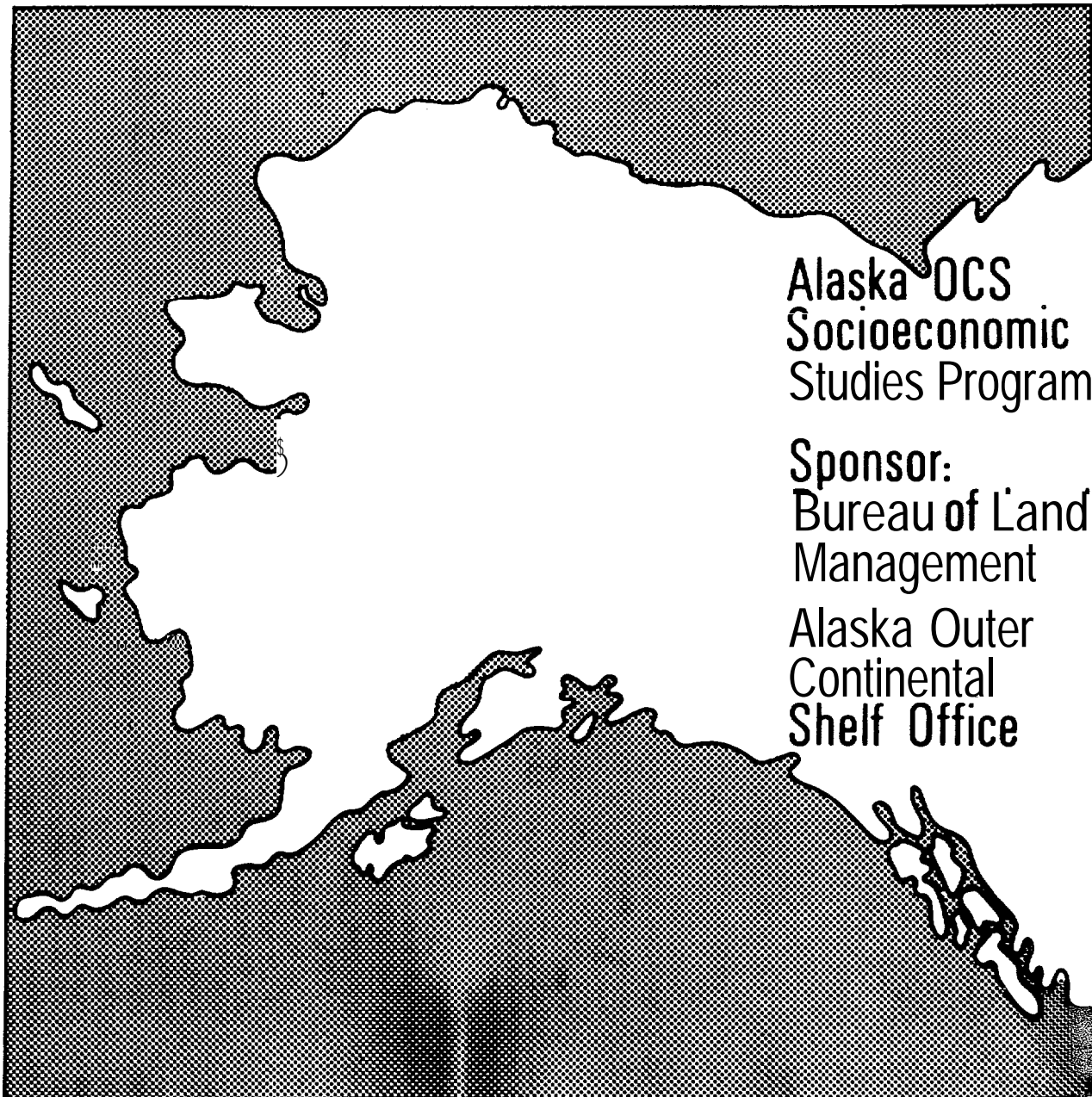


Technical Report
Number 59



St. George Basin
Petroleum Development Scenarios
Local Socioeconomic Systems Analysis

The United States Department of the Interior was designated by the Outer Continental Shelf (OCS) Lands Act of 1953 to carry out the majority of the Act's provisions for administering the mineral leasing and development of offshore areas of the United States under federal jurisdiction. Within the Department, the Bureau of Land Management (BLM) has the responsibility to meet requirements of the National Environmental Policy Act of 1969 (NEPA) as well as other legislation and regulations dealing with the effects of offshore development. In Alaska, unique cultural differences and climatic conditions create a need for developing additional socioeconomic and environmental information to improve OCS decision making at all governmental levels. In fulfillment of its federal responsibilities and with an awareness of these additional information needs, the BLM has initiated several investigative programs, one of which is the Alaska OCS Socioeconomic Studies Program (SESP).

The Alaska OCS Socioeconomic Studies Program is a multi-year research effort which attempts to predict and evaluate the effects of Alaska OCS Petroleum Development upon the physical, social, and economic environments within the state. The overall methodology is divided into three broad research components. The first component identifies an alternative set of assumptions regarding the location, the nature, and the timing of future petroleum events and related activities. In this component, the program takes into account the particular needs of the petroleum industry and projects the human, technological, economic, and environmental offshore and onshore development requirements of the regional petroleum industry.

The second component focuses on data gathering that identifies those quantifiable and qualifiable facts by which OCS-induced changes can be assessed. The critical community and regional components are identified and evaluated. Current endogenous and exogenous sources of change and functional organization among different sectors of community and regional life are analyzed. Susceptible community relationships, values, activities, and processes also are included.

The third research component focuses on an evaluation of the changes that could occur due to the potential oil and gas development. Impact evaluation concentrates on an analysis of the impacts at the statewide, regional, and local level.

In general, program products are sequentially arranged in accordance with BLM's proposed OCS lease sale schedule, so that information is timely to decisionmaking. Reports are available through the National Technical Information Service, and the BLM has a limited number of copies available through the Alaska OCS Office. Inquiries for information should be directed to: Program Coordinator (COAR), Socioeconomic Studies Program, Alaska OCS Office, P. O. Box 1159, Anchorage, Alaska 99510.

CTO-42

Alaska OCS Socioeconomic Studies Program

ST. GEORGE BASIN
PETROLEUM DEVELOPMENT SCENARIOS
LOCAL SOCIOECONOMIC SYSTEMS ANALYSIS

Prepared for

Bureau of Land Management
Alaska Outer Continental Shelf Office

May 1981

NOTICE

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Alaska OCS Socioeconomic Studies Program
St. George Basin
Petroleum Development Scenarios
Local Socioeconomic Systems Analysis

Prepared by
Alaska Consultants, Inc.

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ABSTRACT

This report includes detailed community baseline data about Unalaska, Cold Bay and St. Paul. It also projects and analyzes how the infrastructure of these towns could be affected by future growth without the proposed St. George Basin OCS Lease Sale No. 70. For Unalaska, possible impacts of OCS activity under an "exploration only" and a "mean" petroleum development scenario are also analyzed. The primary objective of these analyses is to determine those local amenities and services which would logically be most impacted without OCS Lease Sale No. 70 and, in the case of Unalaska, additional impacts which could be expected under conditions of offshore oil and gas development.

The primary source of growth impacts on Unalaska in the base case is the bottomfish industry which alone is expected to directly add about 5,000 jobs to the town's employment base and be the major factor in a tenfold increase in the City's population to close to 12,000 residents by the end of the century. Under such conditions, Unalaska would face severe growth management problems in attempting to provide essential community facilities and services. Furthermore, since such rapid growth would be primarily derived from an influx of persons from outside the region, a fundamental change in the town's character could be expected.

Anticipated impacts on Unalaska resulting from offshore oil and gas development associated with OCS Lease Sale No. 70 are comparatively minor. Under the exploration only scenario, total OCS-related population

is projected to peak at only about 140 persons or less than 5 percent of total community population and less than 8 percent of the total projected population growth between 1980 and 1985. Furthermore, this growth is temporary, spanning only the five years of active exploration, although it would place an additional strain upon Unalaska's ability to provide needed community facilities and services. Under the mean scenario, OCS-related impacts on Unalaska can be expected to further compound already extreme local growth management problems if the bottomfish industry in the Aleutians region expands as forecasted in the base case, but the visibility of any OCS impacts will be largely obscured by developments in the fishing industry.

Cold Bay's employment and population is expected to more than double by the end of the century under the non-OCS case, primarily because of its favorable location in relation to shellfish and other fisheries resources. However, developers of these resources are likely to face problems caused by the present lack of an organized local government to provide services such as water supply, sanitary and solid waste disposal, land use planning and recreation.

St. Paul's population and employment is projected to increase by close to 170 and 700 percent respectively by the end of the century under a non-OCS case, based primarily on the assumption that a bottomfish plant will be successfully established on St. Paul Island. It is further assumed that non-local bottomfish employees will be accommodated in a residential enclave which should help mitigate adverse social impacts on this traditional Aleut community.

INTRODUCTION

The first section of this report contains an inventory of existing socioeconomic conditions in three Aleutian region communities - Unalaska, Cold Bay and St. Paul. Included in this inventory are analyses of the population and economy of each community; descriptions of existing land use, land status, housing conditions and possible constraints on urban development; a review of local community facilities and services, including public safety, health and social services, education, recreation and utilities services; and an overview of local government powers and municipal financial conditions, where appropriate.

The three towns inventoried in this report are fundamentally unlike. Unalaska is a traditional Aleut village which has recently experienced major economic and population growth to become one of the nation's leading fish processing centers. Cold Bay is basically an airport in the process of developing as a community, while St. Paul is a traditional Aleut village which is undergoing a change in function from a government "company town" to a self-governing community.

Reflecting the fundamental differences among the three towns, there is some variation in emphasis on local socioeconomic conditions in this report. For example, economic overviews rather than detailed sector analyses were considered more appropriate in the cases of Cold Bay and St. Paul. Similarly, since Cold Bay is unincorporated, those work elements relating to local government powers and finances were omitted.

From the data, the second section of this report indicates potential impacts on population, employment, selected community facilities and utilities services, and the financial condition of these communities in a non-OCS case and, in the case of Unalaska, also in two non-OCS cases. In order to be able to develop realistic forecasts, baseline conditions for each community therefore had to be inventoried in considerable detail. This is particularly important in the case of Unalaska.

The information contained in this report has been derived from a wide variety of sources, supplemented by informal interviews of people in government and industry in all three communities under study. Factual data contained in this report is current as of August 1980 except where specifically noted.

CITY OF UNALASKA

Population and Economy

Unalaska is an isolated community located in the Aleutians on Unalaska and Amaknak Islands, about 800 air miles southwest of Anchorage. Although it has its origins as a traditional Aleut village, Unalaska is currently the nation's number one fishing port in terms of value of landings and its population is now predominantly non-Native.

POPULATION

Past Trends

Unalaska is a traditional Aleut community which was founded during the Russian-America period but there had been settlement in the area for long before that. The town prospered over the years because of its strategic location in relation to major shipping routes and because of its excellent protected harbors. However, it was World War II which brought major and lasting change to this and many other Aleutian communities. Since much of Unalaska's modern development dates from the World War II era, this examination of the community's past population begins from that period.

According to the 1939 Census, Unalaska had a population of 298 persons (see Table 1). However, the community's civilian Native population was

TABLE 1

POPULATION TRENDS
 UNALASKA, ALASKA
 1939 - 1980

<u>Year</u>	<u>Population</u>	<u>Percent Change</u>
1939	298	
1950	173	- 41.9
1960	218	26.0
1970	178 <u>a/</u>	- 18.3
1980	1,288 <u>b/</u>	623.6

a/ Unalaska's corporate limits were enlarged in 1967 to include Amaknak Island.

b/ Preliminary 1980 Census figures include 1,051 persons living in housing units and 237 in group quarters.

Sources: U.S. Department of Commerce, Bureau of the Census (unpublished preliminary 1980 Census data provided by the Aleutian-Pribilof Island Association).

U.S. Department of Commerce, Bureau of the Census. 1971. Number of Inhabitants, Alaska, Washington, D.C. Final Report PC(1)-A3.

U.S. Department of Commerce, Bureau of the Census. 1960. Number of Inhabitants, Alaska. Washington, D.C. Final Report PC(1)-3A.

evacuated out of the region in 1942 and resettled at Burnett Inlet, north of Ketchikan, where they remained for most of the remainder of the War. At peak, the military population at Unalaska reportedly numbered around 65,000 Navy, Army and Marines personnel, with the major facility being the Dutch Harbor Naval Base on Amaknak Island.

In 1947, the Dutch Harbor Naval Base was deemed to no longer be of military value and was abandoned. Unalaska's civilian population had begun returning in 1944, but in reduced numbers so that by 1950, the community's population had dwindled to 173 persons. This decline of almost 42 percent scarcely reflected the dramatic events which had taken place during the 10 year period.

Unalaska's population gradually increased between 1950 and 1960 but, according to U.S. Census figures, the community did not regain its pre-World War II population until the 1970's. Nevertheless, the establishment of the town's modern economic base, the commercial fishing and fish processing industry, began during the 1960's. The first plant here began operating in 1962. By 1967, the number of processing plants had increased to five and, by 1980, to fifteen.

The growth in industry which began in the 1960's was reflected in a dramatic 623.6 percent increase in Unalaska's population between 1970 and 1980. A census conducted by Tryck, Nyman and Hayes for the City of Unalaska in September/October 1977 counted a total of 615 residents and 1,256 transients in the community. An interpretation of preliminary

1980 Census figures indicates a continued growth in resident population as, of a total population of 1,288 persons, 1,051 were living in housing units. Had the 1980 Census been taken during the peak crab fishing/processing period as the 1977 local census was, the community's population would doubtless have been much higher since the 1980 Census counted only 237 persons living in group quarters whereas the various fish processors currently have a combined total of 1,582 units in group quarters which are fully utilized during the peak season.

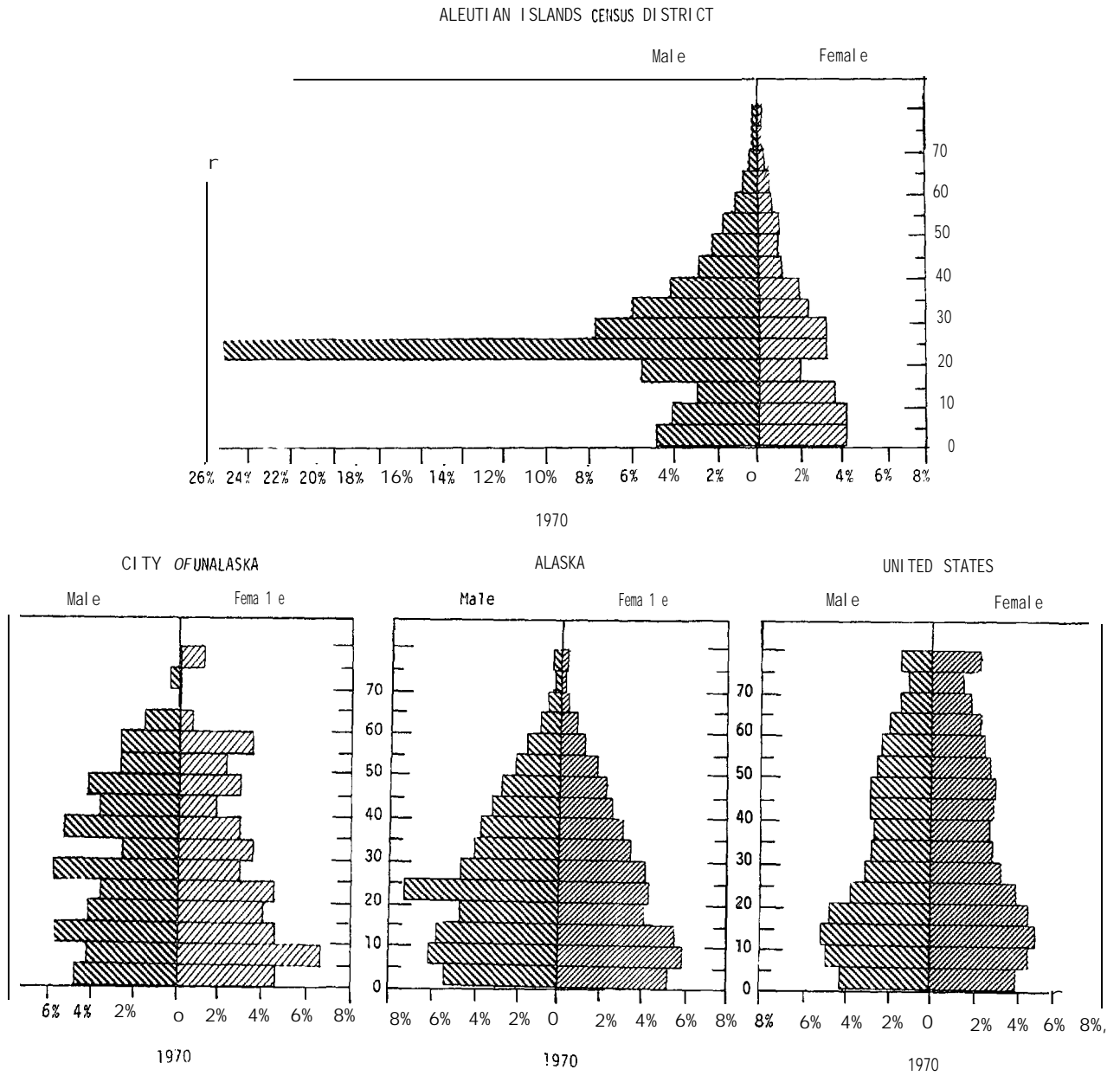
Population Composition

Population composition data for Unalaska derived from the 1970 Census (see Table 2 and Figure 1) indicate that Unalaska's population was then predominantly Alaska Native (63.5 percent) and that its male population was relatively mature (with a median age for males of 29.1 compared with 23.2 Statewide). Males outnumbered females both in Unalaska and the State as a whole, with Unalaska's ratio of 55 percent males to 45 percent females being only slightly more extreme than the State's 54 to 46 percent ratio. Yet, despite differences in race characteristics and median age, the composition of Unalaska's population in 1970 more closely resembled State norms than it did the Aleutian Islands census division where the proportion of young adult males was greatly distorted by a sizable military presence elsewhere in the region.

Although no 1980 Census figures pertaining to age, sex and race are yet available, there is ample evidence that the composition of Unalaska's

FIGURE 1

COMPOSITION OF POPULATION



Source: U. S. Census Bureau, 1970

TABLE 2
 COMPOSITION OF POPULATION BY RACE AND SEX
 UNALASKA, ALASKA
 1970

<u>Race</u>	<u>Sex</u>			<u>Percent of Total</u>
	Mal e	Femal e	Total	
Whi te	34	22	56	31.4
Negro	0	0	0	0.0
I ndi an	0	1	1	0.6
Al eut	55	52	107	60.1
Eski mo	1	4	5	2.8
Other	8	1	9	5.1
<u>TOTAL</u>	<u>98</u>	<u>80</u>	178	<u>100.0</u>

Source: University of Alaska, Institute of Social, Economic and Government Research. September 1973. Age and Race by Sex Characteristics of Alaska's Village Population. College. (Alaska Review of Business and Economic Conditions. Vol. X, No. 2.)

population today bears little resemblance to that reported for the community in 1970. Major changes include a loss of dominance of the Alaska Native component of Unalaska's population, an increase in the proportion of young adults and the introduction of a large non-resident population.

In a 1977 report prepared for the Aleutian-Pribilof Islands Association Health Department, Don Bantz & Associates estimated that Alaska Natives (primarily Aleuts) in Unalaska numbered 168 out of a total resident community population of 725. This estimate indicates a healthy 48.7 percent increase in Unalaska's Alaska Native population between 1970 and 1977. However, it also represents a decline in the Alaska Native component of the community's resident population from 63.5 percent in 1970 to 23.2 percent in 1977. If transient fishing and fish processing populations are included, the Alaska Native component of the population is further diminished. It is assumed that this trend has continued through 1980.

A local census conducted in September/October 1977 for the City of Unalaska by Tryck, Nyman and Hayes indicated a significant increase in the proportion of young males of working age residing in the community. In 1970, males aged between 25 and 34 accounted for 9 percent of Unalaska's total population, compared with 17.4 percent in 1977. It is assumed that growth in this age group is derived primarily from immigration in response to job opportunities. If transient populations were counted, this age group would doubtless be even more heavily represented.

Reflecting **the** increase in **the** proportion of **young males**, Unalaska's male to female ratio in **1977 (59 to 41 percent)** was more extreme than it had been in **1970**. If transient populations were included, **the** current **male to female** ratio at Unalaska would probably be similar to that recorded for the **Aleutian** Islands census division in 1970 since **72** percent of the community's non-resident population in **1977** was found by **Tryck, Nyman** and Hayes **to be** male.

The **racial** composition of Unalaska's transient population is **also** distinctive. In 1977, **Tryck, Nyman** and Hayes found that 38 percent of all non-residents in the **community** were classed as "Other", mainly Filipinos and "other" Asians". It is believed that the Asian component of the seafood processing **workforce** in Unalaska is even **larger** now than it was in **1977**. On the other **hand**, **Alaska** Natives accounted for **less** than 5 percent of Unalaska's non-resident population in 1977, with **Aleuts** making up less than 1 percent.

Growth Prospects

The probability of continued rapid growth in Unalaska's economy is very strong, with major contributing factors likely **to be** the large **scale** **entry into** groundfish exploitation in the Bering Sea/Aleutians region **by** U.S. fishermen; an expansion of the community's **role** as a transshipment point for vessels traveling between the West Coast and the Orient and for oil and freight services destined for more northerly **Alaska** coastal points; plus outer continental shelf **oil** and gas exploration (**and**,

possibly, development) activities resulting from sales scheduled in areas between the Aleutians and the Chukchi Sea. The investment plans and policies of the Unalashka Corporation, the village corporation established under the terms of the Alaska Native Claims Settlement Act, will also be a significant force in Unalaska's future growth since this group is the major land owner in a community which already has a severe shortage of available developable industrial and residential land.

Present fisheries activity in Unalaska centers around the exploitation and processing of king and tanner crab, plus comparatively minor amounts of salmon, halibut, Dungeness and Korean hair crab, shrimp and groundfish. Employment in seafood processing at Unalaska has grown dramatically over the past ten years as a result of a westward movement of shellfish exploitation by U.S. fishermen, with Unalaska being the farthest west Alaska location for the establishment of shore-based plants.

Continued growth in Unalaska's fishing and fish processing industry is anticipated. While some of this growth will probably come from expansion within traditional shellfish fisheries and increased utilization of salmon, a new commercial fishery in this area, the greatest potential for major increases in employment and population is associated with the domestic exploitation of the region's very sizable groundfish resources. Some effort toward establishing a bottomfish industry at Unalaska has already been made. However, regardless of the level of success of initial efforts, groundfish remain a major fisheries resource which has generally been ignored by American fishermen in favor of higher unit

value species such as salmon and crab. Since the establishment of a 200 mile offshore territorial limit, American fishermen and processors have become increasingly interested in exploiting these groundfish resources. It is generally agreed that Kodiak and Unalaska are the most logical locations for the establishment of a major shore-based groundfish operation.

While fisheries development is anticipated to remain the primary source of future growth in employment and population at Unalaska, expansion of the community's role as a transshipment point is also anticipated during the next twenty years. Unalaska's location convenient to Great Circle shipping routes between the West Coast and the Orient make it a logical "pick-up" point for fisheries products destined for the Orient. This activity should undergo a commensurate increase following a successful entry into large scale groundfish processing. Industrial development along the western and northern coasts of Alaska could also result in increased shipping activity through Unalaska, particularly for petroleum products but possibly also for general freight.

Finally, Unalaska's strategic location in relation to outer continental shelf oil and gas lease sales scheduled to be held in the Chukchi Sea, Norton Sound, Navarin Basin, St. George Basin and North Alutian Shelf regions during the next five years make increased use of the community's harbor facilities likely, at least during the exploration phase. Additional roles which Unalaska might play in such activities would vary according to its convenience to a given sale area. Potential conflicts

between oil and gas development and commercial fishing and fish processing activities may make Unalaska's involvement in the former industry locally undesirable. Nevertheless, such activities do hold a potential for increased employment and population at Unalaska during the next twenty years should oil and/or gas be discovered in commercially viable quantities.

Aside from new economic growth, Unalaska is likely to derive a major amount of growth in employment and population as a share of the community's presently transient workforce becomes permanent local residents. Such an eventuality is likely to be speeded if Unalaska's fishing and fish industry becomes more of a year-round operation. While continued rapid growth in basic industry will ensure a continued lag in the growth of secondary employment, the addition of a group of residents who are no longer directly housed, fed and clothed by seafood processing companies should result in a major increase in demand for local goods and services and, thus, growth in trade and service employment and in local government.

ECONOMY

Unalaska's economy is very heavily dominated by the fishing and fish processing industry. The only other source of economic strength of any significance is related to Unalaska's long standing function as a transshipment point for oil and freight to northern Alaska coastal points and for the transfer of fish products to vessels traveling between the West Coast and the Orient. These activities are called "basic" or exogenous as they are export industries whose fortunes are determined by

forces outside the local area and are the foundation upon which "secondary" or endogenous industries, those whose fortunes are determined by local forces, rest. Thus, gains in basic industry are essential for long term community growth.

Composition of Employment

A review of employment in Unalaska was undertaken by Alaska Consultants, Inc. in August 1980. This was deemed to be necessary since although Unalaska is the largest non-military settlement in the Aleutians region, there are strong differences between the composition of employment in this community and that of the region as a whole. Thus, each employer in Unalaska was contacted to obtain average annual full-time employment information for each business establishment in 1980. The results were then categorized by Standard Industrial Classification (SIC) code and tabulated.

Employment in Unalaska's major basic economic activity, fishing and fish processing, is highly seasonal and transient. As a result, most people who work in these industries live in or work out of Unalaska for only part of the year or, in some cases, persons who live in town year-round engage in different occupations during the off-season. To minimize duplication and to reduce the distortion in total employment caused by transient workers, Alaska Consultants, Inc. attempted to estimate average annual full-time employment in all sectors of the community's economy. Except for fishermen, this was done by asking each employer to indicate

if, when and how many seasonal personnel were added to "normal" employee levels.

In the case of fishermen, City officials provided information as to the number of crab fishermen registered out of Unalaska. By multiplying this number by the average number of persons per vessel to find the total number of fishermen and then converting the number of months fished to a year-round basis, the annual average number of crab fishermen was estimated. This figure was then adjusted upwards slightly to account for persons active in other fisheries, primarily salmon, halibut and groundfish.

Overall, basic employment was estimated to account for 90 percent of the average annual full-time employment in Unalaska in 1980. The community's resulting basic to secondary employment ratio of 1.0:0.1 is probably the most extreme in Alaska, excluding special industrial enclaves such as Prudhoe Bay. Except for Anchorage and possibly Fairbanks, Alaska communities normally have small secondary employment sectors. This is especially true of towns with economies heavily dependent on fishing and fish processing, e.g., Cordova was found to have a basic to secondary employment ratio of 1.0:0.5 in 1978. However, Unalaska represents an extreme case. This is even more apparent when compared with national norms which are generally in the neighborhood of 1.0:1.5.

When converted to an average annual full-time basis, Unalaska was found to have a total of 1,600 jobs in 1980 (see Table 3). Over 80 percent of

TABLE 3
 AVERAGE ANNUAL FULL-TIME EMPLOYMENT a/
 CITY OF UNALASKA
 1980

Classification	<u>Number</u>	<u>%</u>	<u>% Basic</u>	<u>Basic Number</u>	<u>Secondary Number</u>
Agriculture, Forestry and Fishing	150	9.4	100	150	0
Mining	2	0.1	100	2	0
Contract Construction	12	0.8	42	5	7
Manufacturing	1,166	72.9	100	1,166	0
Transportation, Communication & Public Utilities	57	3.6	60	34	23
Trade	60	3.8	60	32	28
Finance, Insurance & Real Estate	27	1.7	74	20	7
Service	44	2.8	61	27	17
Government	82	5.1	7	6	76
Federal	(9)	(0.6)	(44)	(4)	(5)
State	(10)	(0.6)	(20)	(2)	(8)
Local	(64)	(4.0)	(0)	(0)	(64)
<u>TOTAL</u>	<u>1,600</u>	<u>100.0</u>	<u>90</u>	<u>1,442</u>	158

a/ Includes self-employed persons and military personnel.

Source: Alaska Consultants, Inc. August 1980.

these jobs were directly associated with fishing (agriculture, forestry and fishing) and fish processing (manufacturing). All employment in these two categories is considered basic since virtually no fish is produced for local consumption. Almost all of the employees in these two categories are transient.

After manufacturing and fishing, the largest employment sectors in Unalaska in 1980 were found to be government, trade, transportation, communication and public utilities, and services. However, unlike manufacturing and fishing, almost all government employment was found to be secondary. In fact, the only government employees judged to be basic were those employed by the U.S. Customs and Coast Guard and a portion of those employed by the Alaska Department of Fish and Game. By far the largest group of government employees in Unalaska were in local government, all of whom were determined to be secondary.

Unlike government, approximately 60 percent of employment in the trade and service sectors was judged as basic, primarily enterprises deriving a large share of their business from serving the needs of the fishing and fish processing industry. A similarly large share of employment in the transportation, communication and public utilities sector was also determined to be basic. In part, basic employment in this sector derived directly from fishing and fish processing, but a significant number of basic jobs in this sector were also related to Unalaska's function as a "pick-up" point for fish products by vessels traveling between the West Coast and the Orient.

A total of 27 full-time jobs was recorded in the finance, insurance and real estate sector. All basic employment in this sector was associated with the operations of the Ounalashka Corporation, the Unalaska village corporation established and funded under the terms of the Alaska Native Claims Settlement Act.

The remaining two employment sectors accounted for a total of only 14 jobs. The basic component of the contract construction sector was all fishing and fish processing-related, while the very limited employment in mining was associated with offshore seismic work and was therefore considered to be basic.

Unemployment and Seasonality of Employment

Like most other Alaska communities with economies heavily based in fishing and fish processing, employment in Unalaska shows a high degree of seasonal variation. Information provided by the Research and Analysis Section of the Alaska Department of Labor specifically for Unalaska indicates that insured employment here ranged between 137 percent (October) and 54.7 percent (January) of the annual average in 1979 (see Table 4). Had total nonagricultural wage and salary employment data been available, the range between the high and low months would doubtless have been even greater since insured employment figures exclude most fishermen.

TABLE 4

INSURED EMPLOYMENT BY MONTH ^{a/}
CITY OF UNALASKA
1979

Employment Sector	Month												Annual Average
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Ott	Nov	Dec	
Agriculture, Forestry and Fisheries	<u>*/</u>	<u>*/</u>	<u>*/</u>	0	0	0	0	0	0	0	0	0	<u>*/</u>
Mining	0	0	0	0	0	0	0	0	0	0	0	0	0
Contract Construction	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>
Manufacturing	393	547	801	881	1,169	1,161	767	664	1,153	1,197	1,003	482	852
Transportation, Communication and Public Utilities	8	8	9	12	14	13	19	26	21	29	29	30	18
Trade	39	35	38	36	38	37	33	38	43	60	49	50	41
Finance, Insurance and Real Estate	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>	<u>*/</u>
Service	25	24	29	32	37	34	30	27	24	24	24	26	28
Government'	91	87	88	79	81	52	51	60	88	90	91	94	79
Federal	(24)	(23)	(23)	(20)	(21)	(20)	(20)	(21)	(21)	(19)	(19)	(20)	(21)
State	(1)	(1)	(1)	(1)	(1)	(1)	(0)	(0)	(1)	(1)	(2)	(2)	(1)
Local	(66)	(63)	(64)	(58)	(59)	(31)	(31)	(39)	(66)	(70)	(70)	(72)	(57)
<u>TOTAL</u>	570	719	986	<u>1,066</u>	<u>1,368</u>	<u>1,328</u>	922	<u>841</u>	<u>1,357</u>	1,429	1,224	710	<u>1,043</u>

*/ Employment figures withheld to comply with disclosure regulations.

a/ Insured employment excludes all self-employed persons and most fishermen.

Source: Alaska Department of Labor, Employment Security Division, Research and Analysis Section. Personal communication

The degree of seasonality of employment in Unalaska is derived almost entirely from the seasonal variations in fishing and fish processing activities. In turn, these variations are reflected in other sectors where a significant proportion of employment is related to serving the needs of the community's primary industry. The only other significant factor contributing to seasonality of employment in Unalaska occurs in the government sector where closure of school during the summer months results in a temporary drop in local government employment.

There are no unemployment statistics available specifically for Unalaska. Unemployment rates for the Aleutian region as a whole are normally low, due in part to the presence of a large transient workforce, all of which is employed, associated not only with fishing and fish processing but also with military-related construction activities. A similar situation is believed to prevail in Unalaska. According to local officials, unemployment is insignificant among the resident workforce. Almost all jobs in the local processing plants are recruited from outside the Unalaska area and this transient workforce leaves the community after the close of each fishing season. Similarly, most fishermen are not permanent Unalaska residents. Thus, while there is doubtless some seasonal unemployment, it is not as great as the community's overall seasonality of employment might suggest.

Recent Trends and Changes

Trends in employment for the Aleutian Islands division are not necessarily related to those which have taken place in **Unalaska**. Although manufacturing is the major employment sector region-wide, the division also includes other major fish processing centers such as Akutan, King Cove and Sand Point. In addition, the region as a whole has large federal government and contract construction sectors which are unrelated to economic activities at **Unalaska**. Thus, in order to show trends and changes in **Unalaska's** employment, insured employment statistics specifically for this community were obtained from the Research and Analysis Section of the Alaska Department of Labor for each year since 1970.

Between 1970 and 1979, total insured employment in **Unalaska** increased by a startling 741.1 percent (see Table 5), a rate even higher than the 623.6 percent increase in population recorded for **Unalaska** by the U.S. Census between 1970 and 1980. Most of this growth took place in the manufacturing sector, i.e. fish processing, where employment rose **346.1** percent between 1971 and 1979 (and by an even larger 384.3 percent between 1971 and 1978). The government sector also recorded a major increase during the 1970 to 1979 period although the extent of this increase is exaggerated by the fact that most employment in this sector was excluded from insured employment statistics in 1970.

TABLE 5
INSURED EMPLOYMENT DISTRIBUTION
CITY OF UNALASKA a/
1970 - 1979

Employment Sector	1970			1971			1972			1973			1974		
	Number	%	% Change	Number	%	% Change	Number	%	% Change	Number	%	% Change	Number	%	% Change
Agriculture, Forestry and Fisheries	0			0			*			*			*		
Mining	0			0			0			0			0		
Contract Construction	0			0			0			0			0		
Manufacturing	*			191	88.8		241	88.0	26.2	*			227	75.5	
Transportation, Communications and Public Utilities	*			*			*			*			*		
Retail Trade	14	11.2		15	7.0	7.1	*			15	6.1		18	4.9	20.0
Finance, Insurance and Real Estate	*			*			0			0			*		
Service	*			0			0			*			*		
Government b/	5	4.0		8	3.7	60.0	16	5.8	100.0	30	12.2	87.5	48	13.1	60.0
Federal	(2)	(1.6)		(2)	(0.9)	(0.0)	(4)	(1.5)	(100.0)	(14)	(5.7)	(250.0)	(14)	(3.8)	(3.0)
State	(3)	(2.4)		(6)	(2.8)	(100.0)	(12)	(4.4)	(100.0)	(16)	(6.5)	(33.3)	(34)	(9.3)	(112.5)
Local															
TOTAL	124	100.0		215	100.0	73.4	274	100.0	27.4	245	100.0	-10.6	267	100.0	49.8

Employment figures withheld to comply with disclosure regulations.

Insured employment excludes all self-employed persons, most fishermen and, prior to 1978, also excluded most State and local government employees, State and local government employment combined through 1974.

Source: Alaska Department of Labor, Employment Security Division, Research and Analysis Section. 1980. Personal communication.

1975			1976			1977			1978			1979			1970 - 1979
Number	% Change		Number	% Change		Number	% Change		Number	% Change		Number	% Change		% Change
*/			16	2.5		*/			*/			*/			
0			0			0			0			0			
0			0			*/			*/			*/			
40	74.9	22.7	501	79.3	47.4	678	84.2	35.3	925	87.1	36.4	852	81.7	- 7.9	
*/			*/			*/			*/			18			
20	4.4	11.1	24	3.8	20.0	*/			34	3.2		41	3.9	20.6	192.9
*/			*/			*/			*/			*/			
*/			*/			14	1.7		22	2.1	57.1	28	2.7	27.3	
56	12.3	16.7	56	8.9	0.0	70	8.7	25.0	83	7.8	18.6	79	7.6	- 4.8	1,480.0
13)	{ 2.9	(-7.1)	(18)	(2.8)	(38.5)	(19)	2.4	{ 5.6	(24)	(2.3)	(26.3)	21)	(2.0)	(-12.5)	(950.0)
0)	{ 0.0		{ 0	{ 0.0		{ 2	0.2	{ 200.0	{ 2	{ 0.2	{ 0.0	1)	{ 0.1	{ -50.0	
42)	{ 9.3		(38)	(6.0)	(-9.5)	(49)	6.1	{ 28.9	(57)	(5.4)	(16.3)	(57)	(5.5)	{ 0.0	
54	100.0	237	632	100.0	392	805	100.0	27.4	1,062	100.0	31.9	1,043	100.0	-1.8	741.1

Although not indicated by insured employment data, significant growth in Unalaska's finance, insurance and real estate sector also occurred between 1970 and 1979 due to passage of the Alaska Native Claims Settlement Act in 1971 and the subsequent formation and funding of the Unalashka Corporation. In addition, growth in the support sectors, most notably trade and services, has taken place. However, the relative importance of these sectors as a proportion of total insured employment has declined.

In summary, major growth in basic industry, fishing and fish processing, has taken place at Unalaska over the past ten years. This growth has not yet been accompanied by a commensurate growth in secondary employment. When growth in basic industry occurs, there is normally a lag in growth in secondary industry. However, it is extreme in Unalaska's case, due in part to the fact that much of the employment growth is currently being met through the use of a transient labor force which lives in group quarters, makes few local purchases and which leaves the community after the close of each fishing season.

Occupational Skills

There are no available data documenting the skills of Unalaska's workforce. The Aleutian-Pribilof Island Association was unable to provide any information in this regard and, although the Alaska Department of Labor recently opened an office in Unalaska, it does not yet have information available as to the skills of persons seeking employment.

In the absence of any hard data and recognizing that essentially all adults in Unalaska who seek work are employed, it is assumed that local residents possess skills in fishing and fish processing, plus the normal range of Clerical, service and other skills demanded to qualify for jobs currently available in the community. The importation of large amounts of transient labor into Unalaska is less related to any local absence of particular skills than it is to the absence of sufficient numbers of people to fill available jobs.

Income Levels

There are no overall income data available specifically for Unalaska. Figures from the 1970 Census indicated that median family income in the Aleutians census division in 1969 (\$8,553) was significantly below the Statewide median at that time (\$12,443). Although 1969 income figures are almost meaningless today except in comparative terms, there is evidence which suggests that income levels among at least some segments of Unalaska's population remain at a level below Statewide averages.

According to Alaska Department of Labor statistics published in the Statistical Quarterly, average monthly wages in the Aleutian Islands division in 1979 (\$1,411) were well below those for the State as a whole (\$1,741). An examination of average monthly wages by industry sector for the Aleutian Islands division between 1977 and 1979 (see Table 6) indicates that, except for contract construction which is not a significant element in Unalaska's economy, the highest average monthly wage rates

TABLE 6
 AVERAGE MONTHLY WAGE BY INDUSTRY SECTOR
 ALUTIAN ISLANDS DIVISION
 1977 - 1979

	1977				1978				1979			
	1st Qr	2nd Qr	3rd Qr	4th Qr	1st Qr	2nd Qr	3rd Qr	4th Qr	1st Qr	2nd Qr	3rd Qr	4th Qr
TOTAL NONAGRICULTURAL INDUSTRIES	\$1,264	\$1,239	\$1,505	\$1,212	\$1,050	\$1,162	\$1,516	\$1,543	\$1,139	\$1,351	\$1,507	\$1,556
Mining	0	0	* /	* /	* /	* /	* /	* /	* /	* /	* /	* /
Construction	\$4,557	\$3,783	\$4,209	\$3,376	\$2,597	\$3,087	\$4,991	\$5,799	\$4,037	\$3,994	\$4,227	\$3,824
Manufacturing	\$1,095	\$1,169	\$,566	\$1,76	\$1,061	\$1,075	\$1,552	\$1,30	\$954	\$,199	\$1,543	\$1,709
Transportation, Communication & Public Utilities	\$1,057	\$1,114	\$1,782	\$1,58	\$969	\$1,061	\$962	\$,866	\$1,121	\$,514	\$,182	\$,43
Wholesale Trade	* /	* /	* /	* /	* /	\$,433	*	* /	* /	* /	* /	* /
Retail Trade	\$1,016	\$1,328	\$,315	\$1,18	\$795	\$1,519	\$998	\$1,15	\$,282	\$,94	\$,43	\$,405
Finance, Insurance & Real Estate	* /	\$748	\$775	\$902	* /	\$741	\$805	\$967	\$1,035	\$1,151	\$1,013	\$1,117
Services	\$668	\$687	\$54	\$62	\$84	\$906	\$692	\$729	\$688	\$769	\$779	\$787
Federal Government	\$958	\$886	\$921	\$1,055	\$949	\$971	\$983	\$2,085	\$,2	\$,29	\$,175	\$76
State and Local Government	\$1,006	\$97	\$,108	\$1,218	\$1,078	\$1,278	\$1,095	\$1,209	\$,243	\$,614	\$,521	\$,401
Miscellaneous & Nonclassifiable	\$2,424	* /	* /	* /	* /	* /	* /	* /	* /	* /	* /	* /

* / Figures withheld to comply with disclosure regulations

Source: Alaska Department of Labor, Employment Security Division, 1977-1979, Statistical Quarterly, Juneau

have consistently been recorded in the manufacturing (i.e. seafood processing) sector here over the **past** three years. (It should be remembered that nonagricultural industries exclude fishermen who **could** be expected to have higher incomes).

The average monthly wage in manufacturing in the Aleutians for the fourth quarter of 1979 (\$1,709), the period when king crab processing is at its peak, was significantly above that recorded in fish and seafood processing for the State as a whole (\$1,314) during the same period. However, this apparent difference is probably related more to longer hours of overtime worked during the peak season in **Unalaska** than to higher wage rates. In fact, the Alaska Department of Community and Regional Affairs (November 1979) reported that wages for fish processing employees in **Unalaska** were well below State averages, with entry level base pay ranging between \$3.50 and \$4.00 per hour in early 1979. Average monthly wage rates in all other employment sectors except for retail trade were below those recorded for the State as a whole during the fourth quarter of 1979.

