

ALASKA LEGISLATIVE COMMITTEE FILES 1901-1902

1816 HRES. AGRICULTURE DAY 3 - (ARRC)

grain maturity. Frosts occurred on August 2, 27, September 1- 9, 12 and 17--all within the normal frost-free growing season. The average daily maximum temperatures from August 14 through September 14 were approximately six degrees below normal, thus delaying maturity. Finally, harvesting was hampered by rain. August received 16 days of precipitation and September received 14 days of rainfall. Grain lodging, shattering and high moisture content resulted from this anomaly.

3. Bison Damage (1980) - Because of the unusual climate at the normal harvest season (August-September) and subsequent harvesting delays, the bison were provided with maximum opportunity to depredate the barley, causing \$150,000 worth of crop damage. Hopefully, more favorable harvest conditions and development of the Delta Bison Management Area will alleviate this problem.
4. Farm Management - As farmers gain additional experience in cultural practices and timing of activities, they will eliminate the bottlenecks in their operations-- such as lack of seed and fertilizer and equipment down-time. The University of Alaska Agricultural Experiment Station is conducting research to help answer these questions. The University of Alaska Cooperative Extension Service is actively assisting the farmers to adapt new research and modify accepted practices to meet their needs. The majority of

the new subsistence farmers are in need of this assistance.

5. Marketing -- The development of a marketing system still poses a major problem for our agriculture. Delta grain producers are now able to supply Alaska's current demand for small grain. As more livestock is brought into the state, the demand for feed grains will increase. However, in order to attain our full potential and the accompanying economies of scale, an export facility must be developed. Large-scale farmers were able to produce barley this year for less than \$110/ton (assuming a 50 bushel per acre average), Table III. Current world market is \$154 per ton. However, the Delta area, as yet, does not have the transport facilities to economically enter that market.

POSSIBLE SOLUTIONS

The Alaska Farmers' Co-op has constructed a bulk fertilizer plant with sufficient storage and blending capacities to meet the existing and future demands of this region. Future fertilizer-induced planting delays should become essentially non-existent.

The grain drying and storage facility, owned and operated by the Co-op is also scheduled for modification. This will speed up drying time and thereby reduce unloading delays at the elevator during the critical harvest season.

Several farmers are contemplating constructing storage facilities for a portion of their crop. This will improve harvesting also.

Continued efforts through the University of Alaska Agricultural Experiment Station and Cooperative Extension Service

will keep the farmers informed of technological advancements and managerial improvements.

The Alaska Agricultural Action Council will continue to pursue agricultural project opportunities in terms of marketing systems, red meat industry coordination and complimentary agricultural development projects. All are vitally essential to developing a successful agricultural industry in Alaska.

SUMMARY

The past three years have brought tremendous changes to the Delta area as well as to the state's entire agricultural industry. Two years ago, only 17,000 acres of land were in production in the entire state of Alaska. Delta Junction alone had nearly that much production in 1980.

It is virtually impossible to evaluate the development of a totally new industry in the third year of its existence, especially when similar development in the rest of the nation required decades.

Alaska's agricultural development must follow the pattern of agricultural development elsewhere in that it requires land, labor, capital and technological advancement. The state is releasing land and making loans available to qualified applicants. The public is providing technological advancement and assistance. The ingredients are already in place--now it will only require time for coordination and continuity.

Alaskans eat, but we are too many to live off the land and must currently import 95-98% of our food, even though we have nearly 18 million acres of potential farmland. We desperately need an industry based on renewable resources--

and what better industry than agriculture?

Alaskan agriculture will succeed.

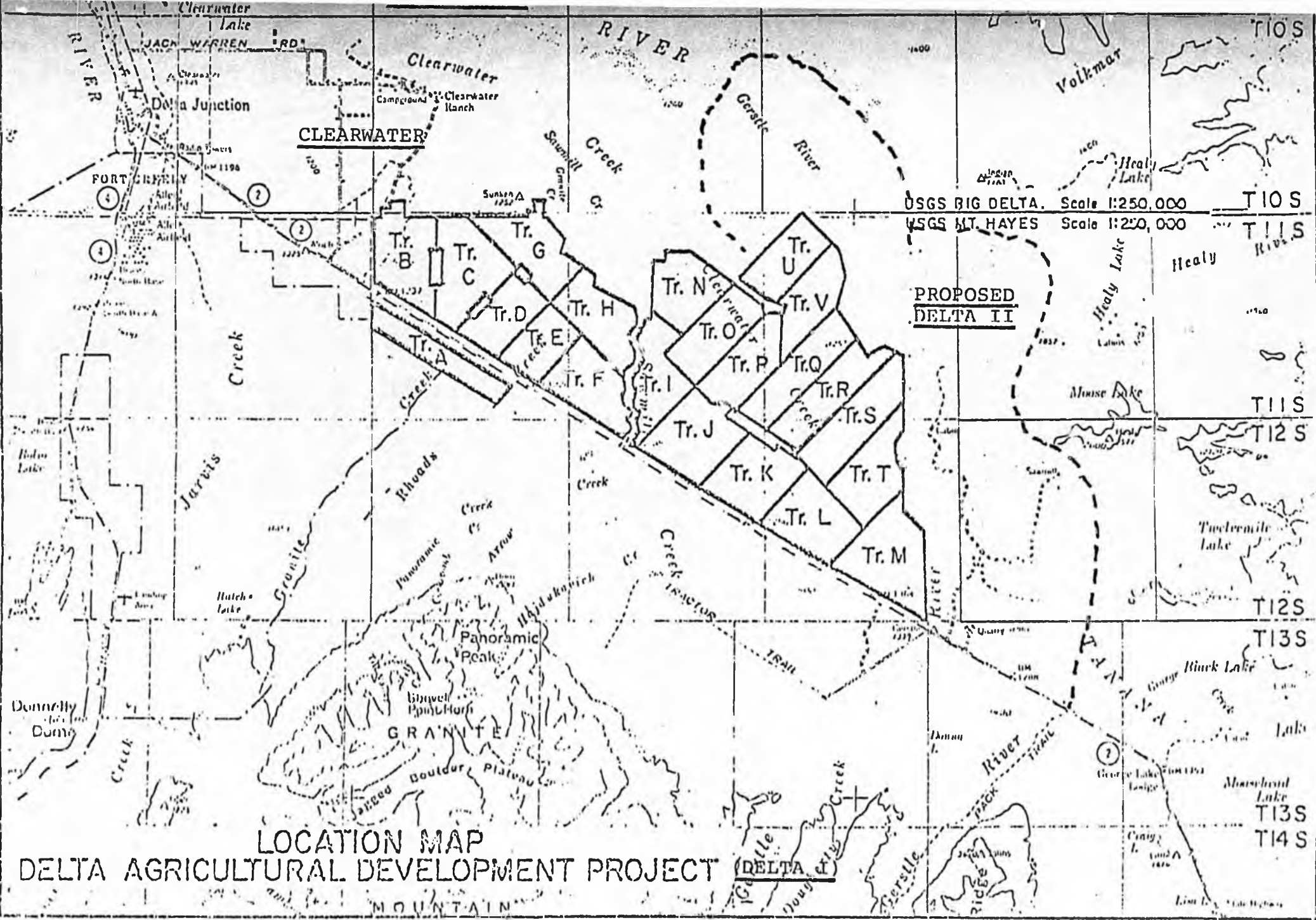


FIGURE 1. Delta Agricultural Areas

Delta I
Delta II

Tanana Loop
Clearwater

TABLE I. Crop-Yield Tests, 1979 Crop-Year, Delta Junction Area, Alaska*

GROWER	PRODUCT	VARIETY	AREA	AVG. YIELD (bu/acre)
Saylor/Jenkins	Barley	Weal	1	58.6
			2	57.4
			3	52.7
		Galt	1	40.7
			2 (sludge area)	106.2
Ruta	Barley	Otra	1	69.8
			2	96.0
Green, Bob	Barley	Weal	1	31.5
Green, Dan	Barley	Weal	1	55.1
Brazier, L.	Barley		1	69.5
Spears, L.	Barley		1	39.8
			2	72.6
			3	58.9
Dougherty	Barley	Weal	1	60.1
Smith	Barley		1	40.4
Carlson, L.	Barley	Weal	1	59.5
			2	96.5
Kachelmier	Barley	Weal	1	76.9
			2	39.8
			3	70.6
		Otra	4	70.7
			5	79.1
			6	70.7
Brazier, L.	Oats		1	99.7
	Timothy seed		2	725.0 lbs/acre
	Rapeseed		1	27.5
			2 (Kenny)	13.7
S & K Farms	Wheat, h.r.s.		1	41.9
Fett, L.	Rapeseed		1 (Hanson Rd.)	11.9
			2 (Putney)	22.8
			3 (Forks)	21.5

* Results of randomly-sampled crop-yield tests from throughout the Delta Junction area prior to machine harvest, fall, 1979. Persons using this data should realize that these results are significantly biased (estimate up to 10%) toward the upper side by the following factors: 1) hand-harvested equals no loss; 2) dockage and moisture generalized for all samples, so any given sample or group may have benefitted; 3) early collection precluded losses to bison, birds, wind-shatter, etc.

TABLE II. Small Grains Yield Tests, Delta-Clearwater Area, 1980 Season*

GROWER	VARIETY	FIELD	BUSHELS	(dry weight)
Olson	Galt	E. end	37.3	37.0
Karr	Windsor	N. side	32.0	31.9
Fett	Galt	3rd panel	27.0	26.9
Brehmer	Weal		80.6	
Helkenn	Weal	S. end	(sample spilled)	
Engellant	Wheat		13.5	13.4
Carlson	Windsor	N. end	60.5	60.5
Brehmer	Galt	E. side	48.73	x
Brehmer	Windsor	4th panel	63.86	x
Spears	Galt	W. side	20.5	x
Kilmurray	?	1/2 mi. e. of graineries	30.6	30.2
Brehmer	Wheat	3rd panel	13.45	13.44
Green	Galt	Tr. F	30.25	30.24
Karr	Windsor	hilltop	74.0	73.9
Kelkenn	Windsor	5th panel	50.4	x
Carlson	Weal	W. side	77.3	x
Helkenn	Lydal	Center	28.6	x
Spears	Galt	W. end	20.2	x
Engellant	Galt		23.5	x
Engellant	Oats		102.5	x
Carlson	Windsor	E. side	62.2	x
Rutt	Lydal		37.0	x
Helkenn	Galt		42.0	x
Brehmer	Tibetan Hulless		57.1	x
Carlson	Wheat		45.7	x
Kilmurray	Barley on old berm row		47.0	x
Bannon	Weal		77.3	x
Karr	Galt		50.4	x

* Data represents randomly-sampled ideal yield potential for small grain crops in the Delta-Clearwater area. Samples were hand-collected using yard² frame, three samples per field, prior to commencement of threshing.

ALASKA
COMMERCIAL
AGRICULTURE
DEVELOPMENT
SERIES

COOPERATIVE EXTENSION SERVICE, University of Alaska and USDA Cooperating

COSTS
OF
PRODUCTION
BARLEY

DELTA
AGRICULTURAL
PROJECT
Delta Junction
Alaska
1980

prepared by
J. Michael Harker
Assistant Professor &
Resource Economist
Cooperative Extension Service
University of Alaska
November 1980

BARLEY PRODUCTION COSTS PER ACRE

Delta Agricultural Project
Delta Junction, Alaska
1980

	UNIT PRICE	LOW COST		HIGH COST		AVERAGE COST	
		Units/Acre	\$/Acre	Units/Acre	\$/Acre	Units/Acre	\$/Acre
Seed	\$ 17.30/cwt.	65 lbs.	\$ 10.40	82 lbs.	\$ 14.76	71 lbs.	\$ 12.29
Fertilizer:			36.78		47.77		41.41
urea	200.00/ton	230	23.00	174	17.40	188	
9-36-18	318.00	84	13.15	190	29.64	138	
applicator rental	4.00		.63		.73		
Fuel:			2.83		4.24		3.60
tillage	.94/gal.	.61 gal.	.57	1.14 gal.	1.07		
fertilizer (tractor)	.94	.20	.19	.28	.26		
fertilizer (truck)	1.05	.18	.19	.13	.14		
seeding (tractor)	.94	.30	.28	.50	.47		
seeding (truck)	1.05	.06	.06	.04	.04		
harvest (combine)	.94	1.00	.94	.86	.81		
harvest (truck)	1.05	.00	.00	1.38	1.45		
harvest (semi)	.94	.65	.60	.00	.00		
Repair & Maintenance			3.81		6.61		5.01
Hired Labor	9.00/hr.	1.38 hrs.	12.42	1.89 hrs.	17.01	1.56 hrs.	14.04
Interest on Operating Capital			1.64		2.24		1.91
TOTAL OPERATING COST			\$ 67.88		\$ 92.63		\$ 78.26
Equipment Depreciation			15.25		32.30		21.44
Interest on Equipment Investment			6.86		14.53		9.65
Machinery Storage Building Depreciation			1.10		2.47		1.79
Interest on Machinery Storage Building			.99		2.22		1.61
Interest on Land Investment			12.90		12.90		12.90
TOTAL COST OF PRODUCTION PER ACRE			\$104.98		\$157.05		\$125.65

The purpose of this analysis is to provide bench marks on the costs associated with large-scale commercial production of barley in Alaska. Also, it is intended to identify existing economic advantage of operations where acreage in production is sufficient to make full use of modern equipment.

Information contained in this cost of production budget is based on data collected in interviews with four Delta Agricultural Project farmers. Acreages under production on the four farms ranged from approximately 500 acres to more than 1,200 acres. Where possible, actual costs were reported and used in this analysis; otherwise, costs were calculated based on fuel use rates and acre-per-hour rates estimated by the individual farmer.

High, low and average cost figures do not represent any one farm. Rather, the lowest cost among surveyed farms for each particular category of expenses (e.g., seed, fertilizer, fuel, etc.) is listed in the column labeled "low cost." Entries in the column labeled "high cost" were similarly determined. The "average cost" column is an average over all farms participating in the survey.

Operating Costs are those which require a cash outlay during the crop year. Average total operating costs for the farms in the survey were \$78.26 per acre. The difference between the high and low total operating costs was \$24.75. While seed and fertilizer costs account for the greatest share of this variation, differences in expenses for fuel, repair and maintenance and labor are of equal interest. All of the latter three classes of expenses were higher on farms using smaller or older equipment. Also, use of a tractor-trailer "sem." on one farm reduced labor costs and greatly reduced the fuel cost associated with hauling grain the relatively long distance from farm to elevator. Also affecting the difference in labor costs, one farm relied much more heavily on hired labor than did other owner operators.

Equipment Depreciation and Interest on Equipment also showed substantial variation, which is almost wholly attributable to differences in farm size. All farms in the survey owned one large combine and all needed primary tillage equipment, drills, and at least one tractor of relatively large size. All farmers had from \$150,000 to \$250,000 investment in equipment for barley production. Interest expense on this investment is the same regardless of the number of acres farmed. Thus for a 1200 acre farm, interest expense on equipment would be only half as much per acre as it would be on a 600 acre farm.

While depreciation results in part from use, it is largely the result of passage of time. If a new tractor is used only slightly, it will depreciate almost as much in one year as will one with an average amount of use. Depreciation expense per acre is, therefore, less if more acreage is farmed with the same amount of equipment. Within the farms surveyed, however, farmers with smaller sized equipment relative to acreage farmed did incur a lesser depreciation expense per acre, but this reduced cost was partially offset by higher fuel and labor costs per acre.

Interest on equipment and equipment depreciation expenses shown in the low column are associated with the farm that had the greatest acreage under production, and those in the high column are associated with the farm with the lowest production acreage. Clearly, as the project farms increase their acreages of production, per acre costs associated with machinery ownership will decrease at least to the level listed in the low column and possibly beyond that with efficient machinery use. The same is true for depreciation and interest expense on machinery storage buildings.

CONCLUSIONS

Of the \$52.07 difference between the high and low total cost of production per acre, more than \$27.00 is attributable to interest and depreciation expense on equipment and equipment storage facilities. In other words, \$27.00 of the high production costs are a result of under utilized equipment. High cost farms, with increased acreage next year, will see costs per acre drop to roughly this year's average cost per acre figure, if other factors remain unchanged.

Disregarding inflationary effects, the range between the low and the average total production cost per acre would seem to be the reasonable expectation for farms of the 1,200-acre class in the coming years. While the most efficient farmers might produce at a cost lower than \$105.00 per acre, this figure represents an attainable goal for the above average farm managers. Farms which expand to the 2,000-acre class can expect added economies in equipment operation and thus, lower per acre labor and equipment ownership costs. However, because there were no farms of this size within the survey, an estimate of this reduction in cost is not made.

It is important to note that three factors have not been budgeted in this analysis: drying costs, handling costs and return to management. The Alaska Farmer's Cooperative, Inc., in Delta Junction quotes \$5.00 per ton handling charges and \$10.83 per ton drying expense for barley with 18 percent moisture content. With the addition of these, the low and average figures for total cost of production are \$128.75 and \$149.40 per acre, respectively, assuming a yield of 1.5 tons per acre. Continuing with the assumption of a 1.5 ton per acre yield, total production costs (excluding drying and handling) would be \$70.00 per ton based on the low total cost and \$83.77 per ton based on the average figure for total cost. If handling and drying

costs (18 percent moisture content) are included, total cost increases to \$85.83 per ton and \$99.60 per ton, respectively.

The following matrix identifies the average yield per acre that a farmer would need to achieve to earn a \$25,000 return to management based on various prices and on the low or average production costs, assuming that the farmer is producing barley on 2,000 acres.

Table A. Yields necessary to provide a \$25,000 return to management on a 2,000-acre Delta Agricultural Project farm.

Price f.o.b. Elevator Delta	Low Production Cost (\$104.98/acre)	Average Production Cost (\$125.65/acre)
	Tons per Acre	Tons per Acre
\$ 80/Ton	1.82	2.15
90/Ton	1.58	1.86
100/Ton	1.39	1.64
110/Ton	1.24	1.47
120/Ton	1.12	1.33

Again, note that this matrix is based on production on 2,000 acres. If the price, f.o.b. the elevator at Delta Junction is \$100 per ton, and if the farmer's production cost (excluding drying and handling) is \$104.98 per acre, a yield of 1.39 tons per acre is necessary to provide a \$25,000 return to management. With production costs of \$125.65 per acre, the manager would need to produce 1.64 tons per acre to make the same return to management, based on the same barley price.

METHODS OF COST CALCULATION

Seed: Listed unit price is the average price paid per hundredweight by farmers surveyed. Cost per acre shown in high and low cost columns is based on actual price paid by individual farmers.

Fertilizer: Blended fertilizer price and composition are averages over all farmers surveyed. As with seed, however, cost per acre for high and low cost columns is based on actual price paid by individual farmers. Applicator rental rate is based on a quote from Alaska Farmer's Cooperative, Inc., Delta Junction, Alaska.

Fuel: The prices of \$.94 per gallon for number 2 diesel and \$1.05 per gallon for regular gasoline are the average prices paid by farmers throughout the cropping year. Rates of fuel use per acre for various operations were supplied by farmers. These rates and average prices were then used to calculate all fuel costs. Fuel expense for trucking grain is based on an assumed yield of 1.5 tons per acre.

Repair & Maintenance: Standard repair and maintenance costs based on hours of annual equipment use are provided in *The Costs of Owning and Operating Farm Machinery in Washington*, E.J. 4035, Cooperative Extension Service, Washington State University 1976. (Authors: G.S. Willett, W.H. Pietsch and F.W. Brown.) Hours of annual use of each piece of equipment for barley production were calculated for each farm. From this, repair and maintenance costs for each item were taken from the above publication and totaled. This figure was increased by 50 percent to account for what is the author's judgement of the cost difference between 1976, Washington costs and 1980, Alaska costs.

Hired Labor: \$9.00 per hour including benefits typified wages paid on all farms. Labor expense was calculated based on farmers' estimates of hired labor requirements.

Interest on Operating Capital was calculated based on 6 percent interest assumption that operating capital would be borrowed on May 1 and paid on October 1. Thus, the calculation was 6 percent times 5/12 of one year times total operating costs (less operating capital costs).

$$i = [(.06) \times (5/12) \times (\text{O.C.})] + \text{acres}$$

Equipment Depreciation: Calculation using straight line method, assuming a 10-year life and 20 percent salvage value on all items.

$$\text{Dep.} = [(\text{New Value} - \text{Salvage Value}) \div 10] \div \text{acres}$$

Interest on Equipment Investment was calculated as 6 percent times the average value over the life of the equipment.

$$i = \{ .06 \times [(\text{New Value} + \text{Salvage Value}) \div 2] \} \div \text{acres}$$

Machinery Storage Building: In the survey of farm operators, no data were collected regarding farm buildings. To estimate this cost, it was assumed that a 40x40 foot building would be sufficient. With a \$25 per square foot building cost, investment would be \$40,000. Assuming a 30-year life and zero salvage value, depreciation expense is calculated as $(\$40,000/30) \div \text{acres}$ using the straight line method. Interest is calculated as $[(\$40,000 \div 2) \times (.06)] \div \text{acres}$.

DELTA AGRICULTURAL PROJECT

In August 1978, a lottery was held to distribute nearly 60,000 acres of land for agricultural production. This was the beginning of the "Delta Agricultural Project".

The land was platted in 22 parcels averaging 2,650 acres each. Sizes of the individual tracts ranged from 2,000 to 3,300 acres. Studies conducted by the University of Alaska determined that these sizes were necessary to provide the economies of scale necessary for small grain production in a semi-arid climate such as found in the interior regions of Alaska.

Clearing of the land began during the first winter following the lottery. The progress made during the two years succeeding the lottery has been phenomenal. The actual work that has been accomplished totals nearly 60% of completion. Vegetation on approximately 55,000 acres has been knocked down and has been piled into burn rows on 35,000 of these acres. Crops were planted in 1980 on about 7,600 acres; 1981 will show a significant increase in planted acreage.

In 1979, 1.3 million dollars were loaned to the Alaska Farmers' Cooperative, Inc. for the purchase and construction of a grain elevator. During 1980, an additional \$300,000 was used to expand their grain storage and handling capabilities. They now have secure storage for over 500,000 bushels of grain.

It has become apparent, however, that an additional facility must be added in the very near future. This elevator likely will be in a location separate from the existing facilities and will receive grain from the eastern portion of the Delta Agricultural Project (Delta I), and also production from the newly planned Delta Expansion Project, (Delta II). It is expected that construction will be started in 1981.

The Alaska Farmers Cooperative, Inc. has constructed a first class fertilizer

storage, blending, and processing plant. This plant has a storage capacity of 6,000 tons. It can blend and outload 12 tons of product in ten minutes. They have also included a modern bagging unit in this facility. With this addition, they will be able to handle the needs of a small farm operator who prefers bagged materials as well as the large farmers who handle most materials in bulk form.

