

Assumptions:

1. Our Estimate assumes that the work will be performed in the summer season.
2. Our Estimate assumes that the plan can and will be shut down during the work.
3. Our Estimate assumes that no Asbestos or other hazardous material is present in existing work.
4. Our Estimate is based on the verbal information provided and is intended as an 'Order of Magnitude' figure ONLY. Detailed Engineering analysis will be required to obtain a definitive estimate.
5. Our Estimate assumes that an All Dry Scrubber/Baghouse System would be acceptable.
6. Our Estimate assumes that no major electrical or instrumentation modifications would be required.
7. Our Estimate assumes that existing plan services systems will be able to handle additions.
8. Our Estimate assumes that no civil structural modifications will be required other than those noted.

TABLE A-5

POTENTIAL AIR QUALITY IMPROVEMENTS
Remove ESP and Install Scrubber/Baghouse System
Planning - Level Cost Estimate

ITEM	DESCRIPTION	QTY	UNIT	<---1991 UNIT COST--->			<---1991 TOTAL COST--->		
				MAT'L	LABOR	TOTAL	MAT'L	LABOR	TOTAL
1	Misc. Mechanical Work	1	L.S.	37,000	10,000	47,000	37,000	10,000	47,000
2	Misc. Electrical Work	1	L.S.	17,000	10,000	27,000	17,000	10,000	27,000
3	Ductwork Tie-Ins	1	L.S.	Incl'd	6,200	6,200	0	6,200	6,200
4	Demolish ESP & Foundations	1	L.S.	5,000	6,000	11,000	5,000	6,000	11,000
5	Install Scrubber/Baghouse Foundations	1	L.S.	53,000	Incl'd	53,000	53,000	0	53,000
6	Install All Day Scrubber/Baghouse System	1	L.S.	2,100,000	338,000	2,438,000	2,100,000	338,000	2,438,000
7	Clean Up & Haul Off	1	L.S.	20,000	7,000	27,000	20,000	7,000	27,000
8	C.E.M. System	1	L.S.	760,000	Incl'd	760,000	760,000	0	760,000
SUBTOTAL							2,992,000	377,200	3,370,000
PRICING & CONSTRUCTION ALLOWANCE									670,000
SUBTOTAL - INDIRECTS (includes Engineering, spare parts, Project Management, Legal, Taxes, etc.)									510,000
TOTAL									<u>4,550,000</u>

Assumptions:

1. Our Estimate assumes that the work will be performed in the summer season.
2. Our Estimate assumes that the plan can and will be shut down during the work.
3. Our Estimate assumes that no Asbestos or other hazardous material is present in existing work.
4. Our Estimate is based on the verbal information provided and is intended as an 'Order of Magnitude' figure ONLY. Detailed Engineering analysis will be required to obtain a definitive estimate.
5. Our Estimate assumes that an All Dry Scrubber/Baghouse System would be acceptable.
6. Our Estimate assumes that no major electrical or instrumentation modifications would be required.
7. Our Estimate assumes that existing plan services systems will be able to handle additions.
8. Our Estimate assumes that no civil structural modifications will be required other than those noted.

TABLE 3-5

Estimated Costs for CBJ Purchase, Operation and Closure of
Channel Landfill and Incinerator ⁽⁹⁾

CAPITAL COSTS (\$1991)		
Item	Cost (\$Million)	
	Low	High
Purchase ⁽¹⁾	\$7.0	\$7.0
Environmental Assessment	0.3	0.4
Liner/Cover ⁽²⁾⁽³⁾	2.6	2.6
Incinerator Upgrade ⁽⁴⁾	0.2	0.2
Final Closure ⁽²⁾⁽⁵⁾⁽¹⁰⁾	7.8	7.8
ANNUAL COSTS (\$1991)		
Item	Cost (\$Million)	
	Low	High
Landfill Operations ⁽⁶⁾	\$0.25	0.9
Incinerator Operation ⁽⁷⁾	1.0	1.3
Landfill Post-Closure ⁽⁸⁾	0.1	0.2