SECTOR ANALYSIS

Fishing and Fish Processing

Unalaska is the primary port for the Aleutian Islands-Bering Sea management area, an area which includes Aleutian Islands waters west of Scotch Cap on **Unimak** Island and **all** waters of the Bering and **Chukchi** Seas to the

east of the U.S./Russian Convention Line of 1867. Within this area are active shellfish fisheries for king crab, tanner crab and shrimp plus an occasional fishery for Dungeness crab; a halibut fishery; an active foreign and a developing domestic groundfish fishery; and a number of salmon fisheries, including a small fishery centered around Unalaska.

In 1979, Unalaska was the leading U.S. port in terms of value of fish landed, although it ranked tenth in the nation in quantity of landings (136.8 million pounds), second in Alaska only to Kodiak (150.5 million pounds). King crab and tanner crab are currently by far the most important species landed and processed at Unalaska, although groundfish exploitation by U.S. fishermen promises to have a major impact on the community's fishing and fish processing industry in the future.

King Crab. The Aleutian Islands-Bering Sea management area is divided into three king crab statistical areas -- the Bering Sea, Dutch Harbor and Adak areas. Red king crab are the primary target species throughout the Bering Sea and the Aleutians, blue king crab are subject to a specific fishery in the Bering Sea, and brown king crab are taken incidentally to red king crab in the Adak/Western Aleutians area.

Commercial king crab fishing in the Bering Sea was begun by the Japanese in 1930. Although the Japanese left the fishery in 1940, they returned in 1953 and remained in the area until 1974 when both Japan and Russia were barred from fishing for king crab in Alaska waters. A Russian king crab fleet operated in the eastern Bering Sea between 1959 and 1971.

American fishermen first entered the Bering Sea king crab fishery with trawl gear in 1949. However, effort and catch levels declined during the 1950's and there was no domestic catch in 1959. A period of fluctuating, low catches followed through 1966 before the fishery expanded to its present full scale level (see Table 7).

The Bering Sea fishery had traditionally taken red king crab from Bering Sea and Bristol Bay waters north of Unimak Island and the Alaska Peninsula from Cape Sarichef to Port Heiden. However, in 1973, a fishery began for blue king crab in the Pribilof Islands, and in 1977 fisheries began for red king crab in Norton Sound and blue king crab near St. Matthew and St. Lawrence Islands.

According to Alaska Department of Fish and Game statistics, a total of 117,058,976 pounds of king crab was taken from the Bering Sea during the 1979-80 season. This catch was processed by 17 plants in Unalaska, 7 in Akutan, 9 at miscellaneous other locations, and by 10 catcher/processors.

The history of the king crab fishery in the Dutch Harbor area is unlike that of the Bering Sea. A domestic king crab fishery began here during 1961, was fully developed by the 1966-67 season and subsequently declined until 1969/70. Catch and effort were stabilized during the early 1970's after the introduction of quotas. Beginning in 1973/74, the fishery sustained increasing harvests until peaking at close to 16 million pounds in 1975/76. Catches then declined to a low of 3.7 million pounds

TABLE 7
 KING CRAB CATCH
 - BERING SEA MANAGEMENT AREA
 1960/61 - 1979/80
 (pounds)

Season	Aleutian Islands		Adak		Bering Sea <u>a/</u>	Total	Bering Sea Foreign Catch
	Western	Eastern	Adak	Catch			
1960/61	-0-	-0-	2,093,756	600,000	2,793,756	25,898,000	
1961/62	1,550,924	-0-	4,776,095	427,000	7,547,199	44,592,000	
1962/63	1,543,052	-0-	8,006,054	68,000	9,617,556	54,275,000	
1963/64	3,893,819	-0-	17,903,720	653,000	22,450,539	54,963,000	
1964/65	4,754,805	-0-	21,193,837	823,000	36,771,642	58,170,000	
1965/66	7,905,628	-0-	8,040,389	1,429,000	17,375,017	41,240,000	
1966/67	26,450,069	-0-	5,883,160	876,000	33,209,229	42,326,000	
1967/68	22,794,108	800,000	16,148,914	2,493,000	42,436,022	33,636,000	
1968/69	11,013,071	1,900,000	17,974,793	7,975,000	38,862,864	27,439,000	
1969/70	8,784,997	1,600,000	17,455,337	10,302,000	38,142,334	14,363,000	
1970/71	9,651,503	500,000	16,057,021	9,105,000	35,313,524	12,984,000	
1971/72	9,414,504	-0-	15,475,924	12,946,000	37,836,428	6,134,000	
1972/73	10,520,192	711,097	18,035,062	21,745,000	51,011,351	4,757,000	
1973/74	12,774,696	722,338	9,038,725	28,190,000	50,725,759	228,000	
1974/75	13,991,129	254,570	2,500,000	49,373,000	66,118,699	-0-	
1975/76	15,906,666	114,042	300,000	52,120,000	68,440,708	-0-	
1976/77	10,198,423	-0-	-0-	69,534,285	79,732,709	-0-	
1977/78	3,684,417	-0-	952,953	76,737,124	81,374,494	-0-	
1978/79	6,842,793	-0-	808,365	99,664,825	107,315,983	-0-	
1979/80	14,979,932	-0-	300,757	17,058,976	132,339,665	-0-	
Average	10,897,677	825,255	8,628,700	28,060,000	47,936,505	30,152,780	

a/ Includes both red and blue king crab.
 b/ Adak and Western Aleutians combined as one registration area
 c/ Catch through February 10, 1980.
 d/ Season: June - March.

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries, Westward Regional Office, March 1980. Westward Region Shellfish Report to the Alaska Board of Fisheries. Kodiak.

in 1977/78 before again increasing, with close to 15 million pounds caught during the 1979/80 season.

According to the Alaska Department of Fish and Game, the 1979/80 Dutch Harbor king crab catch was processed by 16 plants at Unalaska, 6 at Akutan, one each at Beaver Inlet (Unalaska Island), King Cove and Sand Point, and one catcher/processor. Fishermen were paid only .86¢ per pound for most Dutch Harbor king crab caught although the price started at \$1.01 per pound at the beginning of the season. The estimated ex-vessel value to the fishermen was \$12.9 million.

Adak is the smallest of the three king crab fisheries in the Aleutian Islands-Bering Sea management area. This fishery began in January 1961 and increased effort quickly raised production to a record high of 21.2 million pounds in 1964/65. Thereafter, production fell off sharply, due largely to development and expansion of the Unalaska king crab fishery. The "low" catch of 5.9 million pounds in 1966/67 was followed by six years stable production of between 14 and 18 million pounds per season. Since 1972/73, however, catches of red king crab have again fallen off sharply, with catches registering under 1 million pounds per season since 1974/75.

According to the Alaska Department of Fish and Game, fishing in the entire Adak area continued poor during the 1979/80 season due to a low abundance of king crab stocks. Crab taken from the Adak area was processed at Unalaska, Akutan and Beaver Inlet and on the grounds by two catcher/processors.

While the 1979/80 king crab season saw generally good catches except in the Adak area and in the Northern district of the Bering Sea, the return to fishermen was not as good due to increased number of vessels, lower prices and an early closure in the Bering Sea. The Southeastern district of the Bering Sea area was open a mere 30 days (with only 26 days of actual fishing time) and was fished by a peak number of 236 vessels, an increase of 31 percent over 1978/79. Thirty-four vessels fished the Northern district, including several fishing the St. Matthew and St. Lawrence Island blue crab stocks. Because of low crab abundance, fishing in the entire Northern district was closed by emergency order on August 24. A total of 104 vessels participated in the Dutch Harbor king crab fishery, a record which the Alaska Department of Fish and Game attributes to the short four week season for Bering Sea red king crab and poor catches of blue king crab in the Pribilofs. A total of 24 vessels registered to fish in the Adak area.

The importance of the king crab fishery to Unalaska's economy is indicated by relating total and per processor gross income for king crab to that for all fish products in the Dutch Harbor area (see Table 8). While king crab has probably decreased since 1977 as a proportion of the total value of fish products at Unalaska, it nevertheless remains the foundation upon which the community's fishing and fish processing industry rests.

Tanner crab. The Aleutian Islands-Bering Sea management area is divided into three tanner crab districts which are, in order of importance, the Bering Sea, Eastern Aleutians and Western Aleutians districts. Two

TABLE 8

KING CRAB PRODUCTION VALUES
KODIAK, ALASKA PENINSULA AND DUTCH HARBOR MANAGEMENT AREAS
1977
(\$000's)

<u>Management Area</u>	<u>Number of Processors</u>	<u>Total Gross Income</u>		<u>Average Gross Income Per Processor</u>		<u>King Crab a/ Percent of Area's Processing Value</u>
		<u>King Crab</u>	<u>All Fish</u>	<u>King Crab</u>	<u>All Fish</u>	
Kodi ak	18	\$ 38,174	\$91,265	\$ 2,121	\$ 5,070	42
Alaska Peni nsul a	4	\$ 13,932	\$31,052	\$ 3,483	\$ 7,763	45
Dutch Harbor <u>b/</u>	25	\$109,684	\$126,156	\$ 4,387	\$ 5,046	87
<u>TOTAL</u>	<u>47</u>	<u>\$161,790</u>	<u>\$248,473</u>	<u>\$ 3,442</u>	<u>\$ 5,287</u>	<u>65</u>

- a/ King crab percentage of the total and average value from **all** species and products produced by area processors.
- b/ Dutch Harbor includes **Akutan** as well as **Unalaska**, plus the addition of one processor **which** worked the Bering Sea and Adak areas.

Source: Commercial Fisheries Entry Commission. (Reported in) North Pacific Fishery Management Council. September 15, 1980. Western Alaska King Crab, Draft Fishery Management Plan. Anchorage.

tanner crab species, *opilio* and the more valuable *bairdi*, are harvested in the Bering Sea. *Opilio* are not present in commercial quantities in the Aleutians.

The first reported domestic catches of tanner crab in the Bering Sea district were made in 1968 -incidental to the king crab fishery (see Table 9). In 1974, a directed tanner crab fishery began in the Bering Sea with a target species of *bairdi*. Effort has since expanded rapidly, with most vessels in the king crab fleet also participating in the tanner crab fishery.

Aside from the domestic harvest, tanner crab is fished by Japan in the eastern Bering Sea. Russian vessels were also active in this fishery but have not fished for tanner crab here since 1971.

Catches of *bairdi* in the Bering Sea district by the domestic fleet in 1979 were down from the previous year, but the *opilio* catch was up sharply and was primarily responsible for a continued increase in the total tanner crab catch in the Aleutians-Bering Sea management area. Catches in the Eastern and Western Aleutians districts were also behind the 1978 level.

The tanner crab fishery is a very important addition to Unalaska's fishing and fish processing industry as it has extended the operating season for both fishermen and processors. To many fishermen who face both increased competition and shorter operating seasons, the tanner crab fishery is essential for economic survival.

TABLE 9

TANNER CRAB CATCH
ALEUTIANS - BERING SEA MANAGEMENT AREA
1965 - 1979

(pounds)

Year	U. S. Catch				Total	Foreign Catch
	Eastern Aleutians	Western Aleutians	Bering Sea			
			Opilio	Bairdi		
1965	-0-	-0-	-0-	-0-	-0-	3,936,000
1966	-0-	-0-	-0-	-0-	-0-	7,290,000
1967	-0-	-0-	-0-	-0-	-0-	24,000,000
1968	-0-	-0-	-0-	17,900	17,900	30,940,000
1969	-0-	-0-	-0-	1,008,900	1,008,900	47,668,000
1970	-0-	-0-	-0-	1,487,161	1,487,161	47,828,000
1971	-0-	-0-	-0-	166,100	166,100	39,886,000
1972	-0-	-0-	-0-	119,200	119,200	31,186,000
1973	62,128	168,354	-0-	301,348	531,830	27,886,000
1974	498,836	71,887	-0-	5,044,197	5,614,920	27,912,000
1975	77,164	3,350	-0-	7,028,378	7,108,892	18,456,000
1976	534,295	62,180	-0-	22,341,475	22,937,950	19,286,000
1977	1,301,654	-0-	-0-	51,876,235	53,177,889	21,520,173
1978	2,624,016	237,512	1,715,636	66,115,621	70,692,785	33,057,796
1979	1,092,311	197,244	32,187,039	42,518,226	75,994,820	32,914,536
Average	884,343	123,421	16,951,337	16,502,061	19,904,862	27,584,433

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries, Westward Regional Office, March 1980. Westward Region Shellfish Report to the Alaska Board of Fisheries. Kodiak.

Dungeness crab. The Aleutians Dungeness crab district takes in all waters west of Cape Sarichef. The season officially extends from the beginning of May until the end of December but the resource is not actively exploited here and the total district catch in 1979 was only 1,101 pounds which was landed by a single vessel during September and November. Dungeness crab catches in the Aleutians district have fluctuated from a high of 60,000 pounds in 1974 to no catch at all between 1975 and 1977. According to the Alaska Department of Fish and Game, low catch levels are the result of a lack of suitable gear and uncertain market conditions for Dungeness crab rather than a lack of abundance of the resource.

Korean hair crab. The Korean hair crab was fished commercially for the first time in 1979. According to the Alaska Department of Fish and Game, hair crab do not appear to exist in large numbers in any one area and it is likely that this species will continue to be taken incidental to tanner crab rather than supporting an independent fishery. During 1979, 16 vessels delivered a total of 7,093 pounds of hair crab to two Unalaska processors. All landings occurred in April and May.

Shrimp. The Aleutian shrimp district is centered on Unalaska Island and includes the Unalaska Bay, Makushin Bay, Usof Bay and Beaver Inlet sections. The 1979 shrimp catch for the district was 3.3 million pounds, about half the catch of the previous year (see Table 10), due in part to an apparent decline in the resource. A total of 8 vessels fished the district during 1979 although there were never more than 4

TABLE 10
SHRIMP CATCH STATISTICS
ALEUTIANS DISTRICT
1975 - 1979

<u>Year</u>	<u>Catch (pounds)</u>	<u>Number of Vessel s</u>	<u>Number of Landi ngs</u>
1975	893, 567	3	13
1976	3, 670, 609	8	66
1977	4, 599, 858	7	67
1978	6, 661, 510	7	89
1979	3, 281, 469	8	67

Source: Alaska Department of Fish and Game, Division of Commercial Fisheries, Westward Regional Office. March 1980. Westward Region Shellfish Report to the Alaska Board of Fisheries. Kodiak.

vessels active at one time, with deliveries made to a single processor in Unalaska. Shrimp fishing stopped during late September and October as processors geared up for king crab.

Halibut. Halibut is an international fishery with catch levels and the length of the fishing season regulated by the International Pacific Halibut Commission. However, it is a minor fishery in Unalaska, with two of the community's processing firms indicating that they processed small amounts of halibut in 1980. The Bering Sea halibut catch was 658,000 pounds in 1978, down slightly from 681,000 pounds landed in 1977. In the Aleutian region, the 1978 catch was 0.7 million pounds, of which 0.5 million pounds were taken in Area 3C to the west of Unalaska Island. Halibut stocks in this and other areas have been declining since 1960, with a major factor believed to be an increase in both the domestic and foreign trawl fisheries which take halibut as an incidental catch.

Salmon. Although Unalaska and Makushin Bay were sites of salmon canning operations prior to 1920, Unalaska's modern commercial salmon fishery has developed only over the past two years. According to Alaska Department of Fish and Game personnel in Kodiak, the 1979 salmon harvest here was made up of 539,400 pinks, 12,200 reds and 200 chums. In 1980, close to 2.5 million pinks and a "handful" of reds were taken. Of the six processing firms operating in Unalaska in 1980, all but one processed salmon although some obtained their fish from Bristol Bay rather than the local area. In the opinion of several local processors, further expansion into salmon processing at Unalaska appears likely.

Groundfish. The development of a domestic groundfish industry in Alaska is presently in its infancy, with the State's groundfish resources now being largely harvested by foreign fleets operating offshore. However, large scale domestic entry into this industry is likely to take place in the very near future. Given Unalaska's strategic location in relation to the sizable groundfish resources of the Aleutian Islands-Bering Sea region, this is a logical location for the development of a shore-based groundfish industry.

Of the six seafood processing firms currently operating in Unalaska, all but one expressed interest in processing groundfish although opinion was divided on whether such a venture was presently economically justified. Two of these firms currently process minor amounts of cod, with one doing so strictly for bait. The second company indicated plans to build a small pilot plant to process cod and longer term plans for a shore-based operation to process not only cod but also pollock and other groundfish species.

Current estimates place the optimum sustainable yield for groundfish in the Aleutian Islands-Bering Sea region at around 1.6 million metric tons per year and optimum yields for various groundfish species have also been developed (see Table 11). These estimates have been derived from observations of foreign fishing in the region over the past twenty years. When total groundfish production reached close to and above 2 million metric tons, population stresses were observed in a number of species, including pollock, yellowfin sole and Pacific Ocean perch.

PROPOSED 1981 GROUNDFISH HARVEST LEVELS AND ESTIMATED OPTIMUM YIELDS
BERING SEA AND ALEUTIAN ISLANDS AREAS

(metric tons)

Groundfish Species	Fisheries Sub-Area a/	Initial Domestic Annual Harvest	Initial Total Allowable Level of Foreign Fishing	Reserve	Estimated Optimum Yield
Pollock	Bering Sea Aleutian	19,550	930,450	50,000	1,000,000
Yellowfin sole		2,050	109,100	5,850	117,000
Turbot		1,075	84,425	4,500	90,000
Other flatfish c/		1,300	56,650	3,050	61,000
Pacific cod		24,265	31,500	2,935	58,700
Pacific Ocean perch	Bering Sea Aleutian	1,380	1,708	162	3,250
Other rockfish		1,500	5,677	500	7,727
Sablefish	Bering Sea Aleutian	700	2,450	350	3,500
Atka mackerel		100	23,460	1,240	24,800
Squid		50	9,450	500	10,000
Other		2,000	68,537	3,712	74,249
TOTAL		56,100	1,429,802	73,324	1,559,226

a/ Bering Sea (statistical areas I, II and III); Aleutian Islands (statistical area IV).
b/ No reserve considered necessary at this time.
c/ Excludes Pacific halibut.

Source: Draft Environmental Impact Statement for the Groundfish of the Bering Sea and Aleutian Islands Area.
September 1980. North Pacific Fishery Management Council and U.S. Department of Commerce.

However, when catches were lowered and controlled at a level close to 1.6 million metric tons per year, the condition of the entire groundfish resource was observed to either improve or stabilize.

Proposed 1981 groundfish harvest levels indicate the current small scale of the domestic groundfish fishery, since close to 92 percent of the estimated optimum yield is proposed to be made available to foreign fleets in 1981 and almost 5 percent is recommended to be held in reserve, leaving less than 4 percent for domestic harvesting. However, foreign allocations are subject to change, depending on the level of planned domestic effort and, should a large scale entry into groundfish take place, the amount of the resource available for domestic harvesting would increase commensurately.

Transportation

Unalaska has traditionally functioned as a transshipment point for goods destined for more northerly coastal locations, particularly petroleum products. More recently, the community has also developed as a transshipment point for fish products being transported by vessels traveling from the West Coast to the Orient, primarily to Japan. These vessels transport not only locally processed fish but also minor amounts of tuna delivered from the Midway Island grounds.

As the most convenient ice-free port to the Bering Sea and areas further north, Unalaska functions as a transshipment point for fuel products.

Chevron U. S. A., Inc. maintains a tank farm with a holding capacity of 13 million gallons in Unalaska on Amaknak Island. This facility is serviced by tanker between May and September and by barge during the winter months. From Unalaska, fuel is shipped north by barge or it is retained for use by the community and by the Bering Sea and Aleutian Islands area fishing fleets. Increased demands for fuel generated both by scheduled outer continental shelf (OCS) oil and gas lease sales between the Aleutians and the Chukchi Sea and by large scale domestic entry into the groundfish fishery appear likely to result in an expansion of Unalaska's role as a fuel storage and transshipment center during the next few years.

Unalaska's role as a transshipment point for fish products destined for the Orient also appears likely to expand with the development of a major domestic groundfish fishery in this area. As of August 1980, both the American President Lines and Sealand transshipped fish products from Unalaska to the Orient. With large scale entry into groundfishing by domestic fleets, the operations of these or other companies at Unalaska could be expected to undergo a significant increase.

Unalaska's location convenient to Great Circle shipping routes between the West Coast of the United States and the Orient could also result in the community's being used as a "pick-up" point for products other than fish. As noted by the Federal Maritime Commission in 1967:

"Cargo ships traveling from Seattle to Japan often traverse a great circle route through the Aleutian Chain at Unimak Pass. It seems feasible for these liners to call at Dutch Harbor

(only a few hours' diversion from Unimak Pass) to unload containers of freight loaded on the ship at ports on the west coast of the United States and pick up whatever containers originate at points in northwest Alaska for destinations in Japan or other Far East ports. On return voyages the same vessels could discharge containers of Japanese merchandise at Dutch Harbor and pick up containers originating in northwest Alaska for discharge at Seattle and other west coast ports. This ocean service could be supplemented by a barge feeder service operating between Dutch Harbor and ports in northwest Alaska. . ."

Northwest Alaska currently has few exports and federal regulations limit the extent to which Unalaska can function as an international transshipment point. Nevertheless, this community's strategic location in relation to northern and U.S./Orient transportation routes make it a local transshipment point if these conditions change.

Other

Although Unalaska currently has only two significant basic industries - fishing and fish processing and transportation - the community also has a potential for economic growth derived from other sources. These include scheduled outer continental shelf oil and gas sales in areas between the Aleutians and the Chukchi Sea; activities related to large scale domestic entry into groundfish harvesting, such as the establishment of marine repair facilities and expansion of the presence of the Coast Guard to monitor and safeguard fishing activities; and investment plans and land policies of the Unalashka Corporation, the Unalaska village corporation established under terms of the Alaska Native Claims Settlement Act.

Land Use

OVERALL LAND USE PATTERNS

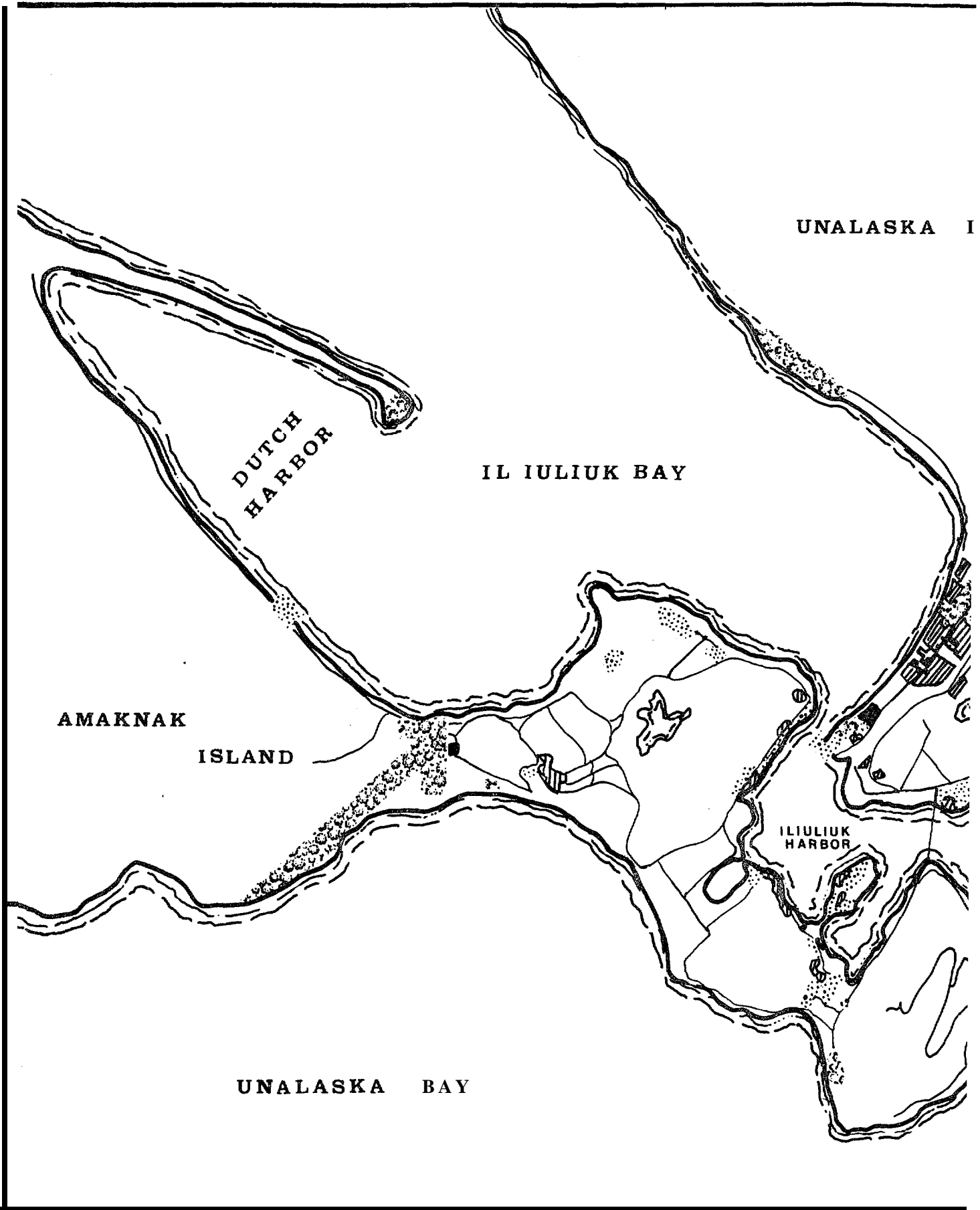
The City of Unalaska includes the traditional Aleut village of Unalaska which is located on Unalaska Island on a narrow spit extending into Iliuliuk Harbor, and the now abandoned Dutch Harbor Naval Base which lies across the Harbor on Amaknak Island. The development history and character of these two settlements is markedly different and the two were even physically separated until early 1980 when a connecting bridge was completed. Other factors which have had a major part in shaping the form of Unalaska's development are relief, the community's location on two islands, and demands of the fishing and fish processing industry for protected waterfront sites.

Until passage of the Alaska Native Claims Settlement Act made selection of the former Dutch Harbor Naval Base by the Unalaska Corporation possible, this former military facility and most of its associated structures and dock facilities lay idle and gradually fell into disrepair. Some idea of the scale of the Base can be gauged from estimates made by the Alaska State Housing Authority that developed military areas on Amaknak Island and adjacent areas included about 800 major structures, of which almost 500 were on Amaknak Island. (These figures excluded more than 100 single room living structures, over 200 quonset huts and miscellaneous other structures such as gun emplacements, storage sheds, "pill boxes" and ammunition bunkers). Some World War II era facilities

such as the airport and the Chevron U.S.A., Inc. dock have been maintained or rehabilitated. In addition, a 1968 land sale held by the U.S. General Services Administration made several waterfront sites available for purchase by seafood processors. However, much of Amaknak Island remains a military ghost town.

Today, most conventional residential development in Unalaska is on Unalaska Island and attains its most concentrated form in the old **townsite** area on the spit (see Figure 2). However, housing has also been constructed on privately developed land up Unalaska Creek valley and at scattered locations along Unalaska Creek Road. On Amaknak Island, most conventional residential development has involved the rehabilitation of old military structures. The two main residential areas here are Standard Oil Hill where the Unalaska Corporation is rehabilitating old military duplexes and the area uphill from the seafood processing plants where people have purchased old military cabanas on lands leased from the Unalaska Corporation. However, the greatest number of housing units in the community are in employer-provided group quarters located adjacent to the various seafood processing plants.

All of Unalaska's industrial areas have waterfront locations and all are centered around either fishing and fish processing or transportation activities. Most of the fish processors are located on Iliuliuk Harbor, with five plants (Pacific Pearl, Dutch Harbor Seafoods, Universal Seafoods, Whitney-Fidalgo and East Point) located on the Amaknak Island side between East Point and the area known locally as Little South



UNALASKA I

DUTCH
HARBOR

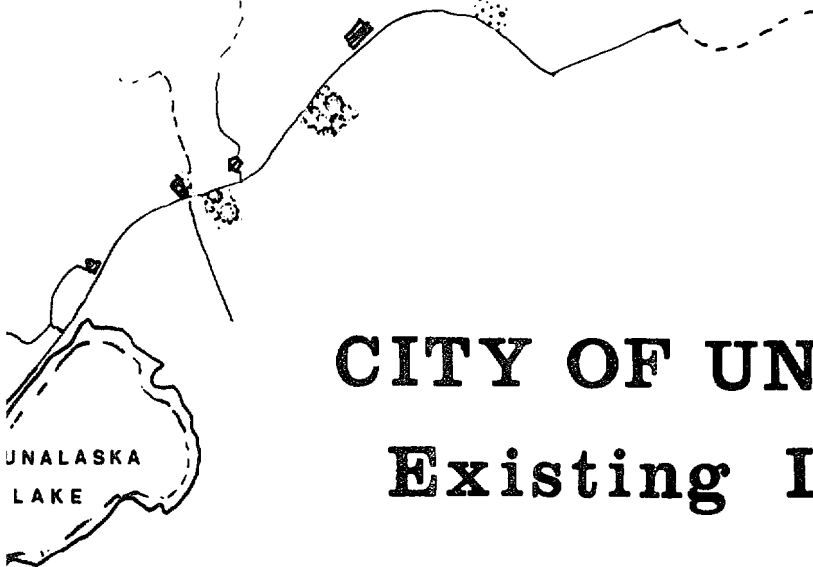
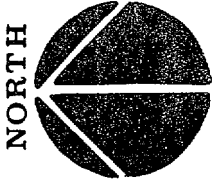
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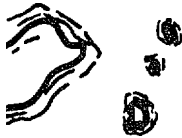
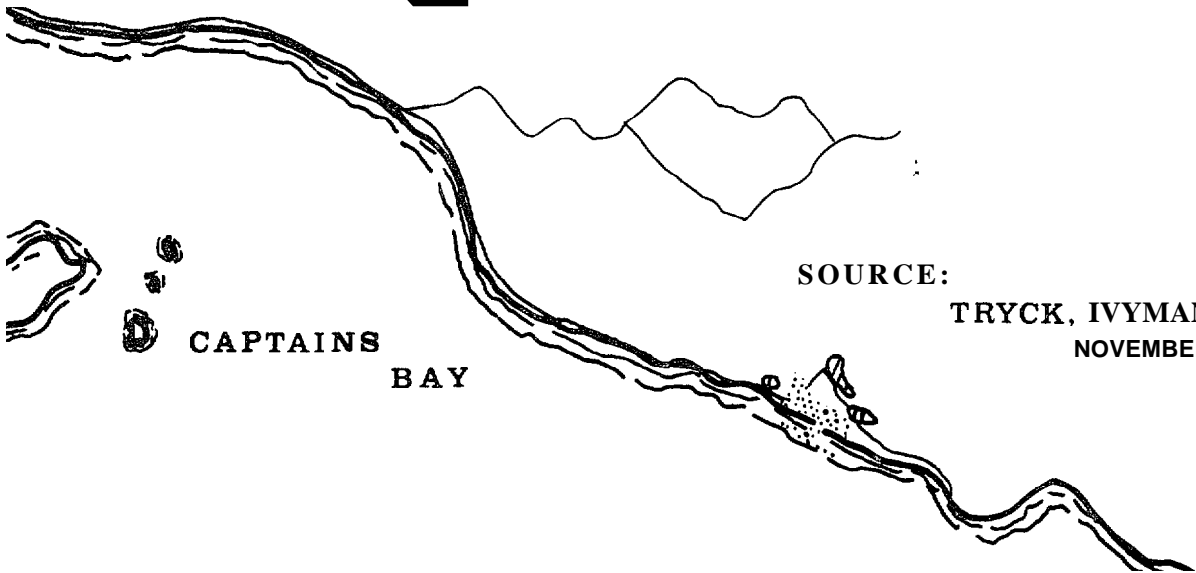
UNALASKA BAY



CITY OF UNALASKA

Existing Land Use

-  commercial
-  industrial
-  public
-  residential



CAPTAINS BAY

SOURCE:
TRYCK, IVYMAN & HAYES
NOVEMBER 1977

America, while the Pan Alaska Fisheries plant is on the Unalaska Island side at the north end of the Unalaska spit. The only seafood processors located outside this main area are Sea Alaska which is at Dutch Harbor on Amaknak Island and a second Pacific Pearl plant at Captains Bay on Unalaska Island.

There are three other major industrial areas on Amaknak Island, all of which are associated with transportation facilities. These include an area facing onto Iliuliuk Bay between East and Rocky Points which is centered around the American President Lines dock; the Chevron U.S.A. dock complex at Dutch Harbor, further to the northwest; and, still further to the northwest, Unalaska airport which extends between Unalaska Bay and Dutch Harbor. Additional industrial activities on Amaknak Island lie north of the airport on Ballyhoo Road, including the proposed site for the new City dock.

On Unalaska Island, commercial activities are scattered throughout Unalaska village. On Amaknak Island they are concentrated in the new Unisea Mall and Inn complex on Iliuliuk Harbor, although a few commercial enterprises have recently opened near the airport in rehabilitated military buildings leased from the Unalashka Corporation.

Planning is the responsibility of the City of Unalaska. A preliminary development plan was prepared for the City by the Alaska State Housing Authority in 1967, and an updated comprehensive development plan which included a coastal management element was completed for the City by

Tryck, Nyman and Hayes in 1977. Aside from these two studies, recent planning efforts by the City have addressed the upgrading and expansion of public utilities such as sewer, water and electric power. The City's immediate planning priorities include development of an official base map, public facilities planning, adoption of subdivision regulations, and upgrading of the City's financial position. The City has also advised the Alaska Office of Coastal Management that it wishes to participate in a coastal area management planning program for all non-federal areas in the Aleutian Islands to the west of Unimak Pass.

DEVELOPMENT CONSTRAINTS

Natural factors and land ownership patterns serve to constrain development in Unalaska. Natural factors constraining development are slopes, water, potential natural hazards and climate. The degree of slope is the primary limiting factor. As slopes steepen, development costs increase commensurately and access becomes both more difficult and costly. Slopes of 25 percent or more are generally considered too steep for development, while slopes of 10 to 25 percent are considered undesirable but can sometimes be used successfully for residential development. In Unalaska, slopes of more than 25 percent account for about 44 percent of all lands within the City's corporate limits and about 70 percent of lands available for development.

Lakes and the Unalaska Creek water supply preserve consume additional lands. Surface water within the City covers approximately 6,000 acres,

slightly less than 40 percent of all land within the City, and the Unalaska Creek water supply preserve encompasses an additional 1,160 acres. Altogether, lands considered undevelopable because of excessive slope, surface water and the water supply preserve account for a total of 14,404 acres, 88 percent of the total acreage within Unalaska's corporate limits.

The Aleutian Islands lie adjacent to the Aleutian Trench, one of the world's most active earthquake regions. Not only does this region have the highest frequency of earthquakes in North America, but more energy is released as a result of earthquake activity here than anywhere else on the continent. Unalaska is within earthquake zone 4 which means it is liable to have earthquakes causing major structural damage. The community's location on the north, or Bering Sea, side of the Aleutian Chain protects it from direct onslaught by tsunamis; however, there is a potential danger of flooding in low-lying areas as a result of the rapid rising of ocean waters which is sometimes associated with tsunami activity.

Unalaska's climate is another constraint on development. Frequent high winds and associated rough seas create difficult docking and mooring conditions for ships, forcing these activities into the more protected bays and harbors, primarily Dutch Harbor for larger vessels and Iliuliuk Harbor for fishing boats. In turn, the use of protected harbors by vessels has led to the development of industrial areas at these locations.

High winds also constrain residential development in Unalaska. The Aleutians have the most extreme wind conditions of any region in the State, with a recommended design wind load of 70 pounds per square foot. In practical terms, this means that residential and other structures should not be built in exposed locations.

Finally, land ownership patterns in Unalaska have served as a development constraint. Before passage of the Alaska Native Claims Settlement Act, in 1971, federal ownership of most of the land in the community limited residential development to the Unalaska townsite and to Unalaska Creek Valley where some land was expropriated by the General Services Administration following World War II and is now in private ownership. Lands for industrial development were also in short supply although this situation was eased somewhat following a sale of 108.7 acres of waterfront industrial land (plus Hog Island) in 1968 by the U.S. General Services Administration.

Most former federal land within Unalaska's corporate limits has now been conveyed to the Unalashka Corporation. The Corporation has established a policy of leasing rather than selling land for development and has negotiated long term land leases with a number of industrial users. It also leases former military buildings to several commercial enterprises and has a residential leasing program as well which involves the sale of "cabanas" (16 by 20 foot unimproved former military structures) for \$5,000 on land leased for \$75 per month. These leases are subject to renegotiation at any time.

According to Tryck, Nyman and Hayes (1977), there are approximately 1,500 acres of undeveloped land in Unalaska which are suitable for development. On Unalaska Island, vacant land suitable for residential development includes undeveloped lots in the Unalaska townsite and in the Unalaska Creek and Pyramid Creek Valleys. On Amaknak Island, vacant residential land lies west of Margaret Bay adjacent to Unalaska Bay, in the Standard Oil Hill area and north of the airport. Land deemed appropriate for commercial development includes vacant lots in the Unalaska townsite, along Unalaska Creek Road between Unalaska Lake and the Public Works maintenance facility, at the west end of Margaret Bay, on upland areas behind the Standard Oil dock and at the airport.

The 1977 comprehensive plan identified a number of locations in Unalaska suitable for waterfront industrial development. The lands surrounding Margaret Bay and Rocky Point Flats are particularly attractive as they are flat, have road access and can easily be served with utilities. A second area identified for future industrial expansion is a 28 acre parcel on the west channel side of Little South America. Waterfront locations considered less suitable because of limited uplands for shore-based facilities are lands along the southeast side of Ballyhoo Mountain and along the inner side of the Dutch Harbor spit. However, although uplands at these locations are limited, they are adequate to accommodate floating processor operations.

Three additional areas on Unalaska Island were identified by Tryck, Nyman and Hayes as being under-utilized and capable of accommodating

additional or expanded industrial activities. These are the Agnes Beach area, land adjacent to the junction of Pyramid Creek and Captains Bay Roads, and the area near the Pacific Pearl cannery at the Captains Bay dock. Land suitable for industrial activities not dependent on a waterfront location is available on Amaknak Island at three locations, at Rocky Point, adjacent to the Standard Oil dock, and south of the airport runway along the beach.

LAND STATUS

Most land in the Unalaska area is owned by the Unalashka Corporation. Under the terms of Section 12(a) of the Alaska Native Claims Settlement Act, the Corporation's enrollment of 266 persons entitled it to select five townships or 115,200 acres of land in the Unalaska area, including the former Dutch Harbor naval base. As of September 1980, the Corporation had received interim conveyance of 110,405 acres, roughly 96 percent of its total entitlement. As required by law, the Corporation selected all available lands within its core township. Outside the core township, selections include available land on Amaknak Island and contiguous coastal lands on Unalaska Bay, Beaver Inlet and Makushin Bay. Within the City of Unalaska, Corporation selections amount to around 9,400 acres, about 90 percent of the City's total land area. In addition, the Corporation has selected portions of a 100 acre parcel encompassing Haystack Hill and Tract B of the Townsite Addition which the Bureau of Land Management withheld from selection for possible future community expansion. Resolution of this issue is currently before the Ninth Circuit Court.

Another problem arose over the airport property, title to which was conveyed to the **Ounalashka** Corporation under terms of the Alaska Native Claims Settlement Act. There was a dispute between the **Ounalashka** Corporation and the State Department of Transportation and Public Facilities over the amount of land required to be transferred to the State as part of the airport property. However, this dispute is now resolved. Transfer of **title** to the surface estate of the airport has taken **place** and the **Ounalashka** Corporation has leased associated buildings from the State.

Only a minor amount of the remaining land within **Unalaska's** corporate limits **is** owned by the federal or State governments although City and privately owned lands are significant. Federal property is limited to the 100 acre tract between the Townsite and the new bridge which is subject to dispute while the only State land is a 20 acre parcel in the **Valley** southeast of town which was acquired through foreclosure in **1960**. According to the State Division of Lands, this land has been classified as "**utility**" because of its remote location and is considered to be disposable.

City land is scattered throughout the community and is associated almost entirely with existing or proposed public services and facilities. Prior to the transfer of **lands** by the **Ounalashka** Corporation, the City owned about 50 acres in the original **townsite** and **along Unalaska** Creek Road in the Valley. An additional 1,280 acres have since been reconveyed to the City by the **Ounalashka** Corporation under the terms of Section

14(c)(3) of the Claims Act. With the exception of public easements which are under negotiation, the City has generally received title to those Corporation lands it most desired. These include the Standard Oil Hill reservoir and surrounding land, the Sitka Spruce Plantation in the same vicinity, and the stand of trees near the end of Expedition Island, all of which are proposed for inclusion in the City park system; the town cemetery; a parcel in Little South America for the proposed sewage treatment plant; the town landfill; the City shop site; land on Ballyhoo Road for the new City dock; and Unalaska Creek watershed land.

Outside the Unalaska townsite, undeveloped private land is in extremely limited supply. In 1968, the General Services Administration sold about 200 acres of excess military land in the Unalaska area at public auction. Included in this sale were about 19 acres of prime industrial waterfront land abutting Iliuliuk Harbor in the vicinity of Expedition Island where several seafood processors are now located; 15 acres of waterfront property at the head of Dutch Harbor; about 75 acres of waterfront property at Captains Bay where the dock and Pacific Pearl plant are located; and the 110 acre Hog Island situated offshore from Amaknak Island in Unalaska Bay, outside Unalaska's corporate limits. Another 100 to 200 acres of excess military land in the Unalaska Creek Valley was sold by the General Services Administration in the 1960's to a private individual. Portions of this area are now being sold for residential development.

HOUSING

At the time of the Tryck, Nyman and Hayes housing survey in 1977, there were 213 conventional housing units in **Unalaska**. Ten units were found to be vacant but six of these were judged seriously deteriorated and not habitable. The four remaining habitable units represented a vacancy rate of 1.9 percent.

Preliminary 1980 Census data counted a total of 393 conventional housing units in **Unalaska**, an increase of 84.5 percent since 1977. The 1980 Census counted 35 vacant units, indicating a vacancy rate of almost 9 percent. However, City officials indicate that there are essentially no vacant units in town, a contention supported by August 1980 field observations of Alaska Consultants, Inc. At that time, City, school and health clinic officials were unable to locate housing for anticipated new employees, and officials and local residents alike were unanimous in identifying the shortage of housing as the most serious problem facing the community.