Grain harvested in 1980 totaled approximately 7,800 tons from the Delta Area. This was much higher than in the past as verified by field checks before harvest. Due to severe weather conditions and predator (buffalo) damage, however, field losses ranged as high as 50%. Despite these problems, the total tonnage harvested will averaged over 30 bushels per acre.

Since 1980 was the first year of any significantly large acreage planted, it served as an educational period. Much was learned from this season and this knowledge will be incorporated into farming plans for succeeding years. We have the technology to overcome the problems that surfaced this year and with the knowledge we've gained, many of the problems encountered in this year's harvest will be overcome.

Estimates of barley production tonnage for the next five years from Delta I and Delta II are:

<u>Year</u>	<u>Delta I</u>	<u>Delta II</u>	<u>Total</u>
1981	25,000	-0-	25,000
1982	40,000	5,000	45,000
1983	40,000	15,000	55,000
1984	40,000	30,000	70,000
1985	40,000	35,000	75,000

With the opening of new agricultural lands in Delta Junction, the private business sector has stepped in to begin supplying the farmers with needed equipment, parts, and service. At the present time there are three equipment dealers operating in the area. They represent the three major manufacturers of agricultural equipment

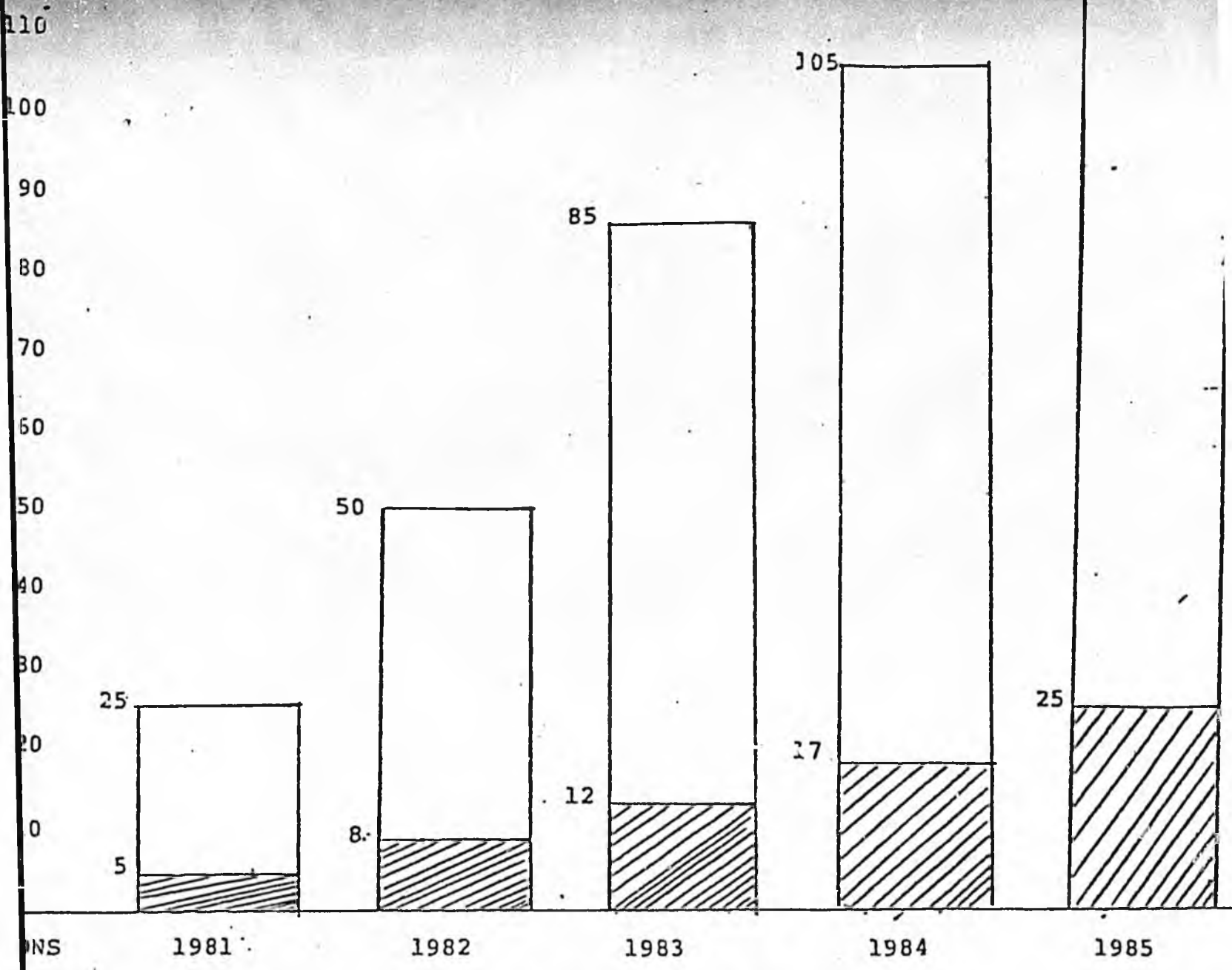
in the U. S.. The financial commitments of the dealers are indicative of the faith they have in the potential for agricultural development in interior Alaska.

Concurrent with the expanded feed grain production in the State is the increase in numbers of livestock being raised. Beef, dairy, and hog production have all taken a large upswing in the Delta area. Beef animals held for breeding purposes have more than tripled in the past year. In addition, several farmers who have not previously kept beef herds are getting geared up to handle them.


The interior dairy industry which for years has been extinct received a shot in the arm when Northern Lights Dairy began producing and processing milk in July of 1980. They were followed by another producer who came on line in November and began shipping milk through their facility. A third farmer is in the planning stage now for the inclusion of a dairy herd in his operation.

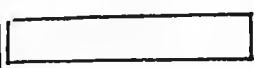
In 1980 there were fewer than 1,500 hogs raised in Alaska. That situation will change rapidly, as evidenced by the construction of a completely confined farrow to finish hog operation, in the Delta area. When in full operation, this plant will house 150 sows and raise 3,000 fat hogs per year.

The additional livestock from these initial enterprises will severely tax the available red meat processing that is available in Alaska. Therefore, it is extremely important that facilities be started now to alleviate a glut in the live animal market that is sure to occur.



Production and Usage of Grain from Delta, Delta Expansion, and Nenana Projects

 in State grain usage

 surplus

MEMORANDUM

State of Alaska

TO: Representative Terry Gardiner
House Resource Committee
Alaska State Legislature

DATE: February 19, 1981

FILE NO:

ATTN: Mary Hakala

TELEPHONE NO:

FROM: Mike Gilleland *Mike*
Planning Coordinator
Alaska Agricultural Action Council
Office of the Governor

SUBJECT: Delta Barley Production

In 1980 approximately 11,000 acres of barley were seeded in the Delta Junction area. Total HARVESTED tons of barley was 7,800. There were over 2,000 acres of barley fields that were damaged by bison foraging and trampling that significantly reduced the quantity harvested.

Of the 7,800 tons, 5,500 were delivered to the Alaska Farmers Cooperative, Incorporated to be subsequently purchased by the State of Alaska with the 3rd year funds from the "Test Marketing" program. The balance of 2,300 tons is being held in on-farm storage by the producers to be used in their own dairy, beef, and hog operations.

The barley purchased from the Cooperative, by the State, is being marketed by the Alaska Agricultural Action Council office in Fairbanks. To date we have sold 1,493 tons to in-state users. We have in addition contracted for sale and delivery of approximately 2,000 tons. As the coordinator of grain sales, I also anticipate at least another 1,000 tons to be sold from the 1980 production. This will leave us with a "cushion" of 1,000 tons for contingencies.

During the past month a survey was conducted, by our staff, of the Delta producers for their estimates of 1981 crop year production. The figures we obtained indicate that around 16,000 acres will be seeded. With "normal" weather conditions, we should be able to produce 20,000 tons of barley. I would anticipate at least a 10% increase in domestic useage which would require some 5,000 tons. The balance of approximately 15,000 tons would then be available for export shipment.

If you need any further clarification on this subject please contact me.

FIRES RELATED TO DELTA AGRICULTURAL PROJECT1979

No.	Name	Cause	Acres	Duration Start to Control
912007	Delta Barley 3	Controlled Burn equip. use	30,050	117 days*
912013	Kachelmier	Controlled Burn Escaped	1,285	7 days
912043	Delta Barley 6	Controlled Burn Escaped	125	2 days
912046	Delta Barley 7	Controlled Burn Escaped	3,400	23 days
912048	Delta Barley 8	Controlled Burn Escaped	5,770	7 days

1980

No.	Name	Cause	Acres	Duration Start to Control
012009	Ferguson Farm	Controlled Burn Escaped	7,155	15 days ✓
012011	Barley Way	Controlled Burn Escaped	220	15 days
012013	Tract H	Controlled Burn Escaped	360	15 days
012034	Tract J	Cat. Exhaust	240	4 days

* Includes three individual manning and demanning operations, two control dates before the final control date.

MAJOR FIRE COSTS RELATED TO DELTA AG PROJECT

60,000 ACRES TOTAL AGRICULTURE PROJECT

FIRE #	ACRES	COST
912007	30,050	4,336,916. includes 799,000. BLM costs
912013	1,285	63,641.
912043	125	Costs for these three fires were lumped in with 912007 fire costs and cannot be broken out individually.
912046	3,400	
912048	5,770	
	40,630	4,400,557.

1980

FIRE #	ACRES	COST
012009	7,155	399,491.
012011	220	28,098.
012013	360	38,024.
012034	240	165,492.
	7,975	631,105.

Issues Regarding the Delta Agricultural Project

1. What was the major impetus for the Delta agricultural project? Date of legislation?

The State of Alaska has recently undergone a period of high economic activity caused by construction of the oil pipeline. With completion of the pipeline, unemployment in Alaska has risen substantially. Agricultural and fishery developments are viewed by many Alaskans as the means to stabilize the economy.

The Delta agricultural project was undertaken by the Governor of Alaska using existing departments of the executive branch. The project is directed by the special projects coordinator within the Office of the Governor. The legislature approved the development program and provided initial funding during its 1978 session in the amount of \$4.8 million dollars. A second appropriation bill in the amount of \$7.1 million passed the legislature in 1979.

2. What are the objectives of the project?

With less than 20,000 acres in production in a state with 20,000,000 acres of farmable land, Alaska's agricultural potential is largely undeveloped. This project is directed at developing a latent renewable resource into a productive economic and social activity.

Such development will strengthen Alaska's economy and reduce its boom-bust cyclical nature. The program will be conducted in a manner that will facilitate creation of the necessary infrastructure concurrent with development of the farm program. In conjunction with this objective is the organization of a marketing effort which will include both domestic and foreign sales of agricultural products from project and adjacent lands.

3. What is the land development program?

Phase one was initiated with a land sale in August 1978. A 60,000 acre block near Delta Junction, Alaska, was broken down into twenty-two tracts and sold by lottery. Presently approximately 53,000 acres have been "knocked down", 40,000 acres piled into berm rows, and 7,000 acres planted to crop. The second phase, adjacent to the first, will be sold by lottery in early 1981 and consists of approximately 50,000 acres. The total amount of land in production in the Delta Junction area, including privately owned, new project lands, should approach 150,000 acres by mid-1980's. Additional projects at Point MacKenzie (near Anchorage), and Nenana area of interior Alaska, are also envisioned for the near future. Total land in production is scheduled to be close to 500,000 acres by 1990.

4. What are the major crops in the Delta agricultural project?

Barley and rapeseed are expected to be the initial major crops on project lands. Wheat may also be included. Lesser crops should include buckwheat, grass seed, hay and silage, and potatoes.

5. How were farmers selected?

A lottery system has been used on all project land sales. To qualify for the lottery pool, an individual had to possess \$35,000 in equity capital, show evidence of management (not necessarily agricultural) background, be a resident of Alaska for 30 days, and be a United States citizen. Corporations were excluded.

6. In what manner has the State participated in the funding process of the project?

Project funding includes a loan program for land clearing which amounts to approximately \$165 per acre. Each farmer who bought a farm tract in the project was eligible for this loan. The terms included interest at 6 percent and a payback of 40 years. The land-purchase price, averaging \$51 per acre, was repayable over a 20-year period. The State has built a gravel-based road system for \$1,100,000 that connected project farms to the main highway. Monies were also allocated to administer the project and for a country elevator loan program (see 10). The State has also made low interest farm construction, machinery, and operating loans available. Plans are also being discussed for state participation in marketing, transportation and processing systems.

7. *What about title on these lands?*

Title on all State lands sold for agricultural uses in Alaska has a unique feature. It is fee simple with two restrictions; subsurface rights and all other development rights are retained by the State. In other words, the land can be used only for farming. The farmer is protected from land price increases based on other uses or non-agricultural speculation.

8. *What are the marketing plans for the crops from this project?*

Crops from project lands will be sold locally and in export markets. The barley will probably substitute for most feed grains entering the State. Projections indicate that local use will increase to consume as much as 50 percent of the crop by 1985. The remainder will be exported, probably to Japan and Taiwan. All rapeseed which grades number 1 will be shipped whole to Japan.

9. *Is transportation development being planned?*

A number of studies and proposals have been completed coordinating an agricultural transportation system for the entire state. These include the use of trucks to transfer sites and off-loading to railroad cars. From that point, grain can be transported to either domestic or export users.

10. *What about storage of grain awaiting shipment?*

A state loan for approximately \$900,000 was granted to Alaska Farmers Cooperative of Delta Junction to build the first major country elevator in Alaska. Additional cooperative storage facilities plus considerable on-farm storage is planned. The State is also considering a proposal to construct a port grain terminal.

11. *Are additional agriculture projects planned?*

Two projects were recently approved by the Alaska Legislature. One, an additional 50,000 acre development adjacent to the present project, and second, a 15,000 acre project near Anchorage designed for the dairy industry.

12. *Where can I obtain more information about agriculture in the State of Alaska?*


You may contact either Bob Pollock, Delta Agricultural Project, P. O. Box 887, Delta Junction, Alaska 99737, phone (907) 895-4687 or Bob Palmer, Chairman, Agriculture Action Council, State of Alaska, Pouch AN, Juneau, Alaska 99811, phone (907) 465-3568.


Alaskan Agricultural Action Council
Revised June 4, 1980

MEMORANDUM

State of Alaska

TO: Ronald J. Somerville
Director
Division of Game

THRU: Richard H. Bishop 
Regional Supervisor

FROM: John W. Coady 
Research Coordinator
Division of Game
Department of Fish and Game
Fairbanks

DATE: March 2, 1981

FILE NO:

TELEPHONE NO: 452-1531

SUBJECT: Potential Impacts of
Intensive Agricultural
Development on Wildlife
in Alaska

This is to provide an outline of significant interactions which have already occurred or that we should anticipate in the near future between agriculture and wildlife in Alaska. A more detailed and fully documented draft report or "white paper" on this subject will be completed soon.

- I. Interaction between agriculture and wildlife will occur.
 - A) The history of both favorable and unfavorable influences of agriculture on wildlife in North America is extensively documented.
 - B) Small family farms generally benefit some wildlife species, while large fields, crop monocultures, and livestock grazing adversely impact several wildlife species.
 - C) In Alaska, the best areas for agriculture are also frequently the best for some wildlife species.
- II. Wildlife habitat will be impacted.
 - A) Loss or alteration of habitat will occur through crop production, grazing, and use of herbicides.
 - 1) This is a major cause of wildlife population declines in many areas of North America.
 - 2) This may cause major impacts in Alaska on some furbearer, moose, bison, black bear, and small game populations.
 - B) Competition for forage may occur.
 - 1) Competition for some willow species occurs between moose and livestock in southeast Idaho and Jackson Hole, and for herbaceous plants between livestock and bison in many areas including Alaska.
 - 2) Competition between livestock and moose for some willows and herbaceous forage is possible in Alaska.

- 3) Competition for grasses, sedges, and forbs between livestock and Dall sheep will occur if grazing is permitted in alpine and subalpine areas.
- 4) Competition between reindeer and caribou will occur if reindeer are allowed to graze on traditional caribou ranges.

III. Depredation will occur.

- A) Depredation on crops and structures will result in the need or pressure to reduce a wildlife population size.
 - 1) For example, a Board of Elk Control was established in Utah to control elk numbers because of depredation problems.
 - 2) In Alaska, depredation by bison, moose, waterfowl, hares, squirrels, beaver, and perhaps other species on grain, hay, garden crops, ensilage, and fences will increase.
- B) Depredation on livestock has already and will continue to result in the need or pressure to reduce or eliminate predators, such as wolves and bears.

IV. Disease and parasite problems in both livestock and wildlife will likely increase.

- A) The introduction of infected livestock or domestic animals that affect susceptible wildlife is of paramount concern.
 - 1) This has contributed to catastrophic wildlife losses of some wildlife populations in western states and provinces.
 - 2) For example, Wyoming lost thousands of antelope and deer to blue-tongue virus last year; cattle are the reservoir host for this virus.
- B) Livestock may infect wildlife, and that wildlife population then will serve as a potential reservoir for reinfection of livestock.
 - 1) Wildlife both may be affected by disease and criticized for being the source of disease.
 - 2) Brucellosis in western states is the best example.
 - 3) Wildlife have been slaughtered to prevent reinfection of livestock.

V. Direct mortality to wildlife will increase.

- A) Unintentional poisoning of wildlife by fertilizers, herbicides, and pesticides has and will continue to occur.

- B) Entanglement in fences will occur.
- C) Shooting of "nuisance" animals and poaching will increase.

VI. Movements of wildlife will be affected.

- A) Lengthy fences will create a physical barrier to local movements and seasonal migrations of some species.
- B) Structures, open fields, and intensive human activity may create behavioral barriers.

VII. Access-Trespass problems will increase.

- A) Access to or through areas by hunters and trappers will be limited by agricultural developments.
- B) Trespass by outdoorsmen, possibly resulting in vandalism and unintentional property damage to agricultural developments, will increase.
- C) Improved public access via agricultural development may create new wildlife management challenges which we should be prepared to meet.

VIII. We should provide for the optimum sustained use of all natural resources.

The agricultural industry should be developed and expanded in Alaska.

- B) Policy decisions should be deliberate and objective and should strive for careful consideration of soil, water, plant, and wildlife resources.
- C) Wildlife losses and the loss of traditional uses of wildlife can be mitigated with careful assessment and planning.
- D) With proper planning, agricultural development can be compatible with the long-term well-being of most wildlife populations in Alaska.

MEMORANDUM

State of Alaska

TO: Ronald J. Somerville
Director
Division of Game
Juneau

DATE: February 4, 1981

FILE NO:

THRU: Richard H. Bishop *RHB*
~~580M~~ Regional Supervisor
Oliver E. Burris *OB*
Management Coordinator
Division of Game

TELEPHONE NO: 452-1531

~~XXXXXX~~

FROM: David M. Johnson *DMJ*
Area Biologist *OS*
Division of Game
Department of Fish and Game
Delta

SUBJECT: CY 1981 Bison Activities

This is an outline of proposed bison-related activities for calendar year 1981 for your approval. I am concurrently beginning work on a contract for land clearing. At this stage, the bid request will not specify areas or exact acreages to be cleared.

SUMMER RANGE

1. Begin working with the Army to rehabilitate summer bison range. Consisting of prescribed burns and/or fertilization, this operation would attempt to provide better quality and quantity of forage and to hold the bison on the summer range longer. It should be possible to fertilize in 1981, at least on a test basis. Burns may not take place until 1982 or 1983. This activity is primarily to alleviate bison-agricultural conflicts. Since summer range is not a limiting factor to a herd of less than 400 animals, it probably is not a cost effective way of improving bison habitat.

2. Provide salt in midsummer. Salt seems to hold the bison on their summer range longer than they might otherwise stay. We would put out 30-50 blocks of 50 pounds each opposite and south of the Texas Range on the Delta River. (See map). Timing of salting would depend on bison movements.

TRAILS

3. Complete North (Alcan Highway) Trail from 33-Mile Loop Road to the bison range clearings. Completion of this trail was disputed last year. If it is left incomplete, even with its blockage along the Loop Road, the bison will use it--as they demonstrated in 1980--to access Tract A. Completing the trail to our fields should reduce the possibility of early damage. Tract A was not planted in 1980 but probably will be this year. It will also give bison moving south from the project a trail along which they may safely move. (See map). Approximately 2 miles of trail would be required.

4. Complete South Trail from 33-Mile Loop Road to bison range clearings. This was the trail originally designated by the Army in their bison plan for bison range access. If the bison move along the military's planned trail system, it may be useful. Two trails, this one and the north trail, should help to maximize bison movement to the range. Approximately 2 miles of trail would be required. (See map).
5. Cooperate with military to provide forage along the trails and in the food plots they have cleared. The Army has largely completed development of a trail system across Fort Greely to the bison range; it incorporates some gravel roads and short sections of new trails. Food plots are located in several places along the trail, and we would work with them to promote maximum use of these food plots. The Army reports that food plots planted late to oats on the 33-Mile Loop were used heavily by bison last fall. Those portions of their trail system that can be planted will be. (See map).
6. Block access to north from trail system with berms, brush, fence sections, and gates as appropriate. While bison go where they will, it may be possible to direct their movements to a degree by blocking cross trails against their passage. This, in combination with the inducement of salt and forage along the "right" trails, may lead more of them to bison range fields. Three cross trails of particular concern are: an old fire line crossing both the north and south military trails, an old trail through our existing fields and Tract A, and the 1408 road. A trail leading from the crushed area may also need to be gated or blocked. Other trails may need to be blocked as well.
7. Assist the Army in providing salt along their trails as animals begin moving. The Army has nearly 500, 50-pound blocks of salt to use for the purpose of directing the animals along their trail system. We would cooperate with them to ensure the blocks are set out at the optimum time and places.

FIELDS AND PLANTINGS

8. Clear fields and trails to limits of money available in a NW-SE axis along the northern edge of the bison range. Fields of varying sizes would be cleared first in the crushed area and later, as money permits, south and parallel to the first series. Trails would interconnect these fields and those cleared in 1979 with the trail system discussed earlier. A trail or trails would also be cleared to water at Sawmill Creek. (See map).
9. Plant fields with barley and perennials. Fields would be planted with barley or perennials. The mix or forage has not been decided, but in order to reduce annual maintenance, more perennial fields would likely be planted than barley fields. We will attempt to farm the barley fields on a sharecrop basis.

HARASSMENT

10. Radio-collar additional bison to allow better detection of movements. Five additional radio collars are on hand and would be placed on bison as time and money permits. In addition, radio collars would be used next fall to track bison movements. They are also useful for composition counts and recording migration patterns.

11. Divert bison south of the Alaska Highway to the trail system and the bison range. We would monitor bison movements regularly as they move east and attempt, through various forms of harassment, to keep them south of the Alaska Highway and moving toward the bison range. As harvest is complete, harassment would cease.

The following table lists the priority, estimated cost, and man-days for the activities listed above.