- (1) Based on initial Channel offer.
- (2) As recommended by Sweet-Edwards/EMCON, draft "Closure Study Report - Channel Landfill," June 1991.
- (3) See Table 3-2.
- (4) See Appendix A, Table A-4.
- (5) Geomembrane Cover, see Table 3-1.
- (6) Low estimate based on \$25.00/ton of waste directly landfilled. High estimate assumes SE/E low estimate for leachate treatment plus \$25.00/ton.
- (7) See Appendix A, Table A-1.
- (8) Based on \$4.00-5.00 per ton into a sinking fund and 30,000 tons per year. The higher cost range results from institution of more stringent federal post-closure requirements and a 30-year post-closure care period. SE/E estimated post-closure care costs at approximately \$193,000 per year in 1991 dollars (see Table 3-3).
- (9) Other potential costs include costs associated with air quality upgrades. These could be up to \$4.5 million in 1991 dollars.
- (10) Landfill closure is assumed to occur in 2017.

TABLE 3 - 6

CITY AND BOROUGH OF JUNEAU, ALASKA

COST ANALYSIS SUMMARY
 SCENARIO: Buy Channel Facilities
 ALTERNATIVE: Low Cost Estimate

Line No.	1994	1998	2003	2008	2013
REVENUE REQUIREMENTS:					
1	\$1,488,800	\$1,879,700	\$2,515,600	\$3,366,400	\$4,504,900
2	1,152,600	1,152,600	1,152,600	1,152,600	0
3	1,252,900	1,252,900	1,252,900	1,252,900	1,252,900
4	\$3,894,300	\$4,285,200	\$4,921,100	\$5,771,900	\$5,757,800
5	30,000	30,000	30,000	30,000	30,000
6	\$129.81	\$142.84	\$164.04	\$192.40	\$191.93
ESTIMATED TONNAGE PER YEAR:					
CALCULATED COST PER TON:					

MAJOR ASSUMPTIONS:

7	Inflation Rate:	6.00%
8	Interest Rate on Investments:	7.50%
Financing:		
General Obligation Bond Issue -		
9	Interest Cost:	7.50%
10	Term:	20 years
11	Issuance Expense:	3.00%
12	Debt Service Reserve Fund:	1 yr. Princ. & Int.
13	Reserve and Working Capital:	1.00%

TABLE 3 - 7

CITY AND BOROUGH OF JUNEAU, ALASKA

COST ANALYSIS SUMMARY
 SCENARIO: Buy Channel Facilities
 ALTERNATIVE: High Cost Estimate

Line No.	1994	1998	2003	2008	2013
REVENUE REQUIREMENTS:					
1	\$2,620,200	\$3,308,000	\$4,426,900	\$5,924,400	\$7,928,100
2	1,162,400	1,162,400	1,162,400	1,162,400	0
3	1,352,900	1,352,900	1,352,900	1,352,900	1,352,900
4	\$5,135,500	\$5,823,300	\$6,942,200	\$8,439,700	\$9,281,000
5	30,000	30,000	30,000	30,000	30,000
6	\$171.18	\$194.11	\$231.41	\$281.32	\$309.37

MAJOR ASSUMPTIONS:

7	Inflation Rate:	6.00%
8	Interest Rate on Investments:	7.50%
	Financing:	
	General Obligation Bond Issue -	
9	Interest Cost:	7.50%
10	Term:	20 years
11	Issuance Expense:	3.00%
12	Debt Service Reserve Fund:	1 yr. Princ. & Int.
13	Reserve and Working Capital:	1.00%



CITY/BOROUGH OF JUNEAU

STATUS QUO

Pros:

- Requires no action on the part of the CBJ.
- Avoids the need for any capital expenditures.