For practical purposes, **Unalaska** is therefore assumed to have a zero housing vacancy rate. Furthermore, during the fall and late winter crab **seasons**, the community's population is greatly swollen with transient fish processing workers; although most of these people do not **live** in conventional housing units. In 1977, Tryck, **Nyman** and Hayes counted 1,128 dormitory-style units in on-shore bunkhouses and on moored processing ships. A count by Alaska Consultants, Inc. in 1980 found 1,582 on-shore

and on-ship bunk units, an increase of 40 percent since 1977. These transient quarters are filled to capacity during the periods of heaviest processing activity.

The composition of the housing stock in Unalaska has changed dramatically during the past decade. In 1970, the U.S. Census counted 72 housing units in the community of which about 83 percent (60 units) were single family, 10 percent (7 units) housed two or more families and 7 percent (5 units) were in trailers or mobile homes. By 1977, single family units represented only 52 percent of the total, while the percentage of multi-family units had grown to 27 percent and trailers and mobile homes to 21 percent (see Table 12).

Field observations by Alaska Consultants in 1980 found a continuation of this trend. In the past several years, the Ounalashka Corporation, the City and the fish processing industry have added a number of multi-family units and trailers to the community's housing stock. The high proportion of trailers and multi-family units reflects, in part, the difficulty and expense involved in obtaining a lot and constructing single family housing in the community while the town's high proportion of transient residents is undoubtedly also a factor.

The 1977 housing survey determined that at least half of the housing units in the community were in need of some repair. Sixty-two percent of the 213 permanent housing units counted in the survey were found to be above average in appearance and condition with no apparent structural

TABLE 12
HOUSING INVENTORY a/
UNALASKA
1977

<u>Housing Type</u>	<u>Number of Units</u>	<u>Percent of Total</u>
One and Two Family (Single Family) (Duplex)	136 (110) (26)	63.8 (51.6) (1.2)
Multi-family	32	15.0
Trailers	45	21.1
<u>TOTAL</u>	<u>213</u>	<u>100.0</u>

a/ Excluded 1,128 units in group quarters.

Source: **Tryck, Nyman and Hayes.** 1977. Recommended Community Development Plan, City of **Unalaska**, Alaska. Anchorage.

deficiencies; 24 percent were judged to be basically sound structures with only a few wall or roof deficiencies or in need of paint or other minor upkeep; and 14 percent were deemed to have obvious structural deficiencies, perhaps beyond rehabilitation.

The two major factors cited in Unalaska's high proportion of substandard housing are age and the lack of financing for new construction or repairs. Between 1950 and 1970, the community experienced little population growth so that correspondingly little residential construction took place. Since that time, the high cost of building materials and the difficulty of obtaining financing through conventional private and public institutions have often caused people to rely on excess military property for building materials.

Old building materials in combination with do-it-yourself construction, give much of the housing an aged appearance. Although substandard housing occurs on both Unalaska and Amaknak Islands, it is most concentrated in the Unalaska townsite.

As previously stated, most housing in Unalaska is located in the Unalaska townsite, up Unalaska Creek Valley, on Standard Oil Hill or in connection with the various fish processing plants. New housing construction is taking place adjacent to Unalaska Lake where the Aleutian Housing Authority is building 20 low income units on Methodist Church property and further up the Valley where private land is available for purchase. In the summer of 1980, the Ounalashka Corporation was discussing plans

to make land in Pyramid Creek Valley available for residential development; however, there may be some problem in providing utilities to this area.

Community Facilities and Services

PUBLIC SAFETY

Police

The **Unalaska** police department is housed in a one story building in a central location in the **Unalaska townsite**. The police station includes an office, a waiting room, a squad room, a bathroom and a small kitchen. The Magistrate's office, also located in the building, will become available for police department use in September 1980 when the Magistrate moves into the **Ounalashka** Corporation building.

The police department is staffed by a chief, seven police officers, four corrections officers and an administrative assistant. City police powers extend to **Unalaska's** corporate limits but the department also handles search and rescue and emergency medical services over a much wider area. The nearest State trooper is located in Sand Point; however, a State Fish and Wildlife Protection officer stationed in **Unalaska** has police powers, although these are normally exercised primarily in connection with fish and game violations. In addition, two of the community's fish processors maintain security by hiring nightwatchmen. However, these people are not empowered to make arrests.

The Unalaska jail, located in the same building as the police station, contains three cells designed so that women and juveniles can be held separately from men. However, the facility often becomes overcrowded during the king and tanner crab seasons. Police equipment includes eight late model patrol wagons equipped with portable FM radios with telephone capability, a 17-foot Boston Whaler for search and rescue operations and a 1980 modular ambulance.

The building housing the police station and jail was constructed in 1974, with an addition built in 1977. During the summer of 1980, the roof was repaired and the Magistrate's office adapted for police department use. The police chief considers the building to be in generally good condition but indicated that more jail space is required, particularly during the king and tanner crab processing seasons when there is a large influx of transients into the community.

There are insufficient data to establish any trends in the incidence of crime in Unalaska. However, according to the police chief, there is a definite correlation between the influx of large number of transients into the community and police department activity. Police department reports to the State Criminal Justice Planning Agency bear this out. During February 1980, the height of the tanner crab processing season when there is generally a large number of transients in town, there were 17 arrests for Part I offenses (the more serious crimes of criminal homicide, rape, robbery, aggravated assault, burglary, larceny and motor vehicle theft) and the same number of arrests for Part II offenses (drug

abuse, gambling, driving under the influence, liquor laws, etc.). In May 1980, a period of generally low activity in the local fishing and fish processing industry, police activity was substantially lighter, involving 12 arrests for Part I offenses and 10 for Part II offenses.

Emergency medical services are provided with a 1980 modular ambulance staffed by 28 volunteers. All crew members have at least EMT-2 status, and two are registered nurses. All police officers in the community have attained at least EMT-1 status.

Fire Protection

The Unalaska Volunteer Fire Department is housed in two separate stations. The oldest, a wood frame structure with two bays, is located in Unalaska adjacent to the Unalaska Creek bridge, while the second station, also containing two bays, is housed in the new Unisea Mall complex on Amaknak Island, across the street from the Unisea Inn and in close proximity to several of the major fish processing plants. Fire protection is provided throughout the road-connected area within the City's corporate limits, including fish processing vessels tied to docks along the community's waterfront. The fish processors have no special fire protection systems of their own except for two plants, one of which is completely sprinklered and one which is partially sprinklered.

The fire department is staffed by a salaried fire marshal and 20 volunteer firemen, half of whom are assigned to each station. Fire fighting

equipment consists of four vehicles: a 1978 quick response vehicle and a 1946 Dodge truck with a 750 gallon per minute pumping capacity stationed at Unalaska and a second 1978 quick response vehicle and a 1,000 gallon tanker stationed at Dutch Harbor. The department also has two portable pumps and a 1,000 gallon folding tank used for pumping and storing water from surface sources in areas without hydrants.

Unalaska's Insurance Services Office (ISO) rating varies from area to area, depending on the availability of fire hydrants and distance from the fire stations. The ISO rating for most of Unalaska is 8, while that for Dutch Harbor is generally 10, except where fire hydrants exist. According to the ISO, Unalaska's ratings unlikely to improve significantly unless the hydrant system is extended.

There have been four serious fires in the community during the past two years. These include a fire on the M/V Yardarm, a floating processor, involving substantial property damage and the loss of one life; a fire on the Robert E. Reesdorf, a floating barge housing processing facilities, also involving property damage and loss of one life; a \$500,000 fire at the Sealand dock; and the crash and burning of a Lear jet at the airport.

The City's major fire protection problems are its inadequate hydrant system, particularly in Dutch Harbor where most of the high value industrial property is located, and its lack of an adequate water supply. During the coldest winter months when water levels in Pyramid and Unalaska Creeks are low, there is occasionally no water available or

it runs at such low pressure as to be ineffective for fire fighting purposes. High winds characteristic of this region pose a fire hazard throughout the community but particularly in the **Unalaska townsite** where many buildings are old and close together and where a wind-swept fire could spread rapidly from one unit to another. The lack of fire fighting equipment at the airport is also a serious deficiency; however, the City's planned acquisition of a crash/fire/rescue truck in 1981 should substantially improve the department's capability at this location.

HEALTH AND SOCIAL SERVICES

Health and social services in **Unalaska** are provided by the State Department of Health and Social Services and **Iliuliuk Family and Health Services, Inc.**, a private non-profit corporation which operates the community's only health facility. A State public health nurse based in Anchorage visits **Unalaska** about four times annually to provide immunizations, well baby care, communicable and chronic disease control and general health counseling, while a State social worker based in **Unalaska** but providing services throughout the Aleutian Chain, provides assistance in the area of child protection.

The **Iliuliuk Family and Health Services Clinic** was constructed in 1976 and a major addition was completed in 1980. The facility is located next to the police station and serves the City of **Unalaska**, including the fish processing industry, the domestic fishing fleet, crew members from foreign vessels, and residents of **Nikolski** and Akutan, nearby

communities which have no health care facilities. In addition, the Clinic's radiology facilities are sometimes used by Cold Bay residents. The Clinic is funded by a combination of user fees, contracts with the school system and the fish processing industry, grants from the State and donations from the City.

The Clinic has two overnight holding areas equipped with a couch and a conventional single bed; however, two hospital beds are currently on order. In addition, the facility contains an emergency room, an X-ray room, a pharmacy, a laboratory, four exam rooms, a dental area, a kitchen, four offices, bathrooms and a waiting room. Emergency transportation services are provided by a police department ambulance manned by a volunteer EMT-trained crew.

The Clinic staff includes a physician's assistant, two mid-level practitioners, a nurse practitioner, a nurses' aide, a receptionist/transcriber, an office manager and a part-time billing clerk. In addition, a physician and one or two registered nurses are hired temporarily for the king and tanner crab seasons. The facility is visited four times a year by a dentist, twice by private practitioners and twice by Public Health Service personnel. Eye care for Alaska Native patients is provided via two annual visits from the Public Health Service optometry staff in Anchorage, and a private optometrist from Anchorage makes a single annual visit for non-Native patients. All other specialist care requires that patients be flown to Anchorage.

According to Clinic staff, the facility serves roughly 8,500 outpatients per year. Patient loads are heaviest during king and tanner crab seasons, sometimes reaching as high as 80 patients a day.

Unalaska's major health problems reflect the peculiar composition of its population. For the Island's transient processing workers and to a lesser extent the fishing fleet, a combination of youth, dormitory-style **living conditions**, long working hours, inhospitable climate and easy access to drugs and alcohol results in a high incidence of both major and minor trauma. According to Clinic staff, venereal disease is an increasing problem and, with a recent influx of workers from Southeast Asia into the community, there is believed to be an increased potential for a local outbreak of waterborne diseases such as hepatitis and typhoid fever. The health problems of the City's permanent population are said to be similar to those of other rural Alaska communities and include alcohol-related trauma and dental health problems.

Aside from emergency and laboratory equipment, the Clinic staff reports that the existing facility is adequate to meet present health care needs but there is a real need for a resident physician and dentist. Toward this end, it applied to the National Health Service Corps for placement of a doctor and dentist in the community but the request was denied.

EDUCATION

Elementary and secondary school services in Unalaska are provided by the Unalaska City School District. The school district is responsible for the hiring of teachers and maintenance of the school plant, while the City is responsible for the construction of new school facilities, as they are required.

Unalaska school children are presently housed in one school complex, located on a 5.5 acre site in the Unalaska townsite. Within the school complex, however, elementary (grades K through 6) and secondary students (grades 7 through 12) are physically and administratively separated. The area served by the school is synonymous with the City's corporate limits although some students from Akutan attended school in Unalaska in 1979 when the school in that community was closed because of administrative problems. Bus service for Amaknak Island students and those living in the more remote areas of Unalaska Island are provided by a private contractor.

The school was constructed in 1973 and includes 13 general classrooms (of which 7 are associated with the elementary school and 6 with the high school), two special education rooms (one for elementary and the other for high school students), two shop areas, a band room, a library, a full gymnasium which also hosts the school's hot lunch program, a kitchen, two lounges, a nurse's office, administrative offices and several storage and work rooms. An additional seven elementary school

classrooms and a swimming pool are scheduled for completion in August 1981. At that time, existing elementary classrooms will be retained for high school and **administrative** use.

Outdoor school recreation facilities include a playground with a variety of play equipment and a general sports area which was covered with construction equipment in the summer of 1980. The school also has a **small** fish hatchery on the **Unalaska** Creek within walking distance of the **school**. During non-school hours both the library and gym are available for public use.

The school's professional staff consists of a superintendent, a principal, 17 full-time teachers and a part-time librarian assisted by two special education aides, a secretary, a bookkeeper and custodian, and maintenance and kitchen personnel.

Besides regular academic courses, a number of special programs are available to **Unalaska** students. Title I and Title IV federal funds provide individualized instruction in mathematics, reading and language and specialized instruction is also available for students with learning disabilities, including hearing problems. In addition, the school operates a Graduate Equivalent Degree (**GED**) program, a fish hatchery program for high **school** students, the community television station and an **Aleut** language and culture program taught by the Russian Orthodox priest and his wife. The "Cuttlefish" program, for which academic credit is given to high school students, produces a published history of the Aleutian Islands each year.

TABLE 13
 SCHOOL ENROLLMENT TRENDS
 UNALASKA
 1969/70 - 1979/80

School Year	Final Enrollment				Total	Average Daily Membership
	Grades K - 6		Grades 7 - 12			
	Number	% of Total	Number	% of Total		
1969/70	52	65.0	28	35.0	80	96.41
1 970/71	70	62.5	42	37.5	112	108.30
1971/72	70	58.8	49	41.2	119	121.84
1972/73	64	56.6	49	43.4	113	120.65
1 973/74	52	50.5	51	49.5	103	110.83
1 974/75	53	45.3	64	54.7	117	115.83
1975/76	56	45.9	66	54.1	122	120.77
1976/77	63	53.8	54	46.2	117	119.37
1977/78	71	53.4	62	46.6	133	131.53
1978/79	84	59.2	58	40.8	142	139.69
1979/80	89	53.6	77	46.4	166	160.19

Source: Alaska Department of Education. Juneau.

Unlike many school districts around the State which have experienced declining enrollments in recent years, enrollment in the Unalaska school system has undergone substantial growth since 1970, the first year in which all 12 grades and kindergarten were offered. Enrollment in the Unalaska school system in 1979/80 was 166 students, a 108 percent increase over 1969/70 when there was a final enrollment of 80 students (see Table 13). The major part of this growth has occurred in the high school grades where enrollment rose 175 percent between 1969/70 and 1979/80 compared with a 71 percent gain recorded in elementary school enrollment during the same period.

Unalaska's 1977 Comprehensive Plan determined that existing school facilities were adequate to accommodate a total student body of about 170, a figure closely approximating the school's 1979/80 final enrollment of 166. Assuming a continuation of recent increases in student enrollment (an average of 12 percent annually over the past three years), the Unalaska school will operate beyond capacity during the 1980/81 school year. However, with the acquisition of seven additional classrooms in the summer of 1981, classroom capacity should be adequate to maintain a student to teacher ratio of less than 20 to 1 through the next five years.

RECREATION

The provision of a variety of types of recreation facilities and activities is an essential element of good community development. In a community

Like Unalaska which normally experiences long periods of inclement weather and seasonally hosts a large population of transient young people, the provision of indoor recreation facilities and activities is of special importance.

At the present time, the only recreation facility provided by the City is the Recreation Center, a rehabilitated World War II military structure located across the street from the school. This building includes the Department of Parks, Recreation and Culture office, a large main hall (36 by 40 feet), a kitchen, several bathrooms and seven additional rooms equipped with an assortment of recreation equipment, including table games, electronic video games, a juke box and television. According to Center staff, the facility is most heavily used by the community's teenage population.

An additional facility currently under construction by the City is a small (14,000 square foot) park in the Unalaska townsite designed for family use. The new park will contain a "tot lot", picnic tables, outdoor cooking facilities, a small bike trail and a grassy area for volleyball. The City has appropriated \$20,000 for this project.

In the spring of 1980, the City established a Department of Parks, Recreation and Culture with the express intent of upgrading its recreation programs and facilities. The new department is staffed by a director and two full-time and one part-time employee and currently has a budget of about \$250,000, approximately half of which is allocated for operating

expenses. Programs currently offered by the department include movies four nights a week, bingo several times monthly and a summer youth recreation program.

Plans are underway for a number of new programs. Several rooms in the Center will be equipped as music and reading rooms for adult use and one day a week the Center will feature adult activities such as lectures and dinners. The department also hopes to increase the involvement of transient processing plant workers in the community recreation program. Toward this end, it is developing an intramural sports program and coordinating the various recreation programs offered by the processors for their employees. In addition, the department will work toward accomplishing the park and open space plan proposed in the 1977 Comprehensive Plan.

As in most small Alaska cities, the public school in Unalaska is a focal point for community recreation activity during non-school hours. The school gym is open nightly and on weekends for community sports use, while the school library is open one night a week to the public. The new swimming pool scheduled for completion in the summer of 1981 will add a new dimension to the community's recreation opportunities as it too will be available for public use during non-school hours. School grounds provide additional community recreation facilities. The school playground, equipped with a variety of play equipment, is heavily used by small children and the general sports area serves the recreation needs of teenagers.

Aside from public recreation facilities, Unalaska has several privately owned attractions which cater to adult recreation needs. The Elbow Room provides music and dancing and the Unisea Inn has a small gymnasium, a game room equipped with pool tables and electronic video games and a bar. Stormy's is a popular evening pizza spot. Facilities provided by the processors for their employees vary, but all have a designated area for recreation activities and all have an employee responsible for recreation programming, although this person may also have other responsibilities. According to City officials, formal processor-provided recreation activities are usually limited to a color TV and sometimes video equipment, while a couple of plants also have pinball machines.

Besides formal recreation facilities, the Unalaska area offers a wide variety of outdoor recreation experiences during periods of good weather. Recreational boating and fishing are popular pursuits as are picnicking, hiking and exploring World War II military ruins.

UTILITIES

Water

Unalaska presently derives its water from two surface sources on Unalaska Island, Unalaska Creek and Pyramid Creek, which together are capable of yielding a flow of 7,500 gallons per minute on a continuous basis. Water on both creeks is dammed to provide an intake source; however, narrow and steep valley walls are unsuitable for the construction of

large reservoirs. In addition, two rehabilitated former military wells on **Unalaska** Creek Road are capable of supplying 1,200 gallons per minute as an emergency standby supply during periods of low flow in the Creeks. The water is chlorinated and filtered.

Water services are provided to the original **Unalaska townsites**; to most of the Valley, the community's principal residential growth area; and to most of Amaknak Island, excluding Standard Oil Hill which uses its own surface source. According to **Unalaska's** planning department, there are currently 330 billings for water service, but this is less than the total number of hook-ups to the system as there are a number of multiple billings.

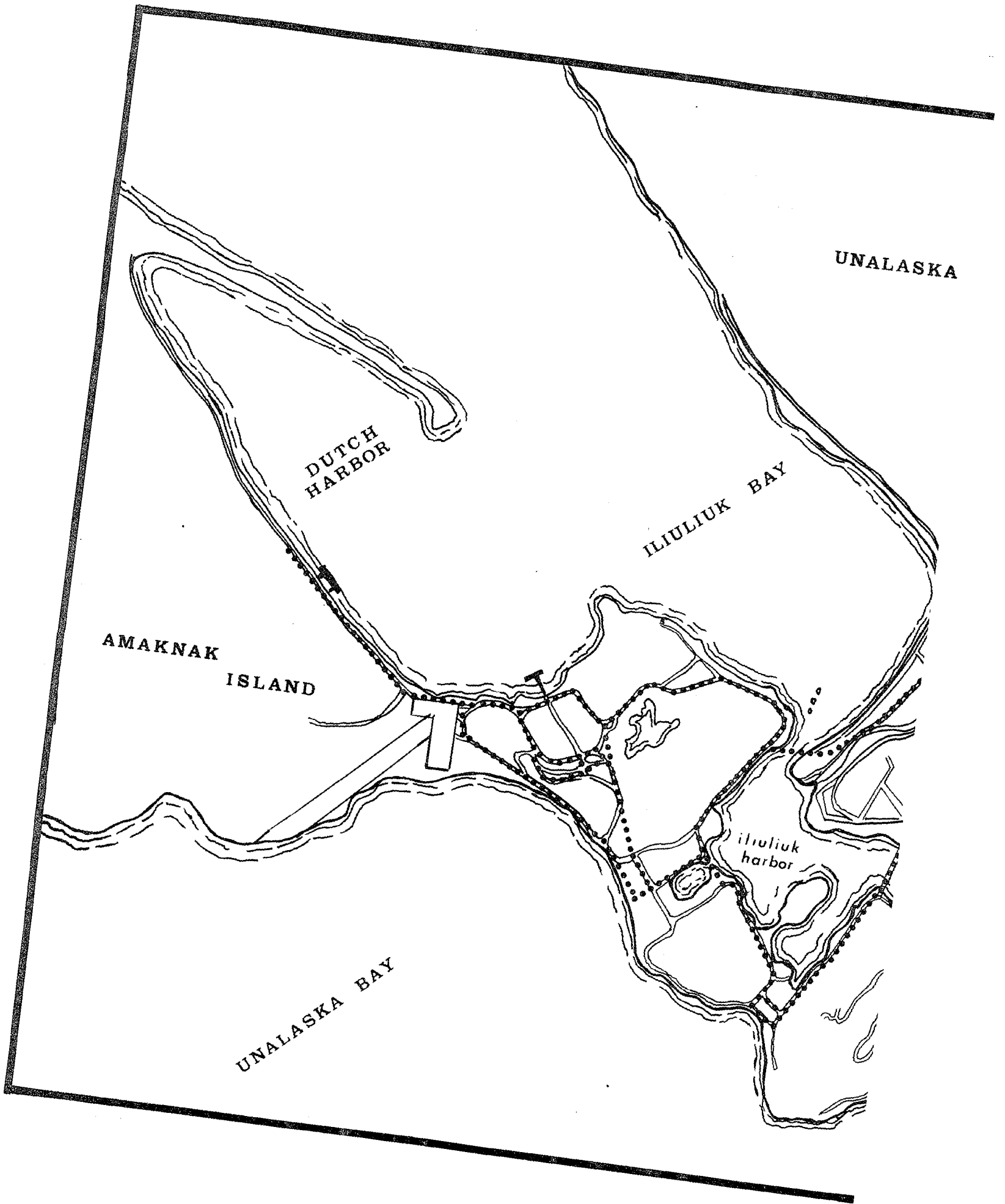
As reported by Tryck, Nyman and Hayes (1977), water transmission lines include 14,000 linear feet of 12-inch wood stave pipe and 2,400 feet of ductile iron pipe to the **Unalaska** Creek dam and 18,500 feet of 16-inch wood stave pipe and 3,000 feet of 12-inch ductile iron pipe to the Pyramid Creek dam. Transmission lines under the east channel of **Iliuliuk** Bay connect the Amaknak **Island** distribution system to the system on **Unalaska** Island (see Figure 3).

Construction of **Unalaska's** existing water supply and distribution system was begun by the military in the early 1940's, with the **Unalaska** Creek dam and the wood stave distribution system dating from this period. The City undertook a major upgrading and expansion of its water system in 1976 with assistance of the U.S. Economic Development Administration.

Improvements made at this time included construction of the Pyramid Creek dam and rehabilitation of the Unalaska Creek dam; construction of a new water treatment and filtration system; installation of the two stand-by wells; construction of underwater transmission lines to Amaknak Island and a hydrant system; and upgrading of portions of the existing wood stave distribution system.

Despite these major improvements, substantial problems remain with Unalaska's water supply, and these will undoubtedly become more severe as the community's resident population and fish processing activities increase. Although there is only spotty metering of water consumption, recent tests at one of the processing plants indicated a consumption rate of 250,000 gallons a day when no processing was taking place. Engineers familiar with the fish processing industry estimate that a large fish processing plant such as those at Unalaska could consume as much as 3 million gallons per day during peak processing periods. Assuming a design capacity of about 13 million gallons per day (including production from the two standby wells), system capacity is thus exceeded when five processors are fully operational.

City officials and processors alike report that water shortages have been experienced on numerous occasions in the past. This occurs most frequently during periods of cold weather when water flows are low on Pyramid and Unalaska Creeks. Such periods often coincide with the height of the tanner crab processing season. Water quality also appears to be a problem. One processor complained that because of poor screening,



UNALASKA

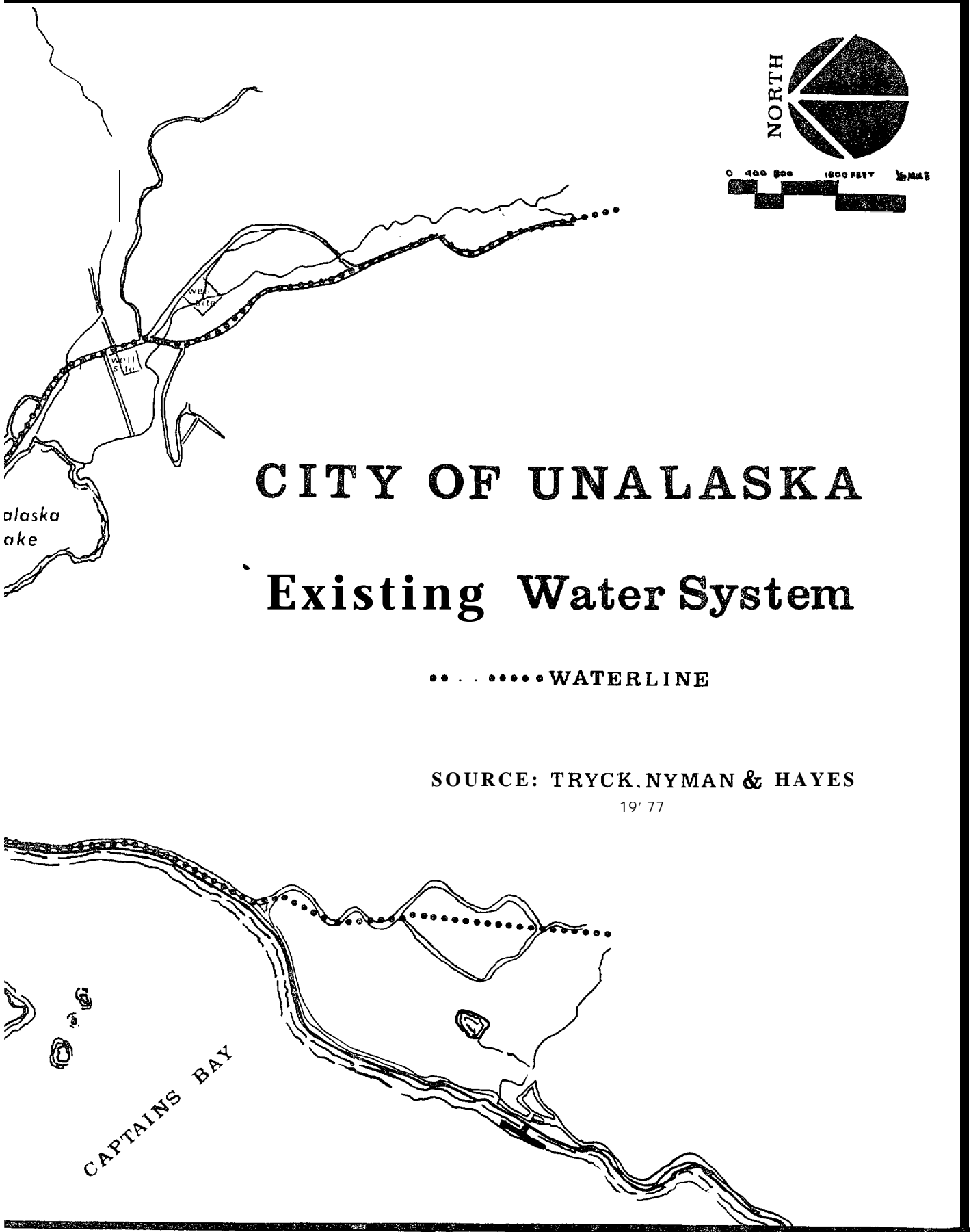
DUTCH
HARBOR

ILIULIUK BAY

AMAKNAK
ISLAND

iliuliuk
harbor

UNALASKA BAY



CITY OF UNALASKA

Existing Water System

.....WATERLINE

SOURCE: TRYCK, NYMAN & HAYES

19' 77

CAPTAINS BAY

his company has been forced to install its own filtration and chlorination system. Residential users of the system report that mosquito larvae and other debris from the surface water source have occasionally been transported into community homes.

The 1977 Comprehensive Development Plan determined that water supply problems stemmed from limitations in the transmission system rather than adequacy of the supply. Apparently, only a fraction of the total flow of Unalaska and Pyramid Creeks is diverted into the supply lines.

Tryck, Nyman & Hayes suggested that larger and/or additional pipes could be installed to intercept and transmit more water to the distribution system and that tributaries of both creeks as well as Unalaska Lake and wells on the Unalaska Creek floodplain could be used to develop additional water supplies. As recommended in the 1977 report, the City is currently investigating funding sources to conduct a major water supply expansion feasibility study.

Sewer

Unalaska has no community-wide sewer system, although it does have four main wastewater collector-outfall lines built by the military during World War II, three of which are currently in use. However, in the Unalaska townsite and up Unalaska Creek valley, sewage disposal is generally accomplished either through the use of cesspools or outhouses. In addition, the community's seafood processors have installed small individual packaged sewage treatment plants which discharge treated

effluents into Iliuliuk Bay and the inner harbor. Seafood processing wastes are ground up by individual plants and then pumped across Amaknak Island to outfall lines extending into Unalaska Bay, with wastes from the Pan Alaska Fisheries plant at the end of the Unalaska spit being ground up and then discharged into Iliuliuk Harbor. The more remote processing plants on Amaknak Island process their industrial wastes individually and discharge them into Dutch Harbor and Iliuliuk Bay.

According to Tryck, Nyman and Hayes, two of Unalaska's four main wastewater collector-outfall lines discharge raw sewage into Iliuliuk Bay, with one serving about 10 units along Unalaska Creek Road and the other serving close to 80 units in the old officers' duplex housing. A third line serving housing and bunkhouses on south Amaknak Island near the inner harbor is intercepted and the wastewater treated in a plant operated by one of the seafood processors and then discharged into Captains Bay. A fourth line which is no longer used once served the barracks/hospital area on central Amaknak Island. All told, the City of Unalaska estimates that there are presently less than 200 hook-ups to the community's three operative distribution lines.

The 1978 Facilities Plan for Municipal Wastewater Collection and Treatment, prepared for the City of Unalaska by Tryck, Nyman and Hayes, identified several problems associated with existing sewage disposal systems in Unalaska. While cesspools in the Unalaska spit area have generally worked well because of the presence of beach gravels, some cesspools and septic tanks in the Unalaska Creek valley where soil conditions are less

favorable, have worked poorly. This is a problem in an area which is the prime location for new housing development.

Another potentially serious problem resulting from the absence of a community-wide sewer system is increased pollution observed in Iliuliuk Bay and the inner harbor area. According to Tryck, Nyman and Hayes, inadequate treatment of seafood processing wastewater is causing the concentration of dissolved oxygen in the community's tidal waters to decrease and both Iliuliuk Bay and the inner harbor are becoming strained as a resource for sewage and seafood processing waste disposal.

Because of the serious deficiencies inherent in existing sewage disposal systems, Tryck, Nyman and Hayes recommended that community-wide sewage collection and treatment were required to meet future community needs and to comply with appropriate federal and State anti-pollution laws. The plan recommended is an areawide system consisting of collectors and interceptors in the Unalaska village area, a submarine channel crossing to Amaknak Island and a collector/interceptor in the central and south portion of Amaknak Island discharging to a treatment facility near the north end of Little South America.

Assuming the City is successful in obtaining a waiver from the provisions of the Clean Water Act of 1972 requiring secondary treatment, the study first recommended construction of a primary treatment plant, to be followed at a later date by a secondary treatment facility. Effluent would be discharged into Captains Bay off Arch Rock and sludge would be

stabilized, dewatered and trucked to a landfill for burial. The phase one plant would be designed to handle only domestic wastes, including those generated by the processing plants; however, it is envisioned that at some time in the future, the plant would also process industrial wastes.

The City has accepted the recommended plan for wastewater collection and treatment and hopes to begin design of a new system in 1980. Depending upon the availability of federal, State and local funds, construction could begin as early as 1981.

Electric Power

Unalaska has no areawide electric power system. The City-owned electric utility primarily serves residences and small commercial users on Unalaska Island. All seafood processors generate their own electric power requirements, with Universal Seafoods also providing power to the Unisea Inn and mall. There are two additional power generation facilities on Amaknak Island, one serving the Chevron U.S.A., Inc. complex and the airport, and the other the Unalashka Corporation housing area on Standard Oil hill.

The City utility currently has one 600 kw and two 300 kw diesel generators for a total installed generating capacity of 1,200 kw. However, one of the 300 kw units is presently inoperative and the 600 kw unit is in need of repair. A new 600 kw unit on order should be installed within the

next month **or** so and should **relieve** immediate pressures on the system. Once the new unit is installed and the existing 600 kw unit repaired, firm power will be maintained at 600 kw, adequate to meet peak loads of around 450 kw expected this winter. According to R.W. Rutherford Associates, the City utility served about 145 residential and commercial customers in 1979 and sold 1,045,000 kilowatt hours (**KWH**) of electric power.

Power costs in **Unalaska** are quite high. A typical residential household will consume between 800 and 1,000 kilowatt hours of electric power per month, excluding heat. In the summer of 1980, this cost **Unalaska** residents between \$114 and \$150 per month. Nevertheless, despite these high costs, the City reports that revenues do not cover expenses and it is therefore considering a series of rate increases to make the system more **self-sufficient**.

The seafood processing industry generates and consumes most of the power in the **Unalaska** area. In 1979, the community's processors had a combined total of 12,250 kw of installed generating capacity, ranging from 850 kw to 2,200 kw per processor. In addition, Chevron U.S.A., Inc. and the **Ounalashka** Corporation together accounted for another 400 kw, raising the total installed electrical generating capacity in the community to 13,850 kw.

R.W. Rutherford Associates determined that once scheduled improvements to the City system are made, total existing installed generating capacity

in the community is adequate to serve both residential/commercial and industrial needs through 1981. To meet anticipated growth beyond that time, however, additional capacity will be required. In addition, replacement of the existing distribution system built by the military is needed, as is replacement of the existing power house.

In a 1977 study prepared for the City of Unalaska, R.W. Rutherford Associates concluded that future community power needs could be met most efficiently and economically from a central power plant and an areawide distribution system. Power usage is projected to grow at an average annual rate of 10 percent through 1985 and at 7 percent thereafter through 1995, when peak demand is estimated to reach 12,000 kw. The study developed several options for meeting this demand involving combinations of diesel, gas turbine and hydroelectric generation; locations for the power plant; and schedules for adding industrial loads to the system.

In the summer of 1980, the City was planning major immediate improvements to its power system, including construction of a new power house in the vicinity of the police station, an increase in generating capacity, and extension of the distribution system to new residential development on Unalaska Island and perhaps to the Pan Alaska Fisheries plant. As currently foreseen, the next phase of development would involve extension of the distribution system to several facilities on Amaknak Island, possibly the new American President Lines dock, the airport and one or two processing plants. The City also plans to initiate a waste heat

recovery program. It is hoped that operation of the system will be eventually turned over to a non-profit Rural Electric Association (REA) cooperative although this may be precluded by the expanded system's heavily industrial nature.

Solid Waste Disposal

The City of **Unalaska** is responsible for garbage collection in the road-connected area within its corporate limits but currently subcontracts the service to **Williwaw** Services, Inc. Residential and small commercial service is provided twice weekly, while most of the fish processors haul their own solid waste. The City charges each of its utility customers \$8.50 a month for garbage service whether or not service is provided. Equipment used by **the** subcontractor is a conventional six foot barrel compactor mounted on a truck chassis. The City of **Unalaska** considers the current level of service provided to be adequate.

The City operates a **10** acre landfill outside of town on the southeast shore of **Iliuliuk** Bay. Problems associated with the landfill include uncontrolled dumping, open burning and capacity limitations because of the difficulty of obtaining suitable cover material within an economic distance. Because of long range **problems associated** with the existing landfill, Tryck, **Nyman** and Hayes recommended in 1977 that the City locate another suitable sanitary landfill site on **Unalaska** Island as well **as** a site on **Amakanak** Island for possible future use. The location of suitable sites is made difficult by problems related to land

availability, water pollution, soil conditions and a shortage of cover material. To date, no additional sites have been located.

Communications

The Interior Telephone Company has provided local telephone service since 1972 from an exchange located on the spit in Unalaska village. As of September 1980, the system served a total of 538 lines, including 335 main stations and 203 extensions. The capacity of the present system is about 400 main stations and there are about 200 outstanding requests for service, even though system capacity has doubled in the past four years. Most unmet service needs are in Dutch Harbor.

In the summer of 1980, Interior Telephone was making major improvements to the local telephone system. The installation of digital switching equipment will enable the immediate addition of 100 main stations and, when transmission lines to Dutch Harbor are installed, system capacity will total 1,700 stations. According to company officials, the new digital equipment can be easily expanded to meet future demands.

Long distance telephone communications in Unalaska are provided by Alascom through its earth satellite system. The system's 15 channels currently operate at capacity during normal working hours; however, in the summer of 1980, Alascom was installing equipment necessary to add about 26 channels.

Local Government Organization

Unalaska incorporated as a first class city in 1942. The City presently has a council/manager form of government with a six man council and a mayor elected at large. The manager directs the day to day operations of the City with policy direction from the mayor and Council.

CITY POWERS

As a first class city under Alaska law which is not within an organized borough, **Unalaska** has the **full** range of powers allowable for a municipality of its class. These include the following three major powers not shared by second class cities:

- o A first class city outside an organized borough may levy property taxes of up to 30 mills (or 3 percent of assessed valuation) without a referendum whereas second class cities may tax only up to 5 mills and must first have voter approval.
- o As a first class city outside an organized borough, the City of **Unalaska** is also a school district and thus has the responsibility for establishing, maintaining and operating a system of public schools.
- o All first class cities elect their mayors at large. The mayor has the veto power which can be **overridden** by not less than three-quarters of the councilmen and he only votes in the case of a tie. This is unlike a second class city where the mayor

is elected by and from the council and has no veto power although he/she has a vote equal to that of each other council member.

The City of Unalaska has assumed a wide range of powers as provided for in Chapter 48 of Title 29 of the Alaska Statutes. In addition, it has assumed responsibility for the operation of many public facilities and services listed in AS 29.48.030, plus those required to be assumed by cities outside organized boroughs as per Chapter 43 of Title 29 (Alaska Statutes). However, telephone and public transportation services are operated by private companies, garbage collection is contracted to a private firm and the health clinic is operated by a non-profit corporation. In addition, there is no areawide sewer system and most electric power in the community is generated by individual fish processing plants. Finally, the Unalaska/Dutch Harbor airport is operated by Reeve Aleutian Airways.

LOCAL GOVERNMENT FINANCES

In order to evaluate the City of Unalaska's financial condition, the most recent City financial statement for the fiscal year ending June 30, 1979 was reviewed, as was data relating to assessed valuation, municipal debt and real property and sales tax rates published by the State Assessor's Office.

A review of the full value of property, as determined by the State Assessor (Alaska Taxable), within Unalaska's corporate limits from 1970 to 1979 was undertaken (see Table 14). According to the State Assessor's records, the full value of property in Unalaska increased by about 429 percent during this period, with all of this increase taking place since 1975, due primarily to the construction and expansion of shore-based fish processing plants.

Under Alaska law, first class and home rule municipalities may levy property taxes of up to 30 mills although this millage rate may be exceeded if it is applied to debt service. In addition, both first and second class municipalities may levy sales taxes of up to 3 percent. (This limitation does not apply to home rule municipalities while overlapping units of government may each levy sales taxes and thus result in higher local sales tax rates.)

A review of property millage and sales tax rates at Unalaska since the 1971/72 fiscal year indicates that local property tax rates rose between 1971/72 and 1972/73 but have declined significantly since 1974/75 (see Table 15). The City's current property tax rate of 14 mills is reasonably typical of those levied by other first class cities in the unorganized borough. However, its 1 percent sales tax is well below the 3 percent rate levied by many first and second class cities around the State.

An analysis of Unalaska's general fund revenues and expenditures for the fiscal year ended June 30, 1979 was also undertaken (see Table 16).

TABLE 14

CITY OF UNALASKA
COMPARISON OF FULL VALUE DETERMINATION
1970-1979

(in \$000's to nearest \$1 ,000)

<u>Year</u>	<u>Full Value Determination</u>
1970	\$ 6, 295
1971	\$ 6, 274
1972	\$ 6, 070
1973	\$ 5, 861
1974	\$ 5, 141
1975	\$ 5, 308
1976	\$13, 904
1977	\$16, 572
1978	\$24, 402
1979	\$33, 332

Source: Alaska Department of Community and Regional Affairs, Division of Local Government Assistance. Alaska Taxable: Municipal Property Assessments and Equalized Full Value Determinations. Juneau. (Annual Report).

TABLE 15

CITY OF UNALASKA
 PROPERTY AND SALES TAX RATES
 1971/72 - 1978/79

	Property Tax (mills)							
	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
Administration	10.60	19.00	19.00	19.00	19.00	17.50	14.00	14.00

	Sales Tax (percent)							
	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
Administration	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0

Source: Alaska Department of Community and Regional Affairs, Division of **Local** Government Assistance. Alaska Taxable: Municipal Property Assessments and **Equalized Full Value** Determinations. Juneau. (Annual Report).

TABLE 16
 GENERAL FUND
 STATEMENT OF REVENUES AND EXPENDITURES
 CITY OF UNALASKA
 YEAR ENDED JUNE 30, 1979

Revenues	Estimated	Actual	Over (Under) Estimate
Taxes:	<u>\$1,081,852</u>	<u>\$1,465,830</u>	<u>\$ 383,978</u>
Personal Property Tax	\$ 189,677	\$ 190,948	\$ 1,271
Real Property Tax	150,675	150,675	-
Sales Tax	741,500	1,124,207	382,707
Intergovernmental Revenues:	<u>\$ 253,000</u>	<u>\$ 329,217</u>	<u>\$ 76,217</u>
State Shared Revenue	\$ 104,000	\$ 92,731	\$ (11,269)
Alaska Business Licenses	2,000	33,847	31,847
Raw Fish Tax	145,000	154,901	9,901
Liquor License	2,000	3,100	1,100
Other	--	44,638	44,638
Other Revenues:	<u>\$ 73,600</u>	<u>\$ 147,594</u>	<u>\$ 73,994</u>
<u>TOTAL REVENUES</u>	<u>\$1,408,452</u>	<u>\$1,942,641</u>	<u>\$ 534,189</u>
Expenditures	Appropriations	Expenditures	(Over) Under Appropriations
General Government	\$ 220,271	\$ 271,621	\$ (51,350)
Police Department	194,693	231,186	(36,493)
Fire Department	30,200	38,346	(8,146)
Civil Defense	5,914	6,685	(771)
Public Works	462,266	493,620	(31,354)
Culture and Recreation	40,725	36,285	4,440
Health Clinic	6,000	7,720	(1,720)
School Support	145,117	145,117	-
Non-Departmental	129,868	95,614	34,254
<u>TOTAL EXPENDITURES</u>	<u>\$1,235,054</u>	<u>\$1,326,194</u>	<u>\$ (91,140)</u>
Transfer to Duplex Capital Projects Fund	<u>\$ --</u>	<u>\$ 191,880</u>	<u>\$ (191,880)</u>
<u>TOTAL EXPENDITURES AND TRANSFER</u>	<u>\$1,235,054</u>	<u>\$1,518,074</u>	<u>\$ (283,020)</u>

Source: City of Unalaska.