PRIORITY AND ESTIMATED COST OF PROPOSED PROJECTS CY 1981

<u>Priority</u>	<u>Activity</u>	<u>Estimated Cost</u>	<u>Estimated Man-Days</u>
1	(8) Clear Fields	\$25,615 ¹	14 ²
2	(9) Plant Fields	11,385 ¹	4 ²
3	(1) Rehabilitate Summer Range	3,000 ³	20
4	(2) Salt	250	4
5	(3) Complete North Trail	150	1
6	(4) Complete South Trail	150	1
7	(6) Block Access	250	10
8	(10) Radio-Collar Bison	3,000 ⁴	10 ⁴
9	(11) Divert Bison	2,000 ⁴	40 ⁴
10	(5) Cooperate with Military: Salt and Forage	-0-	5

Notes

1. The total expenditure of time and money would depend on the amount of money available. Assuming \$37,000 remains from the \$50,000 FY81 Bison Range Appropriation, about 115 acres could be cleared and planted. If an appropriation bill is passed and made effective this spring, if sharecropping arrangements can be negotiated or if major use is made of the crushed area, additional acres could be cleared.

2. The man-days figure proposed assumes clearing and planting 115 acres.

February 4, 1981

3. This money could come from the \$50,000 appropriation. If it comes from another source, or if it is not used, about 10 additional acres could be cleared and/or planted on the Bison Range.

4. At current budget levels, I recommend spending this amount of money and time in FY82. If additional money becomes available, substantially improved control of bison movements could probably be effected.

If you concur with the activity and priorities listed above, it may be necessary to modify our agreement with the U.S. Army or get them to modify their bison plan. Their plan does not call for the completion of the north trail to the bison range. Further, their plan does not call for development of bison range on the west side of the Delta River; however, it does not exclude it either. A draft letter to Colonel Bonito was sent to you a few days earlier.

If this does not provide the detail you requested earlier, please contact Bud or me. The map of the proposed clearing and trail work will be enclosed or sent in a few days as soon as we get it copied.

March 4, 1981

Sally,

Doctor Don Tomlin, Agricultural Director for the Tanana Chiefs agricultural program came by the office today to provide you with a copy of his letter to Representative Moss and backup information.

Dr. Tomlin is requesting continuation and expansion of the village gardening program which is administered by the TCC. BIA will cover only half of the gardening assistants needed to carry out the program's intent. TCC is requesting \$379,500 from the legislature.

Dr. Tomlin will be testifying before the Resources Committee today. He is hopeful of meeting you!

gb

March 2, 1981

Representative Pappy Moss
Alaska State Legislature
Pouch V
Juneau, Alaska 99811

Dear Pappy:

I've changed work since I last talked with you; I'm directing the agricultural program for ~~Tanana Chiefs~~ as of the first of this month.

My boss, Jack Utton, said that he had talked with you about the Tanana Chiefs Conference village agriculture program. As you probably know, they have had continuing growth of interest in the ~~subsistence gardening~~. Last year, through your efforts in the 1979 legislature, TCC was able to place a gardening assistant in each of its six subregions to help the village residents with their gardening efforts.

The money you obtained from the 1980 Legislature for the food processing and preservation facilities in interior villages was channeled through the Department of Community and Regional Affairs. We found an engineer in Anchorage to do the design and pricing on the brine-reservoir, passive freezer building. We're looking at this as a pilot model, to see how well it works before we try any more of them. The rest of the money will go for food processing - preservation buildings (canning kitchen and root cellar, with a lean-to greenhouse) in three villages, and a training program for these facilities. We have every intention of completing construction this summer, in time for the food centers, at least, to be used. The passive freezer can probably be used to store food this fall, but its reservoir of cold will not be functional until it has gone through a whole winter.

I think the food centers will create interest in other villages but indications so far are that not every village will want or need one. We have budgeted for a few more next year.

Jack and I have discussed our views of the ~~future of this village gardening program~~. We hope to ~~develop~~ a ~~core group~~ of skilled ~~gardeners~~ in each ~~village~~ which will carry on the interest and provide support to the neophytes. We think the gardening equipment needs in the villages of our region have pretty well been met and anything further would be of a maintenance nature.

JOBS10
c1

Page 2
March 2, 1981

We do feel that it is extremely important to ~~continue~~ the program of providing people to help with gardening in the villages. We must not lose the momentum of interest developed in the past two years. We hope that a few more seasons of this assistance will build sufficient interest that we can reduce our efforts and expect it to continue.

That brings up the problem we are facing now. Our current B.I.A. ~~support budget~~ will not cover more than one and a half of the gardening ~~assistance~~ for this summer. We need at least six people working in the subregions to maintain the same level of support as last year. To properly handle the job, we need eight people. This is for thirty villages. Koyukon Development Corporation is covering only eight villages this year instead of the twenty last year, while Venetie and Arctic Village have opted out of the programs. It will cost us \$20,650 per person to provide training and keep them working in the villages through the gardening season. We also need to provide them with some basic visual aids, which will cost about \$300 per person. Is there any way you could get money to support our program for this season? We would need an initial appropriation by May 1, and another by July 15. Of course, we need to look forward to 1982, so we don't get caught behind the eight ball again. I've outlined these needs in a budget sheet at the end of this letter.

Confidentially, I think you know as well as we do that a vacuum has developed in this area of assistance to village gardening. The Cooperative Extension Service no longer budgets for travel to the rural areas, nor has it sufficient personnel to handle the rural needs. The Agricultural Experiment Station has never been oriented to the needs of subsistence gardening. I've been rather closely involved in the rumblings in the Rural Education Division of the University regarding its agriculture program at the Galena Regional Learning Center, and given the basic premises of Rural Education's administrators, I can't see any way that they will be able to cope with the need. Koyukon Development Corporation seems to be drawing back on their participation compared with last year. Of course, KDC and the Galena Center cover only 20% of the Doyon region. I didn't intend this as criticism; it's only to point out that a serious vacuum exists in TCC's territory and we must exert greater efforts to fill it. After all, what can be more important than teaching rural residents to produce and store their own foods.

Page 3
March 2, 1981

These, then, are our needs for support of the ~~village gardening program~~. We hope you will be able to give it your support. I'm looking forward to discussing this with you in Juneau.

Sincerely,

TANANA CHIEFS CONFERENCE, INC.

Don C. Tomlin, Ph.D.
Agricultural Director

DCT/699k
enc.

Budget for TCC village gardening assistance program

May 1 to July 14, 1981, 6 persons

wages 6 @ \$1,750 per month	26,250
fringe benefits @ 21%	5,510
travel	7,500
per diem	8,200
training	5,100
visual aids	1,800
	<u>54,360</u>

July 15 to September 15, 1981

wages	21,000
fringe benefits	4,410
travel	6,000
per diem	8,930
training	4,740
	<u>45,080</u>

March 15 to September 15, 1982, 8 persons

wages 8 @ \$1,800 per month	86,400
fringe benefits	18,140
travel	24,000
per diem	30,240
training	11,120
visual aids	900
	<u>170,800</u>

Indirect Costs @ 25.8% of wages	41,720
Indirect Costs @ 36.7% of all other costs	39,830
Total	<u>351,790</u>

Capital Expenditures

6 food processing centers @ \$50,000 (canning kitchen, root cellar, greenhouse)	300,000
plus 10% inflation	30,000
plus overhead @ 15%	49,500
	<u>\$379,500</u>



Alaska State Legislature

House of Representatives

Committee on Resources

Terry Gardiner, Co-Chairman
Fred F. Zharoff, Co-Chairman
465-3715

Pouch V
State Capitol
Juneau, Alaska 99811

AGRICULTURE HEARINGS

House Resources Committee/ Room 118

Wednesday; March 4 3PM TELECONFERENCE

Scheduled Speakers:

DELTA 1 & 11:

Rep. Pappy Moss
Agriculture Action Council
Gerald Brehmer, Delta farmer
Adrian Fredrich, Alaska Farmer's
Coop, via teleconference
Teleconference participants

EISON & WILDLIFE CONCERNS: Dick Bishop, Alaska Dept. of
Fish & Game

RED MEAT INDUSTRY: Bob Pollock, Agric. Action
Council
Don Tomlin

LAND LEASING POLICIES: Ted Smith, DNR

Thursday; March 5 3PM

Issues which will be addressed:

Pt. McKenzie
Nenana-Totchaket

(30) "state" means State of Alaska;

(31) "timber land" means those lands which, because of physical, climatic and vegetative conditions, are presently or potentially chiefly valuable for the production of timber and other forest products;

(32) the masculine gender includes the feminine and the neuter;

(33) the singular number includes the plural;

(34) "unclassified lands" means all lands not otherwise classified;

(35) "university lands" means all Sections 33 reserved to the University under 38 Stat. 1214, as amended (48 U.S.C. 353), and all lands presently or hereafter reserved for the benefit of the University of Alaska;

(36) "vendee" shall mean the purchaser;

(37) "vendor" shall mean the State of Alaska;

(38) "open-to-entry lands" means those lands which meet the criteria as established by AS 38.05.077;

(39) "resource management lands" means those lands containing an association of surface and/or subsurface resources which are especially suited to multiple-use management. Such management may be accomplished in whole or in part pursuant to an inter-agency agreement. (Eff. 7/1/60, Reg. 1; am 8/15/64, Reg. 18; am 3/22/69, Reg. 28)

Authority: AS 38.05.020
AS 38.05.035
AS 41.20.020

**ARTICLE 4.
HOMESITES**
Repealed 5/13/79.

**ARTICLE 5.
OPEN-TO-ENTRY**
Repealed 5/13/79.

**CHAPTER 55.
LAND PLANNING AND
CLASSIFICATION**

Section

- 10. Application of chapter
- 20. Planning and classification
- 30. Preparation of plan
- 40. Classification
- 50. Agricultural land
- 60. Commercial land
- 70. Forest land
- 80. Grazing land
- 90. Greenbelt land
- 100. (Repealed)
- 110. Industrial land
- 120. Material land
- 130. Mineral land
- 140. (Repealed)
- 150. Private recreation land
- 160. Public recreation land
- 170. Reserved use land
- 180. Residential land
- 190. Resource assessment land
- 200. Resource management land
- 210. Utility land
- 220. Watershed land
- 230. Wildlife habitat land
- 240. Reclassification
- 250. Notice
- 260. No effect on valid existing rights
- 270. Proposing classifications
- 280. Definitions

11 AAC 55.010 APPLICATION OF CHAPTER. This chapter deals with the planning and classification of all land under the management authority of the department, as well as land that has been selected or is otherwise to be acquired by the state and managed by the department. The intent of this chapter is to establish a system of land classification based on a land use planning process that recognizes the varied resources of the state, including land, water, and air, and the many competing demands for those resources. The planning process will provide for the balanced use, development, and conservation of those resources for the maximum benefit of the people of Alaska. (Eff. 11/12/78, Reg. 68; am 10/14/79, Reg. 72)

Authority: AS 36.04.900
AS 36.05.020
AS 36.05.300

available for the acquisition of rights to lease locatable minerals under AS 38.05.205 and 11 AAC 86.300 - 11 AAC 86.325, subject to any restrictions in each specific classification: resource management and wildlife habitat.

(f) Depending on the land use plan and subject to any restrictions in each specific classification, land in the following classifications may also be available for the acquisition of rights to lease locatable minerals under AS 38.05.205 and 11 AAC 86.300 - 11 AAC 86.325: commercial, greenbelt, industrial, public recreation, reserved use, and watershed.

(g) Land in the following classifications is available for the disposal of materials and of timber, subject to any restrictions in each specific classification: agricultural, commercial, forest, grazing, industrial, material, mineral, resource assessment, resource management, utility, watershed, and wildlife habitat.

(h) Depending on the land use plan and subject to any restrictions in each specific classification, land in the following classifications may be available for the disposal of materials and timber: greenbelt, private recreation, public recreation, and reserved use.

(i) Land or an interest in land in the following classifications is available for sale, lease or other disposal, subject to any restrictions in each specific classification: agricultural, commercial, industrial, mineral land (if acquired by escheat or foreclosure only), private recreation, residential, and utility.

(j) Title to land in the following classifications must be retained in state ownership, but an interest in land may be available for lease, subject to any restrictions in each specific classification: forest, grazing, material, mineral, public recreation, resource management, watershed, and wildlife habitat; except that grazing land is available for municipal selection under AS 29.18.201 - AS 29.18.213. (Eff. 11/12/78, Reg. 68; am 10/14/79, Reg. 72)

Authority: AS 38.04.015 AS 38.05.185
AS 38.04.900 AS 38.05.295
AS 38.05.020 AS 38.05.300
AS 38.05.045

11 AAC 55.050. AGRICULTURAL LAND. (a) Land classified agricultural is land that, because of its location, physical features, and climate, is or may be made suitable for agricultural use.

(b) The primary management goal is the preservation of agricultural land for either present or future agricultural use.

(c) Land classified agricultural is intended for present or future agricultural use. It is to be used for the production of plants and animals useful to man, and for other uses incidental to and compatible with the primary use or as identified in the land use plan for the area. Agricultural land is available for mineral leasing under AS 38.05.135 - AS 38.05.184, for the disposal of materials and timber, and for the sale or lease of agricultural rights. (Eff. 11/12/78, Reg. 68)

Authority: AS 38.04.900 AS 38.05.069
AS 38.05.020 AS 38.05.300
AS 38.05.035 AS 38.05.321

11 AAC 55.060. COMMERCIAL LAND. (a) Land classified commercial is land that, because of its access to transportation systems, its location adjacent to existing or proposed compatible development, and its physical features, is suitable for nonindustrial business use.

(b) The primary management goal is to make commercial land available in locations that are compatible with local needs and the public interest and to cluster commercial uses at intervals along highways so as to prevent strip development, reduce traffic hazards, and minimize scenic blight.

(c) Commercial land is to be used primarily for the sale, exchange or distribution of goods and services, and for other uses compatible with the primary use. Residential use is allowed unless prohibited by local zoning. Commercial land is available for mineral leasing under AS 38.05.135 - AS 38.05.184, for the disposal of materials and timber, and for sale, lease, or other disposal, and may be made available for the acquisition of rights to lease locatable minerals, depending on the land use plan. (Eff. 11/12/78, Reg. 68)

Authority: AS 38.04.900 AS 38.05.035
AS 38.05.020 AS 38.05.300

11 AAC 55.070. FOREST LAND. (a) Land classified forest is land that, because of physical,

climatic or vegetative conditions, is most appropriately managed for timber and other forest resources.

(b) The primary management goal is the maintenance of forest land for either present or future timber production on a sustained yield basis, and such other benefits as preservation and enhancement of watershed areas, wildlife habitat, and recreation areas.

(c) All uses within forest land must be compatible with the primary management goal. Forest land is available for mineral leasing under AS 38.05.135 – AS 38.05.184, for the acquisition of rights to locatable minerals, for the disposal of materials and timber, and for lease. (Eff. 11/12/78, Reg. 68)

Authority: AS 38.04.015 AS 38.05.035
 AS 38.04.900 AS 38.05.300
 AS 38.05.020

11 AAC 55.080. GRAZING LAND. (a) Land classified grazing is rangeland that, in its uncultivated state, supports native vegetation suitable for forage production and the pasturing of domestic livestock. If the grazing of domestic livestock on such land is potentially in conflict with wildlife, the land may be classified as grazing only if the land use plan finds that grazing is the more appropriate use.

(b) The primary management goal is to maintain the sustained-yield productivity of rangeland, using acceptable range management practices.

(c) Grazing land is to be used primarily for the pasturing of livestock raised for personal use or for sale, or for the sale of animal products. Other uses must be compatible with the primary use. Grazing land is available for mineral leasing under AS 38.05.135 – AS 38.05.184, for the acquisition of rights to locatable minerals, for the disposal of materials and timber, and for lease. (Eff. 11/12/78, Reg. 68)

Authority: AS 38.04.015 AS 38.05.035
 AS 38.04.900 AS 38.05.300
 AS 38.05.020

11 AAC 55.090. GREENBELT LAND. (a) Land classified greenbelt is land maintained in a natural state along a transportation route, prominent physical feature of land, stream,

waterway, or lakeshore, or as open space. The greenbelt classification may be applied, in accordance with AS 38.04.070(4), to state-owned segments of wild, scenic, or recreational rivers.

(b) The primary management goal is to maintain the landscape (including vegetation) within the greenbelt so that it serves as a visual screen, as a scenic transportation or recreational access route, as a wildlife migration corridor through developed areas, for protection of the fishery resource, as a buffer against noise, wind erosion, and polluted or silty runoff waters, or for floodplain management purposes.

(c) All uses within a greenbelt must be compatible with the primary management goals. Material sales from shorelands, logging of dead, downed, defective, or hazardous timber, and underground mining under lease may be allowed in accordance with guidelines in the land use plan. A right-of-way may be allowed to cross greenbelt land, but construction must be performed in a manner that minimizes impact on the greenbelt. If the land use plan determines that private recreational use is compatible and desirable in a specific greenbelt, such use may be allowed through a dual classification, under lease only. (Eff. 11/12/78, Reg. 68; am 10/14/79, Reg. 72)

Authority: AS 38.04.015 AS 38.05.020
 AS 38.04.070(4) AS 38.05.035
 AS 38.04.900 AS 38.05.300

11 AAC 55.100. HOMESITE ENTRY LAND.
 Repealed 10/14/79.

11 AAC 55.110. INDUSTRIAL LAND. (a) Land classified industrial is land that, because of its access to resource and major transportation systems, its location adjacent to existing or proposed compatible development, and its physical and environmental features, is suitable for industrial development.

(b) The primary management goal is to make land available for industrial uses when and where it is needed, and to concentrate industrial use in areas suited for it.

(c) Industrial land is to be used primarily for the manufacture, processing, storage, and testing of goods and materials, the processing of miner-

CHAPTER 60. GRAZING LEASES

Section

- 10. Lands available for leasing
- 20. Applications
- 30. Reclassification
- 40. Term of lease
- 50. Lease rates
- 60. Lease utilization
- 70. Identification of livestock
- 80. Non-use
- 90. Sub-lease
- 100. Range improvements
- 110. Other improvements
- 120. Water rights
- 130. Recreational and other compatible uses
- 140. Stock driveways
- 150. Conversion privileges
- 160. General provisions
- 170. Purpose - short title
- 180. Definitions

11 AAC 60.010. LANDS AVAILABLE FOR LEASING. (a) Grazing leases may be issued on all lands except those which have been classified as "open to entry" pursuant to AS 38.05.077, and those lands classified as "public recreation lands" or "reserved use" lands under ch. 52 of this title.

(b) Lands classified under ch. 52 of this title as "residential lands," "private recreation lands," "agricultural lands," "commercial lands," "industrial lands" or "utility lands" shall be available for short term leasing only, as provided for in sec. 40(a) of this chapter. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.020. APPLICATIONS. Applications for grazing leases shall be filed with the division on a form provided for that purpose or an image copy thereof. Each application shall be accompanied by a \$10 filing fee. Filing fees are not refundable. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.030. RECLASSIFICATION. (a) The state specifically reserves the right to reclassify all or a portion of the leased area to other uses in accordance with 11 AAC 52.190.

(b) Reclassification of a portion of a leased area shall, whenever possible, be carried out in a manner which will minimize interference with the grazing use of the remaining lease area.

(c) The lessee shall be given written notice by certified mail, at least 90 days prior to any reclassification.

(d) The director shall adjust the lease rental to reflect changes in the leased area occasioned by any such reclassification. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020

AS 38.05.070

AS 38.05.300

11 AAC 60.040. TERM OF LEASE. (a) Leases on land subject only to short term leasing under sec. 10(b) of this chapter shall not exceed a term of five years.

(b) All other leases shall be for any period as determined by the director to be in the best interest of the state, provided the term of the initial lease and any renewal thereof pursuant to AS 38.05.100 does not exceed a total of 55 years. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020

AS 38.05.070

11 AAC 60.050. LEASE RATES. The value of the leased lands for purposes of auction minimum valuations, periodic reappraisals, and lease renewals, shall be determined on the basis of the value of the lands for grazing purposes. The grazing lease rates shall give due consideration to estimated carrying capacity for winter and summer use, the use of lands for the growing of forage to be consumed on the grazing lease, and other pertinent economic factors. The minimum leasing rate shall be \$0.05 per acre per annum. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020

AS 38.05.070

AS 38.05.310

11 AAC 60.060. LEASE UTILIZATION. Grazing leases shall be utilized only for purposes within the scope of the lease provisions, and the land classification. Utilization or development of the leased land for other than the allowed uses shall be grounds for cancellation of the lease. Failure to make substantial use of all or any part of the land, consistent with accepted range

practices shall constitute grounds for cancellation. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.070. IDENTIFICATION OF LIVESTOCK. All livestock permitted on a state grazing lease shall be properly identified and such identification registered in accordance with AS 03.40.010-.270. In addition, the director may require that the livestock be tagged, dyed or otherwise marked as a control on numbers permitted on a lease in accordance with the annual operating plan. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.080. NON-USE. (a) To maintain the land at its highest productive capacity, the director may, at any time during the life of the lease, when he deems it necessary, declare all or any part of the lease to be in non-use. The period of non-use may be for any specified length of time up to the expiration of the lease itself.

(b) The lessee shall be given written notice of a declaration of non-use, and the director shall adjust the lease rental to reflect any reduction in the leased area resulting from such declaration.

(c) The lessee may at any time during the life of the lease take non-use on any or all of the grazing lease to adjust or improve operations under the lease. He cannot take non-use, however, merely to hold a grazing lease. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.090. SUB-LEASES. (a) Under no circumstances shall a lessee be permitted to sub-lease a grazing lease.

(b) Grazing lessees may, with the prior written approval of the director, pasture livestock owned by others on a temporary basis. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.100. RANGE IMPROVEMENTS.

(a) Lessee shall not make range improvements

without first obtaining the written approval of the director.

(b) Applications to construct range improvements shall indicate the location of the proposed improvements, the necessity for such improvements, the estimated cost thereof, and that the improvements, as proposed, will not impair the value of the land or interfere with other reasonable uses thereof.

(c) All range improvements are subject to the provisions of AS 38.05.090. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070
AS 38.05.090

11 AAC 60.110. OTHER IMPROVEMENTS.

(a) Grazing lessees desiring to construct other improvements of a permanent nature, such as housing, barns, sheds, slaughterhouses, silos and grain or hay storage buildings, etc., within the grazing lease area, must apply for either the sale or lease of the lands under chs. 54, 57 or 58 of this title.

(b) If the proposed lease or sale is considered to be in the best interest of the state, the lands involved will be excluded from the grazing lease and may be leased or sold in accordance with existing lease or sale procedures. In no event may the lands sold or leased exceed 40 acres, except that this limitation does not apply for a sale of an agricultural interest under ch. 57 of this title. (Eff. 4/15/70, Reg. 34; am 9/7/78, Reg. 67)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.120. WATER RIGHTS. Any waters required for the full use and enjoyment of a grazing lease may be appropriated and reserved for the lessee's use by the director upon request of the lessee. Any such appropriation shall be in the name of the state and inure to the grazing lease lands, and be consistent with the provisions of the Water Use Act. The lessee shall be required to furnish such information as is necessary and requested by the director in order to effect an appropriation. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.130. RECREATIONAL AND OTHER COMPATIBLE USES. (a) The lessee shall not interfere with the right of the public to enter the land for lawful pursuit of game animals, the taking of fish, the trapping of fur animals, or for temporary camping or other compatible uses.