Cons:

- Fails to achieve CBJ's solid waste management goals
- Fails to provide the CBJ with some degree of control over tip fees, future disposal practices, and future disposal services.
- Fails to establish an environmental baseline, through a detailed environmental assessment, at the Channel site.
- Provides highest risk of problems with dependability of service.



CITY/BOROUGH OF JUNEAU

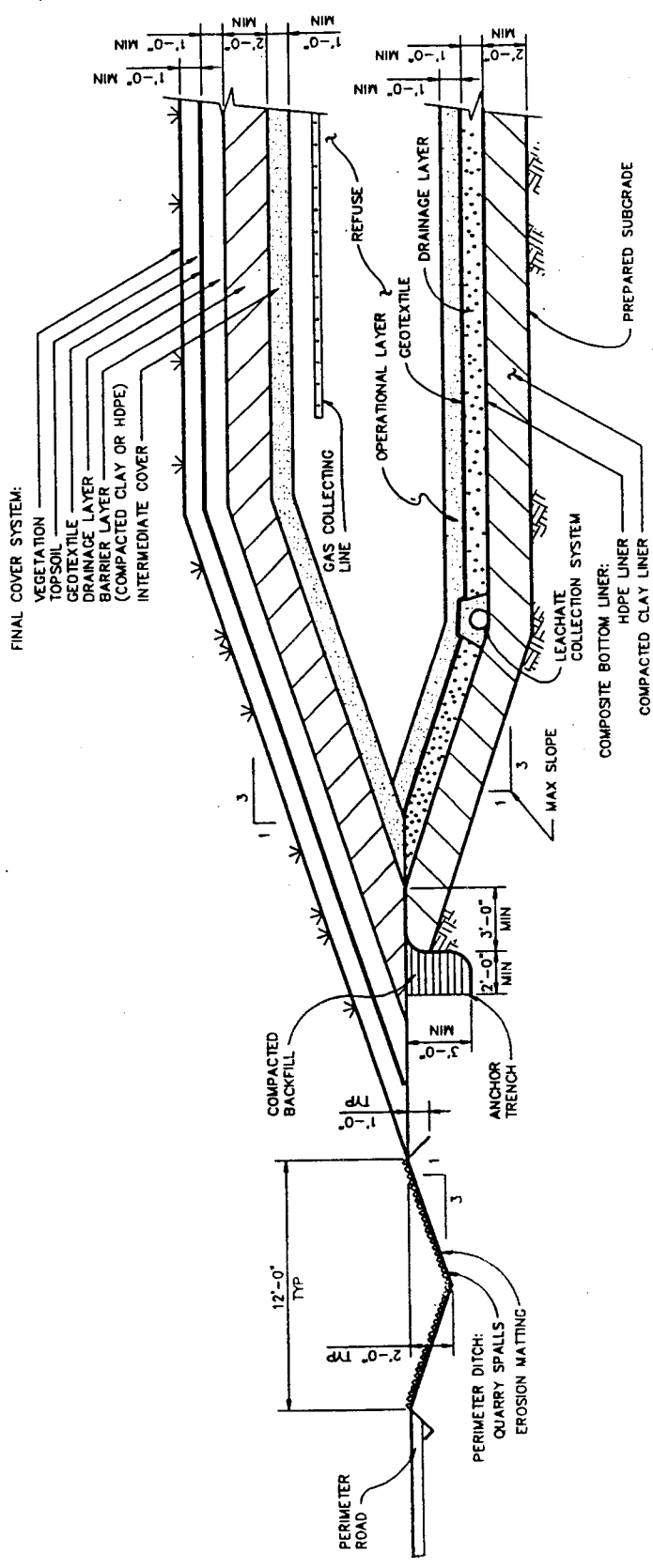
DEVELOP NEW DISPOSAL FACILITIES

Pros:

- Provides the CBJ a disposal facility that meets current environmental regulations and practices.
- Provides the potential for costs that may be less than current tipping fees at the Channel Facilities.
- Increases the reliability and continuity of service
- Provides the CBJ direct control over tipping fees and standard of services.
- Provides the CBJ the option to contract for operation or to operate the facility with municipal employees.