Most of **Unalaska's** general fund revenues are derived from local sources, primarily from sales taxes. Total general fund revenues for FY 1979 amounted to \$1,942,641, with sales tax revenues accounting for 58 percent. Almost all sales tax revenues are derived from raw fish taxes and from taxes on bulk petroleum sales. Intergovernmental revenues, of which raw fish tax rebates constitute the largest single item, accounted for 17 percent of **Unalaska's** revenues in FY 1979, while miscellaneous other sources of income amounted to 8 percent.

Although **Unalaska's** general government revenues are primarily derived from local sources, this is not the case with funds expended for education. According to figures provided by the Alaska Department of Education (see Table 17), close to 80 percent of total operating revenues for the City school system are derived from the State versus about 15 percent from local sources. This is consistent with State law which specifies that State aid shall constitute at least 97 percent of a local school district's "basic need". However, basic need is derived from a State formula for minimum educational requirements and, in practice, most **Alaska school** districts expend a higher proportion of locally generated funds for basic school support. Many school districts also receive federal revenues under P.L. 874, where funds are allocated depending on the number of children whose parents live or work on federal property. However, this is only a very minor source of school district revenue in **Unalaska**.

The City's FY 1979 general fund expenditures totaled \$1,518,074, about **\$1,178 per** capita based on the 1980 Census population of 1,288, or a

ABLE 17

OPERATING REVENUE SOURCES
UNALASKA SCHOOL SYSTEM
FY 77, FY 78 AND FY 79

Year	Local		State		Federal		Other		Total	
	dollars	%	dollars	%	dollars	%	dollars	%	dollars	%
1976/77	\$110,000	15.5	\$568,384	80.1	\$30,460	4.3	\$509	0.1	\$709,353	00.0
1977/78	\$112,500	13.4	\$699,991	81.7	\$42,916	5.0	\$1,580	0.2	\$856,987	00.0
1978/79	\$145,114	15.1	\$743,506	79.1	\$38,987	4.1	\$12,386	1.3	\$939,996	00.0

93 Source: Alaska Department of Education. Personal communication

slightly higher \$1,976 per capita expenditure using the 1979 population of 768 accepted by the Department of Community and Regional Affairs for State Revenue Sharing purposes. The major expenditure category was public works which accounted for 32.5 percent of general fund expenditures followed by general government (17.9 percent), police (15.2 percent), the City duplex construction project (12.6 percent) and school support (9.5 percent).

A review of Unalaska's overall financial condition indicates that while the City's industrial properties and sales give it a substantial tax base, the rapid growth of Unalaska from a small Aleut village to a major fishing and fish processing center have made it difficult for the City to provide the range of community facilities and services normally demanded by a community of this size. As a result, community utilities systems in particular are generally rudimentary, for the most part relics from World War II. To upgrade its water, sewer and electric power utilities will require the large scale expenditure of public funds, most of which will have to be provided by State and federal agencies or through the sale of City revenue bonds.

According to the State Assessor's records, Unalaska's per capita valuation was \$43,401 in 1979 (see Table 18). This was well below the Statewide average of \$66,455 for home rule and first class cities in the unorganized borough that year. However, the Statewide average was seriously distorted by Valdez and Unalaska's 1979 per capita valuation actually exceeded that of all other Alaska cities in this category except for Skagway.

TABLE 18
INDICATORS OF FINANCIAL CONDITION
CITY OF UNALASKA
FY 1979

Population <u>a/</u>		768
Full Value Determination	\$	33,331,900
Full Value Per Capita	\$	43,401
General Obligation Debt	\$	3,519,594
Total Debt <u>b/</u>	\$	3,519,594
Per Capita Debt		
General Obligation	\$	4,583
Total	\$	4,583
Debt as Percent of Full Value		
General Obligation		10.56%
Total		10.56%

Guidelines for Per Capita Debt

Direct	\$	618.48
Overall	\$	733.93
Percent of Full Value <u>c/</u>		5.50%

a/ Unalaska's July 1978 population as accepted by the Department of Community and Regional Affairs for State Revenue Sharing purposes.

b/ Total debt excludes outstanding Mater Utility Revenue Bonds.

c/ Median value for selected places of under 10,000 population used by Moody's Investors Services, Inc.

Source: Alaska Department of Community and Regional Affairs, Division of Local Government Assistance. January 1980. Alaska Taxable 1979: Municipal Property Assessments and Equalized Full Value Determinations. Juneau. (Alaska Local Government, Vol. XIX, No. 1).

As reported by the State Assessor, the City of Unalaska had a total outstanding general obligation debt of \$3,519,594 as of June 1979 for a direct per capita debt of \$4,583. This is close to double the Statewide average for home rule and first class cities in the unorganized borough and is well in excess of the guidelines used by Moody's Investors Services. Furthermore, Unalaska's overall debt in terms of percentage of full value (10.56 percent) is nearly double Moody's Investors Services' recommended guidelines. These statistics indicate that the City of Unalaska has a very limited capacity for the assumption of additional general bonded indebtedness. This is a major concern to local government officials who are facing the necessity for major capital investment in community sewer, water and electrical systems in the near future.

COLD BAY

Population and Economy

Cold Bay is "located on the Alaska Peninsula approximately 600 air miles southwest of Anchorage. The community is basically an airport enclave populated by federal and State aviation officials and airline staffs, plus a minimum of persons performing support functions, although this is changing as the result of the establishment of a local fish processing operation.

POPULATION

Past Trends

Cold Bay is not a town in the conventional sense. It was founded during the early years of World War II with the establishment of the Fort Randall army base and a large air base following the Japanese attack on Kiska and Attu Islands. At the height of the Aleutian campaign, there were reportedly as many as 40,000 troops stationed at Fort Randall. The base was abandoned immediately following the War but the Army maintained the airstrip through the early 1950's when its operation was taken over first by Reeve Aleutian Airways and, subsequently in 1954, by the Civil Aviation Authority, the predecessor of the Federal Aviation Administration.

After World War II, Cold Bay evolved as a refueling and servicing stop for commercial and military aircraft en route to the Aleutians and the Orient. Today, Cold Bay continues to be primarily an aviation town; however, the establishment of the Izembek National Wildlife Range headquarters here in 1960, the recent completion of a large fish hatchery by the State, and the initiation of crab processing operations by the Thirteenth Regional Corporation have served to broaden the community's economic base.

The U.S. Census first recorded population at Cold Bay in 1960. Population trends here during the ensuing 20 years reflect the ebb and flow of political and economic events on the Aleutian Chain and in the Far East during that period. Between 1960 and 1970, Cold Bay's population increased from 86 to 256, a growth of nearly 200 percent (see Table 19). Although this increase undoubtedly reflects a growth in aviation activity within the Aleutians region, the main stimulus was the U.S. military involvement in Southeast Asia. During the height of the Vietnam War in the late 1960's and early 1970's, Cold Bay served as the major refueling and servicing stop for U.S. aircraft under military charter flying the Great Circle route between the U.S. and Southeast Asia.

In 1980, the U.S. Census counted 141 persons in Cold Bay, a decline of almost 45 percent since 1970. There is some dispute over the accuracy of the 1980 Census count (several State agencies estimate the community's current population at between 150 and 200). Nevertheless, it is generally agreed that a significant decrease in the community's population has

TABLE 19

POPULATION TRENDS a/
 COLD BAY, ALASKA
 1950 - 1980

<u>Year</u>	<u>Populati on</u>	<u>Percent Change</u>
1950	--	
1960	86	--
1970	256	197.7
1980	141	- 44.9

a/ Excludes military personnel.

Sources: U.S. Department of Commerce, Bureau of the Census (unpublished preliminary 1980 Census data provided by the Aleutian-Pribilof Island Association).

U.S. Department of Commerce, Bureau of the Census. 1971.
 Number of Inhabitants, Alaska, Washington, D.C. Final
 Report PC(1)-A3.

U.S. Department of Commerce, Bureau of the Census. 1960.
 Number of Inhabitants, Alaska. Washington, D.C. Final
 Report PC(1)-3A.

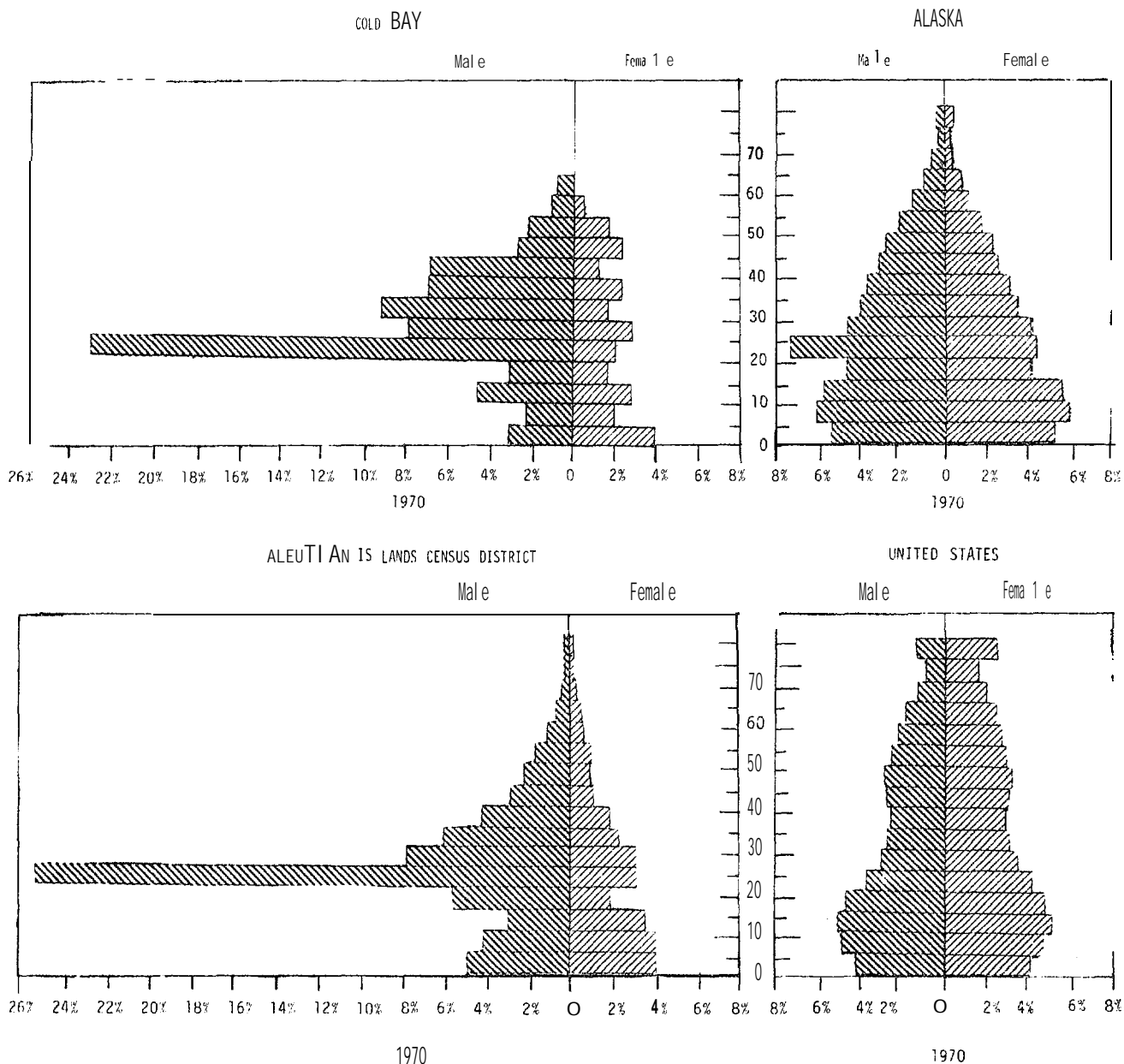
occurred, due primarily to the cessation of U.S. involvement in hostilities in Southeast Asia. However, a number of other aviation industry-related factors also played a role. Because of technological improvements, aircraft flying between the U.S. and the Far East no longer have to stop here en route for refueling. Similarly, the newer generation of aircraft being flown by Reeve often fly directly from Anchorage to Dutch Harbor and the Pribilof Islands, completely bypassing Cold Bay. As aviation activity has declined at Cold Bay, so has the number of government and industry support personnel.

Population Composition

A review of population composition data obtained from the 1970 Census indicates that Cold Bay's population was then overwhelmingly white (83.6 percent) and male (75.4 percent) (see Figure 4 and Table 20). Unlike the State as a whole, Cold Bay had few people in the very young age groups although the low proportion of older people was characteristic of Statewide norms at that time. Like the Aleutian Islands census division in 1970, where a large military presence was reflected in a very high proportion of young adult males, males between the ages of 19 and 24 at Cold Bay represented about 23 percent of the community's total population. The paucity of young adult females and small children indicate that Cold Bay's population was then predominantly transient.

Although there are presently no available 1980 Census figures pertaining to age and sex, there are several indications that these population

COMPOSITION OF FERTILIZATION



Source: U. S. Census Bureau. 1970

TABLE 20
 COMPOSITION OF POPULATION BY RACE AND SEX
 COLD BAY, ALASKA
 1970

<u>Race</u>	<u>Sex</u>			<u>Percent of Total</u>
	Male	Female	Total	
White	166	48	214	83.6
Negro	9	0	9	3.5
Indian	3	2	5	2.0
Aleut	9	7	16	6.2
Eskimo	2	3	5	2.0
Other	4	3	7	2.7
<u>TOTAL</u>	193	63	256	<u>100.0</u>

Source: University of Alaska, Institute of Social, Economic and Government Research. September 1973. Age and Race by Sex Characteristics of Alaska's Village Population. College. (Alaska Review of Business and Economic Conditions. Vol. X, No. 2)

characteristics have changed significantly since 1970. Increases in school enrollment in the face of overall population decline reflect an increase in the proportion of both adult females and young children. Similarly, a substantial increase in the proportion of single family to multi-family units during the past decade indicates that the community has changed from a fundamentally single transient male settlement to one made up largely of conventional family units. However, if the 47 persons living in group quarters at the Cold Bay Air Force Station plus 70 shipboard employees of the Thirteenth Regional Corporation are included, Cold Bay undoubtedly retains many of the population characteristics noted in 1970.

Growth Prospects

Past rates of growth or decline in employment and population at Cold Bay have generally been related to decisions made by military authorities and government agencies as to use of the Cold Bay airport. Such decisions, especially those related to international events like the Vietnam War, are not easily anticipated.

The future outlook for airport-related community growth at Cold Bay is uncertain. Aside from international events, airport-related growth here will depend to a large extent on decisions made by the State regarding the upgrading of other airports in the region, especially at Unalaska, and subsequent decisions made by air carriers as to the most economic means of providing air service to the various communities in the region. However, regardless of the level of improvements made to other airports,

it is assumed that the Cold Bay airport with its two runways, one 1,415 feet and the other 5,126 feet in length, will remain the premier facility in the Aleutians which is available for civilian use.

Despite some uncertainties, Cold Bay does have a potential for increased airport-related employment related to the servicing of OCS exploration (and, possibly, development) activities scheduled to take place in this region. It is by far the best civilian airport in the region and has almost unlimited capacity to accommodate additional traffic. Assuming that military demands remain approximately the same, no other significant airport-related growth at Cold Bay is anticipated.

The fishing and fish processing industry is not new to Cold Bay. The 1980 Census noted the existence of two canneries at Thin Point and a salting station at Cold Bay. More recently, the Northwest Pacific Packing Company operated a king crab freezing operation from the end of the old dock. However, the primary business of this company was reportedly the transporting of fuel from dock to the community and it was active in fish processing operations only from 1964 through 1966.

Fishing and fish processing does have a potential for economic and population growth at Cold Bay. The present operation involves the processing of king and tanner crab. According to Alaska Department of Fish and Game officials in Sand Point, Cold Bay's convenience to productive king crab grounds in the Bering Sea almost immediately north of Cold Bay, plus the higher prices for king crab currently being offered by

this processor to fishermen (\$1.05 per pound versus \$.90 elsewhere), are contributing to what appears to be a successful operation. Future plans of the Thirteenth Regional Corporation include the addition of salmon processing and construction of a shore-based plant at Cold Bay. These activities would further contribute to community growth.

Tourism is a minor element in Cold Bay's economy. However, this area is periodically visited by sportsmen, primarily for brown bear and waterfowl, with most of the latter taken in the Izembek National Wildlife Refuge. Although potential for growth from sport hunting is limited, it is believed that the wildlife populations in this area could sustain additional hunting pressure.

ECONOMY

Cold Bay's economy is centered around the operation of its airport, a facility which serves the entire Aleutians region. Other sources of economic strength include activities associated with the Cold Bay Air Force Station and a recently established seafood processing operation. These activities are called "basic" or exogenous as they are export industries whose fortunes are determined by forces outside the local area and are the foundation upon which "secondary" or endogenous industries, those whose fortunes are determined by local forces, rest. Thus, gains in basic industry are essential for long term community growth.

Composition of Employment

A separate count of employment in Cold Bay was undertaken by Alaska Consultants, Inc. in August 1980. This was felt to be necessary as Cold Bay accounts for only a very minor part of total employment in the Aleutians region. Furthermore, since Cold Bay is primarily a white transportation enclave, there are major differences in the composition of employment in this community and that of the region as a whole. Thus, each employer in Cold Bay was contacted to obtain average annual full-time employment information for each establishment in 1980. The results were then categorized by Standard Industrial Classification (SIC) code and tabulated.

While most employment in Cold Bay is year-round, activities in fishing and fish processing are normally highly seasonal and employees in this industry at Cold Bay are present in the community only for part of the year. To minimize duplication and reduce the distortion in total employment which would be caused by transient workers, Alaska Consultants, Inc. attempted to estimate average **annual** full-time employment in each sector of Cold Bay's economy. Except for fishermen, this was done by asking each employer to indicate if, when and how many seasonal personnel were added to "normal" employee levels.

In the case of fishermen, information on the number of boats delivering to the local processor was obtained from the Alaska Department of Fish and Game. By multiplying this number by the average number of persons

per vessel and then converting the number of months fished to a year-round basis, the annual average number of fishermen was estimated.

Overall, basic employment was estimated to account for 91 percent of the average annual full-time employment in Cold Bay in 1980. The community's resulting basic to secondary employment ratio of 1.0:0.1 is extreme, in Cold Bay's case indicating that this is more of an aviation enclave than a conventional settlement. Except for Anchorage and possibly Fairbanks, Alaska communities normally have small secondary employment sectors. However, Cold Bay represents an extreme case, especially when compared with national norms which are generally in the neighborhood of 1.0:1.5.

When converted to an average annual full-time basis, Cold Bay was found to have a total of 181.5 jobs in 1980 (see Table 21). Close to one-third (58.5) of these jobs are directly related to the operation and maintenance of the Cold Bay airport, including aviation-related employees of Flying Tigers, Reeve Aleutian Airways, the Federal Aviation Administration, the National Weather Service and the Alaska Department of Transportation and Public Facilities. In addition, all 15 jobs counted in the trade and service sectors were employees of either Flying Tigers or Reeve Aleutian Airways, with Flying Tigers operating a hotel/restaurant/bar and a store and Reeve maintaining a hotel/mess hall facility for persons stranded or awaiting flights out of Cold Bay.

The two other major employers in Cold Bay in 1980 were the Cold Bay Air Force Station and the Thirteenth Regional Corporation. The Cold Bay Air

TABLE 21
AVERAGE ANNUAL FULL-TIME Employment_/
COLD BAY

<u>Cl assi fi cati on</u>	<u>Number</u>	<u>%</u>	<u>% Basi c</u>	<u>Basi c Number</u>	<u>Secondary Number</u>
Agri cul ture, Forestry and Fi shi ng	25.0	5.0	100	25.0	0.0
Mi ni ng	0.0	0.0	--	0.0	0.0
Contract Constructi on	0.0	0.0	--	0.0	0.0
Manufacturi ng	30.0	15.0	100	30.0	0.0
Transportati on, Communi cati on & Public Utilities	56.5	28.3	88	50.0	6.5
Trade	6.0	0.3	50	3.0	3.0
Finance, Insurance & Real Estate	0.0	0.0	--	0.0	0.0
Servi ce	9.0	0.5	100	9.0	0.0
Government	73.0	36.6	88	64.5	8.5
Federal	(49.5)	(24.8)	(98)	(48.5)	(1.0)
State	(19.0)	(9.5)	(84)	(16.0)	(3.0)
Local	(4.5)	(2.3)	(--)	(0.0)	(4.5)
<u>TOTAL</u>	<u>199.5</u>	<u>100.0</u>	<u>91</u>	<u>181.5</u>	<u>18.0</u>

a_/ Includes 17 military personnel and 30 civi **ians** resident at the Cold Bay Air Force Station.

Source: Alaska Consul tants, Inc. August 1980

Force Station is managed by a civilian contractor, with all 17 military and 30 civilian employees at the Station living in group quarters on base. Civilian employees are coded as being in the transportation, communication and public utilities sector, whereas military personnel were classed as federal government employees.

A total of 30 persons was estimated to be engaged in fish processing activities at Cold Bay on an average annual full-time basis. The Thirteenth Region's processor, the Al-Ind-Esk-A-Sea, processed king and tanner crab at Cold Bay in 1980 and had a total of 70 shipboard and 2 shore-based employees. The average annual number of fishermen making deliveries to the Cold Bay processing plant was estimated at 25. However, these fishermen do not live at Cold Bay and the processing plant workers are in the community only seasonally.

A review of Cold Bay's employment composition by sector indicates the dominance of the government and the transportation, communication and public utilities sectors. The federal government is the major government employer, with the Federal Aviation Administration (21.5 jobs) and the U.S. Air Force (17 jobs) being numerically the most significant. Other federal employers in the community, in rank order, are the National Weather Service, the Fish and Wildlife Service and the Post Office. Except for the Post Office, all federal jobs in Cold Bay were classed as basic.

The State had a total of 19 average annual full-time employees at Cold Bay in 1980. Over half of these (11 jobs) were associated with the Department of Transportation and Public Facilities. Other State employees worked for the Department of Fish and Game (7 jobs) or the Magistrate's office (1 job). Over 80 percent of the State jobs in Cold Bay were classed as basic, with employment associated with the Magistrate's office rated as secondary, plus a portion of those derived from the Department of Transportation and Public Facilities and the Department of Fish and Game. Since Cold Bay is unincorporated, the community has no local government jobs except for those associated with the operation of the school.

The transportation, communication and public utilities sector had a total of 56.5 average annual full-time jobs in Cold Bay in 1980, of which 88 percent were judged to be basic. The largest single employer was RCA, the civilian contractor managing the Cold Bay Air Force Station, followed by Reeve Aleutian Airways, **Alascom** and Flying Tigers. Three other businesses each had 1 employee. All RCA and Flying Tigers employees were classed as basic, as were most of those employed by Reeve Aleutian Airways and two-thirds of those employed by **Alascom**.

All employees in the agriculture, forestry and fishing and the manufacturing sectors in Cold Bay were associated with the Thirteenth Region's seafood processing operation and all were classed as basic. The only other employment sectors represented in Cold Bay in 1980 were trade and services. Half of the employment in trade sector and all that in the service sector were judged to be basic.

Unemployment and Seasonality of Employment

There is not believed to be any unemployment in Cold Bay since all persons are in the community for job-related purposes and transient workers associated with the fishing and fish processing industry do not remain here year-round. The only possible source of unemployment in Cold Bay is dependents of persons stationed here who might wish to be employed.

Except for persons associated with fishing and fish processing, most jobs in Cold Bay are year-round, with the only significant exception being 7 Alaska Department of Fish and Game employees who are in Cold Bay for only three months per year. However, the fishing and fish processing industry has injected an element of **seasonality** into Cold Bay's economy. During the peak processing months, approximately 72 processing workers are present in the community and as many as 55 fishermen make periodic deliveries to the processing plant. Together, the peak employment in these two sectors increases the annual average full-time employment in Cold Bay by about 36 percent during the king crab and tanner crab processing seasons.

Recent Trends and Changes

There are no statistical data available which document recent trends and changes in employment at Cold Bay. Trends in employment for the Aleutian Islands division as a whole are not representative of those which have

taken **place** at Cold Bay since the economies of the two entities are fundamentally unlike. Furthermore, there are no insured employment statistics available specifically for Cold Bay as the Alaska Department of Labor combines Cold Bay figures with those for a number of other Aleutians communities, including Adak, Akutan, Atka, False Pass, Nelson Lagoon and **Nikolski**.

Despite the absence of employment statistics, it is apparent that changes in employment have occurred at Cold Bay during the past few years. Flying Tigers reported that its operations in the community have been cut back since the end of direct involvement by the United States in the Vietnam War. The **local** operations of the Federal Aviation Administration, the National Weather Service and Reeve Aleutian Airways are also reported to be reduced. These changes have been reflected in a decline in transportation-related employment.

On the plus side, the recent development of a fishing and fish processing operation based out of Cold Bay has led to a seasonal increase in employment and population. As a result, Cold Bay's economy has become less dependent on transportation-related activities, although these activities remain the primary reason for this community's existence.

Occupational Skills

There are no available data documenting the skills of Cold Bay's **workforce**. However, since people move here almost entirely for job-related reasons

and there is essentially no unemployment in the community, it can be reasonably assumed that occupational skills closely parallel those demanded by the available jobs.

Given this assumption, the workforce at Cold Bay can be said to be highly skilled in all areas of airport operations and maintenance, including weather reporting. In addition, seasonal fish processing workers and fishermen are assumed to be skilled in their particular areas. Few skills of a clerical or service nature are demanded at Cold Bay. Other locally demanded skills include military-related and telephone communications, teaching, fish hatchery management and wildlife refuge management. With the possible exception of a few clerical jobs, the recruitment and hiring of personnel in Cold Bay is done from outside the region.

Income Levels

There are no income data available specifically for Cold Bay. Furthermore, while 1970 Census figures indicated that median family incomes in the Aleutians census divisions in 1969 were significantly below the Statewide median at that time, it is unlikely that this was the case in Cold Bay.

Most jobs in Cold Bay demand a high degree of skill and it is assumed that they therefore command reasonably high wages. Probable exceptions to this are military personnel and fish processing plant workers. However, military personnel live on base and have commissary privileges

and room and board for processing plant workers is employer-provided. Given the full employment situation in this community, it is assumed that local demands **for** welfare assistance are non-existent.

ECONOMIC OVERVIEW

Cold Bay is primarily an aviation enclave, with the largest share of jobs in the community related to the operation and maintenance of the Cold Bay airport. The activities of the Cold Bay Air **Force** Station are, to some extent, also transportation-related. However, additional activities have recently been added at Cold Bay with construction of a salmon hatchery here by the State and establishment of a king and tanner crab processing operation by the Thirteenth Regional Corporation (a Native regional corporation established under terms of the Alaska Native Claims Settlement Act, as amended, made up of Alaska Natives resident outside the State). The only other economic activity of **any** significance at Cold Bay is related to periodic visits by sportsmen to hunt waterfowl or brown bear.

The Cold Bay airport is one **of** the best in the State, with only Anchorage International having a longer runway. Cold Bay's location in relation **to** Great **Circle** air routes between the West Coast of the U.S. and the Orient made it a convenient refueling and servicing stop for propeller aircraft and other military charters during the Vietnam War era. **In** addition, the Cold Bay airport's high rate of operability in a region plagued by constantly changing weather conditions, made it a logical

base of operations for travel to other communities on the Aleutian Chain.

Reflecting Cold Bay's important aviation function, a variety of airport-related government agency and airline personnel are stationed in or near this community. Federal and State agencies here include the Federal Aviation Administration, the National Weather Service, the U.S. Air Force and the Alaska Department of Transportation and Public Facilities. Airline operators currently stationed at Cold Bay include Flying Tigers and Reeve Aleutian Airways. A charter operator, Peninsula Airways, also has a local representative from time to time.

It is likely that Cold Bay will continue to play a pivotal role in aviation activities in the Aleutians through the foreseeable future although its role could be reduced if runways in communities such as Unalaska and Sand Point were significantly improved. However, given the physical impossibility of duplicating an excellent facility like the Cold Bay airport at either of those two locations, it is assumed that Cold Bay will remain the logical "forward base" for air travel to the Aleutians.

There is a potential for a growth in airport activity at Cold Bay derived from the scheduled St. George Basin OCS lease sale. Cold Bay's location in relation to the lease sale area make it a logical location for aircraft-related support services, at least during the exploration phase. It is unlikely that the initiation of such activities would

require **the** addition of more government airport-related personnel at Cold Bay. However, increases in employment for both scheduled and non-scheduled airline carriers and related operations at Cold Bay could be significant.

Fishing and fish processing is a new industry at Cold Bay. As a result of a State **land sale** at Cold Bay in 1979, the Thirteenth Regional Corporation acquired approximately 56 acres of **land** adjacent to the Cold Bay dock and has initiated a king and tanner crab processing operation in the community. At the present time, crab processing is being carried out on a floating processor, the **Al-Ind-Esk-A-Sea**, which is moored at the dock. Initial operations at Cold Bay are reportedly successful although some operating problems have been experienced, most notably the need for the processor to move away from the dock when the facility serves other traffic. A lack of water has also caused some difficulties and, according to Alaska Department of Fish and Game officials in Sand Point, travel to King Cove for water was undertaken by this processor several times last season.

The present operation employs 70 shipboard and 2 shore-based employees during the king crab and tanner crab seasons. The processor moved to Bristol Bay during the 1980 **salmon** season but the operators anticipate processing **salmon** at Cold Bay in **1981**. Other plans of the Thirteenth Regional Corporation at **Cold Bay** include construction of a shore-based **cold** storage plant and the **drilling** of water wells. The Corporation is also reportedly investigating **the** feasibility of installing a wind machine for electric power generation.

Depending on the ultimate degree of success of the Thirteenth Region's processing operation, the fishing and fish processing industry appears to offer potential for economic growth in this community. Cold Bay is more conveniently located than Unalaska to productive king crab grounds immediately to the north in the Bering Sea. Furthermore, the present operation has thus far been highly competitive, paying higher prices to fishermen for king crab than other companies operating in the area.

With the addition of salmon processing at Cold Bay, the length of the local operating season will be extended and the impact of the operation on Cold Bay's economy thus increased.

Other economic activities at Cold Bay include those associated with the Cold Bay Air Force Station plus a minor amount of tourism. The Cold Bay Air Force Station is located 11 miles by road from the airport and is managed under contract by RCA. A total of 30 civilians and 17 military personnel are stationed here year-round, all of whom live on base. The primary function of the Station is communications. In the absence of any evidence to the contrary, it is assumed that current staffing levels at this facility will remain approximately the same in the future.

Cold Bay receives only a minor amount of tourism, with major constraints being the community's distance from major population centers and the generally high cost of travel to the Aleutians. However, Cold Bay is the headquarters for the Izembek National Wildlife Refuge, a 415,300 acre area adjacent to the community. The Refuge is a major stopover point for migrant birds, including nearly the entire West Coast population

of black **brant**, most of North America's emperor goose population, approximately 100,000 Lesser Canada geese, as many as 200,000 to 300,000 dabbling ducks, and an even larger number of diving ducks. The area's waterfowl resources attract some attention from sportsmen elsewhere in the State. Reeve Aleutian Airways normally runs two charters each year to Cold Bay for this purpose, each with 40 to 50 sportsmen, during the second and third week in October. These people normally stay in Cold Bay at the Flying Tigers hotel, with any overflow accommodated in a rehabilitated log cabin known locally as the Volcano Club.

The Cold Bay area also has large caribou and brown bear populations. According to the Fish and Wildlife Service, the density of brown bear populations in this area rival that of Kodiak **Island** and Cold Bay is periodically visited by sportsmen on guided trophy brown bear hunts. Alaska Department of Fish and Game **officials** in Cold Bay report caribou in the area are taken almost entirely by local residents.

The same factors which now constrain travel to Cold Bay, distance and expense, are expected to continue in the future. Thus, while hunting pressure on wildlife populations in the Cold Bay area is reportedly light, no major growth in visitor activity in the community is expected. On the other hand, increased pressure from local residents could be felt, particularly if Cold Bay continues to develop as a fishing and fish processing center and if the local airport is used to service OCS exploration activities in the St. George Basin.

Land Use

OVERALL LAND USE PATTERNS

Unlike most Alaska coastal communities where development is concentrated along the waterfront, overall land use patterns at Cold Bay reflect this community's close relationship to aviation activities (see Figure 5). Historically, development at Cold Bay has taken place in a linear pattern along the airport runways. Airport-related industrial activity is concentrated in the vicinity of the airport terminal and the State Department of Transportation and Public Facilities maintenance complex. However, a 1979 State sale of waterfront and adjacent uplands in the vicinity of the Cold Bay dock has also encouraged industrial development in this area. A fish processing vessel owned by the Thirteenth Regional Corporation is currently moored at the dock and there is an associated onshore warehouse and crab pot storage area.

Commercial activities in Cold Bay, which are limited to the Flying Tigers Inn and Reeve Aleutian Airways' bunkhouse and mess hall are located adjacent to the airport industrial area. Almost all housing in the community is employer-provided and is clustered in four complexes. These include the Reeve and Flying Tigers staff housing between the hotels and the State maintenance facility, the Federal Aviation Administration and National Weather Service housing to the west of the maintenance complex, the State quarters area to the north and the Fish and Wildlife Service complex on the hill overlooking Cold Bay.

COLD BAY

EXISTING LAND USE

-  cOMMERCIAL
-  INDUSTRIAL
-  PUBLIC
-  RESIDENTIAL

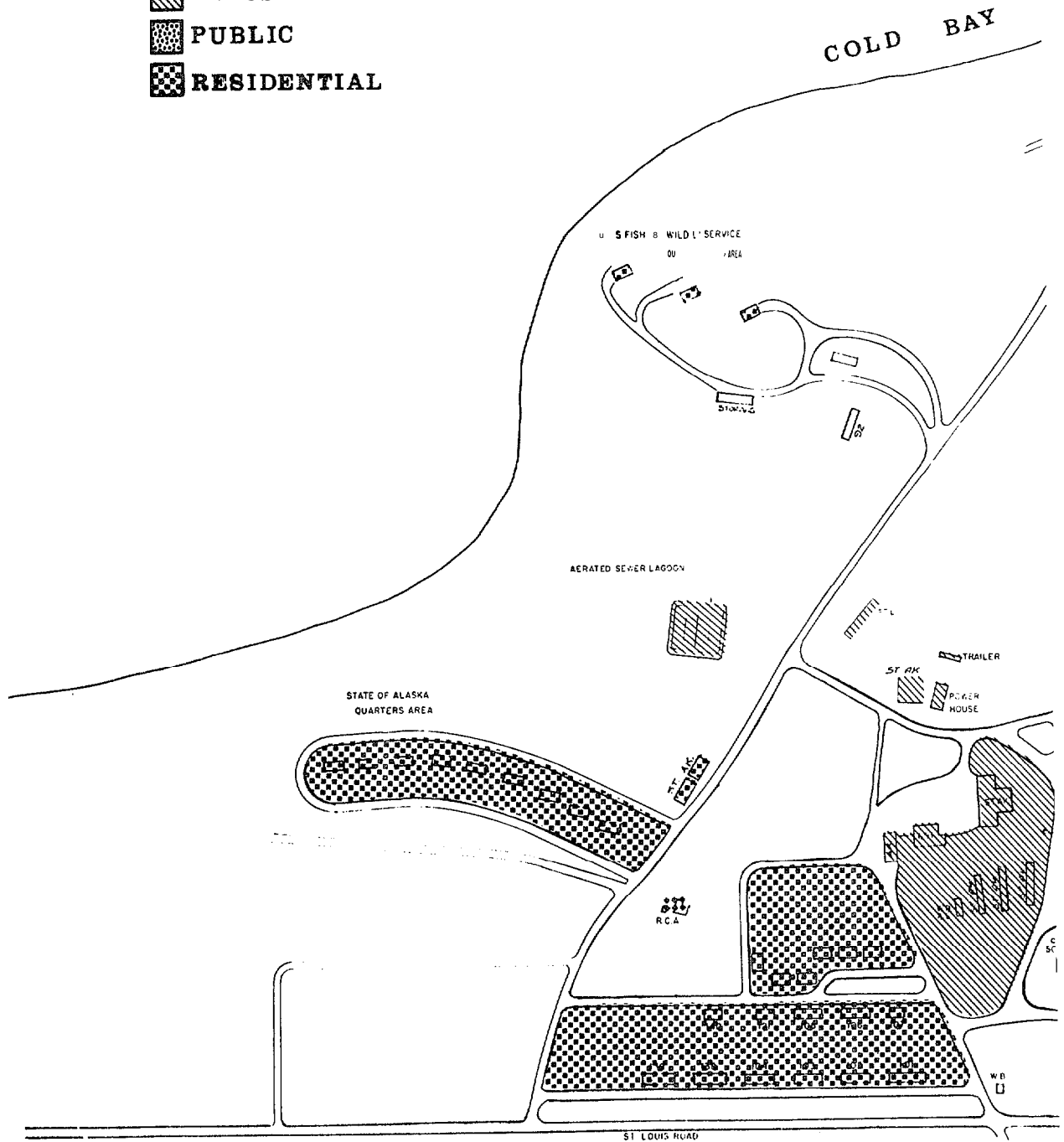
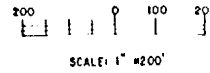
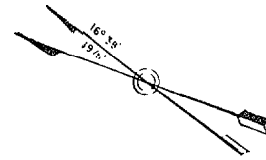
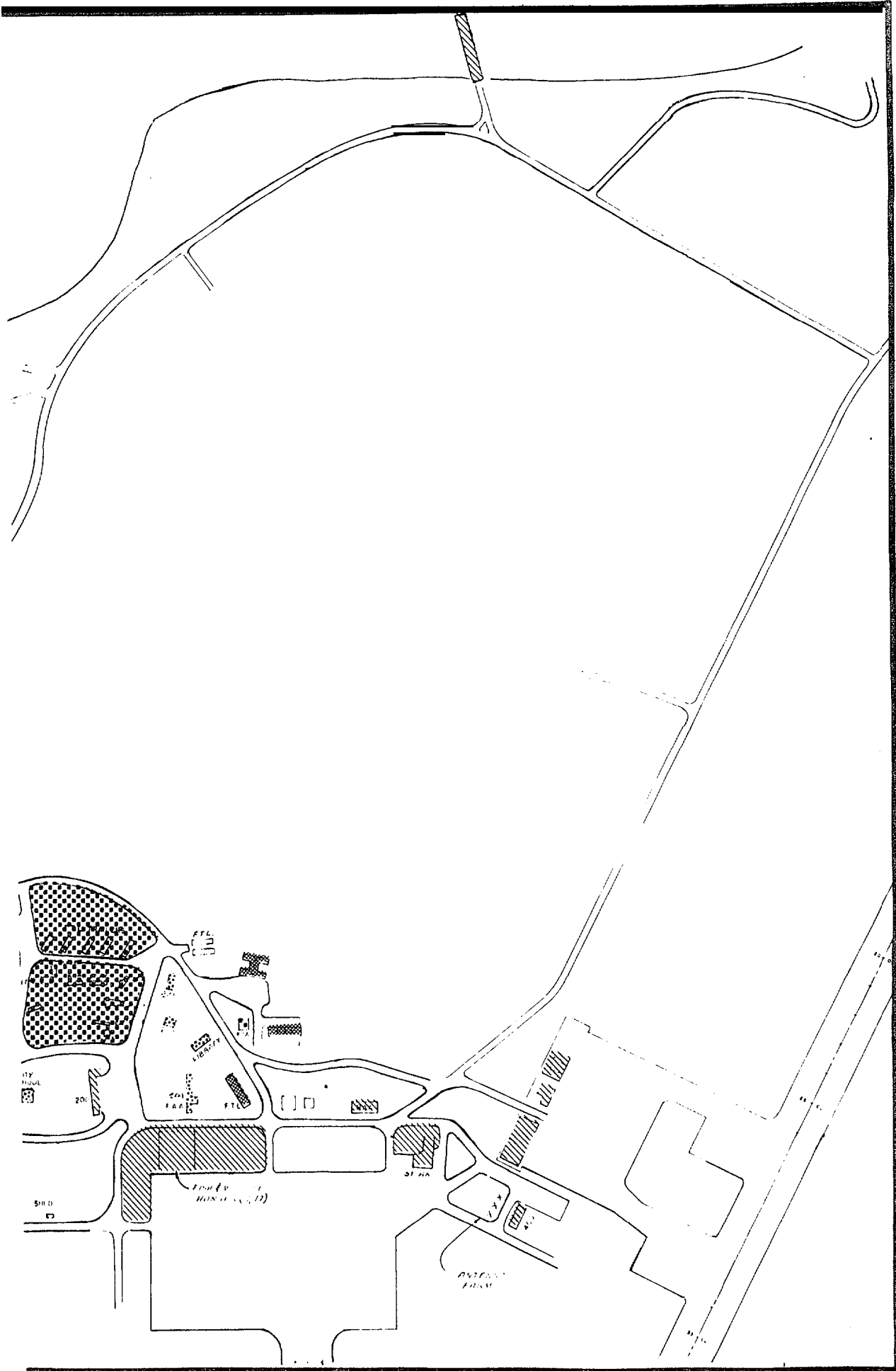


FIGURE 5



As well as buildings currently in use, Cold Bay has a very large number of derelict military structures. Although Fort Randall was abandoned immediately after World War II, no attempt was ever made to remove any military installations or to restore the environment. As a result, areas south of town and even within the present community are still dotted with the remains of hundreds of old quonset huts and other structures.

Cold Bay is unincorporated and there **is** therefore no official local planning authority. Formal incorporation of Cold Bay as a city under Alaska law has been discussed from time to time, with the most recent attempt being in the summer of 1980, but to date these efforts have not met with community-wide support. In the absence of any organized local government, most planning in Cold Bay has been conducted by State or federal government agencies in connection with **their** specific sites or facilities.