(b) In order to protect the lessee's interest, the director may, if he deems necessary, grant written permission to post certain key areas.

(c) Lessee shall not prohibit or otherwise interfere with reasonable access to the leased area for other uses. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070
AS 38.05.285

11 AAC 60.140. STOCK DRIVEWAYS. (a) In the event that an individual with livestock must cross the grazing lease of another, the livestock must be kept within the bounds of the stock driveway. The stock driveway will be adequately marked on both exterior boundaries.

(b) Prior to the movement of livestock, the lessee must apply to the director for a crossing permit, stating the dates of movement and the numbers being moved. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.150. CONVERSION PRIVILEGES. (a) A lessee holding a grazing lease which has been issued pursuant to 11 AAC 58.030 or 11 AAC 58.040 may at any time convert the lease to a grazing lease subject to the provisions of this chapter.

(b) The term of the lease issued under such a conversion shall be identical to the term remaining on the original lease. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.160. GENERAL PROVISIONS. State grazing leases shall be issued subject to the general provisions contained in ch. 58 of this title, and, in addition, subject to the particular

terms and conditions specified in ch. 60 of this title. (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.170. PURPOSE-SHORT TITLE. The purpose of ch. 60 of this title is to ensure leasing of state range lands in a manner that will encourage development of the land consistent with its highest and best use. This chapter of this title may be referred to as the "GRAZING LEASE REGULATIONS." (Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

11 AAC 60.180. DEFINITIONS. In this chapter

(1) "crossing permit" means a permit, issued by the director, authorizing the use of a stock driveway to move livestock on or off the range;

(2) "grazing lands" means those lands which in their natural state have the physical and climatic features that make them primarily useful for the pasturing of domestic livestock;

(3) "preference right grazing lease" means a grazing lease granted to a lessee whose federal grazing lease was cancelled to allow the land under lease to be selected by the state;

(4) "land" means all lands under the jurisdiction of the division;

(5) "non-use" means the discontinuance of use of all or part of a leased area in order to enable the resource to return to its normal productivity;

(6) "range improvement" means any improvement necessary for use of the lease for grazing of livestock, such as fences, corrals, loading and branding chutes, clearing and cultivation of lands for forage crops and survey of lands;

(7) "stock driveway" means a route, designated by the director, and marked along its exterior boundary, over which livestock are

permitted to move across grazing lease areas.
(Eff. 4/16/70, Reg. 34)

Authority: AS 38.05.020
AS 38.05.070

CHAPTER 62.
TIDE AND SUBMERGED LANDS

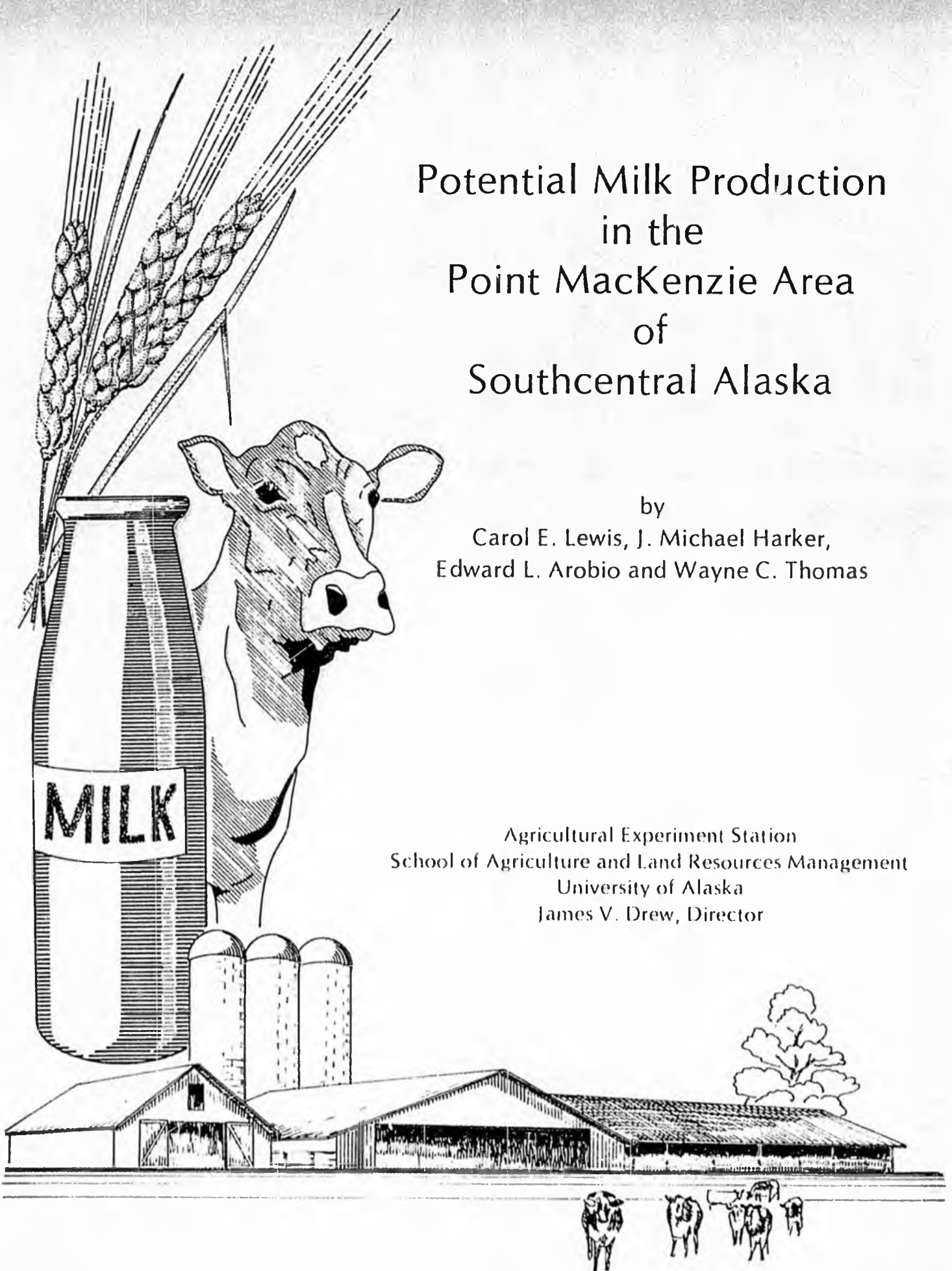
Section	
10.	Short title
20.	Ownership
30.	Protection of fish and game
40.	(Repealed)
50.	Classification
60.	Mining
70.	Materials
80.	(Repealed)
90.	(Repealed)
100.	(Repealed)
110.	Federal priority
120.	(Repealed)
130.	Protest
140.	(Repealed)
150.	Site examination
160.	Loss of preference rights; outside municipality
170.	Loss of preference rights; municipality
180.	Unoccupied and unappropriated state owned tide and contiguous submerged lands
190.	(Repealed)
200.	Applications
210.	Appeal
220.	Appeal—Notice
230.	Finality of decisions
240.	Completion of purchase requirements
250.	Jurisdiction
260.	Preliminary plat
270.	Preliminary plat requirements
280.	Survey procedure
290.	Procedure on final plat
300.	Final plat requirements
310.	(Repealed)
320.	(Repealed)
330.	(Repealed)
340.	Application; municipal corporation
350.	Proof of qualifications
360.	(Repealed)
370.	(Repealed)
380.	(Repealed)
390.	(Repealed)
400.	(Repealed)
410.	(Repealed)
420.	Final plat of survey
430.	Occupant not seaward of municipal corporation or surveyed townsite having Class I preference right
440.	Applications; Class I preference right
450.	Proof of qualifications

Potential Milk Production in the Point MacKenzie Area of Southcentral Alaska

by

Carol E. Lewis, J. Michael Harker,
Edward L. Arobio and Wayne C. Thomas

Agricultural Experiment Station
School of Agriculture and Land Resources Management
University of Alaska
James V. Drew, Director



UNIVERSITY OF ALASKA

Dr. Jay Barton	– President
Dr. Howard A. Cutler	– Chancellor, University of Alaska, Fairbanks
Dr. F. Lawrence Bennett	– Vice-Chancellor for Academic Affairs
Dr. Keith B. Mather	– Vice-Chancellor for Research and Advanced Study
Dr. James V. Drew	– Dean, School of Agriculture and Land Resources Management, and Director, Agricultural Experiment Station

BOARD OF REGENTS

Edward B. Rasmuson, President
Jeffrey J. Cook, Vice President
Donald B. Abel, Jr., Secretary
Herbert C. Lang, Treasurer
Mildred Banfield
Tim Burgess
Dr. Hugh B. Fate, Jr.
Margaret J. Hall
Sam Kito, Jr.
Thomas J. Miklautsch
John T. Shively
Dr. Jay Barton, Ex Officio Member

The Agricultural Experiment Station at the University of Alaska provides station publications and equal educational and employment opportunities for all, regardless of race, color, religion, national origin, sex, age, disability, or status as a Vietnam era or disabled veteran.

In order to simplify terminology, trade names of products or equipment may have been used in this publication. No endorsement of products or firms mentioned is intended, nor is criticism implied of those not mentioned.

Material appearing herein may be reprinted provided no endorsement of a commercial product is stated or implied. Please credit the researchers involved and the Agricultural Experiment Station, University of Alaska.

Potential Milk Production
in the
Point MacKenzie Area of Southcentral Alaska

Carol E. Lewis*

J. Michael Harker**

Edward L. Arobio***

Wayne C. Thomas****

University of Alaska
Alaska Agricultural Experiment Station
Cooperative Extension Service
Fairbanks

- *Associate Professor of Resource Management, Agricultural Experiment Station, University of Alaska, Fairbanks.
- **Assistant Professor and Resource Economist, Cooperative Extension Service, University of Alaska.
- ***Research Associate in Economics, Agricultural Experiment Station, University of Alaska, Fairbanks.
- ****Associate Professor of Economics, Agricultural Experiment Station, University of Alaska, Fairbanks.

FOREWORD

The information presented in this bulletin is part of a report prepared for the Agricultural Action Council of the State of Alaska. The group was formed in 1979 by legislative action and is chaired by W. I. "Bob" Palmer, Special Projects Director, Office of the Governor. The purpose of the group is to plan and manage agricultural development projects within the state.

The report on the feasibility of milk production in the Point MacKenzie Area presented to Governor

Hammond through the Alaska Agricultural Action Council was prepared by the authors of this bulletin and Dr. Boyd Buxton, Agricultural Economist, U.S.D.A., stationed at the University of Minnesota at St. Paul and Dr. Paul Fuglestad, Agricultural Economist, U.S.D.A., stationed in Anchorage, Alaska, both of whom are acknowledged with gratitude.

The authors also wish to thank Cathy Warren who reviewed extensively the tabular data.

CONTENTS

	Page
Foreword	iii
List of Tables	v
Chapter 1: Introduction	1
Chapter 2: Farm Economics	2
Capital Costs for Four Dairy Sizes	2
Barns and Milking Facilities	2
Waste Handling	4
Feed Storage	6
Silos	6
Concentrate	6
Starter, Hay, Bedding	6
Machinery Storage and Workshop	6
Calf, Heifer, and Dry Cow Housing	7
Feed Handling	7
Well	7
Total Capital Costs	8
Farm Budgets	8
Herd Development and Projection of Revenues and Expenses	13
Herd Development	13
Projected Revenues and Expenses	13
Chapter 3: Marketing and Competitive Position	19
Marketing	19
Competitive Position of Alaskan Produced Milk	19
Chapter 4: Final Thoughts	22
Bibliography	23
Consultants	23

LIST OF FIGURES

	Page
Figure 1: Point MacKenzie proposed project area (map)	vi
Figure 2: Typical Stanchion Barns	3
Figure 3: Manure Storage Basins	5

LIST OF TABLES

Table	Page
1 Barn and Milking Facility Specifications	4
2 Waste Disposal Systems for Four Facility Sizes	4
3 Silo Capacities	6
4 Concentrate Storage	6
5 Starter, Hay, and Bedding Storage	6
6 Machinery Storage and Workshop	7
7 Calf, Heifer, and Dry Cow Housing	7
8 Total Capital Investment for Four Facility Sizes	7
9 Annual Cash and Non-Cash Capital Associated Costs for the 50-Cow, Stanchion Dairy	9
10 Annual Cash and Non-Cash Capital Associated Costs for the 75-Cow, Stanchion Dairy	9
11 Annual Cash and Non-Cash Capital Associated Costs for the 100-Cow, Free-Stall Dairy	10
12 Annual Cash and Non-Cash Capital Associated Costs for the 150-Cow, Free-Stall Dairy	10
13 Cost Allocation to Dairy Cows and Replacement Heifers	8
14 Total Costs for Dairy Herds of 50, 75, 100, and 150 Cows in Third Year of Operation	11
15 Break-even Analysis for 50-, 75-, 100-, and 150-Cow-Dairy Farms	12
16 Replacement Heifer Cost Summary for Four Facility Sizes	12
17 Herd Development Plan for the 50-Cow-Dairy Farm	14
18 Herd Development Plan for the 75-Cow-Dairy Farm	15
19 Herd Development Plan for the 100-Cow-Dairy Farm	16
20 Herd Development Plan for the 150-Cow-Dairy Farm	17
21 Quarterly Projection of Revenues and Expenses for the 150-Cow-Dairy Farm	18
22 Estimated Costs per Hundred Weight and ½ Gallon for Alternate Sources of Milk Delivered to Anchorage Retail Stores, November 1979	20
23 Estimated Cost Per Hundred Weight of Milk Through a Typical Anchorage Milk Processing Plant and Delivered to Retail Stores	20
24 Production Rates and Returns for 50-, 75-, 100-, and 150-Cow-Dairy Farms	22

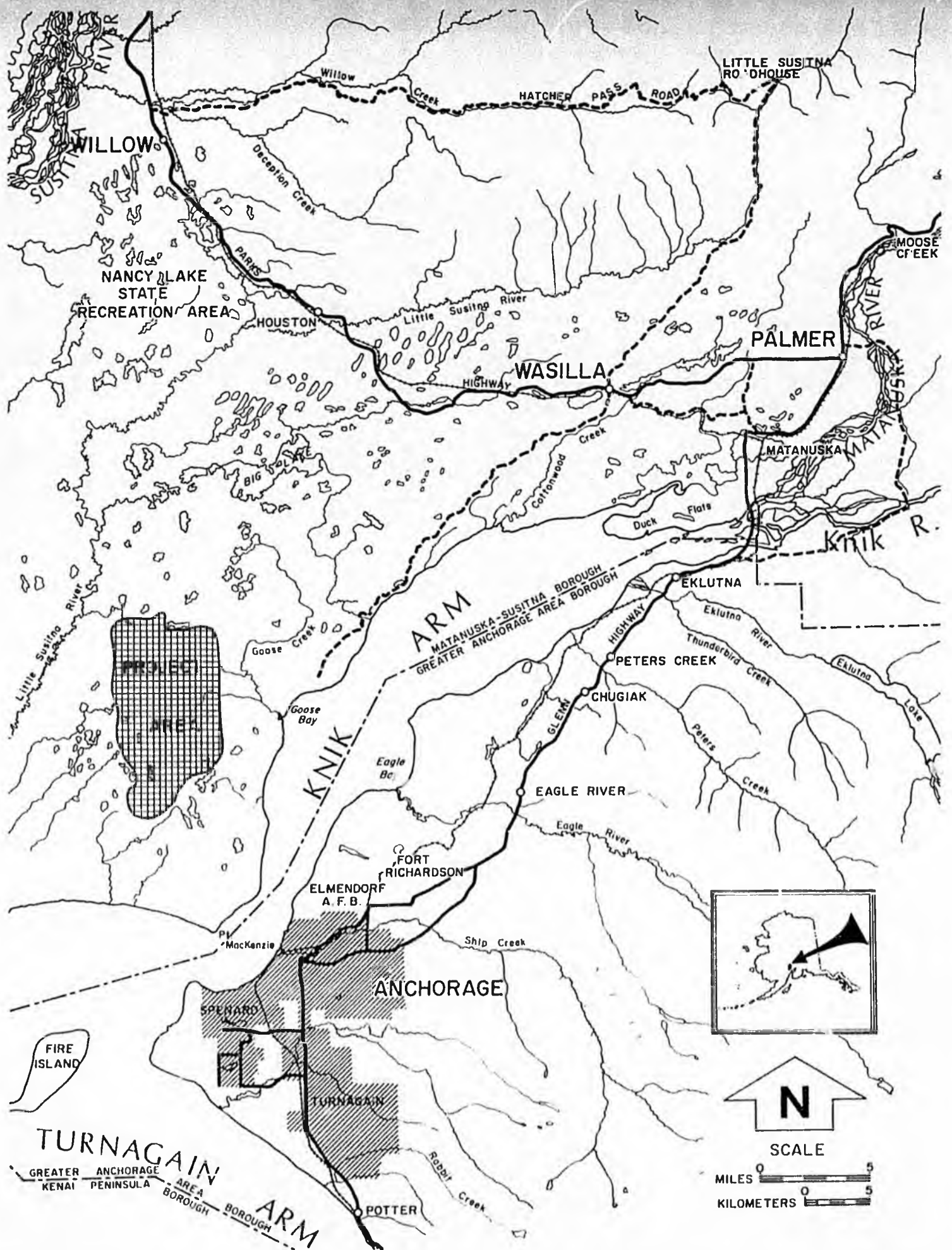


Figure 1: Point MacKenzie, just northwest of Anchorage, is the proposed project area for an expansion of Alaska's dairy industry.

CHAPTER 1

INTRODUCTION

Point MacKenzie is an area northwest of Anchorage directly across the Knik Arm of Cook Inlet (Figure 1). This area contains a substantial amount of latent agricultural land and discussion regarding its potential has been going on for some time. The catalyst which activated the recent planning process directed at Point MacKenzie was concern over potential loss of the southcentral Alaska dairy industry expressed on May 4, 1979, in a letter from Jack Flint, General Manager, Matanuska Maid, Inc., to Governor Jay Hammond: "It is my opinion that if we do not take immediate steps to stabilize this important phase of agriculture, [the dairy industry] will pass from the scene. I think that if it should occur, it would be a serious blow to the State of Alaska, economically and socially. I believe we should also realize that if the dairy industry should cease to exist within the state, it is going to be very difficult to re-establish it."

Mr. Flint's letter and corresponding action by the Matanuska-Susitna Borough have directed planning processes of the State of Alaska toward Point MacKenzie. The Alaska Agricultural Action Council, created by the 1979 state legislature to plan, recommend, and administer agricultural development projects on state lands in Alaska, held a meeting in the Matanuska Valley in September, 1979, and determined that an economic feasibility study, directed toward dairy production, should be undertaken for the Point MacKenzie area. This report is that feasibility study.

In order to perform the analysis, certain general assumptions are made. These include:

1. Sufficient state land is available in the Point MacKenzie area for a dairy farm development project.
2. Land price is \$100 per acre with a \$50 homestead credit making the effective price \$50 per acre to the farmers.
3. Land-clearing costs are \$220 per acre for project farms.
4. The dairy farms will be designed for forage production in the form of silage and haylage; concentrate, hay, and straw requirements will be met by off-farm purchases.
5. Private slaughter facilities are currently available in the Matanuska Valley to handle cull cows and calves from project lands.
6. Electrical power hook-up will be provided each farm.
7. Roads to each farm will be constructed.

The land price of \$100 per acre for purchase of agricultural rights only is set by the Alaska Land Statutes, Section 38.05. It is an average price and may vary depending on soil type and timber on the property. The homestead credit, repealed in 1979, will be reinstated in 1980. The land-clearing costs were based on a \$165-per-acre cost in 1979 in interior Alaska. An additional 15 per cent was added to bring them to 1980 costs. The heavier timber cover will probably require more machine time estimated at \$30 per acre.

CHAPTER 2

FARM ECONOMICS

The total capital investment cost for the physical facilities used in the simulated dairies is estimated for four sizes of farms milking 50, 75, 100, and 150 cows. These are the numbers of cows milked daily. Because cows are dry for two months each year, herds actually total 60, 90, 120, and 180 cows, respectively. Total farm budgets for these dairy herds are also provided, followed by a suggested plan for bringing new dairy farms into full production and a cash flow analysis for these farms during their first three years of operation.

Capital Costs for Four Dairy Sizes

Capital costs are determined using examples from existing dairy farms in Alaska's Matanuska Valley, Minnesota, and Wisconsin. It is assumed that the 50- and 75-milking-cow herds will be housed in stanchion barns. As milking herd size increases to 100 and 150 cows, the less labor-intensive, free-stall barn design is used. Milking in the stanchion barns is accomplished with a pipeline system while a milking parlor is used in the free-stall system. All barns are controlled-environment facilities. Housing for replacement heifers and dry cows is assumed to be in an uncontrolled-environment or "cold" facility. Silage, haylage, and/or hay is fed year-round. Feeding is automated, using auger load-out into feed mixers and either feed carts or augers to move the feed into feed bunks.

Costs of buildings and silos are estimated on a per-square-foot basis. It is possible that the larger structures could be built at less cost per square foot as there is not twice as much material in a 100-cow barn as there is in a 50-cow barn. If several structures are under construction at once, there may also be a savings. These two considerations are not used in the calculations here. An average cost for all size structures is applied. Deviations from this average, relevant to specific cases, will become evident as construction begins. Economies of size are recognized in feed and

milk-handling equipment. For example, feed load-out service for 100 cows is also adequate for 150 cows.

Trade-offs are made between labor and technology. The technology level in all units is kept in the medium range typical of that in existence in the majority of dairy farms in the United States. Alternative-energy technology is not incorporated, although such technologies may offer economic opportunities in the near future. Individual farmers may wish to pursue some of the recent developments in this field, particularly as technology improves.

Barns and Milking Facilities

Barn and milking facility construction costs are based on a full-truss structure, 4-inch insulation in walls and ceiling, and concrete floors and bunks. A figure of \$15/ft.² was estimated from Fairbanks construction costs for utility buildings. This figure includes the iron work for free stalls and stanchions, the heating system, and the electrical work.

Typical layouts for stanchion barns and free-stall barns are shown in Figure 2. The stanchion barns are based on 36-foot barn widths, two rows of cows facing out. Free-stall barns are 78 feet wide with four rows of stalls and a center-feed bunk. The stanchion operations do not require a milking parlor but do require a bulk tank for which space is provided. Milking is performed in the stalls using individual milkers and a pipeline to the milk room. Office space and a lavatory area are not included in the barns. Free-stall barns are provided with a milking parlor and an area for holding cows, maternity pens, hospital area, office, and lavatories, as well as a milk room.