Cons:

- Potentially increases the CBJ's future CERCLA risk, but to a lesser degree than purchase of the Channel Facilities.
- Requires a significant capital investment by the CBJ.
- Requires at least 2 years to implement.
- Creates uncertainty regarding the future incineration of marine waste and the associated costs.



NEW LANDFILL
(TYPICAL CROSS SECTION)

Figure F-2

TABLE F-1

New Landfill Development Cost
(Order of Magnitude Estimates)

SUMMARY ⁽¹⁾ (\$1991)		
Item	Capital Costs (\$Million)	
	Low	High
Permitting and Design	\$0.20	\$0.30
Initial Construction	1.75	2.25
Phase Construction and Closure	2.4	2.9
Final Closure	1.2	1.5
Item	Annual Cost (\$Million)	
	Low	High
Operation ⁽²⁾	\$0.6	\$0.9
Post-Closure Fund ⁽³⁾	0.1	0.2

- (1) Assumes 20-year disposal capacity and 30,000 tons per year of waste. Incineration for volume reduction is not assumed. Landfill would be constructed in 5-year phases.
- (2) Operation cost based on \$20.00-30.00/ton.
- (3) Post-closure costs are \$4.00-5.00/ton. The \$5.00/ton estimate reflects future post-closure requirements that are more stringent than current requirements.

TABLE F - 2
CITY AND BOROUGH OF JUNEAU, ALASKA
COST ANALYSIS SUMMARY
SCENARIO: Build New Landfill
ALTERNATIVE: Low Cost Estimate

Line No.	1994 (a)	1998	2003	2008	2013
<u>REVENUE REQUIREMENTS:</u>					
1					
2	\$857,500	\$1,082,600	\$1,448,900	\$1,938,800	\$2,594,500
3	485,600	485,600	485,600	485,600	0
4	460,400	460,400	575,600	729,700	935,900
5	\$1,803,500	\$2,028,600	\$2,510,100	\$3,154,100	\$3,530,400
6	30,000	30,000	30,000	30,000	30,000
6	\$60.12	\$67.62	\$83.67	\$105.14	\$117.68
<u>MAJOR ASSUMPTIONS:</u>					
7	Inflation Rate:				
8	Interest Rate on Investments:				
	Financing:				
9	General Obligation Bond Issue -				
10	Interest Cost:				
11	Term:				
12	Issuance Expense:				
13	Debt Service Reserve Fund:				
	Reserve and Working Capital:				

6.00 %
7.50 %
7.50 %
20 years
3.00 %
1 yr. Princ. & Int.
1.00 %

TABLE F - 3

CITY AND BOROUGH OF JUNEAU, ALASKA

COST ANALYSIS SUMMARY
 SCENARIO: Build New Landfill
 ALTERNATIVE: High Cost Estimate

Line No.	1994 (a)	1998	2003	2008	2013
REVENUE REQUIREMENTS:					
1	\$1,071,900	\$1,353,300	\$1,811,000	\$2,423,600	\$3,243,300
2	686,600	686,600	686,600	686,600	0
3	575,600	575,600	719,500	912,100	1,169,900
4	\$2,334,100	\$2,615,500	\$3,217,100	\$4,022,300	\$4,413,200
5	30,000	30,000	30,000	30,000	30,000
6	\$77.80	\$87.18	\$107.24	\$134.08	\$147.11
MAJOR ASSUMPTIONS:					
7	Inflation Rate:	6.00%			
8	Interest Rate on Investments:	7.50%			
Financing:					
General Obligation Bond Issue -					
9	Interest Cost:	7.50%			
10	Term:	20 years			
11	Issuance Expense:	3.00%			
12	Debt Service Reserve Fund:	1 yr. Princ. & Int.			
13	Reserve and Working Capital:	1.00%			

(a) Initial year of operation.