DEVELOPMENT CONSTRAINTS

Until very recently, a major constraint to development at Cold Bay was a lack of available private land. Other constraints include severe weather conditions, the general susceptibility of the Aleutian region to earthquakes and the absence of local government.

Most land in the vicinity of Cold Bay is owned by either the State or federal governments. However, two State land sales transferred about 180 acres of waterfront and uplands near the dock to private ownership in

1979. Previously, the only privately held land in the area was 100 acres between Cold Bay and the Izembek National Wildlife Refuge made up of ten homesteads and the same number of headquarters sites, plus a homestead south of town on the road to the State fish hatchery.

Climate conditions at Cold Bay are not as severe as in many other Aleutian communities. However, high winds sometimes interfere with shipping at Cold Bay and occasional extended periods of cold temperatures create sufficient ice to bar access to the Cold Bay dock.

Cold Bay is within earthquake zone 4 which means it is liable to have earthquakes causing major structural damage, a factor which should be taken into account in the design of structures. In addition, the community's location on the west side of Cold Bay facing toward the Pacific Ocean makes it vulnerable to direct onslaught by earthquake-generated tsunami waves.

The lack of an organized community at Cold Bay is another development constraint. Historically, the State or federal governments have provided all community facilities and services here except electric power and telephone. There are indications that the federal government would be extremely reluctant to extend these facilities, particularly water and sewer, to non-government related development. Consequently, new industry moving into the area would probably be forced to provide for its own needs. This has been the experience of the Thirteenth Regional Corporation which is planning to develop its own water supply and is investigating the feasibility of generating its own power requirements.

LAND STATUS

As previously mentioned, **almost all** land in the Cold Bay area **is** owned by either the State or federal governments. Inside Cold Bay, there are about 180 acres of privately owned land (a significant proportion of which is owned by the Thirteenth Regional Corporation), and a small parcel owned by the U.S. Fish and Wildlife Service which is the site of the **Izembek** National Wildlife Range headquarters complex. All other land at Cold Bay is owned by the State. Immediately north of **Cold Bay** there are about 100 acres of privately owned land and a tract owned by the National Weather Service. There is another homestead south of town on the road to the hatchery. All other land in the vicinity of Cold Bay is within the 415,300 acre **Izembek** National Wildlife Refuge, although the State has jurisdiction over about 95,300 acres of tidal **lands** below the line of mean high tide within the Refuge. There are no Native selections in the immediate Cold Bay area.

HOUSING

At the time of the 1970 Census, there were 75 occupied and no vacant housing units in Cold Bay. Preliminary 1980 Census figures indicate a total of only 43 housing units in the community, a decrease of 43 percent. The **1980** Census found one vacant unit, indicating a vacancy rate of slightly more than 2 percent. However, field observations by Alaska Consultants in the summer of 1980 noted 61 occupied housing units at Cold Bay, representing a much smaller 19 percent decrease since 1970.

Neither the 1980 Census nor Alaska Consultants figures include personnel stationed at the Cold Bay Air Force Station or group quarters provided for up to 70 workers on board the Al-Ind-Esk-A-Sea. This vessel was in Bristol Bay at the time of Alaska Consultants visit to Cold Bay in August 1980.

The composition of Cold Bay's housing stock has changed dramatically during the past decade. In 1970, 71 percent of all housing units in the community were in structures containing two or more units. By contrast, Alaska Consultants found that 67 percent of the units were in single family structures (including trailers) in 1980. The number of trailers rose from two in 1970 to nine in 1980, an increase of 350 percent.

Almost all units in Cold Bay are employer-provided rental housing. In 1970, the Census found only three owner occupied housing units in the community, about 4.2 percent of the total. This situation persists. In the summer of 1980, Alaska Consultants estimated that there were at most three owner occupied homes at Cold Bay, now representing about 5 percent of the community's conventional housing units. Excluding group quarters on the Al-Ind-Esk-A-Sea and at the Cold Bay Air Force Station, about 44 percent of the units in Cold Bay are owned by the federal government, 25 percent by the State and the remaining 26 percent by private employers in the community such as Reeve Aleutian Airways, Flying Tigers and Alascom.

Field observations by Alaska Consultants in 1980 determined that Cold Bay's housing stock is in basically good condition. Aside from two

apartments in the State public safety building which have been condemned as living quarters and two State-owned trailers, all government-owned housing appears at least externally to be in excellent condition. Onshore housing provided by the community's private employers is primarily in trailers which have been less well maintained and appear somewhat dilapidated.

Community Facilities and Services

PUBLIC SAFETY

Public safety functions in Cold Bay are provided by the Alaska Department of Transportation and Public Facilities. Police, fire protection and emergency medical services are designed specifically to support the State-operated airport. However, they are generally extended to the rest of the community (excluding the Air Force Station) as needed. The combination police/fire station is housed in a State-owned building adjacent to the runway between the airport terminal and the Federal Aviation Administration tower. This is scheduled for relocation to a site near the Weather Service building at the far end of the runway within the next two years. Public safety operations are headed by an **Alaska** Department of Transportation and Public Facilities employee who is both a State certificated police officer and fire fighter, as well as a grade 1 emergency medical technician.

Police

There is one full-time police officer in Cold Bay. His primary responsibility is airport security although he is also empowered to provide conventional police protection services to the community at large. In addition, police powers are vested in the State airport manager and State Fish and Wildlife Protection officers stationed at Cold Bay. However, the latter are concerned primarily with fish and game violations. The nearest State trooper is at Sand Point.

The combination police/fire station contains a small office, a holding cell, space for storing fire equipment and living quarters. The building is more than 20 years old and is in extremely poor condition. Living quarters associated with the building have been condemned by the State. Police equipment consists of a 1980 pick-up truck equipped with a red light and a flight service band radio.

According to the police officer, serious crime in Cold Bay is a rarity and, when it occurs, almost always involves transients passing through town on their way to or from other Aleutian communities. Most of the community's law enforcement problems are drug and alcohol related. There were three arrests during the first six months of 1980. Two involved drunk and disorderly conduct and the third was a near-fatal knifing incident.

Fire Protection

The State has provided fire protection services in Cold Bay since the Division of Aviation took over operation of the airport at the time of Statehood. The fire department is manned by a full-time chief and 15 volunteer firemen. Fire fighting equipment includes a 1967 International pumper equipped with a 1,000 gallon tank and a 250 gallon per minute (gpm) pump; a 1961 Walters nurse truck outfitted with a 1,000 gallon water tank and 80 gallons of foam; a 1948 Jeep pick-up truck carrying 1,000 pounds of **ansel** dry chemical; and a 1971 **Nodwell** all-terrain vehicle equipped with a fire fighting unit and crash rig. All of these vehicles are designed to fight both structural and aircraft fires, and all are housed in the four bay fire station. The department also has a 17 foot crash-rescue fireboat designed specifically for aircraft rescue operations.

Water sources for fire fighting purposes in Cold Bay are a hydrant system and two 25,000 gallon underground tanks. The hydrants each pump less than 500 gallons per minute. The community currently has an Insurance Services Office (ISO) class rating of 10 for insurance purposes because it has never gone through the formal ISO application process. According to the ISO, a community can obtain a class 9 rating if at least 5 people show up for **all** structural fires, if there is a pumper available with at least 350 gallons of storage and a pumping capability of 150 gallons per minute, and if the hydrant system can sustain flows of 250 gallons per minute for at least two hours. The Cold Bay fire department meets all

these qualifications and could therefore expect to receive an improved rating if it went through the formal ISO rating process.

There have been no serious structural fires in Cold Bay in recent years. However, because of the many old buildings in the community and prevalent strong winds, a potential for serious fire exists. The only recent serious fire was aircraft-related and involved a Lear jet which missed the runway on approach and landed in Cold Bay. This crash resulted in the loss of one life.

Emergency Medical Services

Emergency medical services provided by the State are intended to serve only the airport but are also extended to the community at large if the airport EMT officer is available. EMT equipment is housed in the fire station and includes a 1965 GMC carry-all which has been converted into an ambulance.

Patients requiring additional emergency medical treatment are sent to Anchorage either by commercial aircraft or chartered Lear jet. However, the State authorizes charters only when there is prior permission from the patient's employer or when there is proof that there is adequate health insurance to cover the cost.

HEALTH AND SOCIAL SERVICES

In the absence of a community health facility at Cold Bay, basic health care needs are dispensed by a variety of State and federal government agencies and by an occasional Public Health Service or private physician or dentist passing through town en route to and from other Aleutian communities. In addition, a State social worker based in **Unalaska** but charged with providing services throughout the Aleutians region visits Cold Bay periodically to provide child protection assistance, as needed.

Before the summer of 1980, the Alaska Department of Health and Social Services operated a clinic in Cold Bay staffed by a part-time public health nurse who provided immunizations, well baby care, communicable and chronic disease control and general health counseling. However, the State closed this facility and now serves Cold Bay and the rest of the **Aleutian** Chain from Anchorage. In the future, an itinerant public health nurse will visit Cold Bay once every two months and dispense services out of the Federal Aviation Administration first aid room.

Two federal government agencies in Cold Bay provide limited medical assistance to local residents. A **first** aid room in the Federal Aviation Administration building is stocked with medicines dispensed by telephone from an Anchorage physician. In addition, the physician's assistant at the Cold Bay Air Force Station will see local residents although he is not specifically designated to **do** so.

Nest of Cold Bay's health care needs are met in Anchorage. All major employers in the community carry comprehensive health insurance policies for their employees which cover both transportation costs to Anchorage and necessary medical care, while Alaska Native residents are entitled to fly at government expense to obtain treatment at the Public Health Service hospital in Anchorage. Unlike most Aleutian communities where poor weather and inadequate navigation aids often shut down airport operations, air service in and out of Cold Bay is frequent and dependable. Consequently, good medical service is more readily accessible.

Cold Bay is basically a healthy community. Its population is young. Housing, diet and family incomes are generally adequate and there is little risk of serious accidents associated with most employment in town. However, the likelihood of job-related accidents at Cold Bay will increase if local fishing and fish processing activities continue to expand.

EDUCATION

Education services in Cold Bay are provided by the Aleutian Region School District, a State funded Rural Education Attendance Area (REAA) headquartered in Anchorage. The school district is responsible for the hiring of teachers and maintenance of the school plant, while the Alaska Department of Transportation and Public Facilities, through the REAA, is responsible for construction of new school facilities, as required.

All Cold Bay students are presently housed in a single complex near the airport within easy walking distance of almost all residences in the community. Administratively, students are usually divided on a grades 1 to **4**, grades 5 to 8, and grades 8 to **12** basis, but this changes from year to year depending on the number of students in each grade. Kindergarten classes are not generally offered although they were held during the 1978/79 school year. The decision on whether or not to include kindergarten classes is made by the community school committee on the basis of community interest, the potential number of kindergarten students and availability of funds.

The original school building, consisting of a classroom and a one bedroom teacher's apartment, was constructed in 1961. Two classrooms, a cloak room, restrooms and a storage area were added in 1967. In the spring of **1980**, the teacher housing was converted into work space and a combination library/media center and major repairs were made to the **school** roof. The Aleutian Region School District would like to add a multi-purpose room to the school building but currently lacks sufficient funds.

A 1979 facilities survey and analysis conducted for the School District identified several problems with the existing school plant. However, it determined that space provided within the building was adequate for present community needs and that **the** 2.55 acre school site **could** accommodate probable future expansion demands. Problems were relatively minor, including windows which leaked and which were also not designed to reduce solar gain or noise from the Cold Bay airport, plus water stains on walls and ceilings.

The Cold Bay school is staffed by four teachers, one of whom also acts as a general supervisor, plus a part-time janitor. In addition, a teacher's aide is hired if a kindergarten program is offered. There are generally two elementary and two secondary school teachers although this division is flexible since students are rotated on the basis of individual teachers' experience. The current student per classroom ratio is about 10 to 1.

Enrollment in the Cold Bay school has shown strong year to year fluctuations during the past decade (see Table 22). Overall, final enrollment rose 25 percent between 1969/70 and 1979/80, primarily because of the introduction of a high school program in 1972. Elementary school enrollment has risen and declined several times since 1969/70 but the overall trend has been one of decline, with final enrollment in 1979/80 being about 14 percent below that recorded in 1969/70. During the ten year period, elementary school enrollment ranged between a low of 16 students in 1972/73 to a high of 30 students in 1978/79, a difference of about 88 percent. Secondary school enrollments have also fluctuated since the program was initiated in the 1972/73 school year. Although the overall trend has been upward (a 175 percent increase since 1972/73), there were two years when no high school students were enrolled.

Erratic fluctuations in Cold Bay's student population probably result from a combination of factors. Overall, community population declined here between 1970 and 1980. However, during the same period, the composition of Cold Bay's population changed from a predominance of

TABLE 22
SCHOOL ENROLLMENT TRENDS
COLD BAY
1969/70 - 1979/80

School Year	Final Enrollment				Total	Average Daily Membership
	Grades K - 8 a/		Grades 9 - 12 b/			
	Number	% of Total	Number	% of Total		
1969/70	28	100.0	0	0.0	28	24.08
1970/71	25	100.0	0	0.0	25	25.64
1971/72	21	100.0	0	0.0	21	24.34
1972/73	16	80.0	4	20.0	20	20.05
1973/74	28	100.0	0	0.0	28	28.23
1974/75	24	82.8	5	17.2	29	27.55
1975/76	23	92.0	2	8.0	25	24.51
1976/77	24	100.0	0	0.0	24	27.07
1977/78	21	84.0	4	16.0	25	20.12
1978/79	30	78.9	8	21.1	38	37.55
1979/80	24	68.6	11	31.4	35	34.93

a/ Elementary school enrollment includes one kindergarten student during 1978/79.

b/ Secondary school enrollment includes ninth and tenth grades beginning in 1972/73, eleventh grade beginning in 1977/78 and twelfth grade beginning in 1978/79.

Source: Alaska Department of Education. Juneau.

single transient males to one with more conventional family units and a greater proportion of children. Thus, enrollment in the Cold Bay school has not really reflected the decline in total community population during the past ten years. An even more significant factor in sharp year to year enrollment fluctuations is related to the small scale of the community and to periodic rotations of government personnel. Thus, if even one family with several children moves in or out of Cold Bay, it is likely to result in a significant change in the composition of the local school population.

RECREATION

Almost all recreation facilities in Cold Bay are provided by the federal government. The Federal Aviation Administration owns and operates a community center near the school which is open to the public for weekly movies, as well as for public meetings and potlucks. In addition, facilities at the Cold Bay Air Force Station 11 miles from town are available to federal employees in the Cold Bay area and include a small bar, a post exchange and a canteen serving beer, soft drinks and pizza. Nightly movies shown at the Air Force Station are open to the general public, as are occasional visiting United Services Organization (USO) shows .

By far the most popular recreation spot for Cold Bay's adult population is the Flying Tigers Inn which includes a restaurant and a bar equipped with electronic video games and a juke box. Although designed

specifically to serve **local** Flying Tigers employees, flight **crews** and persons weathered in at Cold Bay or awaiting plane connections, the restaurant and bar are also popular gathering spots for local residents. In addition, young people in Cold Bay spend a great deal of time at the airport terminal where there are video games and candy bar and soft drink machines.

In most rural Alaska towns, the **school** multi-purpose room or gymnasium serve as focal points for community recreation activity. However, the Cold Bay school does not have these facilities. Furthermore, it is the policy of the community school committee that the school should be used primarily for education purposes. This policy does not apply to outdoor school amenities and an outdoor play area and associated recreation equipment adjacent to the school are available for public use.

According to **local** residents, the leisure time pursuits of most government employees and their families at Cold Bay do not depend on the provision of formal facilities. Fishing and hunting are especially popular, with the major local hunting effort being for waterfowl and caribou. Other popular outdoor recreation activities include **snowmobiling** in the winter and motorcycling during the summer months.

UTILITIES

Except for electric power and telephone, utilities services in the Cold Bay area are provided by the Federal Aviation Administration. These

amenities were developed in 1959 to serve Federal Aviation Administration facilities but have since been extended to other users. Both the local water and sewer systems are currently operating at or near capacity and will require substantial capital investment if services are extended to additional users. The Federal Aviation Administration remains the largest single utility customer in Cold Bay, accounting directly for about 30 percent of the water and sewer system hook-ups. However, this agency would prefer to turn over its utilities systems to another entity such as the State or, if one incorporated, to a local government.

Water

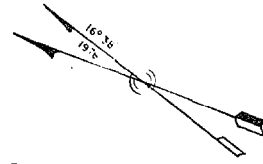
Cold Bay derives its water from five deep wells. Water is stored in two 15,000 gallon tanks, one of which is held in reserve. Two additional underground tanks, each with a capacity of 25,000 gallons, provide water for fire fighting purposes. All water intended for domestic consumption is chlorinated.

The distribution system uses a 6 inch diameter main transmission line, with most feeder lines being 3/4 or 1 inch in diameter, and serves most users in the immediate vicinity of Cold Bay. Exceptions are the dock area (including the Thirteenth Regional Corporation's fish processing operation), the Russell Creek hatchery, the Cold Bay Air Force Station and several homesteads remote from the core community (see Figure 6).

According to the Federal Aviation Administration, there were 64 hook-ups to the system in August 1980.

COLD BAY

Existing Water and Sewer Systems



————— WATER LINE
- - - - - SEWER LINE

ABBREVIATIONS

- FAA • FEDERAL AVIATION ADMIN. BLDG.
- FTL • FLYING TIGER LINE
- RAA • REEVE ALUTIAN AIRWAYS
- ST AK • STATE OF ALASKA
- WB • U.S. WEATHER BUREAU

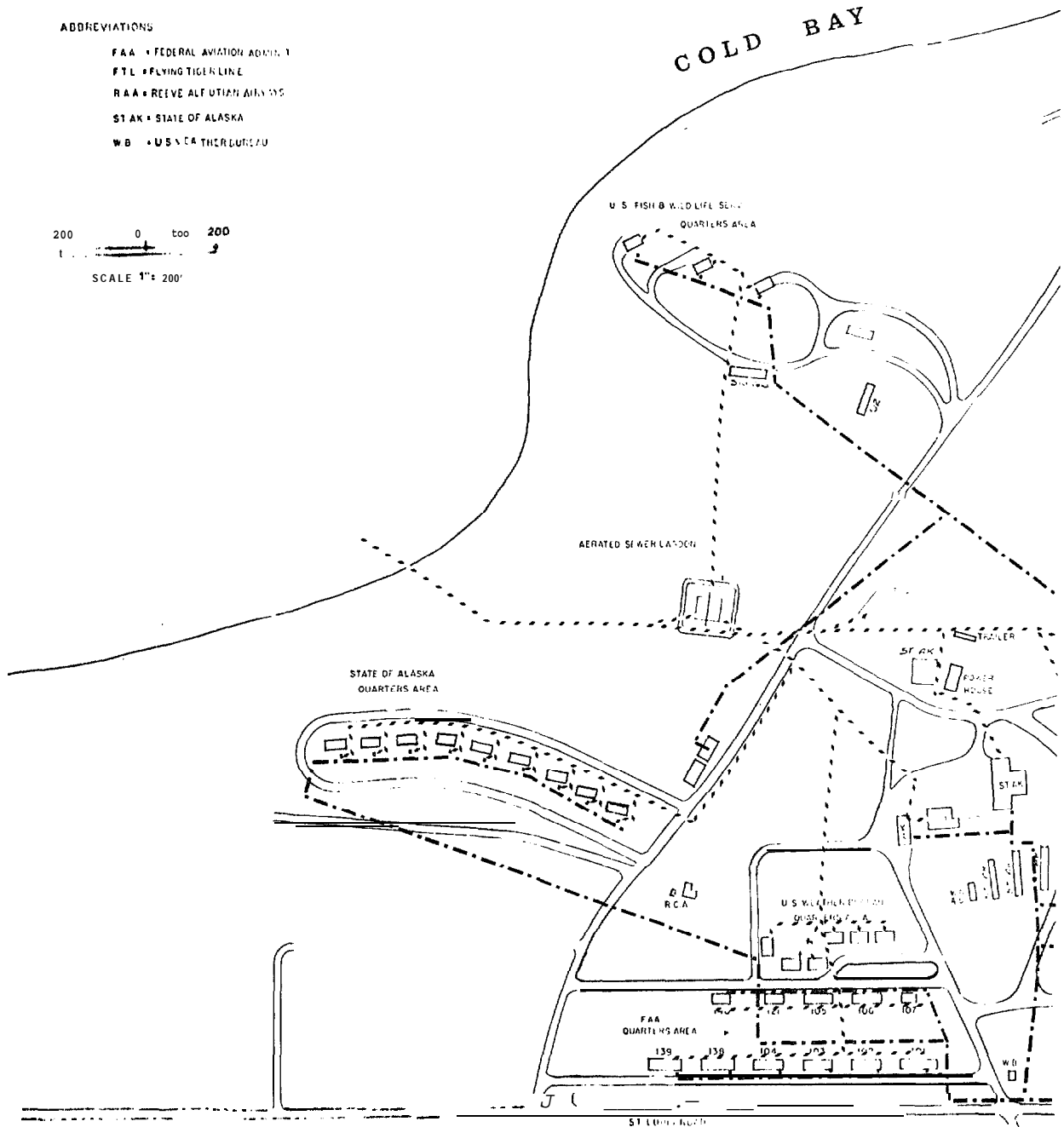
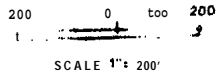


FIGURE 6



Except for the extension of water lines to additional users in 1968, the Cold Bay water system has remained basically unchanged since it was first installed in 1959. The system is essentially a good one but has potentially serious problems of limited supply and storage capacity. According to the Federal Aviation Administration, system users currently consume water at a rate of about 30,000 gallons per day, a rate which has held constant for the past several years. While there has never yet been a local water shortage, the Federal Aviation Administration believes that increased draws on the existing supply would, in the long run, seriously deplete the water source and that development of a new source would be required to accommodate significant community growth. This observation is confirmed by plans of the Thirteenth Regional Corporation to develop its own water source.

Existing storage capacity is another problem as it is barely adequate to meet current demands and would need to be expanded under conditions of community growth. Finally, hardness of the local water also causes difficulties as it tends to form deposits in boilers and hot water heaters, although this condition reportedly can be resolved through the installation of water softeners.

Sewer

The Cold Bay sewer system was developed by the Federal Aviation Administration concurrently with the water system in 1959 and serves approximately the same area (see Figure 6). According to the Federal

Aviation Administration, the existing wastewater collection system is adequately sized to accommodate current usage. As of August 1980, there were 68 hook-ups to the Cold Bay sewer system, a number which has remained relatively constant during the past few years.

Sewage treatment has been provided at Cold Bay since 1965. The present treatment facility dates from 1968 and consists of a mechanically aerated sewage lagoon with a chlorinated outfall. However, this facility is inadequately sized to meet even existing demands. According to the Federal Aviation Administration, the design capacity of the plant is 2,000 gallons per day. Assuming a conservative 20,000 gallons per day flow of wastewater (current community water use averages around 30,000 gallons per day), the sewage treatment plant is obviously operating far beyond its design capacity. The Federal Aviation Administration has no plans to increase plant capacity and indicated that it is attempting to comply with U.S. Environmental Protection Agency regulations without the expenditure of additional funds.

Electric Power

Electric power at Cold Bay is provided by a private company, the Northern Power and Engineering Corporation. The system serves customers throughout the Cold Bay road-connected area, with the only major users outside the system being the Cold Bay Air Force Station and the Thirteenth Regional Corporation's fish processing operation. According to the operators, there were approximately 60 hook-ups to the system in August 1980.

All power in Cold Bay is diesel generated. The power plant is located across from the Alaska Department of Transportation and Public Facilities maintenance complex and houses four diesel units with a combined peak (or nameplate) capacity of 1,800 kilowatts and a firm power (peak capacity minus the largest generating unit) capacity of **1,200** kilowatts. According to Northern Power and Engineering, community requirements in the winter of 1980 were for about 650 kilowatts of peak power and 450 kilowatts of firm power, **well** within the system's capacity. However, with completion of the new State fish hatchery and the possible addition of an onshore cold storage plant by the Thirteenth Regional Corporation, demands on the system are expected to undergo a major increase and the operator is considering adding another 600 kilowatt generating unit in early 1981.

In the opinion of Northern Power and Engineering, Cold Bay's electric power system is basically a good one. Nevertheless, **diesel** power has a major disadvantage compared with other systems in its high operating costs. A typical residential household consumes between 800 and 1,000 kilowatt hours per month, excluding heat. As of September 1980, this cost between \$138 and \$169 in Cold Bay compared with around \$26 to \$31 in Anchorage where natural gas is the primary power source. While the Anchorage system has obvious economies of scale, the difference in the power source is also a significant factor.

Solid Waste Disposal

The only formal garbage collection service in Cold Bay is provided by the Federal Aviation Administration to its facilities and employees. All

other garbage is individually collected and hauled several miles southeast of town to the dump. The dump is maintained by the Alaska Department of Transportation and Public Facilities which periodically backfills the site and digs a new trench. Problems associated with the dump include uncontrolled dumping and open burning. In turn, bears are often attracted to the site, causing a public nuisance.

Communications

Telephone services at Cold Bay have been provided by the Interior Telephone Company since 1972 from an exchange located on State property next to the Alascom building. The system presently has a capacity of 400 lines, well in excess of the 120 lines served in September 1980. According to company officials, the system should be adequate to meet local telephone needs for another twelve years, assuming a continuation of current growth trends.

Long distance telephone communications at Cold Bay are provided by Alascom through its earth satellite system. The system's 46 channels are reportedly adequate to absorb substantial additional growth.

Local Government Organization

Cold Bay is an unincorporated community and therefore has no organized local government. According to local informants, this has never been a closely knit community. Most people live in agency compounds and tend to

socialize in employer-related groups. There have been several attempts to incorporate Cold Bay as a second class city, with the most recent being in the summer of 1980. However, none of these attempts has yet been successful and decisions regarding the provision of capital improvements at Cold Bay are instead made by the various government agencies without significant local input.

In the absence of an organized local government, community amenities at Cold Bay (except **for** electric power and telephone services) are provided by federal and State government agencies. These agencies are becoming increasingly reluctant to extend their systems to serve additional non-aviation related users. Thus, new developments such as the State fish hatchery and the Thirteenth Regional Corporation's fish processing operation are forced to provide most of their own utility requirements.

THE ALEUT COMMUNITY OF ST. PAUL ISLAND

Population and Economy

The Aleut Community of St. Paul Island is one of Alaska's most remote villages, located in the Bering Sea on the northernmost of the Pribilof Islands, approximately 250 miles northwest of Unalaska and almost 950 miles southwest of Anchorage. The community was established during the 1780's when the Russian-American Company brought Aleuts here from Unalaska and Attu to engage in sealing. Since that time, the village has been continuously occupied except for a period during World War II when local residents were resettled at Funter Bay in Southeast Alaska. Today, fur sealing is the major source of local employment and income although tourism has also become important. Military-related employment associated with the Coast Guard Loran Station is a factor in the Island's economy but does not directly employ local residents.

POPULATION

Past Trends

Past rates of population growth at St. Paul have been primarily related to rates of natural increase and out-migration. U.S. Census figures indicate that St. Paul has experienced steady population growth since 1950, although rates of growth have been significantly greater during the past twenty years (see Table 23). During the 1950 to 1960 decade, the

TABLE 23

POPULATION TRENDS
ST. PAUL, ALASKA
1950- 1980

<u>Year</u>	<u>Popul ati on</u>	<u>Percent Change</u>
1950	359	
1960	378	5.3
1970	450	19.0
1980 <u>a/</u>	527	17.1

a/ Excludes 22 persons living in group quarters at the Coast Guard Loran Station near the St. Paul airport.

Sources: U.S. Department of Commerce, Bureau of the Census (unpublished preliminary 1980 Census data provided by the Aleutian-Pribilof Island Association).

U.S. Department of Commerce, Bureau of the Census. 1971. Number of Inhabitants, Alaska, Washington, D.C. Final Report **PC(1)-A3.**

U.S. Department of Commerce, Bureau of the Census. 1960. Number of Inhabitants, Alaska. Washington, D.C. Final Report **PC(1)-3A.**

community's population rose only 5.3 percent, with the numerical gain being less than that which could be accounted for by natural increase. According to the University of Alaska (March 1968), St. Paul experienced a relatively large amount of out-migration of young people during the 1950-1960 decade for employment and, in the case of females, for marriage.

St. Paul's population rose 19 percent between 1960 and 1970. However, it is probable that continued out-migration of young people from the Island took place during this period as much of the growth has been attributed to an influx of St. George residents who were then being actively encouraged by the Bureau of Commercial Fisheries (now the National Marine Fisheries Service) to move permanently to St. Paul.

Preliminary 1980 Census figures indicate continued modest gains in population at St. Paul. The community's 1980 population of 527 persons represents an increase of 17.1 percent since 1970, for an average annual rate of growth of 1.6 percent. These figures exclude Coast Guard personnel living in group quarters at the Loran Station near the airport.

Population Composition

The outstanding feature of St. Paul's population is that it is predominantly Aleut. At the time of the 1970 Census, more than 95 percent of the people living on St. Paul were Alaska Natives, almost all of them Aleuts (see Table 24). According to a draft report prepared for the National Marine Fisheries Service (June 17, 1980), Alaska Natives

TABLE 24
COMPOSITION OF POPULATION BY RACE AND SEX
ST. PAUL, ALASKA
1970

<u>Race</u>	<u>Sex</u>		<u>Total</u>	<u>Percent of Total</u>
	Male	Female		
White	13	9	22	4.9
Negro	0	0	0	0.0
Indian	2	3	5	1.1
Alut	224	199	423	94.0
Eskimo	0	0	0	0.0
Other	0	0	0	0.0
<u>TOTAL</u>	<u>239</u>	211	450	<u>100.0</u>

Source: University of Alaska, Institute of Social, Economic and Government Research. September 1973. Age and Race by Sex Characteristics of Alaska's Village Population. College. (Alaska Review of Business and Economic Conditions. Vol. X, No. 2)

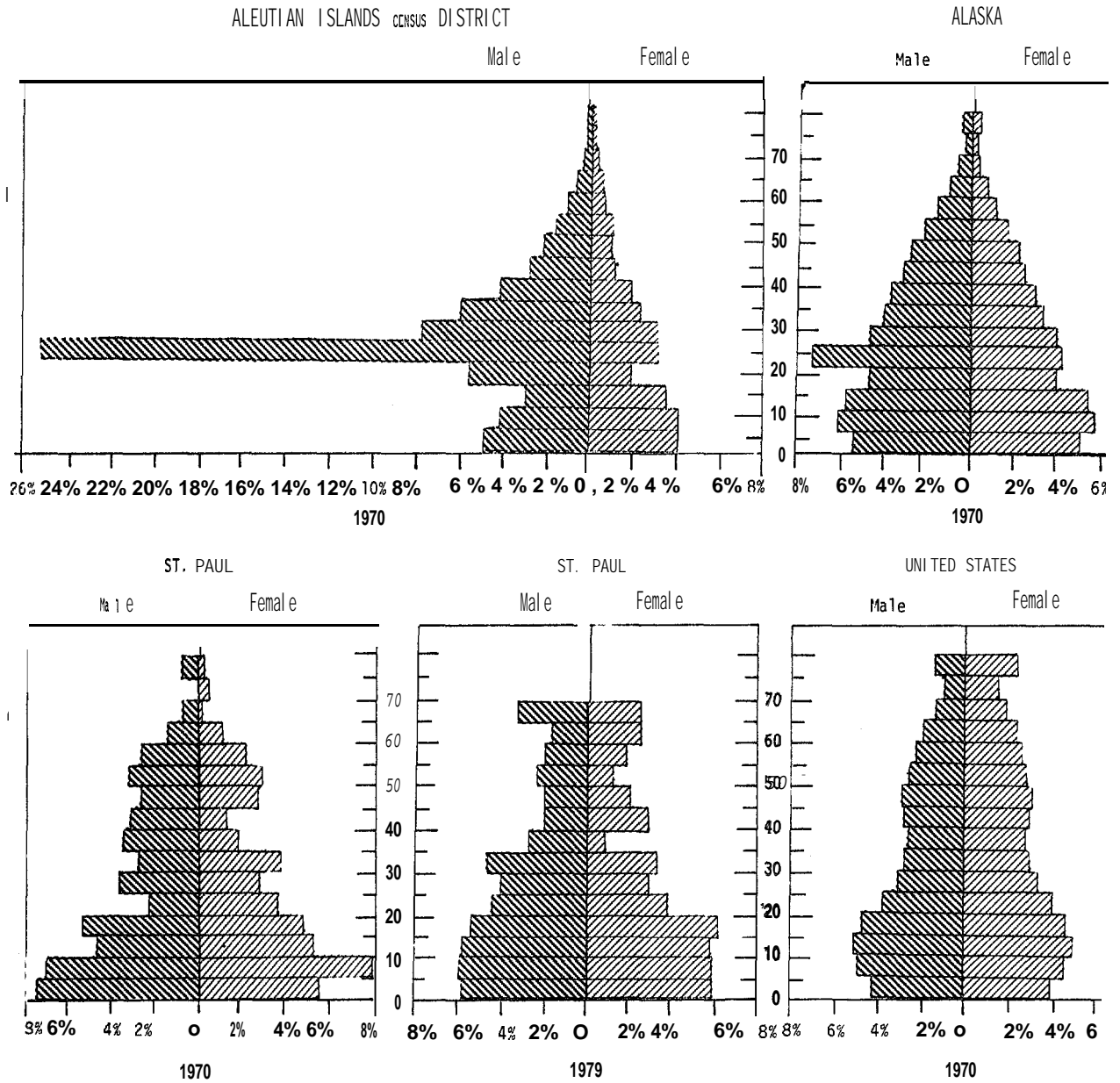
accounted for a slightly lower 90 percent of total community population in 1979. However, if the 22 Loran Station personnel are excluded, the community's population was 93.4 percent Alaska Native, indicating little change since 1970.

A review of the age and sex characteristics of St. Paul's 1970 population reveals that the community reflects some peculiarly Alaskan characteristics, while in other respects it is closer to national than State norms (see Figure 7). Males outnumber females and there is a disproportionately large number of people in the very young age groups. On the other hand, St. Paul has fewer young adults than the State and a higher proportion of people aged 50 or more. The community's population composition is completely unlike that of the Aleutians census division where the proportion of young adult males is greatly distorted by military populations.

St. Paul's 1970 ratio of 53 males for every 47 females was close to the State's 54 percent male to 46 percent female ratio but was unlike the nation as a whole where females outnumbered males by a 51 to 49 percent margin. A much higher proportion of St. Paul's 1970 population was in the under 5 age range (15 percent) than the State (11 percent) and national (8.4 percent) averages, a characteristic of most predominantly Alaska Native communities. Also unlike the State where persons aged 50 or more accounted for only 10.8 percent of the total population in 1970, 16 percent of St. Paul's population was within this older age range. Overall, however, St. Paul's population is young. The median age of St.

FIGURE 7

COMPOSITION OF POPULATION



Source: U. S. Census Bureau 1970.
 Pribilof Island Services Plan, Preliminary Draft,
 Management and Planning Services, June 1980.

Paul males (22.3) in 1970 was slightly below that of the State (23.3) and well below that of the nation (28.6). The disparity was even more marked for St. Paul females where the median age (19.5) resembled neither State (22.2) nonnational (29.6) norms.

Population composition data for 1979 indicate few changes in St. Paul since 1970. However, there is now a smaller proportion of community population under the age of ten and there are more young adults males than in 1970.

Growth Prospects

Future population growth at St. Paul is likely to continue to be closely tied to rates of natural increase and out-migration, with rates of out-migration determined by local opportunities for employment and income. These opportunities are presently uncertain, given continuing attempts in Congress to ban the harvesting of fur seals, currently the major source of employment and income on St. Paul Island. Potential additional sources of economic growth include tourism, the establishment of a domestic groundfish fishery in the Bering Sea, and servicing of outer continental shelf oil and gas exploration (and, possibly, development) scheduled for the St. George Basin. St. Paul's role in these latter two activities could be enhanced through the provision of a boat harbor. On the other hand, local concern over maintenance of the Island's traditional culture could result in a conscious choice not to participate in certain economic activities likely to take place in the region.

The harvesting and processing of fur seals on St. Paul Island has traditionally been the major source of seasonal employment for local residents, with management of the industry vested in the National Marine Fisheries Service. Each July, close to 70 St. Paul (and another 10 from St. George) residents take part in the killing of bachelor male seals, processing of the pelts and the manufacture of byproducts. However, these activities have caught the attention of several national conservation groups and there have been serious attempts to obtain a moratorium on seal hunting on St. Paul. (There has been a moratorium on seal hunting on St. George since 1974). Should these efforts be successful, the community's major local source of employment and income would be lost.

Tourism is a less important but significant source of employment and income on St. Paul Island, with around 1,000 visitors now traveling here each summer. Given the Island's wealth of marine mammals and bird life, continued steady growth of tourism in St. Paul appears likely.

Economic growth at St. Paul derived from domestic groundfish harvesting or outer continental shelf oil and gas exploration activities is much less certain. The Tanadgusix Corporation, the St. Paul village corporation established under terms of the Alaska Native Claims Settlement Act, is currently proposing to develop an industrial port facility and associated community on its lands at Chernofski Harbor on Unalaska Island to accommodate such activities. The alternative of persons from St. Paul leaving the Island temporarily for employment appears, at least from the perspective of the Tanadgusix Corporation, to be more acceptable than locating such activities on the Island.

ECONOMY

St. Paul's economy is centered around fur sealing operations managed by the National Marine Fisheries Service and, to a lesser extent, tourism. In addition, the U.S. Coast Guard is a significant element in the Island's economy but it does not hire local Aleut residents. These activities are called "basic" or exogenous as they are export industries whose fortunes are determined by forces outside the local area and are the foundation upon which "secondary" or endogenous industries, those whose fortunes are determined by local forces, rest. Thus, gains in basic industry are essential for long term community growth.

Composition of Employment

A separate count of employment in St. Paul was undertaken by Alaska Consultants, Inc. in August 1980. This was necessary since St. Paul represents only a very minor part of total employment in the Aleutians region and the composition of employment in this community and that of the region as a whole are fundamentally unlike. Thus, each employer in St. Paul was contacted to obtain average annual full-time employment for each establishment in 1980. The results were then categorized by Standard Industrial Classification (SIC) code and tabulated.

Employment in *two* of St. Paul's major basic economic activities, fur sealing and tourism, is highly seasonal. As a result, some people who work in these industries live in or work out of St. Paul for only part

of the year or, in some cases, persons who live in town year-round engage in different occupations during the off-season. To minimize duplication and reduce the distortion in total employment caused by seasonal workers, Alaska Consultants, Inc. attempted to estimate average annual full-time employment in all sectors of the community's economy. This was done by asking each employer to indicate if, when and how many seasonal personnel were added to "normal" employee levels.

Overall, basic employment was estimated to account for 56 percent of the average annual full-time employment in St. Paul in 1980. The community's resulting basic to secondary employment ratio of **1.0:0.8** is quite different from those found in either **Unalaska** or Cold Bay although it is not unusual for an Alaska Native village. Unlike national norms which are generally in the neighborhood of **1.0:1.5**, except for Anchorage and possibly Fairbanks, economically healthy Alaska communities normally have small secondary employment sectors. If Coast Guard personnel are excluded from total employment at St. **Paul**, the community's 1980 basic to secondary employment ratio was a less healthy **1.0:1.3**.

When converted to an average annual full-time basis, a total of 122.5 jobs were counted in St. Paul in 1980 (see Table 25). More than **three-**quarters of these jobs were derived from the government sector, with 61 percent of employment in this category considered to be basic, mostly derived from fur sealing and Coast Guard activities. Most remaining jobs in St. **Paul** were in the trade sector. The other sectors accounted for a combined total of only 7 jobs on an average annual full-time basis.

TABLE 25
 AVERAGE ANNUAL FULL-TIME EMPLOYMENT a/
 ST. PAUL, ALASKA
 1980

<u>Classification</u>	<u>Number</u>	<u>%</u>	<u>% Basic</u>	<u>Basic Number</u>	<u>Secondary Number</u>
Agriculture, Forestry and Fishing	1.0	0.8	50	0.5	0.5
Mining	0.0	0.0	--	0.0	0.0
Contract construction	0.0	0.0	--	0.0	0.0
Manufacturing	1.0	0.8	100	1.0	0.0
Transportation, Communication & Public Utilities	1.5	1.2	0	0.0	1.5
Trade	18.5	15.1	22	4.0	14.5
Finance, Insurance & Real Estate	5.0	4.1	100	5.0	0.0
Service	3.5	2.9	43	1.5	2.0
Government	92.0	75.1	61	56.0	36.0
Federal	(60.5)	(49.4)	(93)	(56.0)	(4.5)
State	(1.0)	(0.8)	(0)	(0.0)	(1.0)
Local	(30.5)	(24.9)	(0)	(0.0)	(30.5)
<u>TOTAL</u>	<u>122.5</u>	<u>100.0</u>	<u>56</u>	<u>68.0</u>	<u>54.5</u>

a/ Includes self-employed persons and 25 military personnel.

Source: Alaska Consultants, Inc. August 1980.

Neither the mining nor construction sectors were represented in St. Paul during 1980.

A total of 92 average annual full-time jobs was recorded in government at St. Paul in 1980, with about two-thirds of these jobs accruing to federal employees. The two major federal employers on the Island are the National Marine Fisheries Service which manages the Island's fur sealing operations and the U.S. Coast Guard which operates a Loran Station near the airport. These activities are considered basic, as **also** are the operations of the National Weather Service. Other federal government agencies represented at St. Paul include the Public Health Service and the Post Office, both of which were judged as secondary employers.

All State and local government employment at St. Paul was determined to be secondary, with the only State employee being a State Trooper. A total of **21.5** local government jobs were associated with the school, while the remaining 9 jobs in this class included administrative employees of the **Aleut** Community of St. Paul Island (the city government) and the local IRA (Indian Reorganization Act) Council.

Trade was the second largest employment sector at St. **Paul** in 1980. Twenty-two percent of the 18.5 jobs counted in this sector were judged to be basic, all of them tourist-related. These basic jobs included the restaurant operated by the **Tanadgusix** Corporation and two gift shops and cafes which cater primarily to visitors. Most secondary jobs in the trade sector were businesses operated by the IRA Council, including those associated with the local bar, store and gas station.

A total of five jobs was recorded in the finance, insurance and real estate sector. All of these jobs were deemed to be basic and all are associated with the administrative operations of the Tanadgusix Corporation, the St. Paul village corporation established and initially funded under provisions of the Alaska Native Claims Settlement Act.