Interior temperatures of all barns are kept at a minimum of 45°F throughout the year. Ventilation systems for the barns are adequate to move a maximum of 200 cfm of air per 1,000 pounds of animal weight in the barns, 3,000 cfm in the milk house, and 400 cfm per stall in the milking parlor. Heating is accomplished through the ventilation system using

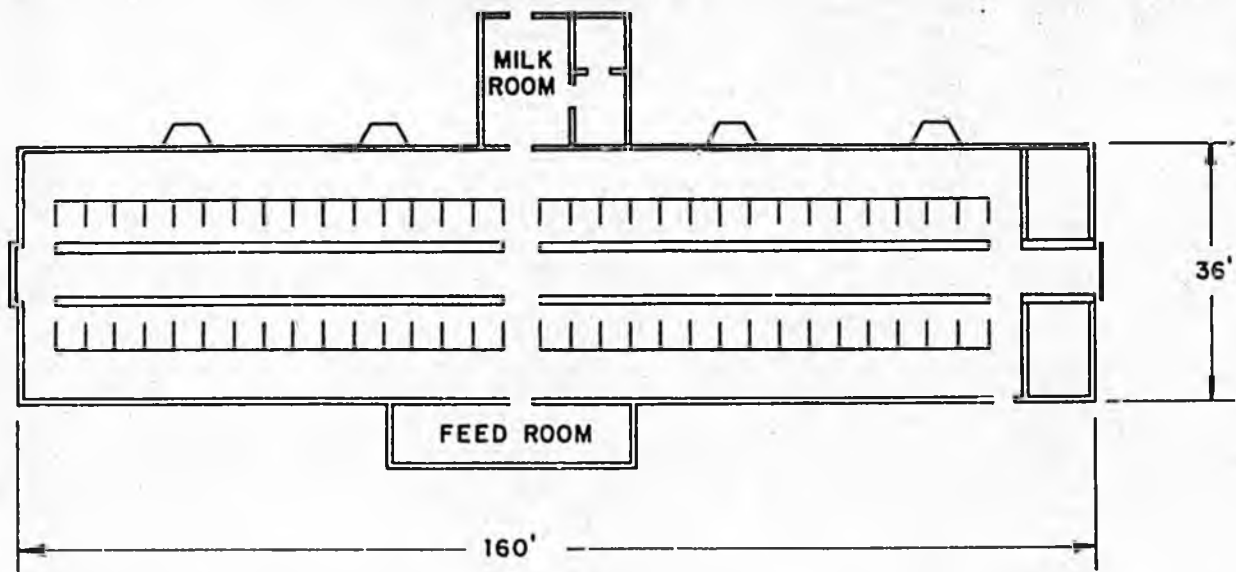
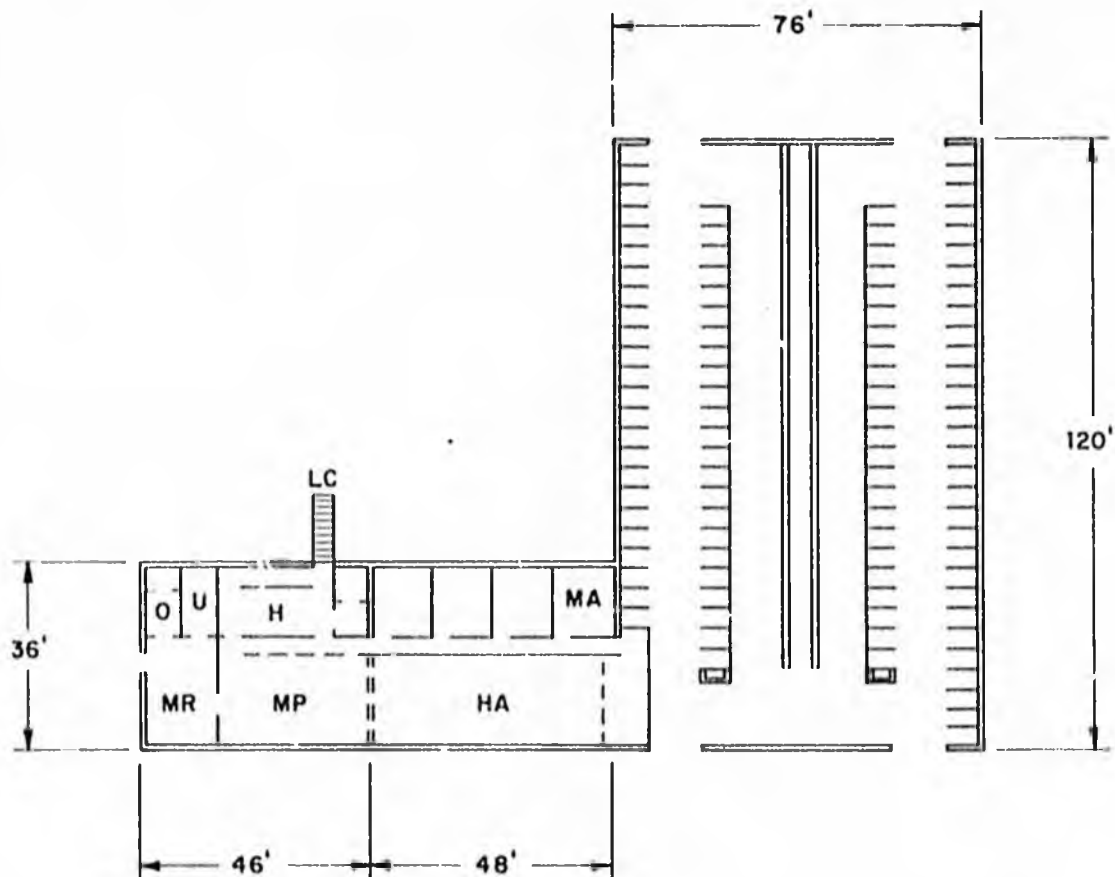


Figure 2: Typical Stanchion Barns. The upper drawing illustrates a typical stanchion barn. The unit shown houses 60 milking cows. The lower illustration is a 100 cow, free-stall facility including a holding area (HA), maternity area (MA), hospital (H), milking parlor (MP), milk room (MR), utility and office area (U, O), and a loading chute (LC). (From: Midwest Plan Service, Dairy Housing and Equipment Handbook. Iowa State University, Ames, 1978).



oil-fired burners. Milking equipment in the stanchion barns includes the bulk tank, milking units, pipeline, vacuum pump, cooling compressors, and associated plumbing. Milking machines handling 40-50 cows per hour are included as are bulk tanks sized to suit the dairy assuming the milk is collected on alternate days. The free-stall milking operations are based on six- and eight-stall, double herringbone (DHB) parlors. All other components are the same as in stanchion facilities. Milk-parlor sizes are based on gallons of production. Barn- and milking-parlor specifications and costs of components are summarized in Table 1.

Waste Handling

All farming operations are based on handling manure in the semisolid form. An earth-basin slurry system without a liner, similar to that shown in

Figure 3, should be adequate in the Point MacKenzie area. Removal of manure from barns is accomplished by barn scrapers dumping into a settling pit where manure is moved by a piston pump to the earth storage basin. Slurry pumps are used to agitate and load manure into tank wagons. Mats are provided in all barns for ease in stall cleanup.

Milk-house waste is handled using a separate leach field for this cost study. Because barn wastes are handled as semisolids, milk-house wastes need not necessarily have a separate system. In fact, there are indications that problems, such as plugging of the drain field, may occur in colder climates. It is informative to include the separate system in this report, however. Lavatory wastes are diverted into a separate septic system at a cost of \$3,000 for each farm unit. Table 2 shows the components and component costs for farm-waste-disposal systems.

Table 1: Barn and Milking Facility Specifications

	Barn	Ft ² per Cow	Milk Parlor	Milk Room	Milking Equipment	Bulk Tank	Ventilation
FACILITY TYPE AND SIZE							
50-Cow Stanchion	36'x133'	96	—	20'x20'	1½" pipeline	825 gal.	133 ft ³
75-Cow Stanchion	36'x200'	96	—	20'x20'	2" pipeline, 3 units	1,000 gal.	200 ft ³
100-Cow Free-Stall	78'x120'	94	36'x94'	—	6 stall DHB	1,375 gal.	120 ft ³
150-Cow Free-Stall	78'x180'	94	36'x96'	—	8 stall DHB	2,200 gal.	180 ft ³
COST OF COMPONENTS FOR EACH FACILITY SIZE							
50-Cow Stanchion	\$71,820	—	—	\$6,000	\$30,000 ^c	\$10,000	\$7,500
75-Cow Stanchion	\$108,000	—	—	\$6,000	\$45,000 ^d	\$10,000	\$11,278
100-Cow Free-Stall	\$140,400	—	\$50,760	—	\$65,000	\$15,000	\$10,000
150-Cow Free-Stall	\$210,600	—	\$51,840	—	\$65,000	\$15,000	\$15,000

^aMoves 200 cfm per 1,000 lbs. of animal weight.

^bAs in above but also handles the milk parlor as noted in text.

^cAssumes a pipeline cost of \$10,000 and two milking machines at \$20,000.

^dAssumes a pipeline cost of \$15,000 and three milking machines at \$30,000.

Table 2: Waste Disposal Systems for Four Facility Sizes^a

	50-Cow Stanchion	75-Cow Stanchion	100-Cow Free-Style	150-Cow Free-Style
Basin ^b	\$ 6,392	\$ 7,936	\$11,664	\$11,664
Barn Cleaner	5,040	9,040	10,300	10,300
Mats	4,020	5,640	7,176	8,058
Piston Pump ^c	8,300	8,300	8,300	8,300
Load-out Pump ^c	4,100	4,100	4,100	4,100
Slurry Pump ^c	5,000	5,000	5,000	5,000
Piping	2,000	2,000	2,000	2,000
Manure System Total	\$34,852	\$42,016	\$48,540	\$49,422
Leach Field	800	1,198	1,598	2,298
Septic System	3,000	3,000	3,000	3,000
Tank and Wagons ^d	4,619	4,619	6,720	6,720
TOTAL	\$43,271	\$50,833	\$59,858	\$61,440

^aAll hardware based on University of Wisconsin 1977 estimates. 1979 Wisconsin = 1977 Wisconsin x 1.20. 1979 Alaska = 1977 Wisconsin x 1.15.

^bBasin size based on an 8-month or 240-day storage period holding 2 ft³/day/cow.

^cPumps 20 HP in size are adequate to move 3,000 gpm over a rise of 10 feet.

^dTank capacities are 152 ft³ with a 60 PTO HP requirement and 243 ft³ with a 100 PTO HP requirement.

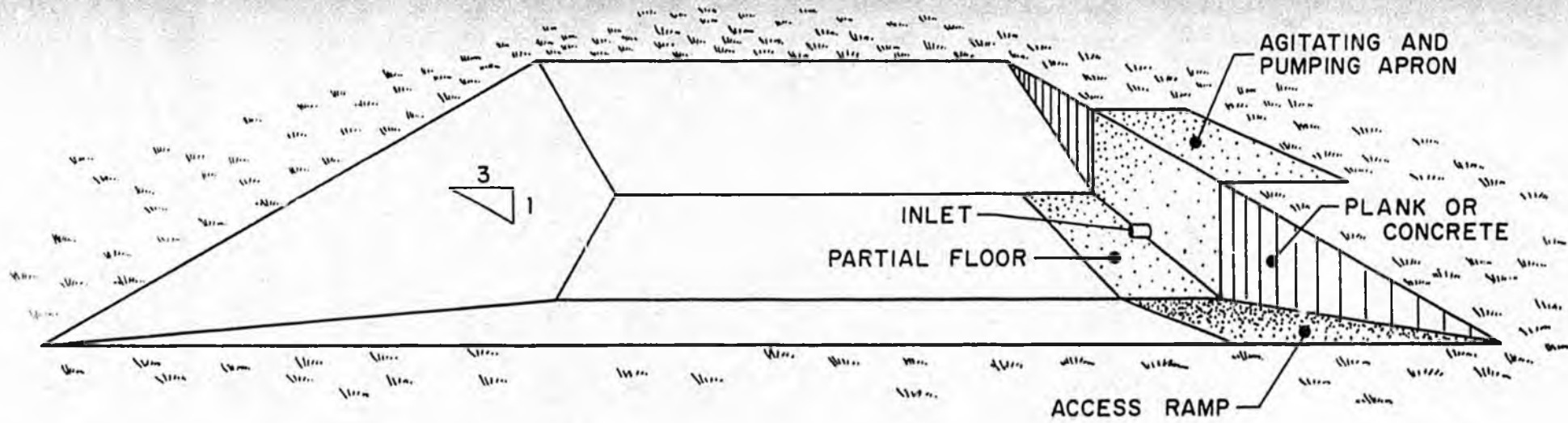
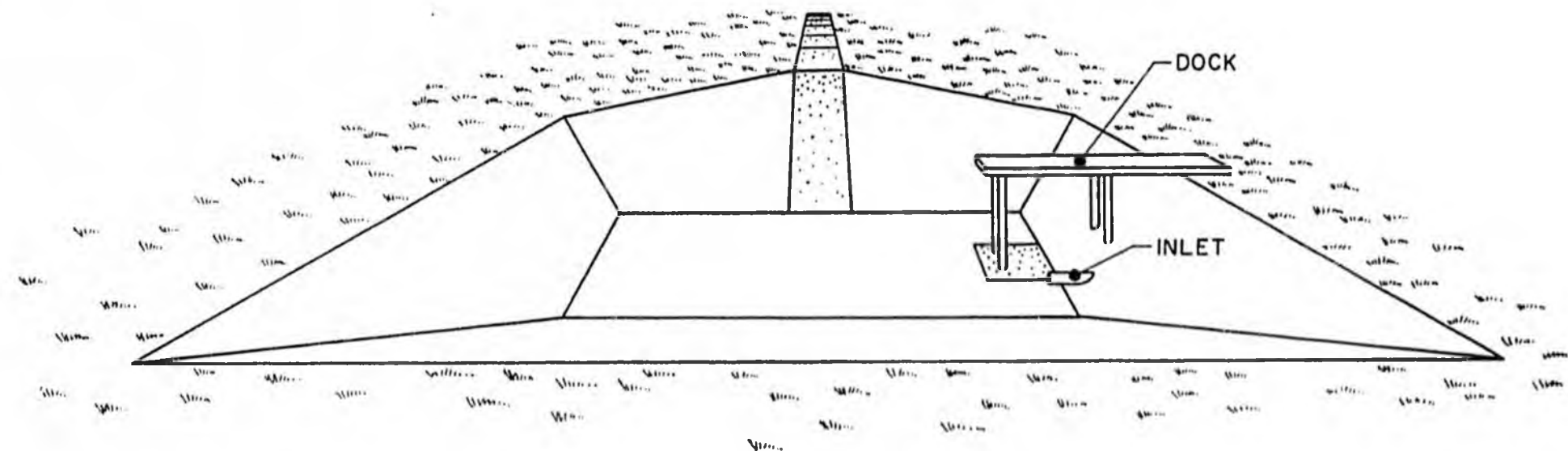


Figure 3: Manure Storage Basins. Two types of manure storage basins. The upper illustration includes a picket gate or a plank or concrete wall to facilitate unloading. (From: Midwest Plan Service. Dairy Housing and Equipment Handbook. Iowa State University, Ames, 1978).



Feed Storage

The feed components used in rations were roughage (including silage or haylage) concentrates, and hay. Calf starter will be required for the calving operation. To obtain storage facility sizes, it is assumed all components will handle a yearly supply. This may not be the case with calf starter. However, it forms a small portion of the total feed requirement and less than a yearly supply would alter the space requirement very little.

Silos

Silos are assumed to be uninsulated. The maximum height of the silos is 60 feet, 10 feet of which is unloader space. The silo-loading system uses a 30-HP electric motor with blowers for top loading. Top-unloading silos load out feed at the silo side into the feed room. This requires a 20-HP electric motor. To obtain a capital cost per ft³, 1979 Wisconsin prices and adjusted southcentral Alaska prices are used. The estimated erected cost is \$2.18/ft³ including loading and unloading facilities. Because of possible problems with freezing along silo sides, base diameters are kept as large as possible while still maintaining a near 60-foot height. The additional parameter of a load-out rate of no less than 6 inches per day is used to further alleviate the possible freezing problems. Table 3 gives silo sizes and capacities and total cost of silage storage.

Table 3: Silo Capacities

Facility Size	Silage Stored	Silo Size	Number of Silos	Total Cost
50 Cow Stanchion	1077T	28'x60'	2	\$160,999
75 Cow Stanchion	1622T	28'x60'	3	\$241,499
100 Cow Free Stall	2154T	30'x60' + 22'x48'	3	\$316,488
150 Cow Free Stall	3231T	30'x60'	5	\$462,051

Concentrate

The concentrate fed will probably be purchased in bulk. The cost of construction of a storage area for the concentrate is estimated at \$1.00 per bushel.

Table 5: Hay, Bedding and Starter Storage

Facility Size	Total Hay ^a	Total Bedding ^b	Total Starter ^c	Building Size	Total Cost
50-Cow Stanchion	9,599 ft ³	10,935 ft ³	75 ft ³	40 x 60	\$31,200
75-Cow Stanchion	14,587 ft ³	16,515 ft ³	109 ft ³	50 x 70	\$45,500
100-Cow Free Stall	19,053 ft ³	21,645 ft ³	146 ft ³	50 x 90	\$58,500
150-Cow Free Stall	28,507 ft ³	32,310 ft ³	216 ft ³	40 x 80 + 40 x 90	\$88,400

^aHay bale size is 4' x 2' x 2' and weight is 70 pounds per bale.

^bStraw bale size is 4' x 2' x 2' and weight is 50 pounds per bale.

^c100-lb. bags sized at approximately 1.3 ft³.

Table 4 lists storage required and total cost assuming only one purchase is made annually. An alternate method would be to purchase a pelleted feed several times during the year. Less storage space would be required in this case.

Table 4: Concentrate Storage

Facility Size	Bushels Required	Storage Size	Total Cost
50 Cow Stanchion	9,226	10,000 BU	\$10,000
75 Cow Stanchion	13,862	15,000 BU	\$15,000
100 Cow Free Stall	18,434	20,000 BU	\$20,000
150 Cow Free Stall	26,643	30,000 BU	\$30,000

Starter, Hay, Bedding

Storage for calf starter, hay, and bedding is in metal, uninsulated buildings with concrete floors. The buildings are ventilated through louvres and eaves. Current Fairbanks cost estimates indicate that such buildings can be constructed for \$13,000/ft². Table 5 gives the amount of feed and bedding stored, building size, and cost of construction.

Machinery Storage and Workshop

The dairy farms will be producing silage and haylage. In addition to equipment associated primarily with this operation, at least front-end loader storage will be required for the dairy. The storage buildings will probably not be heated. Additionally, a heated workshop will be necessary for repairs and maintenance. The storage space required per machine includes 15 per cent space for movement. The workshop size is based on the largest piece of equipment on the farm and includes a working area of 8 feet on the sidewalls and 5 feet at each end. Also included are a grease pit and fuel tanks. Capital cost and construction for the machinery storage are the same as those for hay and bedding storage. Workshop capital costs include a metal building with four inches of insulation and a heating system using oil-burning units. Construction costs are estimated at \$14.50/ft². Table 6 (next page) gives the machinery and workshop sizes and total costs.

Table 6: Machinery Storage and Workshop

Facility Size	Machinery	Workshop	Total Cost
50, 75 Cow Stanchion	40'x60'	40'x46'	\$57,880
100, 150 Cow Free Stall	40'x75'	40'x46'	\$65,680

Calf, Heifer, and Dry-Cow Housing

There are controversies concerning the housing of calves. Indications are that calf death rates are less if they are removed to cold housing one day after birth. The cold housing recommended is a 4' x 14' hutch, 4' x 8' of which is a plywood shed free from drafts and bedded with straw, 4' x 6' being an exposed area enclosed in hog wire for feeding. In high snow areas, management of the hutches may be difficult. Therefore, an alternative is offered by putting the "hutches" in a cold building. An additional advantage of this practice is that the calf housing can be combined with that for heifers and dry cows in a single building. The major advantages of this system is that feeding can be accomplished in one building and that manure handling (a straw pack removed in spring and periodically throughout the summer) is a single operation. The straw pack waste is removed to the fields in spring and fall.

Housing costs are the same as those used for hay and straw storage plus \$1.00/ft² for iron and \$2,000 for all units for plumbing. Space for animals is determined using standard allotments. Twice the hutch area per calf is used to enable hutches to be moved before being occupied by a new calf. Table 7 shows space per cow by age, total number of cows housed, total space and total cost.

Feed Handling

Feed handling in stanchion units is accomplished by electric cart although a feed bunk system could also be used. Free-stall barn feeding is accomplished by augering the feed into the feed bunks. Provisions have been included for feed mixing at the silo unload area. The silos load out into a feed mixer and then either into carts or an auger hopper. A feed mixer is provided to keep feed consistency constant if both haylage and silage are fed. Approximate cost is \$4,000 per silo.

Well

There is limited data to indicate the depth of wells required in the Point Mackenzie area. It is

Table 7: Calf, Heifer, and Dry-Cow Housing

Facility Size	Space Per Cow			Number of Cows Housed ^a				Total Space (ft ²)	Building Size	Total Cost \$
	0-2 mo.	2-12 mo.	12-24 mo. & dry cows ^b	0-2 mo.	2-12 mo.	12-24 mo.	dry cows			
50-Cow Stanchion	56 ft ²	25 ft ²	110 ft ²	19	19	16	10	3,499	40' x 90'	52,400
75-Cow Stanchion	56 ft ²	25 ft ²	100 ft ²	28	28	25	15	5,380	50' x 100'	72,000
100-Cow Free Style	56 ft ²	25 ft ²	110 ft ²	37	37	32	20	7,037	50' x 140'	100,000
150-Cow Free Style	56 ft ²	25 ft ²	110 ft ²	55	55	48	30	10,515	60' x 180'	153,200

^aAssumes a 15% loss at 0-3 months, no losses at 3-12 months, 12% loss at 12-24 months and a herd replacement of 25% of the total.

^bIncludes 45 ft² of resting area and 65 ft² of "lot" area.

^cTwo 50' x 70' or two 60' x 90' buildings could be used.

Table 8: Total Capital Investment for Four Facility Sizes

	50-Cow Stanchion	75-Cow Stanchion	100-Cow Free Stall	150-Cow Free Stall
Barn and Iron	\$ 71,820	\$108,000	\$140,400	\$ 210,600
Ventilation	7,500	11,278	10,000	15,000
Milk Room	6,000	6,000	N/A	N/A
Milk Parlor	N/A	N/A	50,760	51,840
Milking Equipment	40,000	55,000	80,000	80,000
Silos	160,999	241,499	316,988	462,501
Manure Handling	43,271	50,833	59,858	61,440
Concentrate Storage	10,000	15,000	20,000	30,000
Hay and Bedding Storage	31,200	45,500	58,500	88,400
Machine Storage	31,200	31,200	39,000	39,000
Workshop	26,680	26,680	26,680	26,680
Calf and Dry-Cow Housing	52,400	72,000	100,000	153,200
Well	3,500	3,500	3,500	3,500
Feed-Handling Equipment	8,000	12,000	16,000	20,000
TOTAL	\$492,570	\$678,990	\$921,686	\$1,241,711

assumed a 100-foot well eight inches in diameter is adequate to provide a 3,000 gpm flow rate. The current average cost for drilling, casing, and pump is \$35 per running foot. This cost is included in each farm unit.