CITY/BOROUGH OF JUNEAU

CONTRACT FOR DISPOSAL WITH PRIVATE OWNER

Pros:

- Allows the CBJ to influence standards of service and tip fees through the contract negotiation process.
- Allows the CBJ to lower the risk of problems with service continuity through contract penalty clauses.
- Potentially avoids any capital expenditures by the CBJ.

Cons:

- Creates uncertainty concerning cost to the CBJ since costs the CBJ might be required to incur are currently unknown.
- Creates uncertainty with respect to CBJ's ability to attract a private party that is willing to contract in a manner satisfactory to the CBJ.
- Creates uncertainty with respect to the time to implement (1 to 3 years).



CITY/BOROUGH OF JUNEAU

CITY/BOROUGH OF JUNEAU

COLLECTION OPTIONS

- Purchase APUC Certificates
- Contract for Collection Services
- Status Quo



CITY/BOROUGH OF JUNEAU

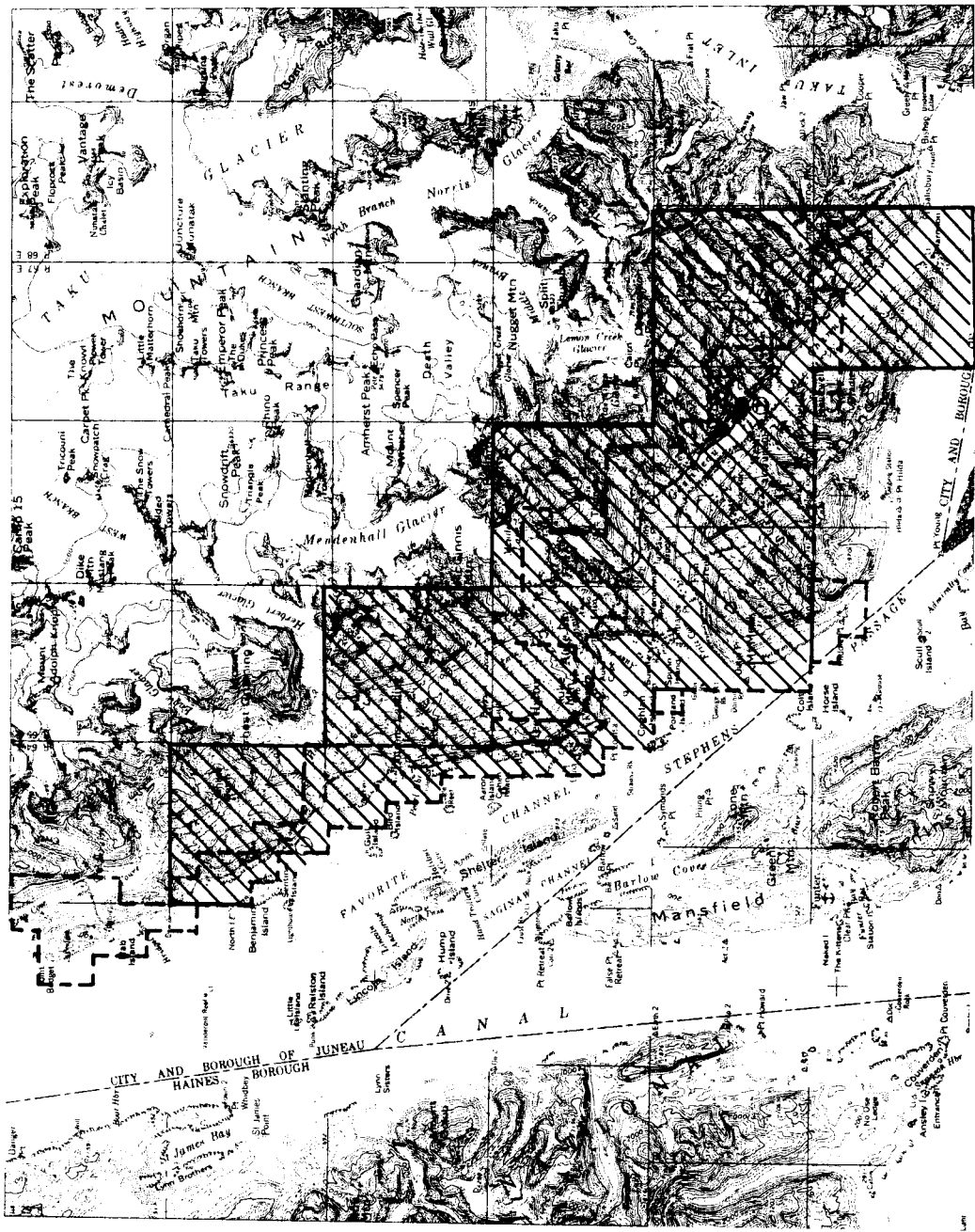
PURCHASE APUC CERTIFICATES, COLLECTION EQUIPMENT AND FACILITIES