The remaining four employment sectors represented at St. Paul in 1980 included 3.5 jobs in services. Close to half of these jobs were tourist-related and therefore basic. The remaining basic jobs in the community are derived from seal byproducts processing (manufacturing) and reindeer herding activities on Umnak Island (agriculture, forestry and fishing). These activities are highly seasonal and become relatively insignificant when converted to an average annual full-time basis.

Unemployment and Seasonality of Employment

Employment in St. Paul's two major industries, fur sealing and tourism, is highly seasonal. At peak (July), there are about 220 persons employed at St. Paul, representing close to 180 percent of the annual average full-time employment reported for this community. However, because most of these jobs are of such short duration, employment for most of the remainder of the year is estimated to be approximately 86 percent of the annual average.

Fur sealing activities managed by the National Marine Fisheries Service involve the hiring of a 40 man field crew for five weeks and a 35 man

plant crew for eight weeks, although this agency also has 19 permanent employees on the Island. The **Tanadgusix** Corporation operates the seal byproducts plant and hires 9 people between the end of June and the beginning of August and another 3 people for a six week period beginning in mid-June. This corporation is also engaged in a reindeer operation on **Umnak** Island which involves the hiring of 5 people for two weeks in April and another two weeks in **July**.

Tourism is another highly seasonal industry on St. Paul Island. The hotel and restaurant are open only during the three month tourist season as are jobs associated with Alaska Tour and Marketing Services, the tour organizers,

There are no unemployment statistics developed specifically for St. Paul. Unemployment rates for the Aleutian region as a whole are usually low, due mainly to the presence of a large transient **workforce**, **all** of which is employed and which leaves the region at the end of the fish processing or construction seasons. However, this is not the case in St. Paul where most jobs are held by local residents. St. Paul's very **low** labor participation rate of about 23 percent (the percentage of total community population employed on an average annual full-time basis) suggests that a high proportion of persons in this community are employed only for a few weeks during the summer. This conclusion is **supported** by Management and **Planning** Services (June 17, 1980) which found that only 48.1 percent of the men and 16.5 percent of the women aged between 15 and 64 in this community were employed year-round.

Recent Trends and Changes

Trends in employment for the Aleutian Islands division are unrelated to those which have taken place at St. Paul since the major industries in this community are different from those of the region as a whole.

According to Management and Planning Services (June 17, 1980), few major changes in the community's employment structure have occurred during the past ten years. A major exception to this, however, was the formation and funding of the Tanadgusix Corporation under terms of the Alaska Native Claims Settlement Act and the subsequent takeover by the Corporation of certain functions previously assumed by the National Marine Fisheries Service. Additional National Marine Fisheries Service functions have also been assumed by St. Paul's city government.

However, while few major changes in the structure of employment at St. Paul have yet taken place, change is likely to occur in the very near future. Sealing on nearby St. George Island ceased in 1974. If a similar moratorium on sealing on St. Paul was declared, the community would lose its major source of employment and income. Furthermore, according to information contained in an October 1980 Alaska Department of Transportation and Public Facilities request for proposals, the budget of the National Marine Fisheries Service has been cut by \$800,000, of which \$600,000 was targeted for local employment at St. Paul. Even if some of these funds are restored, future levels of National Marine Fisheries Service employment on St. Paul are likely to continue to decline, as they have done during the past ten years.

Occupational Skills

There are no available data documenting **the skills of St. Paul's workforce.** However, since most jobs in the community are held by local residents, it is assumed that people possess skills in these areas. This includes highly specialized skills associated with seal butchering and processing, as well as tourist-related jobs associated with operation of the hotel and restaurant. Furthermore, there is evidence that locally available management skills have been upgraded with the establishment of the **Tanadgusix** Corporation.

While locally available skills appear to be adequate to fill existing community jobs, additional skills may have to be acquired if the city government of St. Paul is to successfully take over certain functions now performed by the National Marine Fisheries Service. According to Management and Planning Services, this would include skills in management, accounting, planning and electrical engineering.

Income Levels

The median family income reported by the U.S. Census for the Aleutian Islands division in **1969 was** \$8,553, a figure slightly less than 70 percent of the Statewide median (\$12,443) for the same year. However, these statistics are now eleven years old and are meaningless today except in comparative terms. Furthermore, figures for the Aleutian Islands division were not necessarily representative of those for St. Paul even at the time they were reported.

More recent household income statistics developed for St. Paul by Alaska Health and Social Services Consultants in 1977 indicate that while some gains have apparently been made, the cash incomes of St. Paul families are relatively low by Alaska standards (see Table 26). According to this source, average household income in the community in 1976 was \$15,300, with slightly more than 30 percent of all households having annual incomes below \$10,000 and 50 percent with incomes of less than \$16,000. Given the U.S. Department of Housing and Urban Development's 1980 definition of a low income household of four people in the Aleutians division as one with an income of less than \$14,900, a significant proportion of St. Paul Island households fall below the poverty level.

Management and Planning Services estimated 1979 household income levels in St. Paul by extracting information on wages and salaries and so-called unearned income (Social Security, Civil Service retirement, unemployment and welfare) and relating these figures to the number of households in the community. By this method, it estimated average 1979 household income in St. Paul at a much higher (and less believable) \$24,600.

A mitigating factor in the incomes of St. Paul residents is low expenditures for housing which has been heavily subsidized over the years by the National Marine Fisheries Service although ownership has recently been transferred to the Tanadgusix Corporation. A breakdown of local household spending patterns on St. Paul in 1979 by Management and Planning Services indicated that housing costs consumed only 2.9 percent of local household spending, in sharp contrast to expenditures for groceries/

TABLE 26

HOUSEHOLD INCOME DISTRIBUTION
ST. PAUL, ALASKA
1976

Income	Percent of Total
Under \$5,000	13.5
\$5,000-\$9,999	17.6
\$10,000-\$15,999	18.9
\$16,000-\$19,999	16.2
\$20,000-\$24,999	13.5
\$25,000-\$29,999	9.5
\$30,000 or more	10.8
 <u>TOTAL</u>	 <u>100.0</u>
 Average Household Income	 \$15,300

Source: Management and Planning Services. June 17, 1980. **Pribilof** Islands Services Plan: Preliminary Draft. Seattle.

household items (57.8 percent) and tavern/beer (17.9 percent). Other major items of expenditure included electricity (6.4 percent), fuel oil (5.2 percent) and miscellaneous retail items (4.6 percent).

ECONOMIC OVERVIEW

St. Paul is unlike other areas of the State, both because of the specialized nature of the fur sealing activities which take place here and the manner in which these activities are managed. The Pribilof Islands were under the direct jurisdiction of the U.S. government after 1910, with management currently vested in the National Marine Fisheries Service. Over the years, the government's prime objective has been the conservation, management and protection of fur seals. However, government responsibility also included provision for the health and welfare of Island residents. Originally, residents received free housing, clothing, food, household supplies, health care, education and other services in lieu of income. These services were gradually supplemented by a limited cash wage until 1962 when all workers were awarded standard government wages according to their particular skills and length of employment.

Because of its peculiar history and the continued (although lessened) dependence on government-managed fur sealing operations, St. Paul evolved as a government company town. This is now changing, with the National Marine Fisheries Service gradually turning over many of its community "company" functions to local management and control.

Currently, around 25,000 **fur** seals are harvested each **year** on St. Paul Island. The National Marine Fisheries Service **hires** a 40 man field crew for five weeks to herd bachelor seals into a killing field area and to then stun, "stick" and skin them. The pelts are taken to the processing plant in town where a 35 man National Marine Fisheries Service crew works for an eight week period, soaking, tanning and dyeing the skins. The Tanadgusix Corporation has exclusive rights to fur **seal** carcasses, most of which are frozen and shipped Outside for conversion to oil and **meal**. However, the Corporation also operates a byproducts plant located outside town in the National Marine Fisheries Service administrative complex. This plant hires 9 people for one month and another 3 for six weeks to process meat for crab bait and hearts, livers and kidneys for dog food. Other byproducts include the grinding up of **oosiks** which are exported to the Orient as an aphrodisiac. In addition, reject fur seal skins are retained for **local** arts and crafts use.

The future status of the fur seal industry in the **Pribilof** Islands is uncertain. Potential problems are related not to a decline in the number of fur seals but to a strong move by national conservation groups to ban seal harvesting through Congressional action. Should these efforts be successful, St. Paul would lose its major source of economic livelihood.

Tourism is another source of economic strength at St. Paul, with the prime attraction of the Island being its wealth of wildlife resources. These include both fur and hair seals and sea lions, plus 191 species of birds. The **Pribilof** bird cliffs provide habitat for some of the largest

sea bird nesting colonies in the Northern hemisphere. On St. Paul alone, close to 250,000 birds nest on the cliffs which are accessible by road. Together, the Island's sea mammal and sea bird populations attract a growing number of tourists, with the number having risen from 750 in 1977, to 881 in 1978 and 1,039 in 1979. While some of these people travel with special groups such as the National Audubon Society, most come between early June and early September on a three, four or six day tour operated by Alaska Tour and Marketing Services in cooperation with the Tanadgusix Corporation. To accommodate this traffic, Reeve Aleutian Airways increases its normal once weekly flight schedule to three per week,

Tourism at St. Paul is expected to increase although it is foreseen as continuing to be highly seasonal. The King Eider hotel and restaurant at St. Paul have been operated by the Tanadgusix Corporation since 1976. The hotel has 25 rooms and can accommodate up to 44 persons. There is also an 8 room annex capable of accommodating another 16 persons. Both the hotel and restaurant are open only during the tourist season.

Aside from fur seal harvesting and tourism, St. Paul has a potential for growth derived from large scale domestic entry into the groundfish fishery in the Bering Sea and from the servicing of scheduled outer continental shelf oil and gas exploration (and, possibly, development) activities in the St. George Basin. To be competitive, the Island needs adequate harbor facilities. However, a more important limiting factor may be local attitudes. The Tanadgusix Corporation is currently

investigating the feasibility on developing its lands at **Chernofski** Harbor on Unalaska Island as an alternative development site to lessen the pressure for development on St. Paul Island itself. Primary economic activities foreseen by the Corporation at **Chernofski** include groundfish processing, the servicing of outer continental shelf oil and gas development in the St. George Basin area and development of a new community to accommodate these activities.

Given local attitudes toward large scale economic development on St. Paul which would bring new groups of people and a potential for cultural disruption to the Island, coupled with an apparent willingness of Islanders to temporarily relocate to other areas of the region or State for employment, the Island's potential for groundfish processing or as a servicing center for oil and gas exploration activities appears to be diminished. Furthermore, the Tanadgusix Corporation is the owner of almost all lands on St. **Paul** Island and, should it proceed with its development plans at **Chernofski**, is unlikely to encourage competition with itself by making lands on the Island available for similar activities.

Land Use

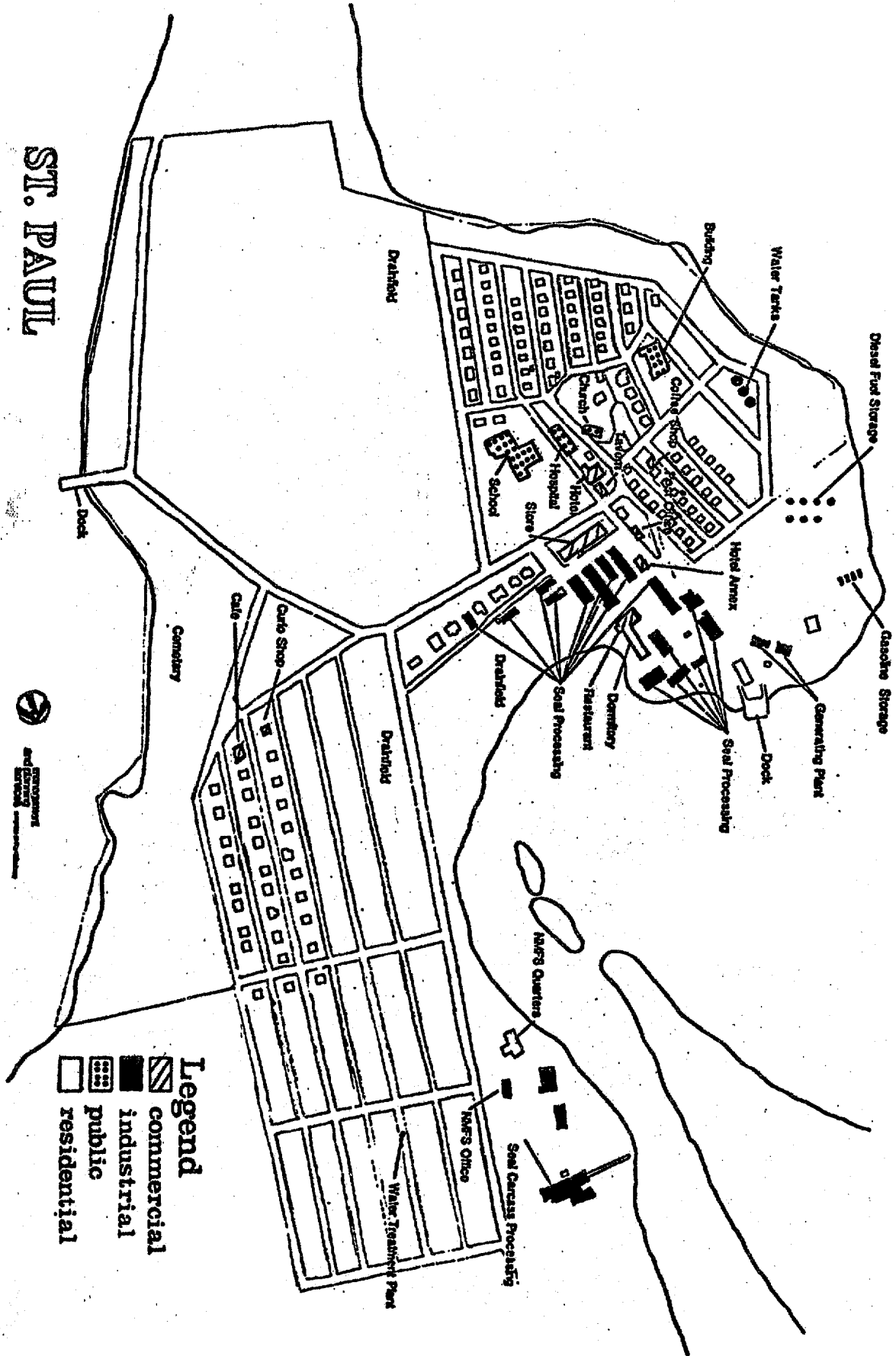
OVERALL LAND USE PATTERNS

Overall land use patterns at St. Paul owe much to the community's development as a government company town and to its natural setting. The present community at Village Cove dates from the early 1900's when the

U.S. government established an onshore fur seal processing industry here after the outlawing of pelagic sealing. Early development clustered around the waterfront and, except for a subdivision east of town begun during the 1960's and the location of Coast Guard and National Weather Service stations near the airport, this pattern has been maintained. As is true of many "company" towns, St. Paul has an unusually orderly layout. Industrial uses are concentrated around the waterfront and are backed by commercial development and major public facilities which are, in turn, backed by residential areas (see Figure 8).

The village is located on a narrow sandy peninsula at the extreme south end of St. Paul Island, the only sheltered anchorage on the Island and easily accessible to the major fur seal rookeries which form the present basis of the community's economy. Before passage of the Alaska Native Claims Settlement Act in 1971, when most land and some of the facilities on St. Paul Island became available for selection by the Tanadgusix Corporation, all development decisions on the Island were dictated by the federal government. Thus, St. Paul's compact development was primarily the result of a conscious federal decision to promote the highest degree of efficiency in the provision of community services rather than reflecting local desires.

Except for a fur seal byproducts plant adjacent to the National Marine Fisheries Service administrative complex, all industrial development in St. Paul is concentrated in an area on the south side of Village Cove bordered by Tolstoi and Bartlett Boulevards. Most commercial development



EXISTING LAND USE

is within the central area of town facing onto Tolstoi Boulevard although two gift shops, a cafe and a Honda rental concession are located within residential areas. Historically, residential development at St. Paul has been concentrated on the hill southwest of the town's industrial and commercial districts. However, construction of housing in the Ellerman Heights area over the past fifteen years has resulted in a more dispersed pattern of residential development.

According to the National Marine Fisheries Service, the village takes in about 180 acres of land. About half (90 acres) is currently in residential use, 3 percent (5 acres) in commercial use, 11 percent (20 acres) is occupied by industrial uses, and the remaining 65 acres is vacant.

As a second class city under Alaska law, the Aleut Community of St. Paul Island has the power of community planning. During the past fifteen years, the changing relationship between the federal government and St. Paul residents and the desire of the National Marine Fisheries Service to establish a viable local government at St. Paul capable of providing a range of municipal services have prompted the undertaking of several community planning studies. These included a 1968 study by the Institute of Social, Economic and Government Research of the University of Alaska which analyzed the community's economic base and specifically addressed the town's ability to support municipal government and services. St. Paul was subsequently incorporated as a second class city and several service functions previously provided by the federal government were transferred to the new municipality.

More recently, the 1980 **Pribilof** Islands Services Plan is currently being undertaken for the National Marine Fisheries Service to determine which additional services now provided by that agency could be transferred to **local** entities and the manner in which this transfer should be accomplished. The study addresses subjects such as the future role of the National Marine Fisheries Service in the **Pribilof** Islands, future service requirements resulting from changing economic conditions, which services could be provided by local entities, **and** the manner in which such services could best be transferred,

Additional planning-related studies include a recently completed boat harbor feasibility study **for St.** Paul by the U.S. Army Corps of Engineers and a feasibility study for possible development of a harbor and associated industrial and community complex at **Chernofski** on **Unalaska** Island on **lands** owned by the Tanadgusix Corporation soon **to** be undertaken by the Alaska Department of Transportation and Public Facilities.

DEVELOPMENT CONSTRAINTS

The physical setting and environmental considerations are the major constraints to development at St. Paul. A potential additional constraint, especially for non-community related development is a lack of available private land.

St. Paul's volcanic and sandy ground is relatively porous and often becomes waterlogged. This is particularly apparent east of the village,

a condition which restricts development in that direction. In the immediate vicinity of the village, steep slopes to the west, the Salt Lagoon to the north, and sand dunes along the southern shore of Village Cove generally restrict development to vacant lots within the surveyed townsite. Elsewhere on St. Paul Island, waterfront development is severely constrained by the presence of steep cliffs and the lack of a protected anchorage.

Any development on St. Paul must take into consideration the Island's critical wildlife habitat. About 80 percent of the Northern fur seal herd utilizes 15 rookeries on the Island for breeding and rearing its young. In addition, close to a quarter of a million sea birds nest on St. Paul each year, mainly along the western and southern coastal cliffs. Almost any development activity in these critical habitat areas would be untenable from an environmental standpoint.

A potential deterrent to major *new* economic development on St. Paul is the lack of readily available private land. Most land on the Island has been transferred to the Tanadgusix Corporation as required under terms of the Alaska Native Claims Settlement Act, although about 1,580 acres have been retained by the federal government. Within the surveyed townsite, this includes the school and clinic sites, the seal processing facilities and the National Marine Fisheries Service administrative complex (except for the byproducts processing plant). Elsewhere on the Island, the federal government has retained title to the airport, the major seal rookeries and the "landfill" area.

While lands transferred to ownership by the **Tanadgusix** Corporation are theoretically available for development, the Corporation has a stated policy of encouraging only development which it perceives as being compatible with existing community lifestyles. As a result, it does not look favorably on the introduction of activities which could result in an influx of a large number of transient workers, as has happened in **Unalaska**.

According to Management and Planning Services, St. Paul has ample lands available to accommodate foreseeable community needs. This includes several undeveloped lots in the original townsite served by roads and utilities services and over 100 vacant lots in the **Ellerman** Heights subdivision which have been reserved for residential development. Undeveloped commercial and industrial properties are more limited since there is no vacant land within the existing "downtown" area. However, there are additional lands in the vicinity of the community building and the civic center and at the far end of the general sports area which are suitable for commercial use. A triangular area near the intersection of **Ellerman** Heights and East Landing Roads has also been recommended to accommodate future commercial needs of the **Ellerman** Heights area. Finally, additional lands suitable for waterfront industrial development lie between the existing processing facilities and **Ellerman** Heights.

LAND STATUS

At the present time, all land on St. Paul Island is owned either by the Tanadgusix Corporation or by the federal government. With an enrollment

of 542 persons, the Tanadgusix Corporation was entitled to select six townships or 138,240 acres of land under Section 12(a) of the Alaska Native Claims Settlement Act. As of September 1980, the Corporation had received interim conveyance to about 25,805 acres on St. Paul, about 95 percent of the Island's total land area.

Since there is not enough land on St. Paul Island to fulfill the Corporation's total entitlement, it has selected an additional 112,434 acres on the Alaska Peninsula and in the Aleutian Islands. These "Off-Island" selections are located on Unalaska Island in the vicinity of Chernofski, on Umnak Island and at Port Moller, Pavlof Bay and Pyramid Mountain on the Alaska Peninsula. To date, the Corporation has received interim conveyance on about 74,000 acres of its "Off-Island" selections.

Under an agreement between the Tanadgusix Corporation and the National Marine Fisheries Service, title to the buildings on lands conveyed to the Corporation was included in the land transfer. Under the terms of this agreement, ownership of housing units and the land on which they are located will be reconveyed to their occupants. However, details of this transfer have not yet been finalized by the Tanadgusix Corporation.

Under Section 14(c)(3) of the Alaska Native Claims Settlement Act, the Tanadgusix Corporation is also required to reconvey an additional 1,280 acres of land to the city government for community expansion purposes. According to Corporation officials, the Aleut Community of St. Paul Island is aware of this requirement but has yet to take action upon it.

As previously mentioned, the federal government withheld 1,582 acres of land on St. Paul Island from Native selection. These lands include the airport, the landfill site, the Coast Guard and National Weather Service stations, the fur seal rookeries, the National Marine Fisheries Service administrative complex, the fur seal processing facilities and adjacent dock and power plant on Village Cove; gasoline, diesel and water storage tanks; three housing units on **Gorbatch** Street and one on Bartlett Boulevard; plus the school and clinic.

HOUSING

According to the National Marine Fisheries Service, approximately 90 acres within the St. Paul townsite area are presently in residential use, or about half the town's developed area. The 1980 Census counted 126 occupied and **11** vacant units in the community, all of which were in single family units except for a **four-plex**, two duplexes and a staff apartment in the **health** clinic. Outside the townsite area, National Marine Fisheries Service staff quarters account for another 24 units and group quarters at the Coast Guard Loran Station house 22 personnel.

Except for housing associated with federal government facilities, all housing units in St. Paul are located on the hillside above the town's commercial and industrial areas, along Bartlett Boulevard below the community store or in the **Ellerman** Heights subdivision. Most homes in the community were **built** by the federal government over the past six decades. These units have been well maintained and are in generally

good condition. Another 20 units constructed in 1978 by the Aleutian Housing Authority in Ellerman Heights are in excellent condition.

There are presently only two privately owned homes in St. Paul. One is a conventionally financed unit in Ellerman Heights and the other is owned by the Assembly of God church. Excluding four single family units retained by the National Marine Fisheries Service, the 20 new homes in Ellerman Heights owned by the Aleutian Housing Authority, and an apartment in the Public Health Service clinic, all other conventional housing units within the St. Paul townsite are owned by the Tanadgusix Corporation. However, title to these units will be transferred to their occupants once a system for accomplishing this transfer has been finalized.

According to recent surveys, there is a shortage of housing at St. Paul which has led, in turn, to some overcrowding within units. The 1980 Census found eleven vacant units. However, this finding is disputed by local residents since, despite the recent construction of 20 new homes, there are still five families from St. Paul on the Aleutian Housing Authority's waiting list. By relating the number of occupied units counted by the 1980 Census to total population, households in St. Paul presently average 4.2 persons. This is identical to that found for the Aleutians census division in 1970 although it is probably higher than current household densities in the region. It is well above the 1970 Statewide average of 3.2 persons per housing unit.

Community Facilities and Services

PUBLIC SAFETY

Police

The St. Paul municipal **police** department has been responsible for providing police protection services on St. Paul since 1971 when the village was incorporated as a second class city. The service was previously provided by the local IRA (Indian Reorganization Act) government from 1965 to 1971 and, before 1965, by the U.S. Department of Commerce. The police station consists of an office on the ground floor of the community building which also houses a State trooper. Jail facilities are located in the basement of the community store and consist of a large room equipped with only a blanket and a leaky toilet. Because of its poor condition and the need to hire someone from town to stand guard, the holding facility is reportedly seldom used.

The St. Paul police department is normally staffed by a full-time police chief. However, this position was vacant during the summer of 1980 and there were no immediate **plans** for it to be filled. City police equipment consists of a truck with a citizen's band radio but the vehicle is now inoperable and the former police chief instead used a borrowed van.

The State trooper assigned to St. Paul is responsible for conducting criminal investigations, search and rescue, crash site investigations and

administration of **the driver licensing** and testing programs on both St. Paul and St. George, and for providing assistance to the local police department, as required. The trooper officially shares an office with the City police department in the community building but he often operates out of his quarters in the Aleutian dorm and coffee shop building. State trooper equipment includes a 1976 Ramcharger equipped with a citizen's band radio and a portable red light.

According to the State trooper, there is no serious crime in St. Paul and, as elsewhere in the State, those problems which do occur are almost always related to alcohol abuse. In his view, the most pressing police problems in St. Paul relate to difficulties in recruiting local policemen, the lack of adequate detention facilities and a need for a supervised alcohol sleep-off center.

Fire Protection

Fire protection services in St. Paul have been provided by the St. Paul volunteer fire department since 1965. The department is presently staffed by 18 volunteer firemen, including a designated fire chief. Protection is provided to all areas of the community except for the Coast Guard and National Weather Service complexes near the airport which are served by the Coast Guard.

City fire fighting equipment includes a 1953 Federal pumper outfitted with a 750 gallon tank and five gallons of light water. The City also

owns an antiquated Howe fire engine which theoretically serves as a back-up vehicle but it is not currently operational. The fire department operates out of a machine shop at the seal processing plant in the community's industrial area but the **building** is too small and **is** in need of repair. Furthermore, according to the fire chief, existing equipment should be replaced as soon as possible.

The **townsite** area has hydrants throughout and eight fire alarm **pull** boxes are located at strategic points. Two sirens are reportedly audible except during periods of very high winds. In addition, all houses are equipped with 10 pound ABC portable fire extinguishers and some have smoke detectors.

St. Paul has an Insurance Services Office (ISO) class rating of 10, mainly because the community has never been inspected. **However,,** the poor condition of existing fire equipment would preclude much improvement in this rating even if the community were inspected.

According to the St. Paul fire chief, there are only one or two fire calls per year. There have been two serious fires in recent years. One partially destroyed the community school and the other seriously damaged a housing unit. However, St. Paul does have a potential for a major fire during periods of strong winds, particularly in the industrial area where there is a concentration of old wooden buildings located close together. In addition, a combination of snow, ice and steep grades put some housing units in the community beyond reach of fire fighting equipment during the winter months.

Health and social services in St. Paul are provided by the U.S. Public Health Service, the Alaska Department of Health and Social Services, and the Aleutian-Pribilof Islands Association. Basic community health care needs are met by the St. Paul health clinic operated by the Public Health Service, while mental health and social services are distributed by the State and by the Aleutian-Pribilof Islands Association.

A State social worker based in Unalaska visits St. Paul several times each year to provide assistance in the area of child protection, as needed. The Aleutian-Pribilof Islands Association, a non-profit Native regional corporation, also sends a professional social worker to the community at least twice each year and funds a local outreach worker who is trained to supplement the services provided by the social worker. This person is trained in first aid, provides basic counseling and helps to facilitate programs such as alcohol education in the local school. In addition, an Aleutian-Pribilof Islands Association psychologist based in Unalaska will visit St. Paul several times a year beginning in the fall of 1980. Finally, the Aleutian-Pribilof Islands Association will provide an emergency medical treatment training program at the request of a local community.

The St. Paul health clinic was originally constructed in 1929, with major improvements made and an addition built in 1968 when the Public Health Service took over operation of the facility from the U.S. Bureau of

Commercial Fisheries. The clinic is centrally located next to the King Eider hotel on Tolstoi Boulevard and serves the entire community except for the Coast Guard Loran Station which has a small dispensary and infirmary staffed by a medic.

Facilities included within the clinic include an office, examination room, a small surgery, a two bed acute care room, a one bed invalid room, an X-ray and dark room, a laboratory and a dental operations unit. The clinic is currently staffed by a mid-level practitioner and a nurse's aide and, until recently, there was also a resident physician in the community.

Services provided by the clinic include routine outpatient care, minor surgical and occasional obstetrical deliveries and periodic specialty clinics conducted by visiting Public Health Service doctors from Anchorage. Consultation with the Alaska Native Hospital in Anchorage is assisted by a direct telephone connection between the two facilities. However, all specialized care which cannot be routinely handled by visiting physicians requires a medivac to Anchorage. The Public Health Service considers the St. Paul health clinic adequate for the community's needs although, because of its age, the facility requires constant maintenance. An opposite point of view was contained in a recent study conducted for the Aleutian-Pribilof Islands Association Health Department which recommended that the clinic be upgraded and a social services/mental health/alcoholism facility be added.

TABLE 2 7

LEADING CAUSES OF OUTPATIENT VISITS
ST. PAUL
FY 1975 - FY 1977

Causes	FY 1975	FY 1976	FY 1977
Di seases of Ci rcul atory System	276	437	808
Acci dents, Poi soni ngs, and Vi ol ence	435	707	365
Di seases of Respi ratory Sys tern	437	502	490
Di seases of the Ski n and Subcutaneous Ti ssue	293	496	291
Mental Di sorders	371	361	104
Ear Di seases	145	311	192
Di seases of Di gesti ve System	138	305	121
Endocri ne, Nutri ti onal , and Metabol i c Di sorders	219	138	143
Musculoskeletal System and Connecti ve Ti ssue	126	216	143
Eye Di seases	230	149	88
Suppl emental <u>a/</u>	414	522	1,055

a/ Includes physical examinations, medical-surgical follow-up, lab and X-ray tests and well child care.

Source: Bantz, Don, & Associates. 1978. Tribal Specific Health Plan: Aleutian-Pribilof Islands Association Health Department. Anchorage.

According to the Public Health Service, the St. Paul facility currently receives around 4,000 outpatient visits each year, an annual average of close to eight visits per community resident. According to the **Aleutian-Pribilof Islands Association Health Department**, the major health problems in the community include diseases of the circulatory system; accidents, poisonings and violence; diseases of the skin and subcutaneous tissue; and mental disorders (see Table 27).

EDUCATION

Elementary and secondary school education services in St. Paul are provided by the **Pribilof Schools Regional Education Attendance Area (REAA)** which is headquartered in St. Paul. The **Pribilof Schools REAA** is responsible for the hiring of teachers and maintenance of the school plant, while the Alaska Department of Transportation and Public Facilities is responsible for the construction of new school facilities.

All St. Paul Island school children attend school in a single complex located on **Tolstoi** Boulevard across from the health clinic. However, elementary (kindergarten through the 6th grade) and high school (grades 7 through 10) are physically and administratively separated. The school is within easy walking distance of all homes in town so that no busing of students is required. Students in grades 11 and 12 are sent off the Island, either to the Bureau of Indian Affairs boarding school at **Mt. Edgecumbe** in Southeast Alaska or to schools in the **Matanuska-Susitna** Borough or Anchorage under the State boarding program. Local school

officials indicated that their policy of sending senior high school students off the Island to give them more exposure to the outside world would probably continue in the future. Schools in communities such as Palmer and Wasilla in the Matanuska-Susitna Borough are favored by many local students because of their more rural setting.

The school complex was constructed in 1973 but underwent major renovation in 1979 as a result of a 1978 fire. The building houses nine general classrooms, three of which are reserved for elementary school and six for high school use, although this changes from year to year. Other rooms include an art room, a bilingual education room, two special education rooms, a library, a TV room and a multi-purpose room. A new vocational education wing was being added in the summer of 1980 and will include space for auto mechanics, a wood shop, arts and crafts and graphic arts. The school is in excellent condition and reportedly has few maintenance problems.

Outdoor facilities associated with the school include a playground with a variety of equipment, a general sports area equipped with a backdrop for softball and baseball, and a hard surfaced basketball court which was originally intended as a tennis court. During periods of good weather, the playground and sports area are the focal point of activity for the community's young population.

The school's professional staff consists of a principal and 21 teachers, one of whom is bilingual. Other school employees include a secretary,

TABLE 28
 SCHOOL ENROLLMENT TRENDS
 ST. PAUL
 1969/70 - 1979/80

School Year	Final Enrollment				Total	Average Daily Membershi p
	Grades K - 6 a/		Grades 7 - 10 b/			
	Number	% of Total	Number	% of Total		
1969/70	94	83.2	19	16.8	113	115.10
1 970/71	99	86.8	15	13.2	114	114.92
1971/72	105	89.0	13	11.0	118	118.87
1972/73	110	88.7	14	11.3	124	122.25
1 973/74	99	74.4	34	25.6	133	133.57
1 974/75	92	65.7	48	34.3	140	143.26
1975/76	96	61.9	59	38.1	155	187.90
1976/77	89	59.3	61	40.7	150	155.23
1977/78	85	59.4	58	40.6	143	147.53
1978/79	80	59.3	55	40.7	135	138.96
1979/80	83	64.3	46	35.7	129	129.39

a/ Elementary school enrollment includes kindergarten classes.

b/ Secondary school enrollment includes ninth grade beginning 1973/74 and tenth grade beginning 1974/75. One eleventh grade student was included in the 1977/78 school year. Eleventh and twelfth grade students attend high schools in Mt. **Edgecumbe, Wasilla, Palmer** and Anchorage.

Source: Alaska Department of Education. Juneau.

a bookkeeper, six teacher aides and both a full-time and a part-time janitor. Aside from regular academic courses, the school offers several special programs. Title I federal funds are used in the special education program and Title IV funds have also been used in recent years to help finance travel to Anchorage for fifth and ninth grade students. In addition, the school operates both Headstart and community school programs.

Like many school districts around the State, the St. Paul has experienced declining enrollments in recent years (see Table 28). Overall, final enrollment increased by about 14 percent between 1969/70 and 1979/80, largely because of the addition of grades 9 and 10 in 1973 and 1974. If students in these two grades are excluded, final enrollment actually declined over the past decade.

The rates of decline in enrollment in the elementary and high schools are quite different. Elementary enrollment increased steadily between 1969/70 and 1972/73 but declined thereafter through 1978/79. Although enrollment increased by about 4 percent in 1978/79, it remains far below the levels of a decade ago. By contrast, high school enrollment dropped between 1969/70 and 1971/72, increased substantially with the addition of grades 9 and 10 in 1973/74 and 1974/75 but has since again dropped.

According to Management and Planning Services, the St. Paul school has excess capacity and could easily accommodate any foreseeable increases in student enrollment. The current local student per classroom ratio of 11 to 1 is relatively low, even for a rural school district.

RECREATION

St. Paul offers a wealth of outdoor recreation experiences which attract visitors to the community as well as local residents. However, like most small Alaska villages, St. Paul has few formal recreation facilities. These are limited to the civic center, the recreation room in the community building and the school multi-purpose room.

The **school** multi-purpose room was constructed in 1973 and receives a great deal of use not only by school children but also by the community in general. It is heavily used for community volleyball and basketball activities and is open regularly during the winter months for general community "gym" nights. School facilities are **also** used for the community school program and the Camp Fire summer youth recreation program.

The civic center is located on the hill above town across from the community building and is used for a variety of functions. It includes a teen center and a large room which is used several times a week for movies as well as for bingo and public meetings. Use of the recreation room in the community building is restricted to volleyball, roller skating and community dances. The **Tanadgusix** Corporation's restaurant which is open during the summer tourist season and two cafes in private homes also provide meeting places for local residents, while a bar located next to the King Eider hotel and which is owned and operated by the St. Paul IRA is popular with some of the City's adult population.

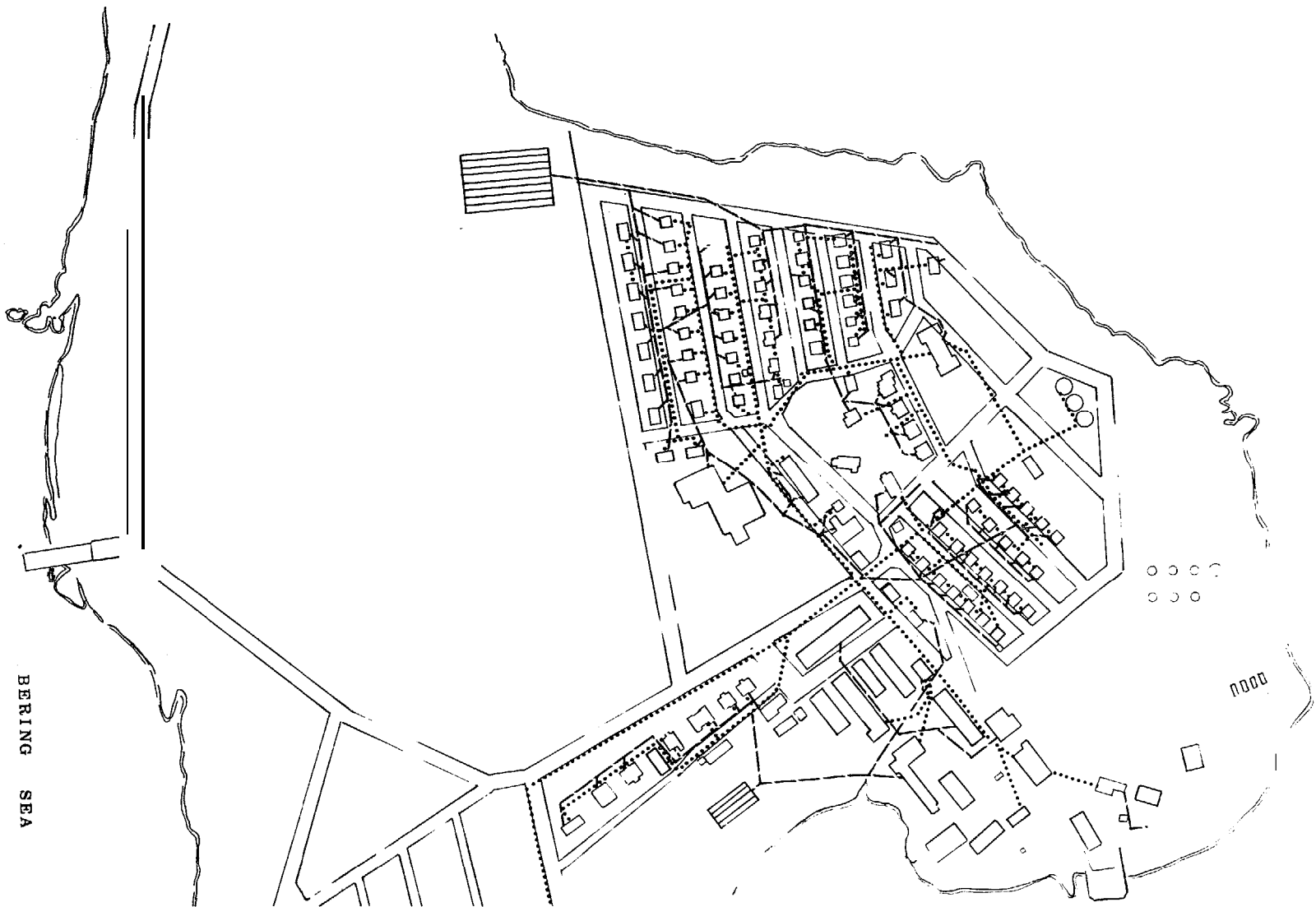
Existing outdoor recreation facilities include the school playground, an adjacent sports area which includes a hard surfaced basketball court and a backdrop for baseball and softball, plus five camp sites at various locations on the Island, some of which are equipped with fire rings, picnic tables and shelters.

Many recreation activities in which St. Paul residents participate do not depend on the provision of formal facilities. In the summer months, these include motorcycling, walking, fishing, camping, picnicking and nature watching. During the winter and periods of bad weather, arts and crafts, sewing, listening to records and tapes, visiting friends and relatives, and watching television are reportedly popular pastimes.

UTILITIES

Water

St. Paul obtains its water from two deep wells located approximately two miles north of town in the vicinity of the airport. The water is chlorinated and pumped to three gravity tanks with a combined storage capacity of **600,000** gallons which are situated on a hill above the village. The distribution system serves all areas of town, including Ellerman Heights, the National Marine Fisheries Service administrative complex across Village Cove, and the Coast Guard and National Weather Service stations near the airport (see Figure 9). A separate intake and distribution system supply salt water to the industrial area for seal



BERING SEA

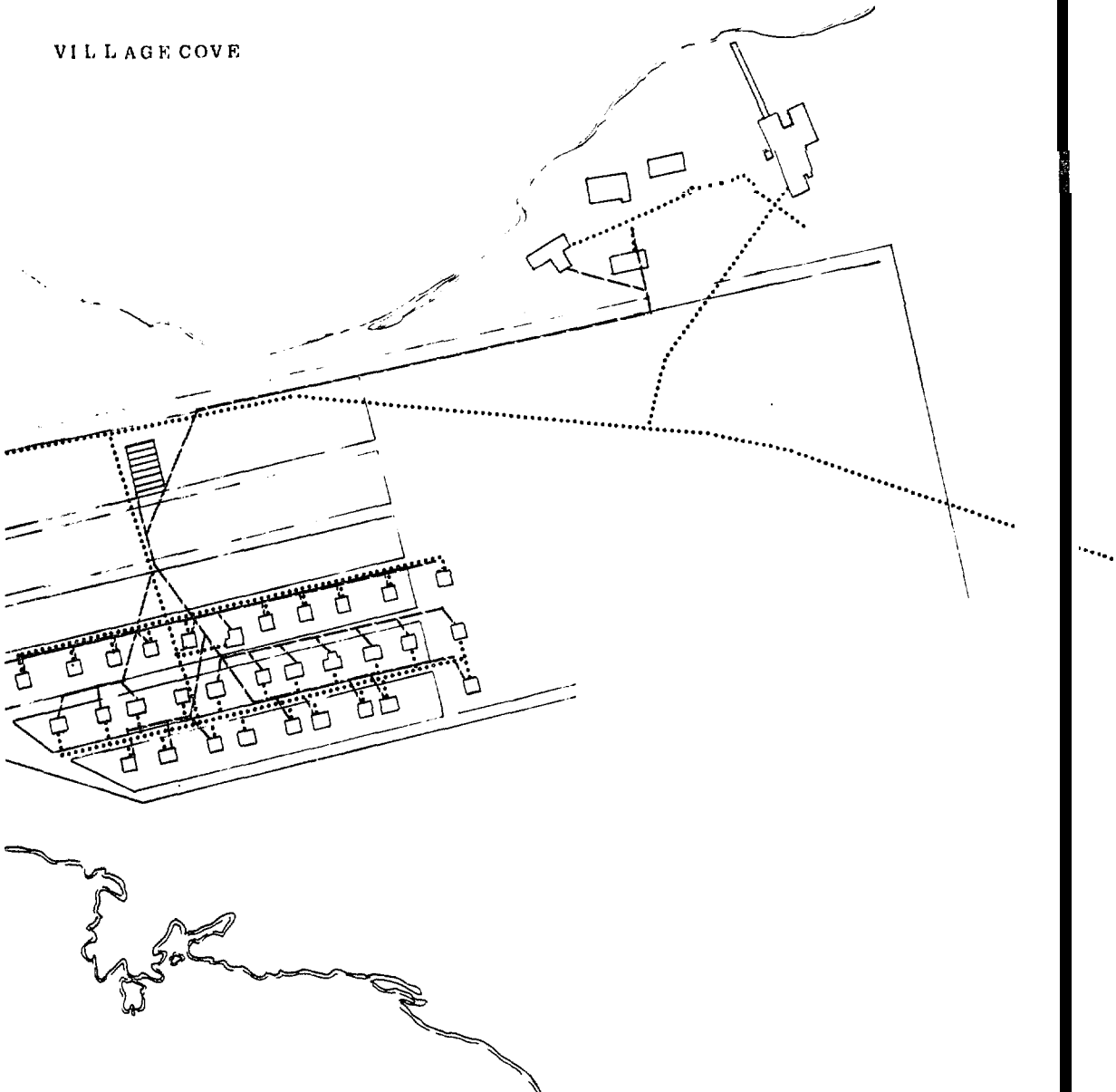
3 V

ST. PAUL

Existing Water and Sewer Systems

..... water line
- - - - sewer line

VILLAGE COVE



processing purposes. The system is operated by the city. However, the National Marine Fisheries Service retains ownership of the system and is responsible for major maintenance.