Total Capital Costs

The total capital investment for the four dairy systems is given in Table 8 (pg. 9). On a per-cow basis, the 150-cow, free-stall dairy requires the least capital injection. Tables 9 through 12 (pgs. 9 and 10) show the annual cash and noncash owner costs associated with the dairy farms. Costs allocated to the dairy operation only are associated with milking and dry cows. Those allocated to the replacement heifers include animals required for a 25% annual herd replacement and are aged 0 to 24 months. Feed-associated cost allocation and calf and dry-cow housing cost allocation are accomplished on a feed-requirement and a space-occupied basis respectively. The percentages used in allocation are shown in Table 13.

Table 13: Cost Allocation to Dairy Cows and Replacement Heifers

Facility	Dairy Cows	Replacement Heifers
Silos	84%	16%
Hay and Bedding Storage	17% ^a	83%
Concentrate Storage	81%	19%
Calf and Dry-Cow Housing ^b	22%	78%

^aOnly dry cows use straw bedding. Milking cows are not fed hay.

^bBased on space occupied.

Farm Budgets

Enterprise costs and returns presented in this report are estimated for dairy-farm operations milking 50, 75, 100, and 150 cows daily. Returns from the sale of calves and culls are specifically identified. However, a specific assumption of per-herd milk production is not used in the analysis. Rather, revenues from calf and cull sales are first subtracted from costs, and then the average milk production per cow required to break even (cover all remaining costs) is calculated. Included in the costs is a charge for operator labor of \$15,000 per year. Returns arising from milk production above that required to break even is the return to management.

Basic assumptions reflected in the estimated budgets are:

1. Cows are milked ten months of the year and are dry two.
2. All feed is purchased except for silage or haylage which is grown on the farm.

3. Land-clearing costs and purchase price are included in silage (haylage) costs.
4. Dairy farmers replace 25% of their herds annually with springer* heifers.
5. All replacement heifers are provided by the dairy farms in the third year of operation.
6. All breeding is by artificial insemination.
7. Dairy farms of 50 and 75 cows use a stanchion confinement-stall system. With 100 and 150 cows, a free-stall system is used.
8. Family labor is the only labor used on 50- and 75-cow dairy farms. It has been suggested that the 75-cow dairy farm may require one additional laborer if a stanchion barn is used.
9. Dairy farms with 100 cows require family labor plus one hired laborer while the 150-cow dairy farm requires two laborers and one herdsman in addition to family labor.
10. Three acres of cropland in silage production are required for each milking and dry cow in the dairy herd.
11. An interest rate of 6%, that charged by the Alaska Agricultural Revolving Loan Fund, is charged against the capital investment. A 9% interest charge is leveled against operating capital assuming a mixture of private and public loan monies.

Data for this analysis were obtained from several sources. Feed rations, production techniques, and production costs were developed in consultation with animal scientists of the University of Alaska Agricultural Experiment Station and experienced Alaskan dairymen. Silage and haylage production costs are detailed in a preliminary USDA working paper available from the authors (Fugelstadt, U.S.D.A.-E.S.C.S.). Investment requirements are described in an earlier section. Milk prices were obtained from Matanuska Maid Inc., while prices for calves and culls were provided by marketing specialists of the Alaska Division of Agriculture and Alaskan dairymen.

Production costs are summarized in Table 14 (pg. 11). Total annual costs for the 50-, 75-, 100-, and 150-cow dairy farms are \$175,061; \$237,471; \$323,853; and \$479,008, respectively. Costs are divided into feed cash costs, non-feed cash costs, and non-cash costs. Of these three categories, feed is the major expense accounting for approximately 39 per cent of total cost for each herd. Major costs in non-cash costs are operator labor and interest and depreciation on facilities. As noted previously, we have included an operator labor charge of \$15,000 annually as an absolute minimum under which an owner would be willing to remain in business.

In Table 15 (pg. 12), returns from sales of calves and culls and the average milk production per cow

Table 9: Annual Cash and Non-Cash Capital Associated Costs for the 50-Cow, Stanchion Dairy

	Depreciation (years)	Depreciation ^a (\$)	Investment Cost ^b (\$)	Insurance ^c (\$)	Taxes ^d (\$)	Repairs & Maintenance ^e (\$)	Total Cost (\$)
DAIRY							
Barn & Iron	30	2,394	2,155	503	934	1,436	7,422
Ventilation	10	713	236	53	98	150	1,250
Milk Room	30	200	180	42	78	120	620
Milking Equipment	10	3,800	1,260	280	520	800	6,600
Silos	20	6,762	4,057	947	1,758	2,704	16,228
Manure Handling	20	2,164	1,208	303	563	865	5,193
Concentrate Storage	20	405	273	57	105	162	972
Hay & Bedding Storage	20	265	159	37	69	106	636
Machine Storage	20	1,560	936	218	406	624	3,744
Workshop	20	1,334	800	187	347	534	3,202
Calf & Dry-Cow Housing	20	577	346	81	150	231	1,385
Well	350	105	25	46	70	596	
Feed-Handling Equipment	10	760	252	56	104	160	1,332
ANNUAL TOTAL		21,284	12,027	2,789	5,178	7,962	49,242
REPLACEMENT HEIFERS							
Silos	20	1,288	772	180	334	515	3,099
Concentrate	20	95	57	13	25	38	228
Hay & Bedding Storage	20	1,295	777	181	337	518	3,108
Calf & Dry-Cow Housing	20	2,044	1,226	286	531	817	4,904
ANNUAL TOTAL		4,722	2,832	660	1,227	1,888	11,329

^a Depreciation is calculated using the straight line method. Salvage value is 5% of new cost for equipment and zero for buildings.

^b Investment costs are charged at 6% annual rate using:

$$\text{Investment Cost} = \frac{\text{New Cost} + \text{Salvage}}{2} (\text{Interest Rate})$$

^c Insurance rates are \$7.00 per \$1,000 new cost.

^d Taxes are 13 mil, the current rate in the Matanuska-Susitna Borough.

^e Repairs and maintenance are charged at 2% of new cost.

Table 10: Annual Cash and Non-Cash Capital Associated Costs for the 75-Cow, Stanchion Dairy^a

	Depreciation (years)	Depreciation (\$)	Investment Cost (\$)	Insurance (\$)	Taxes (\$)	Repairs & Maintenance (\$)	Total Cost (\$)
DAIRY							
Barn & Iron	30	3,600	3,240	756	1,404	2,160	11,160
Ventilation	10	1,071	355	79	147	226	1,878
Milk Room	30	200	180	42	78	120	620
Milking Equipment	10	5,225	1,733	385	715	1,100	9,158
Silos	20	10,143	6,086	1,420	2,637	4,057	24,343
Manure Handling	20	2,542	1,525	356	661	1,017	6,101
Concentrate Storage	20	578	383	85	158	243	1,447
Hay & Bedding Storage	20	387	232	54	101	155	929
Machine Storage	20	1,560	936	218	406	624	3,744
Workshop	20	1,334	800	187	347	534	3,202
Calf & Dry-Cow Housing	20	792	475	111	206	317	1,901
Well	10	350	105	25	46	70	596
Feed-Handling Equipment	10	1,140	378	84	156	240	1,998
ANNUAL TOTAL		28,922	16,428	3,802	7,062	10,863	67,077
REPLACEMENT HEIFERS							
Silos	20	1,932	1,159	270	502	773	4,636
Concentrate Storage	20	135	90	20	37	57	339
Hay & Bedding Storage	20	1,888	1,133	264	491	755	4,531
Calf & Dry-Cow Housing	20	2,808	1,685	393	730	1,123	6,739
ANNUAL TOTAL		6,763	4,067	947	1,760	2,708	16,245

^a Footnotes as in Table 9.

Table 11: Annual Cash and Non-Cash Capital Associated Costs for the 100-Cow, Free-Stall Dairy^a

	Depreciation (years)	Depreciation (\$)	Investment Cost (\$)	Insurance (\$)	Taxes (\$)	Repairs & Maintenance (\$)	Total Cost (\$)
DAIRY							
Barn & Iron	30	4,680	4,121	983	1,825	2,808	14,508
Ventilation	10	950	315	70	130	200	1,665
Milk Parlor	30	1,692	1,523	355	660	1,015	5,245
Milking Equipment	10	7,600	2,520	560	1,040	1,600	13,320
Silos	20	13,313	7,988	1,864	3,462	5,326	31,953
Manure Handling	20	2,993	1,796	419	778	1,197	7,183
Concentrate Storage	20	810	486	113	211	324	1,944
Hay & Bedding Storage	20	497	298	70	129	199	1,193
Machine Storage	20	1,950	1,170	273	507	780	4,680
Workshop	20	1,334	880	187	347	534	3,202
Calf & Dry-Cow Housing	20	1,100	660	154	286	440	2,640
Well	10	350	105	25	46	70	596
Feed-Handling Equipment	10	1,520	504	112	208	320	2,664
ANNUAL TOTAL		38,789	22,377	5,185	9,629	14,813	90,793
REPLACEMENT HEIFERS							
Silos	20	2,536	1,522	355	659	1,014	6,086
Concentrate Storage	20	190	114	27	49	76	456
Hay & Bedding Storage	20	2,428	1,457	340	632	971	5,828
Calf & Dry-Cow Housing	20	3,900	2,340	546	1,014	1,560	9,360
ANNUAL TOTAL		9,954	5,433	1,268	2,354	3,621	21,730

^aFootnotes as in Table 9.

Table 12: Annual Cash and Non-Cash Capital Associated Costs for the 150-Cow, Free-Stall Dairy^a

	Depreciation (years)	Depreciation (\$)	Investment Cost (\$)	Insurance (\$)	Taxes (\$)	Repairs & Maintenance (\$)	Total Cost (\$)
DAIRY							
Barn & Iron	30	7,020	6,318	1,474	2,738	4,121	21,762
Ventilation	10	1,425	473	105	195	300	2,498
Milk Parlor	30	1,728	1,555	363	674	1,037	5,357
Milking Equipment	10	7,600	2,520	560	1,040	1,600	13,320
Silos	20	19,406	11,644	2,717	5,046	7,762	46,575
Manure Handling	20	3,072	1,843	430	799	1,229	7,373
Concentrate Storage	20	1,215	729	170	316	486	2,916
Hay & Bedding Storage	20	751	451	105	195	301	1,803
Machine Storage	20	1,950	1,170	273	507	780	4,680
Workshop	20	1,334	800	187	347	534	3,202
Calf & Dry-Cow Housing	20	1,685	1,011	236	438	674	4,044
Well	10	350	105	25	46	70	596
Feed-Handling Equipment	10	1,700	630	140	260	400	3,330
ANNUAL TOTAL		49,436	29,249	6,785	12,601	19,385	117,456
REPLACEMENT HEIFERS							
Silos	20	3,696	2,218	517	961	1,479	8,871
Concentrate Storage	20	285	171	40	74	114	684
Hay & Bedding Storage	20	3,669	2,731	514	954	1,467	8,805
Calf & Dry-Cow Housing	20	5,975	3,585	836	1,554	2,390	14,340
ANNUAL TOTAL		13,625	8,175	1,907	3,543	5,450	32,700

^aFootnotes as in Table 9.

Table 14. Total Costs for Dairy Herds of 50, 75, 100, and 150 Cows in Third Year of Operation

	Cost per Unit	50 COWS		75 COWS		100 COWS		150 COWS	
		Amount	Total Cost	Amount	Total Cost	Amount	Total Cost	Amount	Total Cost
FEED:									
1. Silage ^a	\$18.20-\$22.87/ton	1,028.84T	\$ 23,529.57	1,539.39T	\$ 31,295.80	2,057.69T	\$ 38,540.53	3,086.53T	\$ 56,174.85
2. Concentrate	\$220/ton	187.98T	41,355.60	281.78T	61,991.60	375.95T	82,709.00	563.93T	124,064.60
3. Hay	\$120/ton	6.84T	820.80	10.04T	1,204.80	13.69T	1,642.80	20.53T	2,463.60
4. Salt	\$14/cwt	104.94 cwt	1,469.16	156.95 cwt	2,197.30	209.88 cwt	2,938.32	314.81 cwt	4,407.34
Total Feed Cash Costs			\$ 67,175.13		\$ 96,689.50		\$125,830.65		\$187,110.39
NON-FEED COSTS:									
1. Replacement Heifers ^b			\$ 27,296.15		\$ 39,719.14		\$ 52,510.33		\$ 78,585.96
2. Hired Labor		0	0	0	0	1	12,000.00	3	44,000.00
3. Property Tax ^c	\$13/\$1000		5,899.80		8,144.70		11,072.60		14,766.40
4. Dairy R&M			7,962.00		10,863.00		14,313.00		19,385.00
5. Electricity			6,000.00		6,000.00		8,000.00		8,000.00
6. Breeding Fees	\$10/head	60 cows	600.00	90 cows	900.00	120 cows	1,200.00	180 cows	1,800.00
7. Semen (1.75 ampul/head)	\$12/ampul		1,260.00		1,890.00		2,520.00		3,780.00
8. D.H.I.A.	\$.25/head/mo.		180.00		270.00		360.00		540.00
9. Fuel & Oil			800.00		900.00		1,000.00		1,100.00
10. Insurance ^d	\$7/\$1000		3,177.20		4,384.30		5,961.40		7,949.60
11. Vet & Drugs	\$20/head		1,200.00		1,800.00		2,400.00		3,200.00
12. Bedding	\$2/65 lbs.	2,700.00 lb.	83.08	4,050.00 lb.	124.62	5,400.00 lb.	166.15	8,100.00 lb.	249.23
13. Dairy Supplies & Misc.	\$25/milking head		1,250.00		1,875.00		2,500.00		3,750.00
Total Non-Feed Cash Costs			\$ 55,700.23		\$ 76,870.76		\$114,503.48		\$187,106.19
NON-CASH COSTS:									
1. Operator Labor			\$ 15,000.00		\$ 15,000.00		\$ 15,000.00		\$ 15,000.00
2. Interest on Investment:									
Cows ^e			3,690.00		5,535.00		7,380.00		11,070.00
Facilities (includes equipment)			12,027.00		16,428.00		22,377.00		29,249.00
Feed ^f			1,577.54		2,184.65		2,771.78		4,084.04
Operating Capital ^g			1,688.40		217.55		381.19		703.15
3. Depr. on Capital Investment			21,284.00		28,922.00		38,789.00		49,436.00
Total Non-Cash Costs			\$ 53,747.38		\$ 68,287.20		\$ 86,699.68		\$109,542.19
TOTAL COST			\$176,630.79		\$241,843.30		\$327,033.81		\$483,758.77

^aThe silage budgets were slightly revised so that the working paper described on page 17 shows slightly different figures.

^bSee Table 17 for replacement heifer cost summary.

^cIncludes an annual property tax of \$12.03/cow.

^dIncludes an annual insurance cost of \$6.47/cow.

^e(6%)(1600 + 450)(milkers + dry cows)

^fInterest calculated as follows:

$$\frac{\text{silage cost} + \text{hay cost} + \text{concentrate cost} + \text{salt cost}}{2} (.09)$$

^gInterest calculated as follows: 1/12 of operating costs less feed, replacement heifer cost, and property taxes times 9%.

Table 15: Break-Even Analysis for 50, 75, 100, and 150-Cow Dairy Farms

Herd Size	Cull Cows		Cull Heifers		Cull Calves		Required Annual Milk Production ^a
	Number	Revenue	Number	Revenue	Number	Revenue	
50	15	\$ 6,750	1.5	\$1,200	40.5	\$ 486	16,646 lbs./cow
75	22.5	10,125	2.25	1,800	60.75	729	15,122 lbs./cow
100	30	13,500	3.0	2,400	81	972	15,348 lbs./cow
150	45	20,250	4.5	3,600	121.5	1,458	15,124 lbs./cow

^aCalculated Using:

$$[(\text{Total cost} - \$ \text{ rec'd fr. cull cattle}) / \$ \text{ rec'd per lb. milk}] / \text{Total no. cows} = \text{lb. milk per cow}$$

Table 16: Replacement Heifer Cost Summary for Four Facility Sizes

	50-Cow	75-Cow	100-Cow	150-Cow
Overhead Costs:				
Repair & maintenance	\$ 1,888	\$ 2,708	\$ 3,621	\$ 5,450
Interest on investment	2,832	4,067	5,433	8,175
Depreciation	4,722	6,763	9,054	13,625
Property tax	1,227	1,760	2,354	3,543
Insurance	660	947	1,268	1,907
Total Overhead Cost	\$11,239	\$16,245	\$21,730	\$32,700
Feed Costs:				
Silage	\$ 3,634.27	\$ 4,845.96	\$ 5,927.77	\$ 8,676.49
Concentrate	4,870.80	7,306.20	9,741.60	14,612.40
Hay	3,223.80	4,835.70	6,447.60	9,671.40
Salt	632.10	948.15	1,264.20	1,896.30
Interest on feed ^a	390.05	557.83	720.89	1,069.97
Milk Replacer	1,182.17	1,773.25	2,364.33	3,546.50
Calf Starter	554.04	831.07	1,108.09	1,662.13
Bedding	1,269.92	1,925.98	2,580.85	3,850.77
Calf Supplies	300.00	450.00	600.00	900.00
TOTAL	\$27,296.15	\$39,719.14	\$52,510.33	\$78,585.96
PER COW^b	\$ 1,707.34	\$ 1,652.90	\$ 1,637.94	\$ 1,633.95

$$^a \text{Interest on feed} = \left(\frac{\text{Silage}}{2} + \frac{\text{Hay}}{2} + \frac{\text{Concentrate}}{8} + \frac{\text{Salt}}{8} + \frac{\text{Milk Replacer}}{8} + \frac{\text{Starter}}{8} \right) \cdot (.09)$$

$$^b \text{Cost per heifer} = \frac{\text{Total cost} - \text{calf and cull heifer receipts}}{\text{Number of replacement heifers required annually}}$$

required to cover all remaining costs are provided. Farmers receive 30 cents per pound for cull cows, \$800 per animal for cull heifers, \$12 per head for calves, and \$16.84 per cwt for milk.

The milk production required to cover all costs generally decreases as herd size increases. The 50-cow dairy farm requires an annual, average, per-cow production of 16,646 pounds of milk. This decreases to 15,124 pounds for a herd of 150 cows. Although it has been assumed that dairy herd sizes up to 75 cows need only family labor, it has been suggested that a 75-cow dairy farm may well require one hired laborer. If this is the case, then required milk production would have to increase from an average of 15,122 pounds per cow for 75 cows to an average production of 15,963 pounds per cow because of the additional labor cost.

Can Alaskan dairymen expect to obtain these per-cow, milk-production averages? With good management this should be possible. The current average production per cow for the six Alaskan herds belonging to the Dairy Herd Improvement Association (DHIA) is 16,844 pounds. This compares favorably with the California, Wisconsin, and New York averages of 18,674 pounds, 15,558 pounds, and 15,768 pounds, respectively.

It has been assumed throughout this report that each dairy enterprise would raise its own replacement heifers. However, as the Alaskan dairy industry enlarges, it is quite possible that replacement heifers would be available from other sources. Table 16 summarizes the cost of production for dairy heifers on a dairy farm.

Herd Development and Projection of Revenues and Expenses

The farm budgets presented above are for dairy farms that are fully developed. This will not occur, however, until the third year of operation. How farms reach this developed stage and the revenue and expense picture for the first two years of operation must now be addressed.

Herd Development

One of the first problems in starting a dairy farm is stocking the new farm so that full production can be reached as quickly as possible and milk production can be constant from month to month. One possible plan for accomplishing these goals is presented here in which cows are assumed to be milked ten months and dry two (See Tables 17, 18, 19, and 20, pgs. 14-17). Dairy farms are also assumed to cull 25 percent of the milking herd annually with cows culled when dry.

Initially, herds are stocked with purchased bred heifers. Animals arrive by contract air carrier before their last trimester of pregnancy, in two lots spaced six months apart. One-third of the heifers calve three months after arrival with the remaining two thirds calving two and four months later. By the end of the ninth month of the first year, dairy farms have reached full capacity in milking cows. However, purchases of replacement heifers are required in month eleven of year one and year two. Starting with the third year, dairy farms are able to provide all their own replacements.

For a herd of 100 milking cows (Table 16), for example, the development plan works as follows: 60 bred heifers are purchased initially, with one-third scheduled to start milking in months one, three, and five of year one. These cows are then dry in month eleven of the first year and in months one and three of the second year. As they become dry, 15 of the 60 are culled. A second lot of 60 heifers is delivered in month four of the first year and calve in months seven, nine, and eleven. As these cows become dry, 15 are again culled. An additional 30 heifers are purchased and brought on line in the second year. No more livestock purchases are required thereafter, since all replacements can be provided by the dairy farms beginning in the third year. It should be noted that these development plans are based on exact schedules that may be highly idealized. It may be that a producer would want a larger number of animals in the first purchase to increase immediate cash flow and compensate for possible delays in future calving schedules.

Projected Revenues and Expenses

Table 21 (pg. 18) provides a revenue and expense projection for a 150-cow farm during the first three years of operation. The figures in this table can be adjusted for smaller sized farms—for example, .33 for a 50-cow-dairy farm or .5 for a 75-cow-dairy farm. This will yield a rough approximation of revenues and expenses for these smaller enterprises. Assumptions under which these projections are prepared are as follows:

1. All costs of feed for the first three months before the first lot of cows freshen are included in first quarter costs.
2. Cows produce only 85% of expected mature equivalent milk production during first lactation.
3. Property taxes are paid in January.
4. Labor is first hired in months five, seven, and nine of year one.
5. Repairs, maintenance, and electric costs are equally distributed through the year.
6. Fuel is purchased twice yearly in April and October.
7. Insurance is paid semiannually in April and October.
8. An initial purchase of \$1,000 of dairy supplies and \$600 of calf supplies is assumed. Thereafter, replacement of these supplies is proportionate to the number of cows milked in each quarter.
9. All bedding is purchased October 1.
10. Seventy-five per cent of silage costs are incurred in April through May. The remaining 25 per cent is encountered in July through September. Hay is purchased October 1.
11. All other costs are distributed equally over yearly quarters.
12. Repayment of debt on capital begins in the third year.

Assuming that production begins in October of 1981, a cumulative operating deficit results through December of 1982. Beginning in January through March of 1983, all losses have been recovered. A cumulative net profit continues for the remainder of the projection, even after the repayment of debt on the capital investment begins in the last quarter of 1983. Further, the dairy farm has cumulative silage assets of \$55,000 at the end of the 1983-1984 production year.