Pros:

- Increases the CBJ's control over standards of service and rates.
- Increases reliability of collection services.

Cons:

- Creates uncertainty since the costs for the APUC certificates are unknown.
- Potentially increases CBJ's future CERCLA risk as a waste transporter.



 CHANNEL SANITATION CORPORATION

 JUNEAU SANITATION CORPORATION

Figure 4-2
CURRENT APUC
CERTIFICATE AREAS

R.W. BECK
AND ASSOCIATES



Table D-1

DESCRIPTION OF CHANNEL SANITATION EQUIPMENT

Year	Vehicle make	Packer make	Estimated Worth	Description
1985	Kenworth	Dempster	\$26,000 to \$38,000	Rear Loader 20 yard capacity. Truck and Packer recently rebuilt.
1985	Kenworth	Dempster	\$26,000 to \$38,000	Rear Loader 20 yard capacity. Truck and Packer recently rebuilt.
1990	Kenworth	Dempster	\$78,000 to \$115,000	Route King 2 packer. Rear Loader. 20 yard capacity. 750 Allison automatic trans.
1990	Kenworth	Dempster	\$78,000 to \$115,000	Route King 2 packer. Rear Loader. 20 yard capacity. 750 Allison automatic trans.
1990	Kenworth		\$71,000 to \$105,000	Drop Box truck.
1989	Ford		\$11,000 to \$16,000	Econoline Van, used for medical waste pick up.
1979	Mack		\$11,000 to \$16,000	Used for metals/ recycling.
1980	Mack		\$11,000 to \$16,000	Used as a sanitation truck.



CITY/BOROUGH OF JUNEAU

STATUS QUO

Pros:

- Allows the CBJ to control certain aspects of collection, through ordinance and permits.
- Requires no capital investment by the CBJ.

Cons:

- Provides the CBJ no ability to influence rates, which remain under APUC regulation.
- Provides the CBJ no control over some aspects of collection, for example the CBJ would have no ability to implement variable can rates.



CITY/BOROUGH OF JUNEAU

CONTRACT FOR COLLECTION WITH A PRIVATE CERTIFICATE HOLDER

Pros:

- Allows the CBJ to influence the standards of service and rates through negotiation of the contract.
- Increases the reliability of collection services through use of contract penalty clauses.

Cons:

- Potentially increases the CBJ's future CERCLA risks.
- Creates uncertainty with respect to CBJ's ability to attract a private APUC holder that is willing to contract in a manner satisfactory to the CBJ.



CITY/BOROUGH OF JUNEAU

CONCLUSIONS AND RECOMMENDATIONS

DISPOSAL

- Do not purchase Channel facilities.
- Conduct a feasibility study to confirm the suitability of the potential site for a new landfill located north of the correctional facility. If suitable, develop or reserve.
- Work with private disposal companies to determine if a mutually advantageous contract for disposal services can be achieved.

COLLECTION

- Defer a decision until after completion of the solid waste management plan and resolution of disposal issues.