Development of St. Paul's water source and construction of the distribution system took place during the early 1950's. Service was extended to Ellerman Heights during the mid-1960's and was further expanded in this area in 1977 to serve new housing. Other recent improvements to the system include the installation of new electric pumps in the well houses in 1977.

The distribution system is made up mainly of dead-end mains ranging from one to eight inches in diameter. The smaller mains are galvanized steel and most of the larger mains are cast iron. Since water level gauges on the exterior of the storage tanks do not work, water levels are checked manually by climbing the tanks and pumps are activated, as required, to keep the tanks reasonably full.

According to Management and Planning Services, the St. Paul water system is in generally good condition. The cast iron distribution lines should last for a number of years. However, the galvanized steel lines in older parts of town reportedly have a number of small leaks and may have to be replaced in the near future. Furthermore, the water tanks have several large cracks which results in water losses.

According to the Arctic Environmental Information and Data Center (AEIDC), water consumption rates in St. Paul ranged between 60,000 and 80,000 gallons per day in 1977 and are heaviest during the summer fur sealing and tourist seasons. While the system is generally adequate to accommodate present community needs, Management and Planning Services indicated that any significant increase in industrial demand could require the development of an additional fresh water source.

Sewer

St. Paul has three separate domestic sewer systems (see Figure 9). The first two systems were constructed by the Bureau of Commercial Fisheries in 1952 and serve the original townsite plus the industrial area and adjacent housing on Bartlett Boulevard below the community store. These systems are now owned and operated by the National Marine Fisheries Service. A third system was constructed in two phases during the 1960's and 1970's to serve the National Marine Fisheries Service administrative complex and new housing in the Ellerman Heights subdivision. The portions of this system which serve the new Aleutian Housing Authority units is owned and maintained by the city government. Neither the Coast Guard Loran Station nor the National Weather Service complex is connected to the domestic sewer system.

The domestic sewer systems were originally designed to carry untreated wastes directly to beach outfalls. However, the four and six inch transmission lines were intercepted in 1965 by new eight inch lines

running to septic tanks and drain fields. Each of the two older sewer systems has lift stations to pump sewage up into the septic tanks. When these fail, untreated sewage runs out through the old beach outfalls. According to Management Planning and Services, one of the lift stations was not operating during the spring of 1980 and raw sewage was being dumped into Village Cove, an obviously undesirable situation. A splitter box separates sewage from Ellerman Heights into two 10,000 gallon septic tanks, each with a large drain field.

Aside from domestic sewage collection and treatment, St. Paul's seal processing plants also generate industrial wastes. These wastes are screened separately before being discharged into the ocean, and the sludge is transported to the landfill site.

Electric Power

Electric power in St. Paul is provided by the National Marine Fisheries Service at a cost to the consumer of about 12¢ per kilowatt hour (KWH). Service is provided to the entire community except for the Coast Guard and National Weather Service stations and the airport which are served by the Coast Guard.

All power in St. Paul is diesel generated. The power plant is located in the industrial area near the dock and currently houses six operating diesel units and two 280 kilowatt units for a total nameplate capacity of 1,460 kilowatts. According to Management and Planning Services, however, total effective generating capacity is closer to 1,060 kilowatts.

The **capacity of the installed diesel units is** more than adequate to meet present community peak power demands of about 625 kilowatts during fur seal processing activities. Firm power requirements currently average about 500 kilowatts during the winter months.

According to Management and Planning Services, portions of St. Paul's electric power system are in good condition while others are not. The older part of the plant, including the six small generators, dates back to 1955. **It was originally designed to operate automatically but most of the automatic equipment has since fallen into disrepair and the plant is** instead run manually. On the other hand, the underground electric distribution system is in generally good condition except for some of the older conduits which leak when the ground is saturated.

According to Management Planning and Services, existing generating capacity is adequate to accommodate modest increases in demand. However, diesel storage capacity is severely constrained under present operating conditions and additional storage capacity would need to be provided in order to accommodate any further expansion of the power plant.

Solid Waste Disposal

Garbage from the entire St. Paul Island road-connected area is collected by the city government and transported to a sanitary landfill site. Collection is generally twice a week and a standard fee of \$15 per month is levied against all customers. Equipment consists of a ten year old standard compressor truck.

The sanitary landfill is located about three miles north of town near the airport. Trash is burned almost daily and the site is backfilled by a bulldozer about once each month.

Communications

Except for a small telephone network operated among some National Marine Fisheries Service buildings and a direct telephone link between the St. Paul health clinic and the Alaska Native Hospital in Anchorage, St. Paul has no local telephone service. However, several subscribers have telephones for long distance communication via the Alascom satellite communications system. These include the city government, the Tanadgusix Corporation, the National Marine Fisheries Service, the school, the community store and two coffee shops. Another two telephones in the community building are available for public use. The city government is looking for a provider of local telephone services but estimates that this is at least two years away.

Most local and inter-Island communication on St. Paul is conducted by radio. Nearly every home on the Island has a citizen's band radio for local communication and some are equipped with long wave radios for communication with St. George Island. In addition, the National Marine Fisheries Service, the Coast Guard and the National Weather Service operate high powered radios capable of reaching the Aleutians or the mainland.

St. Paul has no radio station but a television station operates out of the community building. Most programming is via the State operated satellite system, but tapes from the Alaska State Library and some local programming are also provided.

Local Government Organization

St. Paul incorporated as a fourth class city under Alaska law in 1971 and was reclassified as a second class city in 1972. The city has a council-manager form of government. Like other second class cities, St. Paul has seven elected councilmen, one of whom is appointed mayor. The city manager is responsible for directing the day to day operation of the city with policy direction provided by the mayor and council.

CITY POWERS

As a second class city within the unorganized borough, St. Paul could theoretically choose to exercise all municipal powers authorized by **Title 29** of the Alaska Statutes except for education. However, in practice, cities of this class do not do so, in part because of their limited taxing ability. Although a second class city may levy a sales tax of up to 3 percent, property taxes may not exceed 5 mills or one-half of one percent. The imposition of either **sales** or property taxes must be approved by local referendum.

Because of St. Paul's development as a government company town, many services normally provided by local government units have, instead, been provided by the National Marine Fisheries Service (and its predecessor agencies). The National Marine Fisheries Service initially turned over responsibility for several municipal services to the Aleut Community of St. Paul, the local IRA government. These included recreation, police and fire protection which were subsequently turned over to the city government upon its incorporation in 1971.

Since 1971, the city has assumed additional responsibilities. These include solid waste disposal, maintenance (but not ownership) of the community water system, ownership of one of the three sewer systems, road maintenance and airport operation (under contract to Reeve Aleutian Airways). However, the National Marine Fisheries Service continues to have major responsibility for the water and sewer systems and for the electric power generation and distribution. In addition, the State-funded Rural Education Attendance Area (REAA) is responsible for operation of the school system and the U.S. Public Health Service operates the local health clinic.

The National Marine Fisheries Service is interested in turning over additional services to the city government and contracted with Management and Planning Services to determine which of these services could best be transferred and in what manner the transfer should take place. Although the final report has not yet been released, preliminary conclusions were that while the city government possesses the management skills to operate

a full range of municipal services, it lacks the financial ability to do so. Thus, maintenance of certain community facilities and services is likely to continue to require federal assistance.

LOCAL GOVERNMENT FINANCES

In order to evaluate the Aleut Community of St. Paul Island's financial condition, the most recent statement of the city government's general fund revenues and expenditures for the fiscal year ended June 30, 1979 was examined (see Table 29). An analysis of city revenues and other receipts indicate that over half (51.3 percent) were derived from intergovernmental revenues, primarily State Revenue Sharing funds. A locally imposed 3 percent sales tax netted slightly more than \$34,000 and accounted for 20.5 percent of city revenues and other receipts in FY 1979 (There is no local property tax). Most other revenues were derived from the provision of various municipal services.

The largest share of municipal expenditures in FY 1979 was for general administration and payroll taxes and employee benefits. Together, these items accounted for almost half (46.3 percent) of total expenditures. Other significant expenditures were incurred to carry out public works and public safety responsibilities.

During FY 1979, general fund expenditures by the Aleut Community of St. Paul Island were well above general fund revenues. This caused difficulties for the city government which was forced to take out a

TABLE 29
 GENERAL FUND
 STATEMENT OF REVENUES AND EXPENDITURES
 ST. PAUL
 YEAR ENDED JUNE 30, 1979

<u>Revenues</u>	<u>Actual</u>
Taxes:	\$34,211.95
Sales Tax	34,211.95
Intergovernmental Revenues:	\$87,362.00
State Revenue Sharing	\$ 76,075.00
Federal Revenue Sharing	9,043.00
Police Services Contract (NMFS)	1,000.00
CETA Grants (Public Jobs)	1,244.00
Other Revenues:	\$34,835.12
Garbage Services	\$ 14,208.06
Water Services	7,580.02
Rents	10,552.00
Telephone Surcharges	1,795.07
Miscellaneous Revenues and Refunds	699.97
Other Receipts:	\$13,913.29
Payroll Taxes	3,632.91
Retirement Plan Contributions	280.38
Loan	10,000.00
<u>TOTAL REVENUES AND RECEIPTS</u>	<u>\$170,322.36</u>
<u>Expenditures</u>	<u>Actual</u>
Classified Expenses:	\$179,431.36
Mayor and Council Administration	8,102.67
Public Safety	57,314.72
Public Works	21,005.66
Public Broadcasting (Television)	52,553.05
Municipal Building	7,984.87
Payroll Taxes and Employee Benefits	1,710.89
	30,759.50
Other Disbursements:	\$10,863.78
Loan Repayment	\$ 10,000.00
Payroll Tax Refunds	334.26
Retirement Plan Employee Contributions	385.58
Cash Shortage	143.94
<u>TOTAL EXPENDITURES</u>	<u>\$190,295.14</u>

Source: Childs, William L. Certified Public Accountant. November 21, 1979. Anchorage.

short-term \$10,000 loan in order to meet its payroll until State Revenue Sharing funds were received. It appears likely that, given its current weak financial condition, the city government lacks the financial ability to assume additional responsibilities or to embark on any major program of capital improvements.

COMMUNITY FORECASTS

INTRODUCTION

The first section of this report presented detailed baseline data about existing community conditions at **Unalaska**, Cold Bay and St. Paul. The objective of this section is to analyze how the growth and community infrastructure of these settlements might evolve, both with and without the proposed St. George Basin OCS Lease Sale No. 70, scheduled for December 1982. Figure 10 illustrates the general location of the petroleum basin containing the tracts being considered for Sale No. 70.

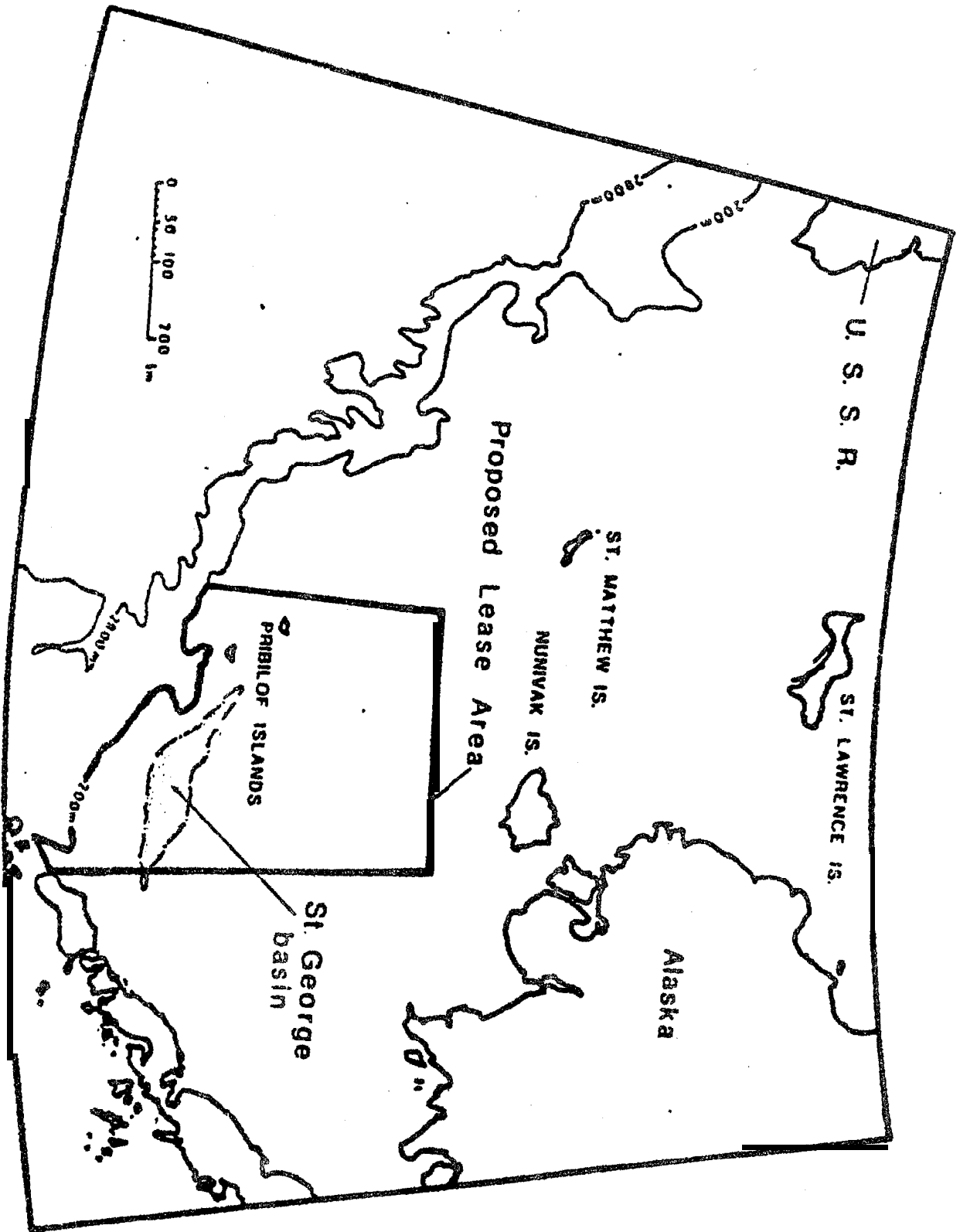
In order to assess the range of possible community impacts of the proposed lease sale over two decades, the scenario method was used to construct and compare three different growth cases, a base case without the St. George Basin Lease Sale #70 and two distinct petroleum development cases.

To identify the significant community impacts of the different petroleum scenarios, this logical sequence of analyses was followed:

- o First, using techniques of economic base analysis and employment and population multipliers or other projection methods, annual forecasts of future employment by economic sector and of future population were prepared for the base case for **Unalaska**, Cold Bay and St. Paul and for each of two OCS petroleum development scenarios at **Unalaska**. These scenarios were

FIGURE 10

LOCATION OF PROPOSED LEASE AREA & OUTLINE OF ST. GEORGE BASIN



prescribed by the Alaska OCS Office, based on oil and gas reserves estimates supplied by the U.S. Geological Survey. The specific forecasts of OCS-related employment used in the present study, from which indirect employment and future population estimates were derived, were obtained from the Alaska OCS Office's petroleum scenarios.

- o Second, a set of uniform standards and assumptions was developed for forecasting. For a given population, standards were developed for projecting future public service and facility requirements and **local** government revenues and expenditures to facilitate comparisons among the different communities and alternative scenarios.
- o Finally, the standards and assumptions were used to quantify population-related community impacts of the various scenarios for purposes of comparative analysis.

As background for the analysis of the different scenarios, a brief explanation of the role of scenarios and the forecast methodology is provided **below**. A fuller explanation of the forecast methodology is given in the Appendices to this report.

Methods of Forecasting

EMPLOYMENT AND POPULATION

The primary method used to forecast employment and population was the economic base method, outlined in detail in the Appendices to this report. Briefly explained, this method divides all local economic activities into two categories: exporting or basic industries which bring money into the locality by exporting locally produced goods and services; and non-exporting or service industries which produce goods and services for local consumption. Then, current employment is tabulated by economic sector and grouped as basic or service employment. Next, recent trends and future prospects for each basic economic sector are analyzed and future levels of basic employment are forecast for each year. Finally, suitable ratios or multipliers relating basic employment to service or indirect employment are applied to basic employment projections to yield overall employment forecasts by sector. The suitable ratios vary from locality to locality, depending upon specific features of the local economy.

The employment forecasts are then used to project future population by applying an appropriate ratio of local employment to local population. The ratio proper to a given locality can be derived empirically, with adjustments as needed to account for any future factors which might alter it. This employment/population ratio varies with the social composition of a local population, particularly with its age structure

and labor force participation rate, and with the vitality of the local economy.

Because of specific local circumstances at St. Paul, the economic base methods of analysis and forecasting was supplemented with forecasting techniques more suited to those circumstances.

The local employment forecasts for the base case were derived in a straightforward way from existing economic data. However, the calculation of total local employment forecasts for the OCS scenarios was more complicated.

Base Case

The base or non-OCS case describes the probable course of community growth, assuming a continuation of current economic trends, that is, in the absence of any OCS-related economic activities. The base case also incorporates assumptions about the future development of the bottomfish industry in the Bering Sea region.

For the base case, a **full** analysis of community growth needs was prepared, focusing on the critical elements of community infrastructure: housing and residential land supply; public utilities (water supply, sewage systems, electric power, solid waste disposal, telephone), public safety; health and social services; education; and recreation. Emphasis was given to those services and facility needs usually provided by local

government. A forecast was also prepared for **the** fiscal impact of growth on local government revenues and expenditures.

The base case forecasts and analyses were then used **as** the benchmark for assessing the incremental significance of the impact forecasts prepared for each of the OCS scenarios. The analyses of the petroleum scenarios stress the noteworthy departures from base case conditions.

Bottomfish Scenario

The embryonic shore-based **bottomfish** industry has potential to transform the economic structure of the Aleutian region. As this industry represents a new element in the region's economy, a separate projection was made of employment which could accrue to the three study communities as a result of **bottomfish** industry development. This projection was then incorporated into the base case forecast of employment and population for each community.

There is a wide range of opinion among knowledgeable analysts about the feasibility and timeliness of shore-based **groundfish** processing and the ultimate outcome of this industry's development in the Bering Sea region is by no means clear. For the sake of consistency among various interrelated studies sponsored by the Socioeconomic Studies Program, the Alaska OCS Office directed that the present study make use of **bottomfish** employment projections developed by Earl Combs Associates. The Combs' projections were built upon specific premises about the competitiveness

of shore-based processing plants versus shipboard processing and other processing options, the geographic distribution of shore-based plants, the type of labor and living arrangements that would prevail and other premises. Overall, the premises advanced by Combs tend to reflect a very positive view of the feasibility and likelihood of shore-based processing. Thus, the incorporation of the Combs projections into the base case forecast tended to result in relatively high regional and local estimates of future economic growth.

Other analyses of the **bottomfish** industry's growth potential in the Bering Sea region have reached radically different but defensible conclusions about the industry's future. For example, the more conservative economic analysis prepared by CH2M Hill in a study for the Washington Public Ports Association concluded that a shore-based **bottomfish** processing industry in the Aleutian region would not be competitive for reasons of product quality and cost efficiency with onboard **pre-processing** (heading, gutting, block freezing) and delivery of frozen fish blocks to West Coast plants for **final** processing. Such a scenario, if **realized**, would cause **little** change in the status quo in Aleutian region communities. **By** that scenario, the base case and OCS impact analysis would differ substantially from the analysis which is presented in this report.

Petroleum Development Scenarios

The outcome of the search for oil and gas is highly speculative and it is thus impossible to advance any definitive single forecast about the

community development impacts of a particular OCS lease sale. At the time of the lease sale and for some years after, resource estimates and corporate decisions about development schedules and production facilities must be considered tentative, pending decisive exploration results and economic analyses.

Still, even preliminary and pre-lease resource data can be used statistically to calculate the likelihood of various recoverable reserve estimates. These different estimates, coupled with insight into the critical factors governing petroleum development decisions and operations, can be used to hypothesize forecasts or scenarios of how petroleum development might unfold in accord with one or another of the reserve estimates. Finally, the petroleum development scenarios provide a basis for constructing coherent, plausible accounts of potential socioeconomic impacts upon nearby communities of the proposed OCS lease sale to match the different assumptions about ultimate reserves and development decisions.

This report characterizes the socioeconomic impacts on Unalaska of two OCS petroleum development scenarios, an exploration only scenario and a mean scenario.

The estimates of total direct employment attributable to each scenario were provided by the Alaska OCS Office. These estimates were then disaggregate according to premises described in the Appendices to determine the employment and population growth assignable to Unalaska as a result of each scenario,

COMMUNITY INFRASTRUCTURE AND FINANCES

A set of uniform standards was developed for forecasting local public facility and service demands and local revenues and expenditures, usually on a per capita basis. Quantitative standards were developed for the following items of community infrastructure: housing demand by type of unit; residential land use; water system capacity; domestic sewage treatment capacity; electric power generating capacity; disposable solid wastes; telephone system capacity; police officers; jail facilities; fire stations; hospitals; school enrollment and classroom needs; and recreational facilities.

The utility requirements of specific OCS industrial facilities such as service bases, pipe coating yards, construction camps and oil and LNG terminals, were estimated separately from community needs. Depending on the scenario and locality, various of these facilities may be wholly isolated from the settlement, or connected by road or in close proximity to the settled area. As a rule, it was presumed that large industrial enterprises would develop their own primary or back-up utility systems, because they would find it more timely, economical and reliable to do so whenever existing excess local capacity was not readily available for their use. In those scenarios where industrial utilities may be a pertinent community development issue, their impact on community utility systems is evaluated.

These standards were then applied to **the** population forecasts to generate for each community its forecast of public service and facility needs for the base case and the OCS scenarios.

This use of uniform standards uniformly applied has the advantages of simplicity, of minimizing local biases and of yielding easily compared forecasts of impacts upon individual communities under the different scenarios. Conversely, the methodology has the disadvantage of slighting local features which may importantly influence the shape which impacts take. As a result, the methodology may occasionally generate unrealistic impact forecasts. **Whenever** the uniform standards produced a forecast at odds with common sense or known local constraints? this was noted and an alternative forecast and the reasons for it were presented.

The revenue and expenditure forecasts require some special qualifications for their proper use and understanding. The fiscal forecasts simply carry forward into the future the local revenue patterns and expenditure practices which prevailed before the forecast period, adjusted for population growth (as determined by the economic base analysis). In terms of purchasing power, local property tax revenues were kept at a constant per capita level by discounting inflation, except for the addition of revenue from new OCS-related industrial property which is taxed at the prevailing local rate, subject to the limits of State law.

The general fund and school district expenditure forecasts assume that each local governing unit will maintain its present level, variety and quality of services at present per capita costs. On the whole, this is a debatable assumption, though it is not easy to pinpoint when and where exceptions to it may occur. Finally, the forecast of funds surplus to operating expenditures and available for capital improvements, debt service or other purposes is obtained by subtracting expenditures from revenues.

The fiscal forecasts also do not take into account possible changes in local tax policies (i.e., adoption of a use tax) or in local government operations (i.e., assumption of additional functions) or State tax policies (i.e., revision of the statutes governing local taxation of oil and gas property) or many other factors which could radically upset the fiscal balance. While it is granted that factors of this sort may well alter fiscal relationships, they are not for that reason alone germane to the fiscal analysis of growth impacts stemming from the OCS lease sale,

Again, it should be emphasized that this methodology has limited validity for predicting the services and facilities which will actually be provided in the future or for predicting actual expenditure and revenue patterns. For example, since the methodology imposes common standards for public service levels and assumes a continuation of current local fiscal practices, it cannot allow for local decisions to alter the assumed pattern of services or the pattern of taxation and expenditures.

Nevertheless, the methodology does provide comparisons, within the framework of the assumptions, suggestive of the trend of growth impacts on the settlements under study and that is the point of the OCS scenario analyses.

Finally, a major but necessary omission from the forecasts of local government revenues and expenditures is a projection of long term capital requirements to finance major capital improvements. In order to present such information, a complete needs assessment of the range of community facilities and services for each community would be required, a local assessment of the relative priority for improvement or replacement of various projects would then be made, and cost estimates and the means for financing such projects would be developed. Such information is not available for Unalaska, Cold Bay or St. Paul and its development is well beyond the scope of this study, Nevertheless, it is needed to present a completed picture of the probable financial demands on communities under conditions of a non-OCS and several OCS scenarios and its absence from this report and the reasons for it are hereby noted.

PROJECTIONS OF GROWTH - BASE CASE

Unalaska

COMMUNITY FORECASTS

Significant Factors Affecting Growth

Between 1970 and 1980, Unalaska experienced a period of rapid growth, the result of a trend begun in the 1960's when large scale exploitation of the region's king and tanner crab resources got underway. During the 1970's, Unalaska became the nation's premier fishing port in terms of the value of landings.

By 1980, the king and tanner crab resources of the region were approaching full utilization and the industry's growth curve had leveled off.

Still, there remains some opportunity for expansion in the traditional fisheries through exploitation of less valuable shellfish species and through diversification into salmon and other species.

Unalaska's position on the east-west shipping routes has contributed to its role as a transshipment point for marine cargo destined for western and northwest Alaska. Any future economic activity which contributed to marine shipping volumes to and from those regions would also probably further boost Unalaska's role as a transshipment port. In particular, if the suspected potential of those regions for oil and gas or other

mineral resource development materializes, the level of shipping activity through **Unalaska** could rise substantially.

Although it is the largest civilian community in the Aleutian region, **Unalaska** has not emerged as a dominant regional center comparable to such rural centers as **Nome**, Bethel, **Dillingham** or Kotzebue. Among the factors which may account for this is the difficulty of **intra-regional** transportation. Administrative ties among the communities of the region are also weak, a fact perhaps best exemplified by the location of the administrative headquarters of the Aleutian **Region** School District in Anchorage rather than in **Unalaska** or another Aleutian community.

However, as the region becomes more heavily populated and communications and transportation linkages improve, **Unalaska** has potential to assume a stronger regional role.

Just as harvest of the previously untapped crab resources accounted for **Unalaska's** rapid growth during the past decade, exploitation of the Bering Sea's rich groundfish resources has potential to support continuing growth at **Unalaska**. Historically, this fishery has been dominated by catcher/processor ships operated by Japanese, Korean, Russian and other foreign fishing enterprises. Passage of the 200 mile limit legislation, which gave domestic fishermen and processors preferential access to all fisheries resources within 200 miles of United States shores, is expected to alter historic patterns. As yet, less than 5 percent of the annual harvestable groundfish catch of about 2 million metric tons in the Bering Sea is taken by domestic commercial fishermen. However, in an

assessment of the future of the **bottomfish** industry in the Aleutian region prepared for the Alaska OCS Office by Earl Combs, Inc., that firm concluded that the region's **bottomfish** resources would be harvested entirely by U.S. vessels within two decades.

Large scale development in the **bottomfish** industry also has potential to stimulate strong growth in a series of related basic industries such as transportation, construction and trade and services for fishing fleet support. If **Unalaska** becomes a base of operations for a large part of the region's domestic **bottomfish** fleet, for onshore processing and for transshipment of the production of floating processing ships, then substantial employment growth from these activities could also be expected to contribute to **Unalaska's** overall growth.

Unalaska's permanent resident population is very small compared to its employment levels. This can be attributed to a number of factors including the seasonal nature of employment in the crab industry, and that industry's use of transient labor and dormitory-style housing, all of which tend to depress the dependency ratio and the multiplier effect of basic employment. As **Unalaska** develops a more mature economy with a stronger secondary sector and a higher percentage of permanent residents in its labor force, the permanent resident population will be steadily enlarged,

Future Employment

According to the base case scenario, **total** employment at **Unalaska** is estimated to grow from **about 1,600 jobs** in 1980 to almost 9,000 jobs by the year 2000 (see Table 30). This represents a cumulative increase of 460 percent in twenty years **which** is equal to an average annual increase of about 8 percent, a very high rate of sustained economic growth.

Attainment of this forecast depends heavily upon assumptions made about the future growth of the domestic bottomfish industry at **Unalaska** as about 80 percent of all projected new employment, or almost 6,000 jobs, is directly or indirectly attributable to developments in that industry. Thus, the forecast is highly sensitive to assumptions made about the **bottomfish** industry and the actual outcome could vary widely from the forecast if those assumptions are not realized.

Unalaska's local economy has an extremely low employment multiplier, a reflection of its highly transient labor force and weak local commerce sector. The base case economic forecast anticipates that a **larger** permanent population with greatly augmented **local** purchasing power will support a much broader array of local shops, service businesses and other secondary activities and that there will be a resulting sharp rise in the relative size of the secondary employment sector. In fact, while total basic employment is estimated to quadruple over the next twenty years, secondary employment is estimated to increase **elevenfold** over the same period of time, largely due to expansion in the trade and service sectors.

TABLE 30
 ESTIMATED TOTAL EMPLOYMENT AND POPULATION
 BASE CASE
 CITY OF UNALASKA
 1980 - 2000

<u>Employment Sector</u>	<u>1980</u> (actual)	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Agriculture, Forestry & Fishing	150	277	547	869	1,064
Mining	2	2	2	3	3
Contract Construction	12	107	236	375	377
Manufacturing	1,166	1,768	3,023	4,517	5,436
Transportation, Communications & Public Utilities	57	90	160	264	348
Trade	60	143	278	477	604
Finance, Insurance & Real Estate	27	42	67	105	125
Services	44	104	197	336	429
Government	82	128	270	479	581
<u>TOTAL EMPLOYMENT</u>	<u>1,600</u>	<u>2,661</u>	<u>4,780</u>	<u>7,425</u>	<u>8,967</u>
<u>TOTAL POPULATION</u>	<u>1,288</u>	<u>2,945</u>	<u>6,280</u>	<u>10,586</u>	<u>13,221</u>

Source: Alaska Consultants, Inc.

Assumptions for Basic Employment. Basic employment is projected to **increase** from 1,442 jobs in 1980 to over 7,000 jobs by 2000 (see Table 31). This new employment is concentrated almost wholly in the fishing and manufacturing (i.e. fish processing) sectors of the economy, primarily from new shore-based **bottomfish** processing activities and secondarily from floating catcher/processor operations based out of **Unalaska**.

- o Traditional Fishing and Seafood Processing. After rapid growth in the crab fishery during the 1970's, the crab resources of the Aleutian/Bering Sea region are approaching full utilization. Therefore, only a modest rate of growth at **Unalaska** is forecast in the traditional (i.e. excluding **bottomfish**) fisheries. Some additional diversification into salmon processing is expected to contribute to this expansion. Total employment in commercial fishing and fish processing for **non-bottomfish** species is estimated to grow at a rate of about 1 percent annually over the forecast period, representing an addition of about 300 new basic jobs.

- o Bottomfish Industry. Basic employment in the **bottomfish** industry at **Unalaska** was estimated by allocating to the community a share of the total regional **bottomfish** employment projection developed by Earl Combs, Inc. for the Alaska OCS Office. Table 32 presents Combs' regional employment projections for the shore-based and catcher/processor-based sectors of the industry. Forty percent of the region's shore-based employment

TABLE 31
ESTIMATED TOTAL BASIC EMPLOYMENT
BASE CASE
CITY OF UNALASKA
1980 - 2000

<u>Employment Sector</u>	<u>1980</u> (actual)	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Agri cul ture, Forestry & Fi shi ng	150	277	547	869	1,064
Tradi ti onal	(150)	(158)	(166)	(174)	(183)
Bottomfish	(0)	(119)	(381)	(695)	(881)
Mi ni ng	2	2	2	3	3
Contract Construction	5	47	106	141	93
Tradi ti onal	(5)	(6)	(6)	(7)	(7)
Bottomfish	(0)	(41)	(100)	(134)	(86)
Manufacturi ng	1,166	1,768	3,023	4,517	5,436
Tradi ti onal	[1,166)	(1,225)	(1,288)	(1,354)	(1,423)
Bottomfi sh	0)	(543)	(1,753)	(3,163)	(4,013)
Transportati on, Communi cati ons & Public Utilities	34	50	73	108	158
Trade	32	47	69	102	149
Fi nance, Insurance & Real Estate	20	22	24	27	30
Servi ces	27	40	58	86	126
Government	6	7	9	11	13
<u>TOTAL</u>	<u>1,442</u>	<u>2,260</u>	<u>3,911</u>	<u>5,864</u>	<u>7,072</u>

Source: Alaska Consultants, Inc.

TABLE 32

PROJECTED EMPLOYMENT
GROUND FISH INDUSTRY
ALEUTIAN REGION
1980 - 2000

<u>Year</u>	<u>Shore-Based Employment</u>			<u>Sea-Based Catcher/Processor</u>	<u>Total Groundfish Employment</u>
	Harvest	Process	Total		
1980	0	0	0	0	0
1981	0	0	0	0	0
1982	54	606	660	240	900
1983	114	606	720	410	1,120
1984	168	606	774	640	1,414
1985	222	1,212	1,434	880	2,314
1986	276	1,212	1,488	1,120	2,608
1987	390	1,818	2,208	1,520	3,728
1988	498	2,424	2,922	2,000	4,922
1989	666	3,030	3,696	2,640	6,336
1990	834	3,636	4,470	3,280	7,750
1991	1,002	4,848	5,850	3,920	9,770
1992	1,110	4,848	5,958	4,400	10,358
1993	1,278	6,060	7,338	5,040	12,378
1994	1,446	6,666	8,112	5,680	13,792
1995	1,500	6,666	8,166	5,920	14,086
1996	1,554	7,272	8,826	6,160	14,986
1997	1,668	7,878	9,546	6,560	16,106
1998	1,776	7,878	9,654	7,040	16,694
1999	1,836	8,484	10,320	7,280	17,600
2000	1,890	8,484	10,374	7,440	17,814

Source: Earl Combs, Inc.

(see Table 33) and 10 percent of the catcher/processor employment (see Table 34) was allocated to Unalaska.

Direct employment at Unalaska in the bottomfish industry is projected to grow from virtually none at the start of the forecast period to 662 by 1985, 2,116 by 1990, 3,858 by 1995 and reach 4,894 by the year 2000, at which time employment growth is expected to level off (see Table 35).

- o Transportation. Basic employment in the transportation sector can be expected to increase rapidly with bottomfish development. Fleet and plant operations will consume large volumes of fuel and other supplies, most of which will be delivered to Unalaska by marine shipping. Unalaska's role as a supply base for commercial fishing operations will also promote its growth as a distribution center for all of western and northwest Alaska. In addition, Unalaska will become the point of origin for the export of large volumes of frozen bottomfish products processed locally or delivered to the community for transshipment by offshore processing ships. Due to these factors, it was estimated that basic employment in the transportation, communications and public utilities sector, of which transportation is the largest component, will grow in pace with the combined basic employment in the commercial fishing and manufacturing sectors or at about 8 percent annually.

TABLE 33

ESTIMATED DIRECT AND INDIRECT SHORE-BASED EMPLOYMENT AND POPULATION
 BOTTOMFISH SCENARIO
 CITY OF UNALASKA
 1985 - 2000

<u>Year</u>	<u>Direct Employment</u>		<u>Total</u>	<u>Indirect a/ Employment</u>	<u>Total Employment</u>	<u>Total b/ Population</u>
	<u>Residing in Households</u>	<u>Residing in Group Housing</u>				
1985	57	517	574	63	637	809
1990	268	1,520	1,788	232	2,020	2,672
1995	653	2,613	3,266	522	3,788	5,224
2000	1,038	3,112	4,150	726	4,876	6,951

a/ Employment multiplier: residing in households: 1985 - 1.2; 1990 - 1.3; 1995 - 1.4; 2000 - 1.5.
 residing in group housing: 1.1.

b/ Dependency ratio: residing in households: 2.0.
 residing in group housing: 1.1.

Source: Alaska Consultants, Inc.

TABLE 34

ESTIMATED DIRECT AND INDIRECT CATCHER/PROCESSOR-BASED EMPLOYMENT AND POPULATION
 BOTTOMFISH SCENARIO
 CITY OF UNALASKA

<u>Year</u>	<u>Direct Employment</u>	<u>Indirect a/ Employment</u>	<u>Total Employment</u>	<u>Total b/ Populati on</u>
1985	88	18	106	212
1990	328	98	426	852
1995	592	237	829	1,658
2000	744	298	1,042	2,084

a/ Employment multiplier: 1985 - 1.2; 1990 - 1.3; 1995 - 1.4; 2000 - 1.4.

b/ Dependency ratio: 2.0.

Source: Alaska Consultants, Inc.

TABLE 35

ESTIMATED TOTAL DIRECT AND INDIRECT EMPLOYMENT AND POPULATION
 BOTTOMFISH SCENARIO
 CITY OF **UNALASKA**
 1985 - 2000

<u>Year</u>	<u>Di rect Empl oyment</u>	<u>Indi rect Empl oyment</u>	<u>Total Empl oyment</u>	<u>Total Popul ati on</u>
1985	662	81	743	1,021
1990	2,116	330	2,446	3,524
1995	3,858	759	4,617	6,882
2000	4,894	1,024	5,918	9,035

Source: Alaska Consultants, Inc.

Substantial secondary employment growth will accrue in this sector in connection with increased air traffic, delivery of consumer goods and operation of local public utilities.

- o Construction. Industrial and community growth at Unalaska on the scale premised by the base case scenario will entail a major construction boom to build plant, transportation, housing and other community improvements. While these capital projects are long lived, the construction employment they generate will be compressed into the period of most rapid development of the industry. Part of this construction boom represents non-local investment in basic industrial and industrial support facilities and can be counted as basic construction employment. It is estimated that basic construction employment will reach a peak of about 141 jobs annually during the mid-1990's coinciding with the period of most rapid expansion in shore-based processing plant capacity. Basic construction employment can be expected to taper off once groundfish resources become fully utilized by the domestic commercial fishing industry.

Part of the construction activity stems from local demand for housing, community improvements, commercial construction, etc. and can be considered secondary in nature. Overall, it is estimated that the construction industry will comprise about 15 percent of new secondary employment created at Unalaska, rising to about 284 jobs by the end of the forecast period.

In summary, **it** is estimated that the base case scenario will result in an increase in total construction employment from about 12 jobs in **1980 to** about 377 jobs by **the end of** the century.

- o** Other. A **1980** field count of employment at **Unalaska** found that 60 percent **of** employment in the trade and service sectors was basic, largely in businesses catering to the needs of the fishing and fish processing industry. The base case economic scenario for **Unalaska** foresees large scale growth in the **bottomfish** industry. This will be accompanied by an increase many times over in the number of fishing vessels which operate out of **Unalaska and** purchase services and supplies there. Future basic employment in the trade and service industries is closely linked to the expansion of overall employment in the fishing and fish processing industry and is forecast to grow **at** about the same rate as basic employment in those two sectors, approximately 8 percent annually.

Apart from its rich fisheries, its oil and gas potential and its location on east-west shipping routes, the **Unalaska** area has little in the way of basic economic resources upon **which** to build a more diversified economy. As a result, only very minor increases in basic employment are expected to occur in other sectors of the economy such as government, finance or mining which are not as directly affected by the fortunes of the fishing industry.

Assumptions for Secondary Employment. It is expected that the projected rapid increase in the permanent resident population, new home construction and rising local purchasing power will provide a powerful economic stimulus to growth of secondary industry, resulting in a change in the overall structure of the community's economy. According to 1980 employment data, Unalaska's employment multiplier was 1.1, that is, each ten basic jobs created one additional secondary job. The base case scenario assumes that, with the initiation of **bottomfish** development, secondary employment will expand rapidly at **Unalaska**, and that the employment multiplier will rise to 1.2 by 1985, to 1.3 by 1990 and to 1.4 by 1995, at which **level** it **will** stabilize.

Secondary employment was distributed among the various sectors in a pattern similar to the distribution observed in more mature medium-sized Alaska fishing communities such as Kodiak and Cordova. Specifically, 30 percent of new secondary employment was allocated to the government sector, 24 percent to trade, 16 percent to services, 15 percent to construction, 10 percent to transportation, communications and public utilities and the remaining 5 percent to finance, insurance and real estate.

Overall secondary **employment** is forecast to increase from 158 jobs in 1980 to almost 1,900 jobs by the end of the century (see Table 36).

TABLE 36

ESTIMATED TOTAL SECONDARY EMPLOYMENT
 BASE CASE
 CITY OF UNALASKA
 1980 - 2000

<u>Employment Sector</u>	<u>1980</u> (actual)	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Agriculture, Forestry & Fishing	0	0	0	0	0
Mining	0	0	0	0	0
Contract Construction	7	60	130	234	284
Manufacturing	0	0	0	0	0
Transportation, Communications & Public Utilities	23	40	87	156	190
Trade	28	96	209	375	455
Finance, Insurance & Real Estate	7	20	43	78	95
Services	17	64	139	250	303
Government	76	121	261	468	568
<u>TOTAL</u>	<u>158</u>	<u>401</u>	869	<u>1,561</u>	<u>1,895</u>

Source: Alaska Consultants, Inc.