Table 17: Herd Development Plan for the 50 Cow Dairy Farm

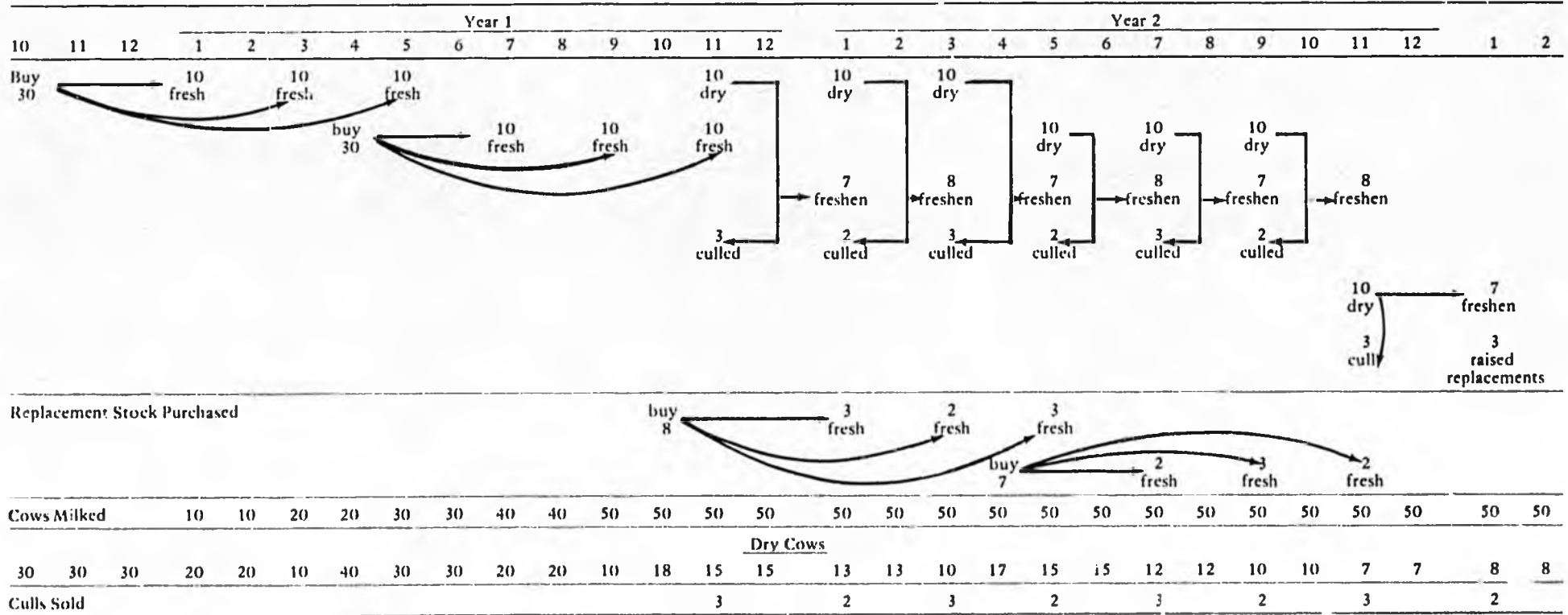
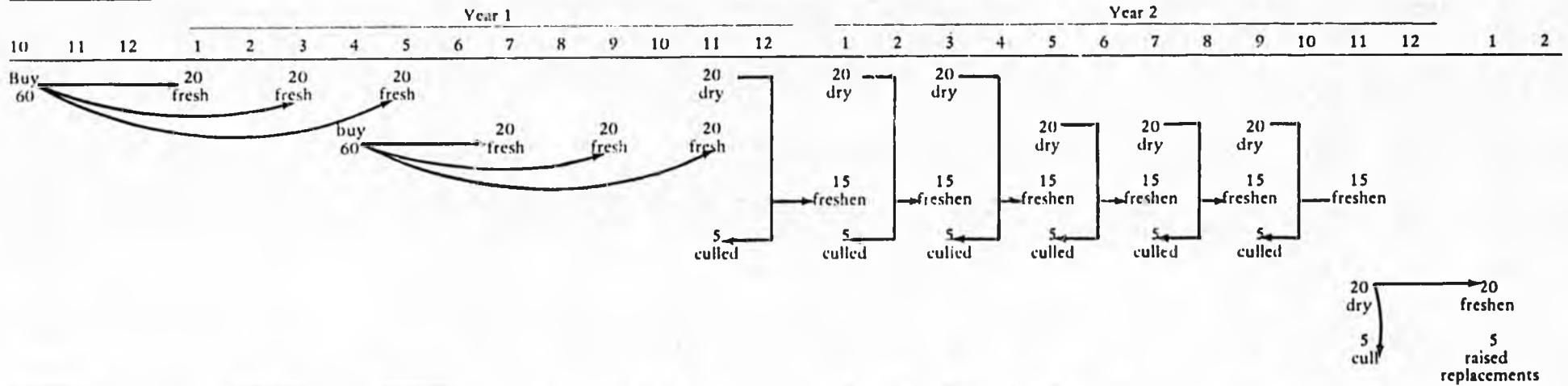
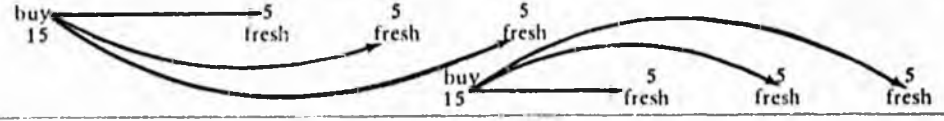


Table 19: Herd Development Plan for the 100 Cow Dairy Farm



Replacement Stock Purchased



Cows Milked				20	20	40	40	60	60	80	80	100	100	100	100	100	100	100	100	100	100	100	100	100	100				
	60	60	60	40	40	20	80	60	60	40	40	20	35	30	30	25	25	20	35	30	30	25	25	20	20	15	15	15	15
Culls Sold													5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	

Table 20: Herd Development Plan for the 150 Cow Dairy Farm

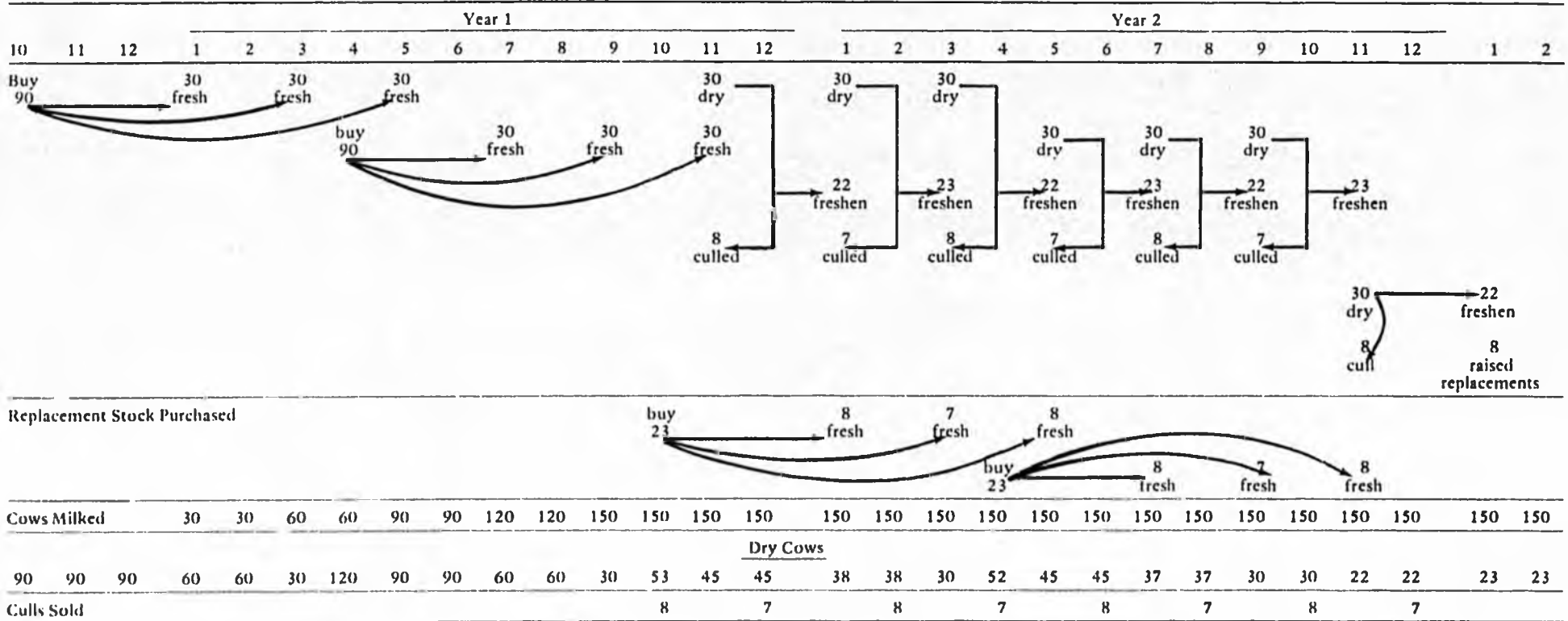


Table 21: Quarterly Projection of Revenues and Expenses for the 150-Cow-Dairy Farm^a

	1981-1982				1982-1983				1983-1984			
	Oct.-Dec.	Jan.-Mar.	Apr.-June	July-Sept.	Oct.-Dec.	Jan.-Mar.	Apr.-June	July-Sept.	Oct.-Dec.	Jan.-Mar.	Apr.-June	July-Sept.
Cash Receipts												
Calves	\$ 364	\$ 364	\$ 364	\$ 364	\$ 364	\$ 364	\$ 364	\$ 364	\$ 354	\$ 364	\$ 364	\$ 364
Cull Cows	0	0	0	3,375	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062
Cull Heifers	0	0	0	0	0	0	0	0	900	900	900	900
Milk	26,360	51,575	84,811	97,419	102,003	106,587	112,318	114,610	114,610	114,610	114,610	114,610
Total	\$26,724	\$51,939	\$85,175	\$101,158	\$107,429	\$112,013	\$117,744	\$120,036	\$120,936	\$120,936	\$120,936	\$120,936
Cash Expenses												
Feed ^b	\$66,625	\$23,052	\$ 81,549	\$63,391	\$36,711	\$37,458	\$ 86,235	\$65,895	\$37,574	\$37,536	\$ 86,197	\$65,868
Hired Labor	0	2,000	9,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Property Taxes	0	18,309	0	0	0	18,309	0	0	0	18,309	0	0
Repairs & Maintenance	5,208	6,208	6,208	6,208	6,208	6,208	6,208	6,208	6,208	6,208	6,208	6,208
Electricity	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Breeding Fees	0	300	300	300	300	450	450	450	450	450	450	450
Semen	0	630	630	630	630	945	945	945	945	945	945	945
D.H.I.A.	540	0	0	0	540	0	0	0	540	0	0	0
Fuel & Oil	550	0	550	0	550	0	550	0	550	0	550	0
Insurance	4,928	0	4,928	0	4,928	0	4,928	0	4,928	0	4,928	0
Vet. & Drugs	800	800	800	800	800	800	800	800	800	800	800	800
Dairy Supplies	1,000	235	470	700	937	937	937	937	937	937	937	937
Calf Supplies	600	100	200	225	225	225	225	225	225	225	225	225
Bedding	3,750	0	0	0	4,100	0	0	0	4,100	0	0	0
Total	\$87,001	\$53,634	\$106,635	\$85,254	\$68,929	\$78,332	\$114,278	\$88,460	\$70,257	\$78,410	\$114,240	\$88,433
Net Profit (Loss)	(\$60,277)	(\$1,695)	(\$21,460)	\$15,904	\$38,500	\$33,681	\$ 3,466	\$31,576	\$50,679	\$42,526	\$ 6,696	\$32,503
Payment to Debt									\$38,854	\$38,854	\$38,854	\$38,854
Cumulative Operating Deficit or Net Profit	(\$60,277)	(\$61,972)	(\$83,432)	(\$67,528)	(\$29,028)	\$4,653	\$8,119	\$39,695	\$51,570	\$55,192	\$23,034	\$16,683
Livestock Purchases	\$144,000	\$144,000		\$36,800		\$36,800						

^aAll costs incurred in period prior to freshening of first cows are charged to first quarter of first year.
^bIn revenue and expense projection, feed cost includes feed fed to replacement stock.

CHAPTER 3

MARKETING AND COMPETITIVE POSITION

Marketing

Milk is one of the few agricultural products having a well-organized marketing system in Alaska. Matanuska Maid, a dairy farmer cooperative, has identified the fresh milk market in Alaska, excluding the southeast portion of the state, at approximately 6,500,000 pounds per month. About 19 per cent is milk produced in Alaska, with the remaining 81 per cent shipped in by bulk and processed here or processed and packaged for retail sales outside the state before shipment to Alaska.

There are currently two major milk processors in Alaska—Matanuska Maid and Arden Farms—both located in Anchorage. Matanuska Maid processes all the milk produced in Alaska. The problem for these two processors lies in retaining a market share sufficient to maintain a volume of milk for efficient processing while competing with falling prices for imported milk. In-state milk production has declined from 22.1 million pounds in 1961 to 14.4 million pounds in 1978 with imported milk replacing the loss.

Fresh-milk producers in Alaska are being pressured by high land values in the Matanuska Valley. Dairy men are now able to realize significant gains by selling their land to speculators and subdividers, gains much higher than would be realized by continuing to farm or by selling to another farmer. As a result, since the 1960s dairy farms have been declining rapidly. The industry, thus weakened, has had a difficult time meeting increased competition from "outside" dairy men. Increased milk production from Point MacKenzie farms may help increase the competitiveness of the industry.

An important question is whether or not new milk producers at Point MacKenzie can reasonably expect to have a market for their milk. Some consumers may not choose Alaska-produced milk, even if it is price competitive, while others would probably be willing to pay a premium for local milk. Some retail firms may prefer, due to economic pressure, not to handle local milk unless it is competitive with out-

side milk. It is probable that considerably less than 100 per cent of the market will be supplied by local milk even with the additional production from Point MacKenzie.

Competitive Position of Alaskan-Produced Milk

The current competitive position of Alaskan-produced milk compared with alternative sources is analyzed below. Such analysis is important in considering the future of the Alaskan dairy industry. While disagreement is possible for any figure given, cost data in the analysis are as accurate as possible at this time. The magnitude of any inaccuracies would not be great enough to alter the conclusions.

Milk produced in Alaska must compete for a reasonable share of the market with milk shipped in from outside the state. As shown in Table 22 (pg. 20) Alaska farmers were receiving \$16.84 per hundred weight in November, 1979. Farm-to-processor transportation cost by regulated carrier was \$1.36 per cwt. Therefore, the total cost for Alaska-produced milk to an Anchorage processor was \$18.20 per cwt. Local processing cost adds another \$13.61 per cwt and brings the total cost, when delivered to the retail store dock, to \$31.81 per cwt. Milk shipped in by bulk and processed locally had a slightly higher wholesale cost of \$33.04 per cwt. This is primarily because regulations require that bulk milk shipped into Alaska must be pasteurized a second time, adding a cost of \$2.00 per cwt. Prepackaged milk shipped in from the Puget Sound had a significantly lower wholesale cost. Table 22 presents the cost of prepackaged milk using a Class I price (regulated handler) and blend price (non-regulated producer/distributor). These total \$27.66 and \$26.66 per cwt which is \$4.15 and \$5.15 less than Alaskan produced and processed milk, respectively. Recombined milk (dry skim milk and butterfat shipped in from out of state and recombined with water in Alaska) was competitive with the prepackaged milk even with the higher Alaska processing costs.

Table 22: Estimated Costs Per Hundred Weight and Per 1/2 Gallon for Alternative Sources of Milk Delivered to Anchorage Retail Stores, November 1979

	Fresh Milk from Seattle				
	Local Farmers	Bulk	Class I	Prepackaged Processor-Distributor	Ingredients to Recombine
Farm Value	\$16.84 ^a	\$12.85 ^b	\$12.85 ^b	\$11.85 ^b	
Delivered to Plant	18.20 ^c	13.10 ^d	13.10 ^d	12.10 ^c	\$11.34 ^f
Haul to Washington Pier		.65 ^g			
Transportation to Alaska		3.68 ^g	8.83 ^h	8.83 ^h	.70 ⁱ
Service charges		2.00 ^j			
Processing Cost	13.61 ^k	13.61 ^k	5.73	5.73	13.61
Butter and Powder					1.00 ^l
Recombining Cost					.10 ^l
Cost at Wholesale					
Per 100 Pounds	<u>\$31.81</u>	<u>\$33.04</u>	<u>\$27.66</u>	<u>\$26.66</u>	<u>\$26.75</u>
Cost Per 1/2 Gal. Wholesale	\$1.37	\$1.42	\$1.17	\$1.15	\$1.15
Cost Per 1/2 Gal. Retail ^m	\$1.58	\$1.63	\$1.37	\$1.32	\$1.32

^a FOB price at farm for milk produced in the Matanuska Valley.

^b Transportation cost of \$.25 from farm to processor in Puget Sound area is an estimate.

^c Cost of local milk at an Anchorage processing plant.

^d Estimated Puget Sound Class I price, November 1979.

^e Estimated Puget Sound Blend price, November 1979.

^f Estimated manufacturing milk price in all federal order marketing areas.

^g Source: An Anchorage milk processing firm.

^h \$.38 per half gallon transportation cost between Seattle and Anchorage.

ⁱ \$4.50 transportation cost per 100 pounds of non-fat dry milk or 100 pounds of butter.

^j Primarily the cost of pasteurization before transporting bulk milk to Alaska. This milk is pasteurized a second time in Alaska. Source: An Anchorage milk processing firm.

^k Includes fluid bottling and distribution to retail. Source: An Anchorage milk processing plant.

^l Source: Hammond, Buxton and Thraen, 1979.

^m Assumes 15% markup.

Table 23: Estimated Cost Per Hundred Weight of Milk Through a Typical Anchorage Milk Processing Plant and Delivered to Retail Stores

	VOLUME PER MONTH		
	2 Million Pounds	5 Million Pounds	
		No Change in Technology	No Change in Technology
Milk and Carton	\$19.64	\$19.64	\$19.18 ^a
Plant Labor	1.80	1.17	.99
Plant Overhead	1.77	1.15	.98
Distribution to Retail	6.28	4.08	4.08
Administration and Profit	2.32	1.50	1.50
TOTAL	<u>\$31.81</u>	<u>\$27.54</u>	<u>\$26.73</u>

^a Reduction in bulk transportation cost from Matanuska Valley/Point Mackenzie to Anchorage due to deregulation of intrastate bulk milk movement. SOURCE: An Anchorage milk processing firm.

This is a large difference in processing cost between local and outside processors. Further consideration is required to understand this large difference. Anchorage milk-processing plants have substantially lower volume than do their Seattle competitors, therefore incurring a higher cost per processed unit. Additional sources of higher costs for Anchorage plants arise from outdated plant equipment and higher labor costs. Can these economic disadvantages be overcome? Table 23 represents the costs associated with a typical processing plant in Anchorage. Assuming a monthly volume of 2 million pounds, the total cost per cwt

was determined to be \$31.81. The typical plant capacity is 5 million pounds per month. This production level, therefore, implies that such a plant is substantially underutilized. If volume were to increase to 5 million pounds per month (production from existing dairy herds and 3,000 additional cows in Point Mackenzie), plant costs per unit of production would drop substantially. Cost per cwt at this volume would be approximately the same as prepackaged Class I milk shipped in from Seattle. Further, if improved technology were incorporated into this plant and intrastate bulk milk shipment was deregulated, then

local milk could be produced and processed at a cost approaching processor-distributor milk from Puget Sound. In other words, with changes in the industry, Alaska milk can again become competitive.

Is this scenario a real possibility? First, 5 million pounds is 76 per cent of the current market for fresh milk in Alaska excluding southeast. State population is expected to grow to 496,000 in five years (Kruse, 1979). This means that the milk market, assuming no change in consumption patterns, would increase to 8 million pounds. The 5 million pounds of locally produced milk would then account for only 62 per cent of total consumption compared to 20 per cent currently. Because Alaska milk would be merely competitive in production and processing costs with outside milk, not lower priced, it is difficult to determine whether consumers would prefer comparatively priced Alaskan or outside milk. Nevertheless, for 5 million pounds of Alaska-produced milk to be sold annually, assuming the above population growth, 62 per cent of the market would have to be captured.

It is clear that, without greater volume and plant modernization, dairy farmers in Alaska must bear a greater portion of the cost differential that currently exists between prepackaged outside milk and local milk to be fully competitive. The existing small-dairy industry may be able to survive with its premium-priced product. However, the only way to lower the price of Alaska milk to the consumer, assuming no relative cost changes, is through expansion of local

milk production, subsequent increases in processing volume and additions in processing technology.

An additional marketing question for which no analysis has been undertaken is the response of sellers of prepackaged outside milk to competitively priced Alaskan milk. If Alaskan milk begins to capture a larger share of the market, what will be the response of these outer sellers. Will they be in the position to reduce prices? If they do, can Alaskan producers compete? If Alaskan producers cannot compete, should the state of Alaska attempt to interfere in the market to protect the Alaskan producers?

Economists generally hold that competition brings about the most desirable balance between production and consumption and leads to maximum welfare for all citizens. The major force that brings about this ideal pattern is price. Prices provide signals to producers and consumers which lead to the most desirable level of production and consumption. Interference in the market by the state would probably distort these signals. Thus, any interference by the state in the market through either marketing orders, fair trade legislation, or producer subsidies should be undertaken only after careful and thorough consideration of the welfare implications resulting from any such action. However, such involvement may be necessary if outside producers should sell their milk in Alaska below production cost in an effort to maintain their market share.

CHAPTER 4

FINAL THOUGHTS

Dairying at Point MacKenzie appears economically feasible if the price paid to dairymen remains at \$16.84 per cwt. The largest herd size considered, 150 cows, was the most economically viable. A positive revenue and expense flow could be generated for this dairy enterprise by the middle of the second year of operation. Table 24 indicates the number of pounds of milk per cow required annually to cover all costs at \$16.84 per cwt.

A critical aspect of an expanded milk industry in Alaska is processing. The dairy farmers, both old and new, must press for greater efficiency in processing. A major concern is high labor costs relative to "outside" competitors. For an efficient, competitive milk-processing capability in Alaska, careful attention must be given to the cost and productivity of each unit of labor and capital. The optimum combination of these two factors of production in terms of costs and returns is essential for efficient processing.

Although it is possible that private financial institutions would finance a modernization program, it is more likely that milk processors will depend on the state for capitalization through several existing low-cost loan programs. In this event, the state may exercise some degree of control over the management of milk-processing firms. This could ensure reaching and maintaining a high level of efficiency in order to make certain that Alaskan milk could capture and hold the necessary 62 per cent of the market.

There is an advantage to the Alaskan processor if state loan programs are used. State loan-program managers can exercise a degree of flexibility in pay-back periods. If outside milk processors consider maintaining their share of the Alaskan market to be

important enough, prices could be lowered below those of Alaskan milk over the short run. The state could delay payments on capital loans to allow Alaskan processors to engage in price competition and attempt to maintain their market share.

Future transportation rates to Alaska may reflect a greater-than-relative change in comparison to other costs due in large measure to the higher costs of petroleum. If so, the transportation advantage currently available to imported prepackaged milk may be reduced. If this situation develops, the competitive position of Alaskan dairy farms and milk processors vis-a-vis outside competitors will improve.

In conclusion, several points should be made. The analysis presented is a reasonable approximation of present conditions in the Alaskan dairying industry. Although some of the data are estimates, they are based on relevant components of the dairy industry in other states.

There is risk associated with any action. However, if two conditions are met, it is quite reasonable to believe that the dairy industry in the state can grow. First, individual farms must utilize best management practices. Second, the processing sector must become more efficient. If the first is realized, milk production will increase. This will partially affect the second condition with no action required by the processing sector. Full realization of potential plant efficiency will come if processors take advantage of cost reductions available through installation of equipment utilizing new technology. With the prospect of a continuing industry and possible low-cost state loans, milk processors should be able to realize a high efficiency for the present size of plant.

Table 24: Production Rates and Returns for 50-, 75-, 100-, and 150-Cow Dairy Farms

	50 Cows	75 Cows	100 Cows	150 Cows
lbs per cow to cover all costs at \$16.84 per cwt	16,646	15,122	15,348	15,124
Net return per cwt (17,000 lbs per cow ^a)	\$.35	\$1.85	\$1.63	\$1.85
Net return per cwt (16,000 lbs per cow ^a)	(\$.68) ^b	\$.92	\$.68	\$.92
Net return per cwt (15,000 lbs per cow ^a)	(\$1.85)	(\$.14)	(\$.39)	(\$.14)

^aCalculated using $[(\text{lbs. production per cow})(\$ \text{ per lb.})] - (\text{Total production cost} - \text{Revenue from cattle}) / \text{total no. cows}$
 $\text{lbs. production per cow} / 100$

^bImplies negative returns.

BIBLIOGRAPHY

- Alaska Crop Livestock Reporting Service. *Alaska Agricultural Statistics*, Palmer, Alaska, June 1978.
- Bracewell, Earl W. "Projected Analysis of 150 Cow, 400 Acre Dairy Farm in Point MacKenzie Area," Presented at Alaska Rural Development Council, June 13, 1979.
- Brevik, Ted J., and Allan N. Bringe. *Uninsulated Housing for Dairy Calves*. University of Wisconsin Cooperative Extension A2576. January 1974.
- Fischer, Martin, Jerome Hammond, and Wallace Hardie. *Fluid Milk Processing and Distribution Costs*. University of Minnesota, Agricultural Experiment Station Bulletin 530. 1979.
- Foley, R. C., D. L. Bath, F. N. Dickinson, and H. A. Tucker. *Dairy Cattle: Principles, Practices, Problems, Profits*. Philadelphia: Lea and Febiger, 1972.
- Graves, R. E. *Large Piston Manure Transfer Pumps*. University of Wisconsin Cooperative Extension A2797, May 1976.
- Graves, R. E. *Earth Storage Basins for Liquid Manure*. University of Wisconsin Cooperative Extension A2795, June 1976.
- Hammond, Jerome W., Boyde M. Buxton, and Cameron S. Thraen. *Potential Impacts of Reconstituted Milk on Regional Prices, Utilization, and Production*. University of Minnesota, Agricultural Experiment Station Bulletin No. 529. 1979.
- Hopkins, John A., and Earl O. Heady. *Farm Records and Accounting*. Ames: Iowa State University Press. 1962.
- Johannes, Russell. *Cost Analysis of Housing and Manure Handling Systems and Value of Manure Produced*. Marshfield Experiment Station, College of Agriculture and Life Sciences, University of Wisconsin-Madison, March 1975.
- Kruse, John A. Assistant Professor, Survey Research, University of Alaska, Fairbanks, personal communication, December 1979.
- Loudon, Ted L. *Picket Dam for Draining Water from Uncovered Manure Storages*. Agricultural Engineering, Michigan State University, AEIS No. 350, File No. 18.7.
- Lasley, Floyd, Wilbur Jones, and Leah Sitzman. *Milk Dealers' Sales and Costs: A Trend Analysis, 1952-1977*. U.S. Department of Agriculture, Economic, Statistics and Cooperative Service. Report No. 62, July 1979.
- Midwest Plan Service. *Dairy Housing and Equipment Handbook*. MWPS-7, 3rd Printing, Iowa State University, Ames. 1978.
- National Research Council. *Nutrient Requirements of Dairy Cattle*. National Academy of Sciences, Washington, D.C. 1971.
- Whitakes, James H. *Agricultural Buildings and Structures*. Reston, Virginia: Reston Publishing Co., 1979.

CONSULTANTS

- Axel Carlson, Agricultural Engineer, Cooperative Extension Service, University of Alaska, Fairbanks.
- Boyd Buxton, Agricultural Economist, Natural Resources Economics Division, Economics, Statistics and Cooperative Service—U.S.D.A., Stationed at the University of Minnesota, St. Paul.
- Paul Fugelstadt, Agricultural Economist, Natural Resources Economics Division, Economics, Statistics and Cooperative Service—U.S.D.A., Stationed in Anchorage, Alaska.
- Steve Hamilton, Dairyman, Palmer, Alaska.
- Arthur L. Brundage, Professor of Dairy Science (Manager of University of Alaska Dairy Herd), Agricultural Experiment Station, University of Alaska, Fairbanks.
- Raynard Zunker, Dairyman, Wausau, Wisconsin.
- G. H. Tennas, Professor and Superintendent of the Marshfield Experiment Station, University of Wisconsin.
- Jack Flint, General Manager, Matanuska Maid, Inc., Anchorage, Alaska.

ALASKA

RENEWABLE

RESOURCES

CORP. (ARRC)

SUNSET

HEARINGS

ALASKA RENEWABLE RESOURCES CORPORATION

Legislative Recommendations

1982

Principal Problem Experienced	Reason	Possible Remedy	Recommended Solution
1. Redundant/ambiguous top management authority	1. Three trustees of equal authority and responsibility	1. Change Board structure	1. P/T board of seven members, majority from private sector
2. Goal ambiguity/strategic confusion	2. Unclear/unfocused legislation	2. Restrict investments to R&D, start-ups, and expansions of ventures with less than \$2 million net worth. Drop granting powers.	2. Legislated focus as shown to left under "possible remedy"
3. Operational bureaucracy	3. Department of Revenue/ Department of Administration perceptions of their responsibilities over ARRC operation. Legal opinions about constitutionality of funding.	3. Capitalize ARRC. Remove from Executive Budget Act. ARRC operates and invests from capital and earnings	3. Strengthen accountability requirements by requiring quarterly statements Legislative Budget & Audit also contracts for additional audit by experienced firm.
4. Public concerns about market power	4. Narrow focus in industry targets/use of ARRC for emergency stabilization of fisheries industry	4. Broaden industry focus. Don't legislate emergency anticyclical investment goals. Be more realistic about portfolio balance.	4. Include all manufacturing/ processing in target industries



Alaska State Legislature

HOUSE OF REPRESENTATIVES
COMMITTEE ON RESOURCES

KEN FANNING, CO-CHAIRMAN
ERIC SUTCLIFFE, CO-CHAIRMAN
POUCH V
JUNEAU, ALASKA 99811
(907) 465-3715

M E M O R A N D U M

To: Joe Hayes, Speaker of the House

From: Representatives Eric Sutcliffe and Ken Fanning, Co-Chairmen
Resources Committee

Date: March 8, 1982

Subject: Sunset Review of the Alaska Renewable Resources Corporation

After a public hearing on oversight review of ARRC, the House Resources Committee determines that ARRC has not satisfactorily served the "public need" in order to justify its continued existence. Although the Committee concurs that there are few sources of high risk equity financing available to Alaskan entrepreneurs, both the concept and structure of ARCC are flawed.

~~Because~~ The House Resources Committee ^{will not} ~~cannot~~ introduce new legislation at this time. ~~And~~ the Committee declines to specify what, if any, alternative to ARRC should be pursued. Legislation to amend the ARRC statutes is presently before the Senate. When, and if, this legislation appears before the House Resources Committee, it will be given the appropriate scrutiny.

The House Resources Committee concurs with and submits the Division of Legislative Audit Review of the Department of Revenue Alaska Renewable Resources Corporation, dated November 13, 1981, as its findings and recommendations in accordance with AS 44.66.050.

STATE OF ALASKA

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

AUDIT DIVISION
POUCH W—ALASKA OFFICE BUILDING

JUNEAU, ALASKA 99811

February 19, 1982

FEB 22 1982

TO: Representative Ken Fanning
Co-Chairman
House Resources Committee

FROM: *M. L. Wilkerson*
Gerald L. Wilkerson, CPA
Legislative Auditor
Division of Legislative Audit

SUBJECT: Discussion of Legislative
Oversight Responsibilities
as Related to Sunset Audits

As required by "sunset" legislation, your Committee has been assigned the oversight review of the Guide Licensing and Control Board and the Alaska Renewable Resources Corporation. In addition to the audit reports released earlier by this Division, the following information may be helpful.

According to AS 44.66.050, the standing committee of legislative jurisdiction as provided in Rule 20 of the Uniform Rules of the Legislature shall hold one or more hearings to receive testimony from the public and other parties that have associated responsibilities or interests. In addition, the Committee shall consider Legislative Audit's report, the agency's proposed budget, the agency's program performance report, and any other tools that might assist it in evaluating the conduct and activities of the agency being terminated.

It is important to note that the terminating agency shall have the burden of demonstrating a public need for its continued existence during the public hearings.

The determination of "public need" for continued existence shall take into consideration the following factors set out in AS 44.66.050(c):

1. The extent to which the board, commission or program has operated in the public interest.

2. The extent to which the operation of the board, commission, or agency program has been impeded or enhanced by existing statutes, procedures, and practices which it has adopted, and any other matter, including budgetary, resource, and personnel matters.
3. The extent to which the board, commission or agency has recommended statutory changes which are generally of benefit to the public interest.
4. The extent to which the board, commission or agency has encouraged interested persons to report to it concerning the effect of its regulations and decisions on the effectiveness of service, economy of service, and availability of service which it has provided.
5. The extent to which the board, commission or agency has encouraged public participation in the making of its regulations and decisions.
6. The efficiency with which public inquiries or complaints regarding the activities of the board, commission or agency filed with it, with the department to which a board or commission is administratively assigned, or with the office of the ombudsman have been processed and resolved.
7. The extent to which a board or commission which regulates entry into an occupation or profession has presented qualified applicants to serve the public.
8. The extent to which state personnel practices, including affirmative action requirements, have been complied with by the board, commission or agency to its own activities and the area of activity or interest.
9. The extent to which statutory, regulatory, budgeting or other changes are necessary to enable the agency, board or commission to better serve the interests of the public and to comply with the factors enumerated in this subsection.

The Legislative Audit reports have addressed these issues individually but only to the extent allowed by restricted audit scopes detailed within the reports.

The Law further states that the committee of reference shall, not later than the 60th day of the legislative session, submit a report to the presiding officer of each

house. The report is to include a summary of findings as to compliance with the "public need" factors enumerated above together with recommendations as to each of the following:

1. An identification of the problems or the needs that the programs and activities of the board, commission or agency are intended to address.
2. A statement, to the extent practicable, of the objectives of the program of the board, commission, or agency program, and its anticipated accomplishments.
3. An identification of any other programs having similar, conflicting or duplicate objectives.
4. An assessment of alternative methods of achieving the purposes of the program.
5. An assessment of the consequences of eliminating the board, commission or program and consolidating its activities with another program, or of funding it at a lower level.
6. A justification for the recommended continuation or extension of the board, commission or program, and an explanation of the manner in which it avoids duplication of or conflict with other efforts.
7. Any other information which, in the opinion of the committee, would improve the performance of the board, commission or agency with respect to its representation of and responsiveness to the public interest.

The committee of reference may introduce a bill providing for the reorganization or continuation of the agency being terminated as stipulated in AS 44.66.050(e).

If additional information is needed, please contact this office at 465-3830.

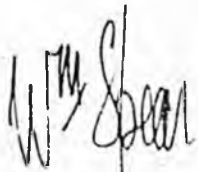
cc: Senator Arliss Sturgulewski
Chairman
Legislative Budget and Audit Committee

ALASKA BAIT PRODUCERS, INC./TENAKEE SPRINGS □ ALASKA F.I.S.H./ SOLDOTNA
/KODIAK □ ALASKA FOOD/ANCHORAGE/KODIAK □ BALL BROTHERS/
ANCHORAGE/DILLINGHAM □ **FLYING FISH** AND CRAB/ANCHORAGE □ ICICLE
SEAFOODS /PETERSBURG/**HOMER/SEWARD**  **TRINITY** RESOURCES/KODIAK □
SEAFOODS OF ALASKA/**STERLING**  **NEW SEWARD, INC.**/ANCHORAGE □ KACHAMAK
SEAFOODS/TOGIAK/**HOMER**  **ALASKA LONGLINE** FISHERMAN'S ASSOC.
/SITKA □ ALASKA **SEAFOOD MARKETING INSTITUTE**/JUNEAU □ AMERICAN
EAGLE/CORDOVA  **SCHNABEL LUMBER/HAINES** □ ALASKA TIMBER
/KLAWOCK □ **MASTERCRAFT KITCHENS/ANCHORAGE**  **ALASKAN WOODS, INC.**/AN-
CHORAGE □ **PINE'S SAWMILL/TOK**  **STEIK ENTERPRISES**/NINILCHIK □ SEAWARD
SHIPYARDS/KETCHIKAN  **SEA FISHER/PETERSBURG** □ ANCHOR RENEWABLE
FARMS/ANCHOR POINT  **ALYESKA CANDY KITCHENS**/ANCHORAGE □ MARTIN
CLARK/DILLINGHAM  **MARTIN'S SEAFOOD/ANCHORAGE** □ SALAMATOF
/KENAI □ **STERLING SEAFOODS/SITKA**  **KOKECHIK/HOOPER BAY/SCAMMON**
BAY/CHEVAK □ **RICE FUR FARM/FAIRBANKS** □ WYMAN **(SITKA)**  **ALASKA STAR**
(SITKA) □ □ **ALEUTIAN DRAGON** (CORDOVA) □ **ARCTIC FISHER**
(NOME) □ **TEPA, INC./ANCHORAGE**  **GREAT LAND FARMS/PALMER** □ **ARCTIC FARM**
AND GARDEN/NORTH POLE □ **YUKON RIVER FOREST STUDY** □ **KUSKOKWIM RIVER**
FOREST STUDY □ **QUICK PIC**  **SELDOVIA DAY FISHERIES STUDY /SELDOVIA**
□ **SOUTHERN SOUTHEAST REGIONAL AQUACULTURE ASSOCIATION** □ **ALTERNATIVE**
ENERGY DEVELOPMENT CORPORATION/ANCHORAGE □ **ENTREPRENEURIAL STUDIES**
PROGRAM/ANCHORAGE □ **ALASKA COUNCIL FOR ECONOMIC EDUCATION/FAIR-**
BANKS □ **ALTERNATIVE ENERGY CONFERENCE/ANCHORAGE** □ □ □ □ □ □ □

ALASKA RENEWABLE RESOURCES CORP.

• ANNUAL REPORT 1981 •

Letter
from the
Trustees



This document, the 1980-81 annual report of the Alaska Renewable Resources Corporation is possibly unique among reports from either public or private sector organizations.

Submitted in compliance with requirements of AS 37.12.090, the report accepts the statutory invitation to comment in more depth concerning ARRC activities. As will be seen, the main portion of our report is conventional enough; we report our success and our problems.

What makes the report unusual is the fact that we also recommend the dissolution of the corporation as it is now constituted. Our experience has led us to call for a comprehensive reassessment of how and under what circumstances public funds are allocated and used for economic development in Alaska.

Citing as it does the success of the company, our report seems to offer few practical reasons for the recommended dissolution. After all, private sector firms receiving ARRC money have created some 600 new jobs and either preserved or maintained Alaskan control over approximately 3,400 more.

However, despite these and other equally positive results, the political realities within Alaska, and a great deal of working experience, have convinced the Trustees that — while many of the basic underlying concepts in the legislation seem sound — the organization, and the political environment in which it was created are ill-suited to actual long-term implementation.

Specifically, the ARRC's potential to contribute to economic development is seriously inhibited by:

- An initial and continuing lack of political consensus as to whether the goals of the ARRC are properly addressed at all by public sector financing in the private sector.
- A serious question as to whether or not the overall strategies of industrial and company development can effectively be undertaken by one organization.
- The weakened ability of the ARRC to function in an environment of frustrated and unrealistic expectations for the organization — each expectation attached to one or more of a wide range of economic and social development goals.
- Organizational, legal and funding structures inherent in the ARRC which may be inappropriate for the effective implementation and continuation of the statutory goals.

The trustees agree that to improve the economy of the state, Alaska should continue to confirm that which is stated in the preamble to the ARRC legislation. The state should commit to:

- rehabilitation, enhancement and development of renewable resources and
- development of human resources by providing maximum opportunities for employment and higher standards of living.

We are proud of having established the ARRC, a working and substantial financial institution, from what was originally little more than good intentions and academic theory.

Our personal and professional experiences have convinced us of the extraordinary value to our state of appropriately structured development finance organizations. We share, as an experienced board of trustees and as informed individuals, the sincere desire to participate in the future of development finance in Alaska.

The enabling legislation for the ARRC was extraordinary in its breadth, and took in a wide range of goals which would result in company and industry development. The powers granted to pursue these goals were highly diversified and comprehensive. Thus, to begin putting the ARRC experience into perspective, it is really necessary to start with at least a brief consideration of the legislation which created it.

***All quoted references in this document are taken from CSHB 687 (Financial), Chapter 179, "An Act Relating to the Renewable Resources Funds," 1979.

The Alaska Renewable Resources Corporation was described by one noted economist as "one of the most innovative and creative ideas in development finance in the Western hemisphere." It was also certainly one of the more difficult to understand.

The Legislation

Policies

The ARRC statute deployed substantial financial resources of the state in pursuit of a policy of developing Alaska's "human resources by providing maximum opportunities for employment and a higher standard of living for its citizens."*** Further policy declared that the funds provided would go to "development of renewable resources in order to contribute to "a stable, self-sustaining state economy, employment opportunities and life-style opportunities for its citizens and . . . commercial, traditional and common uses of the state's renewable resources."

Findings

Underlying the actual legislation were certain findings which described the need in the Alaska economy for positive action. For instance, certain of Alaska's renewable resources were found "not being utilized to their full potential." General problems were cited such as "high unemployment and unstable economy." The economy was referred to as being historically dependent on "sporadic and non-stable development."

Several factors were enumerated as contributing to "slow development" in the renewable resource based industries. These included, in abbreviated form:

1. insufficient research and development
2. insufficient venture capital financing
3. lack of knowledge about renewables in business and financial circles
4. lack of scientific information on many resources
5. lack of technology appropriate to Alaska

In overall conclusion, the findings stated that "assisting the development of viable industries is best accomplished by providing assistance to the private sector."

The ARRC's working experience indicated that many of the problems designated in "Findings" were indeed true. However, other findings appeared less correct, and additional and unexpected economic difficulties were also encountered.

An evaluation of the policies and findings above leads to the conclusion that the ARRC was charged with improving nearly every chronic and destructive problem perceived in Alaska's economy.

The major purpose of the organization was stated as being to:

“facilitate the rehabilitation, enhancement and development of the state's renewable resources so as to strengthen the self-sustaining sectors of the state economy.”

Further definition elaborated:

‘rehabilitation, enhancement and development’ means any activity or program which improves the health and well-being of a renewable resource or renewable resource population leading to an increase in the quality of productivity of the resource and to an increase in the benefits derived from the resource to the citizens of the state.

Powers, Duties and Financial Assistance

The ARRC had an invaluable power: it could invest in the stock of private companies on a significant scale. The purchase of shares, called “equity investment” across a scope as broad as the ARRC’s, was not only unique, it was also the most useful tool the ARRC had for addressing what is widely perceived as a major problem with the state's economy: the shortage of investment capital. Because the state committed a proportionately significant amount of money to the ARRC, it was able to invest in such a way as to counter this problem.

Alaska is frequently described as having a “young economy,” that is, one in which there has been little opportunity to accumulate cash in large quantities. Like a young person, Alaska's economy tends to be perennially short of cash in the private sector. New or expanding companies cannot find equity investors in their enterprises, so they necessarily borrow — that is, incur debt. Even the availability of debt financing is limited, often short-term borrowing is used in place of more appropriate long-term financing. Such a condition almost invariably leads to a financial crisis even where the enterprise is sound in its basic concept. The result has often been the bankruptcy or outside takeover of an Alaskan company.

Companies operating with large amounts of borrowed money or “debt” are termed “highly leveraged;” — a condition which characterizes many Alaskan businesses. What the ARRC was able to do through equity financing of highly leveraged companies was permit their continued operation through more balanced and appropriate capital structures.

With an ARRC investment many Alaskan firms gained the opportunity, win or lose, to put their houses in order in a way never before possible. And ARRC money also gave new or expanding enterprises the advantage of starting off with an appropriate mix of equity and debt.

The ARRC had the power to make loans, to give grants and in any other way to match the appropriateness of its investments precisely to the needs of the business in need of funds.

To gain the greatest likelihood of matching its work to the real requirement of Alaska business, the ARRC broke the total picture into more manageable "strategic components." Each component could then be addressed with sensitivity to its special requirements for financial and managerial assistance.

Major Early Decisions

Mix of Industry and Company Development

Given the full scope of Alaska's economic problems as its ambitious assignment, the ARRC necessarily had to arrive rapidly at a working compromise between theory and practice.

This compromise was particularly important because the legislation contained directives for two totally different and not necessarily compatible directions for economic development. These were:

1. **Industry Development** — creating entire complexes of self-supporting companies which together constitute an industry.
2. **Company Development** — creating companies which promise to be healthy as individual enterprises but which are otherwise unrelated to one another.

Industrial development is, as the name implies, a massive undertaking. The concept is highly attractive in many ways, but it takes a great deal of time to make plans, test them, achieve consensus on how to take action and then (when all is done) actually measure the results.

Industrial development as practiced by the World Bank and other organizations requires a specialized staff and a completely different approach than does company development. Money, management and the total time involved are quite specific to industrial development operations.

It is useful to recall that the trend among opinion leaders during the ARRC's early months was one of rejecting "studies" and to demand "action." This pressure helped move the ARRC firmly into its work in company development, reserving deeper economic planning for a later time.

Optimizing the Process of Company Development

An underlying economic assumption behind the ARRC legislation is that small companies are more productive in providing new jobs, business innovations and new creation of wealth. Thus any increase in the number or stability of Alaska's private companies would be expected to improve the total stability and productivity of the state economy.