Future Population

Unalaska's resident population is projected to grow more than tenfold over the forecast period from 1,288 residents in 1980 to over 13,000 residents by 2000 (see Table 30). This is an average annual growth rate of better than 12 percent. About three-quarters of this growth is tied directly or indirectly to development of the **bottomfish** industry as assumed in the base case scenario.

In 1980, most processing plant workers in Unalaska lived in group quarters. The forecast assumes that a large share of the newcomers to Unalaska will also live in group quarters, with the proportion declining as the **bottomfish** industry becomes more firmly established. By the end of the forecast period, it is estimated that about two-thirds of all Unalaska residents will be members of households and **living** in dwelling units while one-third will occupy group housing.

In general, the demographic profile of Unalaska's future population is expected to show a disproportionate number of young males and unattached adults, with relatively few children and older persons. As the majority of newcomers will originate from outside the region and outside the State, the percentage of Unalaska's population which is Alaska Native will dwindle over the forecast period.

IMPACT ASSESSMENT

Social Impacts

The growth forecast in the base case scenario envisages a total transformation in **Unalaska's** economic, social and physical organization. The community will experience rapid population growth and high population turnover, conditions which are favorable to a high incidence of personal and social disorders. Severe strain will be placed on all elements of the community's infrastructure, but **especially on** the private housing supply. Many of the community development problems which **will** arise could be offset to some degree by a company town approach to **labor** force management, but this would tend to inhibit **Unalaska's** evolution as a community. While the scenario assumes that there will **be** massive infusions of non-local public investment to build the infrastructure necessary to support the projected community and industrial growth, this aid **will** doubtless have to be prompted by local crises and local conflict about the best allocation of scarce public resources toward community building.

Impacts on Community Infrastructure

Under the growth assumptions of the base case scenario, **Unalaska** will have evolved into a settlement ten times the size of the existing community by the year 2000. Town growth at this scale and pace will not take place as a series of incremental additions and expansions to the

existing community infrastructure. Rather, **it** will amount to wholesale construction of a virtual new town.

While future demand for community facilities and services can be described in general quantitative terms, the existing infrastructure does not serve as a valid point of departure for identifying potential problems in their provision. Nevertheless, future development will be constrained **by** the same fundamental limitations of land and resource availability. These factors suggest some features of the shape which future town growth might take.

Housing and Residential Land. The key factor in the demand for housing and for nearly all other **infrastructural** elements **will** be policies of the bottomfish industry and preferences of its workers regarding housing arrangements. Current practice in **Unalaska** is for seafood processors to provide dormitory-style quarters for the bulk of their seasonal plant workforce. A different pattern of housing is ascribed to the bottomfish processing industry since year-round operations are more favorable to the conventional private household style of living. It is assumed that a significant share of plant workers, small during the first years of plant operations but increasing as the industry demonstrates its viability, will seek to live in private households rather than in group housing. Furthermore, it is assumed that large numbers of new residents drawn to **Unalaska** by indirect employment opportunities outside the bottomfish industry will be accommodated within the private housing market.

The forecast of housing demand estimates that about 3,400 new housing units will be added at Unalaska by the year 2000 for new residents (see Table 37). Growth occurs throughout the forecast period, but is strongest between 1991 to 1995 when an estimated 1,242 dwellings will be demanded. While Unalaska had practically no local construction industry in 1980 (total employment in contract construction amounted to only 12 jobs), development of this housing supply and related utilities should stimulate a long term construction boom.

Even with a trend away from group housing toward development of a conventional private housing sector, it is estimated that the bottomfish industry will still find it necessary to maintain housing facilities for about 3,112 plant workers at Unalaska in the year 2000.

It is further estimated that construction of the indicated number of private dwelling units will necessitate development of over 500 acres of vacant land for residential use by 2000. According to the inventory published in the City's comprehensive plan of land available and suitable for residential development, this level of demand can be accommodated at the densities assumed for the housing forecast. However, considerations of terrain and land use planning may mean that residential growth will be clustered in several locations where land is available and site conditions are suitable rather than in a single compact settlement. The location of housing areas will doubtless be influenced by the siting of plant facilities and these improvements will, in turn, affect the design of other elements of the physical infrastructure.

TABLE 37
 FORECAST OF NET CHANGE IN DEMAND
 FOR HOUSING UNITS AND RESIDENTIAL LAND
 BASE CASE
 CITY OF UNALASKA
 1981 - 2000

	<u>Net Change Demand for Housing Units</u>	<u>Net Change Demand for Residential Land (acres)</u>
1981 - 1985	435	65.2
(One & Two Family)	(217)	(43.4)
(Multi-family)	(109)	(10.9)
(Mobile Homes)	(109)	(10.9)
1986 - 1990	893	134.0
(One & Two Family)	(447)	(89.4)
(Multi-family)	(223)	(22.3)
(Mobile Homes)	(223)	(22.3)
1991 - 1995	1,242	186.3
(One & Two Family)	(621)	(124.2)
(Multi-family)	(311)	(31.1)
(Mobile Homes)	(310)	(31.0)
1996 - 2000	834	125.1
(One & Two Family)	(417)	(83.4)
(Multi-family)	(208)	(20.8)
(Mobile Homes)	(209)	(20.9)
TOTAL	3,404	510.6
(One & Two Family)	(1,702)	(340.4)
(Multi-family)	(851)	(85.1)
(Mobile Homes)	(851)	(85.1)

Source: Alaska Consultants, Inc.

Utilities

- o Water. The shellfish processing industry has grown so swiftly **at Unalaska** that, despite recent improvements, the water supply system is not adequate even for present needs. There are problems of water supply and of water quality for both domestic and industrial users. Unfortunately, there are no current data on industrial water consumption, but it is clear that domestic use commands less than 5 percent of the system's reported design capacity of 13 million gallons per day, with the remaining capacity absorbed by the shellfish processing plants.

In the future, industrial water consumption at **Unalaska** is expected to grow only modestly, mainly because **bottomfish** processing operations prefer to use salt rather than fresh water. The traditional sector of the processing industry is forecast **to** grow at a **slow** rate of about 1 percent annually and so **will** not call for a major increase **in** water supplies beyond that required to reliably meet its present needs.

However, future domestic water demands are estimated to grow from the present consumption rate of about 250,000 gallons per day to about 1,650,000 gallons per day by 2000 (see Table 38) .

TABLE 38
 ESTIMATED CAPACITY REQUIREMENTS
 WATER SUPPLY SYSTEM

BASE CASE
 CITY OF UNALASKA
 1985 - 2000

[000' s of gallons per day)

<u>Year</u>	<u>Domestic Capacity</u>	<u>Industrial Capacity</u>	<u>Total Capacity</u>
1985	368	18,375	18,792
1990	785	19,320	20,105
1995	1,323	20,310	21,633
2000	1,653	21,345	22,998

Source: Alaska Consultants, Inc.

Provision of a dependable, high quality water **supply** for the town's present and future needs indicates that a number of system improvements may be in order, including water treatment facilities for improved water quality; fuller development **of** existing surface water sources, possibly supplemented by deep **wells** to provide reliable winter flows; added water storage capacity; and new transmission and distribution lines.

- o Sewer. Existing facilities for collection and treatment of sanitary waste at **Unalaska** are seriously inadequate and pose a potentially severe public health hazard to the community and the processing industry. There is no community sewage collection or treatment system. About half of the community's residents rely upon septic tanks or outhouses, with the rest using three separate collection systems, two of which discharge raw sewage into **Iliuliuk** Bay. Large volumes of processing wastes are also discharged into **Unalaska** Bay, Dutch Harbor and **Iliuliuk** Bay and are contributing to the degradation of harbor waters around **Unalaska**.

In view **of** the population growth, harbor development and fishing fleet activity projected for **Unalaska**, it is assumed that a community sewage collection and treatment system will be built **at Unalaska** in the near future, with a design capacity **of** about 800,000 gallons per day by **1990** and about 1,650,000 gallons per day by 2000 (see Table 39).

TABLE 39

ESTIMATED CAPACITY REQUIREMENTS
 DOMESTIC SEWAGE TREATMENT
 BASE CASE
 CITY OF UNALASKA
 1985 - 2000

 (000's of gallons)

<u>Year</u>	<u>Daily Treatment Capacity</u>	<u>Peak Hourly Capacity</u>
1985	368	46
1990	785	98
1995	1,323	165
2000	1,653	207

Source: Alaska Consultants, Inc.

o Electric Power. **The** existing system for generating and delivering electric power **to** consumers at Unalaska is very fragmented and inefficient. The City power utility serves some residences and businesses and **has** a nominal installed capacity of 1,200 kw, **with** a new 600 kw generator on order. The City does not **serve** the industrial users **who** are the major power consumers. Instead, **there** is an assortment of private generating plants operated **by** processors **and** other private users with a total combined generating capacity of 12,650 kw. Thus, the City utility serves only about one-tenth of the total power demand. **All power** is supplied by diesel generators and is expensive.

For the long run, a central power **plant** serving *all* consumers in the community would be a far more economical and reliable approach **to** supplying **local** power needs. It is assumed for the base case scenario that the projected increases in community **power** demands will prompt the creation of an integrated electric utility system.

The **bottomfish** industry is a major consumer of electric power for its processing, freezing and cold storage operations. The estimate **of** future residential and industrial power demands foresee that total power capacity requirements will double **by 1990** to almost 25,000 kw and double again **by 2000 to** about 50,000 kw (see Table 40).

TABLE 40
 ESTIMATED CAPACITY REQUIREMENTS
 ELECTRIC POWER SYSTEM
 BASE CASE
 CITY OF UNALASKA
1985 - 2000

<u>Year</u>	<u>Estimated Capacity Requirements in kw's</u>
1985	11,044
1990	23,550
1995	39,698
2000	49,579

Source: Alaska Consultants, Inc.

- o Solid Waste Disposal. Garbage collection services for residential and **commercial** customers **are** provided by a private operator **under** contract to the City. **As a rule**, the processing plants truck their own **solid** wastes. All solid waste is disposed of at the City's 10 acre landfill site which is reportedly not **well** maintained. The City's comprehensive plan urges that new landfill sites be found and developed, but suitable sites are not readily available and none have yet been identified.

In any case, the capacity of the existing landfill site will, under the base case **scenario**, soon be exceeded and it will become imperative to locate additional sites. Disposal of the projected volumes of solid wastes (see Table **41**) by a landfill operation will require about 25 acres by 1990 and another 50 acres by the year 2000.

- o Communications. Once currently programmed improvements to the local private telephone utility's switching equipment and to **Alascom's** satellite communications equipment are completed, **Unalaska's** basic **capabilities** for telephone communications **should** be adequate through 1985. Continued growth **in** following years will add steadily to the communications workload but the indicated expansion of local and long distance capacity is not expected to present any noteworthy difficulties (see Table 42).

TABLE 41
 ESTIMATED DISPOSABLE SOLID WASTES
 BASE CASE
 CITY OF UNALASKA
 1985 - 2000

<u>Year</u>	<u>Annual Tonnage</u>	<u>Annual Volume (cubic yards)</u>
1985	3,370	20,420
1990	7,550	45,760
1995	12,730	77,140
2000	15,900	96,340

Source: Alaska Consultants, Inc.

TABLE 42
ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE **SYSTEM**
BASE CASE
CITY **OF** UNALASKA
1981 -2000

	<u>Increase in Number of Tel ephones</u>
1981-1985	544
1986-1990	1,116
1991-1995	1,552
1996-2000	1,042

Source: Alaska Consultants, Inc.

Public Safety

- o Police. Unalaska has an **unusually large police** department for a city of its size, with **the** accepted explanation being the heavy influx of transient labor during crab processing periods. The community's population **also** includes a disproportionate number of young male adults which tends **to** skew the level of police activity.

Under the **base** case scenario, the same social circumstances which inflate current police statistics will persist. Therefore, a somewhat higher ratio of law enforcement officers **to** population may be needed at **Unalaska**. It is estimated that about ten additional police officers will be required during each five year interval between 1980 and 2000.

Unalaska's present jail is in good condition but its three jail cells are often insufficient to accommodate existing needs during the seasonal peak of processing activity. It is anticipated that a major **jail** facility at **Unalaska** will be demanded **to** meet base case needs, estimated to reach about 25 jail cells by the close of the forecast period.

- o Fire Protection. The projected residential and industrial growth forecast **to** take place **at Unalaska** means that **firefighting** capabilities **will** have to be greatly upgraded in order to

maintain an adequate level of fire protection. Furthermore, certain features of Unalaska's physical layout and development recommend the provision of superior fire protection services. Residential areas will be dispersed at scattered developable tracts, while the concentration of high value industrial plants, large fuel storage facilities and a busy port will magnify fire dangers.

During the forecast period, several new fire stations with supporting equipment will be needed to provide protection within adequate response time to new development occurring on Unalaska and Amaknak Islands. In view of the high density waterfront development and harbor activity which is expected, it may be also advisable for the City to develop marine firefighting capabilities. Finally, the community water system should be designed to allow a minimum water flow of 500 gallons per minute to all areas, with higher flows to industrial zones.

Health and Social Services. In 1980, Unalaska's health service needs were met primarily by the community health clinic. The clinic is staffed by five health professionals but does not have a resident physician. Instead, medical and dental care is provided locally by visiting physicians and dentists who travel regularly to Unalaska to dispense their professional services. In general, local health personnel report that facilities are adequate but that the full-time services of a physician and dentist are needed.

By 1985, Unalaska should be large enough to justify the full-time presence of a couple of doctors and a dentist and construction of a small hospital with about a dozen beds. The demand for medical services and facilities will grow quite rapidly over the rest of the forecast period, and it is estimated that by the year 2000 about a dozen doctors and dentists and a hospital with 40 to 50 beds will be needed to maintain an adequate standard of medical care for Unalaska's residents.

Education. The Unalaska City School District's enrollment grew rapidly between 1970 and 1980, more than doubling within the decade to about 160 students. Under the base case scenario, the elementary and secondary school population is forecast to double again by 1985, again by 1990 and once more by 2000 (see Table 43). By the end of the forecast period, elementary enrollment is projected to reach over 1,000 students and secondary enrollment almost 700 students. Impressive as this growth rate seems, it assumes that Unalaska's school age population will make up only about 13 percent of the total community population, well below the Statewide average, due to the high proportion of transients and unattached adults.

Even once its current building program is finished in 1981, the City's school facilities should be adequate for a couple of years. Thereafter, accelerating growth in student enrollment will necessitate a sustained building program to keep educational facilities up to standard. It is estimated that about 20 new classrooms will be demanded between 1985 and 1990, 25 more by 1995 and another 14 by the end of the forecast period.

TABLE 43

SCHOOL ENROLLMENT FORECAST
BASE CASE
CITY OF UNALASKA
1985 - 2000

<u>Year</u>	<u>Elementary Enrollment</u>	<u>Secondary Enrollment</u>	<u>Total Enrollment</u>
1985	230	153	383
1990	490	326	816
1995	826	550	1,376
2000	1,031	688	1,719

Source: Alaska Consultants, Inc.

As Unalaska grows and more residential areas are developed, new elementary school sites will have to be acquired in order to maintain a neighborhood school system for younger school children.

Recreation. In order to provide for its recognized recreation needs, the City recently established a Department of Parks, Recreation and Culture. Existing recreation facilities include the community center, a neighborhood park and the school gym and playground which are open for general community use after school hours. A swimming pool is planned for completion in 1981 and will add to the local range of recreation opportunities.

Keeping pace with the future recreation demands of its growing population, particularly those of children and young adults, will involve a wide variety of community recreation improvements. A number of neighborhood parks and recreation areas scattered throughout residential areas will be demanded, totalling about 40 acres over the forecast period. A major community center facility able to serve the cultural and recreation needs of many segments of the community is also estimated to be demanded by 1985, with several expansions during the forecast period needed to keep up with a rapidly growing user population. The community could also use a number of indoor sport facilities equipped with playing courts suitable for sports such as basketball, tennis, volleyball, etc., as well as additional swimming facilities. Many of these facilities could be built in conjunction with educational plants to ensure maximum community use.

Local Government Finances. Because of its recent history of rapid growth and because of **the** extreme rate of growth envisioned under the base case scenario, it is not reasonable to **place** much confidence in long term fiscal projections built by extrapolation from the City of **Unalaska's** current financial situation. Table **44** presents a forecast of future revenues and expenditures calculated by the rules developed in the Methods, Standards and Assumptions memorandum. However, these quantitative projections may not be as significant as some general observations about **Unalaska's** present and probable future fiscal circumstances.

In 1980, **Unalaska** relied very heavily upon local sales taxes for its general fund revenues with a large share of these taxes deriving from purchase of goods and services, particularly fuels, by non-residents. Real property taxes provided less than 10 percent of general fund revenues, even though the City's real property tax base and property tax rates are fairly typical for an Alaska city of its size. **Unalaska's** existing bonded indebtedness is quite high, whether measured in terms of per capita debt or as a percentage of real property assessments. Thus, at a time when the City already faces a backlog of capital improvement needs, it does not appear to have the property tax base or reserve capacity to back a major bonding program.

In the future, the City of **Unalaska** will face a massive, long term program for capital improvements of every variety to meet its projected growth needs. It is very unlikely that it will be able to raise adequate

TABLE 44
 FORECAST OF GENERAL FUND REVENUES AND OPERATING EXPENDITURES

BASE CASE
 CITY OF UNALASKA
 1985 - 2000

[\$000' s)

Year	General Fund Revenues			Operating Expenditures			Available for Capital Improvements
	Property Tax	Other Revenues	Total	City Operations	School Support	Total	
1985	\$ 345	\$ 4,097	\$4,442	\$2,700	\$ 332	\$ 3,032	\$1,410
1990	735	8,737	9,472	5,758	708	6,466	3,006
1995	1,238	14,728	15,966	9,707	1,193	10,900	5,066
2000	1,547	18,394	19,941	12,123	1,490	13,613	6,328

a/ Includes sales taxes, intergovernmental revenues and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

capital funds through issuance of bonds on its own account, especially since growth in its industrial property tax base **will** depend upon and tend to follow public works projects.

The base case scenario implicitly presupposes that fiscal obstacles confronting the City will be overcome and that essential community facilities, utilities and services will be installed in a timely fashion for the use of industry and its labor force. Presumably, the City will obtain funding participation from State and federal governments and from the private sector to **build** the community infrastructure.

The operating costs for providing municipal facilities and services can also be expected **to** rise steeply. The steadily expanding role of the State of Alaska in providing operating funds for school districts and in funding revenue sharing and other revenue transfer programs for local governments may help to defray some of the local financial burden.

CAUSE/EFFECTS OF IMPACTS

The primary source of growth impacts at **Unalaska** in the base case is the major growth forecast to take place in the **bottomfish** industry.

That industry alone is expected to add about 5,000 direct jobs to the town's employment base. The resident population is projected to increase tenfold over the forecast period. As the present population of the Aleutian region is too small to supply the manpower needs of the **bottomfish**

industry, there will be a massive influx of newcomers from outside the region.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

The base case scenario entails construction of all of the facilities and improvements for a new community of 12,000 residents. A large injection of State and federal funds will be needed to finance this development and intensive land use and capital improvements planning will be needed to guide community development activities. Such rapid growth may well be accompanied by serious social problems and local conflict about community development priorities.

SUMMARY OF IMPACTS

Under the base case scenario, **Unalaska will be** beset by acute problems of growth management as the community seeks to provide the essential facilities, services and community amenities required to provide a desirable standard of living for its rapidly growing population. By the year 2000, **Unalaska will** have undergone a fundamental change and will have little in common with the community as it is today.

Cold Bay

COMMUNITY FORECASTS

Significant Factors Affecting Growth

The primary economic function of Cold Bay has traditionally been as a transportation service center for military and civilian aviation to and through the Aleutian region, with most employment directly linked to airport operations or to various aviation service activities. Recent **population** trends at Cold Bay are directly related to levels of transportation activity. Community population peaked around 1970 when the Cold Bay airport was busiest as a servicing stop for U.S. military aircraft in transit to and from the Orient, and **fell** off as U.S. activities in Vietnam declined during the 1970's.

It is expected that Cold Bay will remain the primary center of air traffic to and from the Aleutian region. Consequently, the vitality of this sector of the community's economy will closely parallel the **level** of economic activity and related aviation activity in the region as well as locally. The base case economic forecast assumes that the Bering Sea **groundfish** industry will be completely captured by domestic fishermen and fish processors over the next twenty years, resulting in the direct addition of as many as 11,275 new resident jobs in the Aleutian region according to estimates prepared for the Alaska OCS Office by Earl Combs, Inc. Nearly all of these new jobs will be located west of Cold Bay and

served by air through that community. Accommodating this air traffic will help maintain and expand the level of employment at Cold Bay in transportation-related functions.

Increased fishing vessel and marine shipping activities in the Aleutian and Bering Sea region may also encourage the U.S. Coast Guard to upgrade its capabilities by establishing a base of operations in the Aleutians rather than continuing to serve the region from Kodiak. The Coast Guard's current long range plan anticipates establishment of a base at Cold Bay during the 1980's.

Apart from **bottomfish**, a major impetus to growth at Cold Bay would be the establishment of a permanent shore-based shellfish, salmon and other seafood processing operation, such as is now in the planning stages by the Thirteenth Regional Corporation. In addition to direct employment such a processing plant **would** create in the fishing and manufacturing sectors, some economic growth could also be expected in service industries linked to the fishing industry and **in** the transportation sector.

Changes in the manpower levels of the Cold Bay Air Force Station are difficult to predict, since they are highly sensitive to unpredictable factors in international relations. In the absence of any disclosed plans to alter the present level of operations at the Air Force Station, it has been assumed that the current level of staffing will be maintained over the study period.

Cold Bay possesses few economic resources upon which to develop and sustain a permanent economy. Its primary economic asset is its strategic location for national defense purposes which, in combination with its superior airport **facilities**, has made it the center of military and civilian air service operations in the region. **In** addition, its air transport services and harbor create some potential for Cold Bay to participate as a support base in the growth of the region's fisheries.

The Cold Bay area does possess significant wildlife resources. Its brown bear and caribou populations periodically attract sport hunters and the community is also **the** administrative headquarters for the **Izembek** National Wildlife Refuge, an outstanding habitat for migrant waterfowl. However, the remoteness of the area's wildlife resources and high transportation costs make it unlikely that it will ever become a popular destination for recreational visitors.

The secondary economy at Cold **Bay** **is** presently minimally developed but is typical of a small and remote community with an employment base dominated by government activities. While diversification of the community's economic base with new private sector employment in the fisheries or other industries may broaden the secondary economy, it remains likely that the community's employment multiplier **will** continue to be well below "normal" ratios,

Future Employment

Under the assumptions of the base case, total employment at Cold Bay is forecast to increase from about 200 in 1980 to about 460 by 2000, an overall increase of about 131 percent (see Table 45). Most this increase occurs in the basic sector as a result of growth in seafood processing based at Cold Bay.

Assumptions for Basic Employment. In the base year of 1980, more than 90 percent of Cold Bay's employment was classified as basic, mostly in the categories of fishing and manufacturing, transportation and government. These same categories are expected to continue to provide most of Cold Bay's basic employment.

- 0 Transportation. Cold Bay's air transportation facilities and services are the reason for this community's existence. Cold Bay airport is one of the best in the State and is serviced by a large complement of public and private employees. In the future, it is expected that the basic component of Cold Bay's provision of air transport services to the region will expand, particularly in response to the growth projected to occur at Unalaska and elsewhere in the region in the **bottomfish** industry over the next two decades. This new industry should stimulate a steady increase in air passenger and air cargo traffic through Cold Bay. Therefore, basic employment in the transportation, communications and public utilities sector is

TABLE 45

ESTIMATED TOTAL EMPLOYMENT AND POPULATION
BASE CASE
COLD BAY
1980 - 2000

<u>Employment Sector</u>	<u>1980</u> (actual)	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Agriculture, Forestry & Fishing	25.0	32	41	52	66
Mining	0.0	0	0	0	0
Contract Construction	0.0	7	10	13	15
Manufacturing	30.0	38	49	62	80
Transportation, Communications & Public Utilities	56.6	60	71	84	98
Trade	6.0	9	14	21	26
Finance, Insurance & Real Estate	0.0	0	1	2	2
Services	9.0	15	19	26	32
Government	73.0	83	101	122	142
<u>TOTAL EMPLOYMENT</u>	<u>199.5</u>	244	<u>306</u>	382	461
<u>TOTAL POPULATION a/</u>	<u>243 a/</u>	332	422	531	646

a/ Total 1980 population includes 47 personnel at Cold Bay Air Force Station, and an estimated 25 fishermen and 30 fish processing plant employees delivering to or based out of Cold Bay.

Source: Alaska Consultants, Inc.

forecast to increase at a rate of 3 percent annually during the next two decades.

- o Government. Basic employment in the **public** sector is projected to grow at a rate of 3 percent annually. Two factors are expected to contribute to this growth. First, the steady increase in air and marine traffic throughout the Aleutian region will require an increase in the staffing of federal and State agencies such as the Federal Aviation Administration, the Alaska Department of Transportation and Public Facilities and, most notably, the U.S. Coast Guard which anticipates establishing a base at Cold Bay for its operations in the Bering Sea during the 1980's. Second, the establishment of a seafood processing industry at Cold Bay will involve some increase in State personnel engaged in the regulation and management of that industry.

- o Fishing and Seafood Processing. In 1980, the fishing and seafood processing industry was a major seasonal employer at Cold Bay. The Thirteenth Regional Corporation's floating processor the **Al-Ind-Esk-A-Sea**, was stationed here for part of the year and processed king and tanner crab. This operation employed the annual equivalent of about 25 fishermen and 30 plant workers and the operation appears to have had a successful beginning. The Thirteenth Regional Corporation has acquired a waterfront tract at Cold Bay and anticipates construction of a

shore plant to process crab, salmon and other species on a year-round basis, a development which **would** significantly add to Cold Bay's resident employment base.

For the base case forecast, it has been assumed that a modest scale processing plant will be established at Cold Bay with diversified capacity to process crab, salmon and other species on a year-round basis. It is also assumed that direct resident employment in the fishing and manufacturing sectors **will** grow at an annual rate of 5 percent over the forecast period as a result of this new enterprise.

- o **Bottomfish.** The analysis of the bottomfish industry in the Aleutian region prepared for the Bureau of Land Management's Alaska OCS office by Earl Combs, Inc. projected that about half of the total annual harvest of bottomfish in the Bering Sea region would be processed onshore **by 2000**. The Combs' projection viewed favorably the prospects for the emergence of a large scale shore-based industry at **Unalaska** and a smaller operation at St. **Paul**. However, it did not view positively the likelihood of this industry's development at Cold Bay.

Among Cold Bay's handicaps is a relatively less advantageous location in relation to the groundfish resources compared to other potential ports such as **Unalaska**, Sand Point, King Cove and Kodiak. Therefore, the base case does not anticipate any

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groundfish processing at Cold Bay except as an incidental **activity to the operation of a local multi-product seafood** processing plant.

- o Other. Fishing ports generally develop a trade and services sector which is devoted in part to providing goods and services to meet the basic needs of transient fishing vessels. The base case forecast for Cold Bay assumes that growth in the fishing industry based at Cold Bay will generate some expansion in the basic component of the local trade and services sectors linked to that industry. Specifically, basic employment in the trade sector is forecast to grow at a rate of 5 percent annually and in the service sector at 4 percent annually.

Assumptions for Secondary Employment. The level of secondary employment can be related to basic employment by an employment multiplier which measures the number of jobs generated in the secondary sector by the local expenditures of basic employees for goods and services. Small, isolated communities such as Cold Bay are usually unable to support a wide array of local services and consequently have a narrow secondary economy and a low employment multiplier. In fact, the employment count compiled by Alaska Consultants in the summer of 1980 recorded only 18 secondary jobs out of a total of 199.5 jobs in the community. This is equivalent to an employment multiplier of about 1.1 or about one secondary employee for each ten primary or basic employees.

For employment forecasting purposes, it was assumed that the secondary economy at Cold Bay would expand slightly as the economic base expanded and became more diversified with the establishment of a local fish processing industry. Thus, the employment multiplier was assumed to rise to 1.15 by 1990 and to 1.2 by 1995.

In the base year of 1980, all of the secondary employment was concentrated in the three employment sectors of transportation, communications and public utilities, trade and government. In the future, it was assumed that Cold Bay's secondary economy would also support some growth in the contract construction and services sectors. For the total employment forecast, secondary employment was distributed among the various economic sectors as follows: government - 35 percent; trade - 24 percent; services - 16 percent; contract construction - 15 percent; and transportation, communications and public utilities - 10 percent.

Future Population

Under the assumptions of the base case, Cold Bay's resident population is estimated to increase by about 400 persons between 1980 and 2000 to a total of 646 residents, nearly tripling the 1980 base year population of 243 persons (see Table 45). The main event contributing to this anticipated growth is the establishment of a shore-based seafood processing industry at Cold Bay, with steady expansion of the community as the center of the Aleutian region's air transportation activities also a contributing factor.

Historically, Cold Bay's population has shown a very **low** dependency ratio. For example, in the base year of 1980, the dependency ratio was **141** permanent residents **to** 97.5 permanent employees or a dependency ratio of 1.45. This excludes military personnel and transient employees engaged in the floating seafood processing operation seasonally based at Cold Bay. If these persons were also included, the dependency ratio would be even **lower**. The explanation for this low dependency ratio can **be** found in Cold Bay's historic function as a remote service outpost with limited attractions and amenities for conventional family life.

The type and scale of economic expansion in the transportation and fish processing industries expected to occur at Cold Bay **will** probably perpetuate the established pattern since both of these industries are prone to attract disproportionate numbers of transient and unattached workers. Therefore, the dependency ratio used to project future civilian population was held constant at 1.45 throughout the forecast period. Future military population, like future military employment, was also held constant through the study period.

IMPACT ASSESSMENT

Social Impacts

The population and employment growth projected for Cold Bay under the base case is small in absolute numbers, even if **large** relative to the existing community base. A large part of this projected growth **will**

occur in an industry which is new to Cold Bay, the fishing and seafood processing industry. This factor will tend to diversify the economic and social structure of the community. Still, even at the close of the forecast period, Cold Bay will remain a small and isolated settlement with a relatively narrow range of locally provided commercial and public services. It is expected that the government and transportation sectors will still account for more than 50 percent of total employment at Cold Bay by 2000.

Cold Bay's present resident population is mostly non-Native and it is not expected that this will be changed by future growth. If, in addition to the base case employment forecast, significant development in the groundfish industry took place at Cold Bay, the town could eventually evolve into a much larger community dominated by the fishing and fish processing industry.

Impacts on Community Infrastructure

Housing and Residential Land. The base case forecast estimates that about 175 additional units will be needed to house new population growth projected to occur over the next 20 years at Cold Bay (see Table 46). This forecast assumes that the relatively modest but permanent economic stimulus lent by the seafood processing industry will support the evolution of residential development in individual households rather than company town type development relying mainly upon group housing for plant workers. If the latter case were to prove true, the number of dwelling units needed for future growth would be correspondingly reduced.

TABLE 46

FORECAST OF NET CHANGE IN DEMAND
FOR HOUSING UNITS AND RESIDENTIAL LAND
BASE CASE
COLD BAY
1981 - 2000

	<u>Net Change Demand for Housing Units</u>	<u>Net Change Demand for Residential Land (acres)</u>
1981 - 1985	39	5.8
(One & Two Family)	(19)	(3.8)
(Multi-family)	(10)	(1.0)
(Mobile Homes)	(10)	(1.0)
1986 - 1990	39	5.8
(One & Two Family)	(19)	(3.8)
(Multi-family)	(10)	(1.0)
(Mobile Homes)	(10)	(1.0)
1991 - 1995	47	7.0
(One & Two Family)	(23)	(4.6)
(Multi-family)	(12)	(1.2)
(Mobile Homes)	(12)	(1.2)
1996 - 2000	50	7.5
(One & Two Family)	(25)	(5.0)
(Multi-family)	(12)	(1.2)
(Mobile Homes)	(13)	(1.3)
TOTAL	175	26.1
(One & Two Family)	(86)	(17.2)
(Multi-family)	(44)	(4.4)
(Mobile Homes)	(45)	(4.5)

Source: Alaska Consultants, Inc.

A significant proportion of **the** new dwelling" units projected for Cold Bay will probably be constructed under sponsorship of government agencies and **private** employers for their employees stationed at Cold Bay.

In the absence of any meaningful guidelines from existing housing patterns, **it** is assumed that approximately half the forecast housing need **will be** supplied by one and two family units, with the remaining half **split** evenly between multi-family and mobile home units. Because the base case forecast envisions a steady rate of growth, the demand for new **housing** units is expected to be fairly **evenly** spread out over the forecast period.

In terms of residential land use, it is estimated that the projected housing demand for the next two decades could be accommodated on about 26 acres of land, **well** within the available supply of developable land at Cold Bay. However, the existing pattern of scattered housing developments clustered around major employers is likely to prevail in the future, even with the introduction of a new major private employer in the fish processing industry. This scattered pattern of residential, commercial and industrial land uses will be a **critical** factor influencing the economic feasibility of providing community services and utilities in future years.

Utilities

- o Water. At present, most of Cold Bay's water supply is obtained and distributed through a community system which was originally developed by the Federal Aviation Administration for its own facilities and subsequently extended to other users. An important exception is the dock area and the floating processing plant which moors there when it is in operation. The plant obtains its water supply through periodic trips to King Cove.

The Federal Aviation Administration system's water source is produced from five separate wells which have a yield adequate to meet current consumption volumes of about 30,000 gallons daily. Nevertheless, there is concern that groundwater supplies from this well system are limited and that additional sources of supply would be needed to provide for additional consumption by new residential or industrial users.

Under the base case assumptions, domestic water consumption is expected to increase nearly threefold over the next two decades (see Table 47). Furthermore, the seafood processing industry is a major user of fresh water. Based upon an index of industrial water consumption per processing plant employee of about 7,500 gallons daily at Kodiak, which has a fish processing industry similar to that forecast to develop at

TABLE 47
 ESTIMATED CAPACITY REQUIREMENTS
 WATER SUPPLY SYSTEM
 BASE CASE
 COLD BAY
 1985 - 2000
 (000's of gallons per day)

<u>Year</u>	<u>Domestic Capacity</u>	<u>Industrial Capacity</u>	<u>Total Capacity</u>
1985	42	285	327
1990	53	368	421
1995	66	465	531
2000	81	608	689

Source: Alaska Consultants, Inc.

Cold Bay, it is estimated that the processing industry will require about 600,000 gallons of fresh water daily for plant operations by 2000. This figure is almost 90 percent of Cold Bay's total estimated water demand. Thus, it is clear that additional water sources will have to be developed to keep pace with projected needs.

In fact, the development of added water supply and storage facilities is virtually a **pre-condition** for the development of a shore-based fish processing industry. This situation is recognized by the **Thirteenth** Regional Corporation which plans to develop its own water source at Cold Bay. In view of the relatively short distances separating the dock and privately owned waterfront property to the distribution system for other development clusters, it appears feasible and mutually advantageous that all water source, storage and distribution facilities be integrated to provide for more reliable supply, as long as there are adequate assured water sources for both domestic and industrial users,

- o Sewer. The existing sewage treatment system, consisting of a mechanically aerated treatment lagoon with disposal of the chlorinated effluent by means of an outfall, was installed by the Federal Aviation Administration in **1959**. Reportedly, the design capacity of the original installation was 2,000 gallons per day, but the treatment facility is currently receiving

20,000 to 30,000 gallons of wastewater daily. Thus, the treatment facility is already operating far beyond its design **capacity** and is **in** need of upgrading merely to comply with water quality standards. As the treatment load is expected to nearly triple by 2000 under the base case (see Table 48), it seems clear that major improvements to the treatment facility will be needed to maintain sanitary and environmental standards for handling of domestic sewage.

It is assumed that processing wastes generated by the seafood processing plant will be treated in compliance with applicable environmental standards at the plant site and will not **be** mingled with domestic wastes.

- o Electric Power. The power system at Cold Bay is owned and operated by a private utility, the Northern Power and Engineering Corporation. Present firm power **generating** capacity of the system is 1,200 kilowatts. This is adequate for current needs since the Air Force Station and floating processing plant provide their own power requirements. However, the base case forecast envisions that the present firm power capacity **will** be exceeded by 1985 and that the system's capacity requirements will climb to about 2,500 kilowatts by the end of the forecast period (see Table 49).

TABLE 48

ESTIMATED CAPACITY REQUIREMENTS
 DOMESTIC SEWAGE TREATMENT
 BASE CASE
 COLD BAY
 1985 - 2000
 (000's of gallons)

<u>Year</u>	<u>Daily Treatment Capacity</u>	<u>Peak Hourly Capacity</u>
1985	42	5
1990	53	7
1995	66	8
2000	81	10

Source: Alaska Consultants, Inc.

TABLE 49

ESTIMATED CAPACITY REQUIREMENTS
ELECTRIC POWER SYSTEM
BASE CASE
COLD BAY
1985 - 2000

<u>Year</u>	<u>Estimated Capacity Requirements in kw's</u>
1985	1,245
1990	1,582
1995	1,991
2000	2,422

Source: Alaska Consultants, Inc.

In **the judgment of the utility company**, the addition of a major industrial user, such as the proposed onshore seafood **processing plant with its cold storage facilities, would overtax the existing system. Therefore, the company is considering adding another 600 kilowatt generating unit to its system as early as 1981.** If the proposed processing plant is equipped with its own back-up generator for emergency and occasional peak demand use, the improvements under consideration by the private utility should be adequate through 1990, at which time another 600 to 800 kilowatt generating unit may be demanded,

- o Solid Waste Disposal. In the absence of a **local** government, maintenance of a satisfactory garbage disposal program at Cold Bay has been a problem and has the potential to become an even more serious problem in the future. There is no community garbage collection service. The Federal Aviation Administration attends to garbage collection for its own facilities and employees, but other residents of the community haul their own refuse to the common dump several miles outside town. The Alaska Department of Transportation and Public Facilities attempts to maintain the dump site as a sanitary landfill. With the anticipated rise in solid waste anticipated under the base case (see Table 50), the present arrangement for refuse collection and disposal will become increasingly unsatisfactory until some private or public organization is established to

TABLE 50
 ESTIMATED DISPOSABLE **SOLID WASTES**
 BASE CASE
 COLD BAY
 1985 - 2000

<u>Year</u>	<u>Annual Tonnage</u>	<u>Annual Volume (cubic yards)</u>
1985	380	2,300
1990	507	3,070
1995	638	3,870
2000	777	4,710

source : Alaska Consultants, Inc.

provide collection services for all facilities and to maintain the landfill site.

- o Communications. The base case forecast estimates that an additional 220 telephone hook-ups will be needed by the year 2000 to maintain a standard level of service for Cold Bay (see Table 51). This is within the capability of the existing system which has a capacity of 400 telephone lines but which presently serves only 120 users. Thus, it does not appear that any major investment in the telephone system will be demanded apart from the need to extend service lines to new users.

Public Safety

- o Police. Police protection at Cold Bay is presently provided primarily by a Department of Transportation and Public Facilities employee who is a certified police officer, but whose main duties concern airport security. A number of other State employees stationed at Cold Bay, such as the Fish and Wildlife Protection officers and the airport manager, are authorized to perform police functions and can assist the airport security officer, if needed. The nearest State trooper is located at Sand Point.

TABLE 51
ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
BASE CASE
COLD BAY
1981 - 2000

	<u>Increase in Number of Telephones</u>
1981-1985	49
1986-1990	49
1991-1995	59
1996-2000	62

Source: Alaska Consultants, Inc.

The existing arrangement is adequate **for** present purposes and for the near future. However, as the resident population grows and as **the** volume of traffic through the airport rises, it will become increasingly difficult to maintain a standard **level** of police services without a full-time police officer. Therefore, it may be necessary to station a State trooper at Cold Bay sometime around 1990.

The jail facility at Cold Bay- a single holding cell - is old and dilapidated and unsatisfactory even for present levels of use. To provide a standard level of detention capability, Cold Bay should **be** equipped with a jail facility with a minimum of three cells. Such a facility would also be adequate to meet Cold Bay's detention facility requirements through the end of the century.

- o Fire Protection. Because of the firefighting equipment and services maintained by the State at the airport, Cold Bay is better prepared than most rural Alaska communities of its size to respond to fires. However, the multi-purpose airport building which the fire department shares with the airport security officer and other public safety functions is deteriorating and in need of replacement, regardless of future community expansion demands. Also, routine replacement of some of the older firefighting vehicles will probably prove necessary during the forecast period.

Apart from equipment needs, the major fire protection problem which Cold Bay faces now **and** in the future is the upgrading of the **water** distribution system to provide for a hydrant system capable of delivering 500 gallons of water per minute.

Health and Social Services. Health services are presently provided to Cold Bay residents by an itinerant public health nurse **who** periodically visits the community. Similarly, social services are available through a State social worker stationed at **Unalaska** who travels to Cold Bay to provide services to community residents as needed.

Cold Bay's population is not large enough to warrant the residence of a full-time physician or dentist. However, because relatively reliable air transportation to medical facilities in Anchorage is available, residents are usually able to travel to Anchorage for timely treatment for major illnesses.

The community growth anticipated at Cold **Bay would** not ordinarily justify the presence of a physician but, by 1990, should merit the assignment of a permanent public health nurse and maintenance of a community public health clinic, supplemented by periodic visits by a private physician and dentist.

Education. Elementary and secondary school enrollments at Cold Bay are forecast to about **double** over the forecast period (see Table 52), a

TABLE 52
 SCHOOL ENROLLMENT FORECAST
 BASE CASE
 COLD BAY
 1985 - 2000

<u>Year</u>	<u>Elementary Enrollment</u>	<u>Secondary Enrollment</u>	<u>Total Enrollment</u>
1985	40	26	66
1990	50	34	84
1995	64	42	106
2000	77	52	129

Source: Alaska Consultants, Inc.

slower rate of growth than was projected for the population as a **whole**. Even so, this projection is premised on the assumption that workers at **the** shore-based seafood processing plant expected to be built at **Cold** Bay will become permanent residents of the community with **their** families.

At present, the three classroom school is staffed with four teachers and is administered by the Aleutian Region School District. The school building was built in stages between 1961 and 1967 but is in a good state of repair and adequate for present needs. The school is situated on a 2.55 acre site which **is** ample for a community of Cold Bay's projected population.

According to contemporary educational standards, an additional one to three new classrooms will be needed between 1990 and 2000 to accommodate projected enrollment growth. This projection, in combination with the age of existing facilities, may justify construction of a new school plant by about 1990.

Recreation. Like most small rural Alaska communities, recreation at Cold Bay tends to be oriented toward outdoor activities requiring few or no developed recreational facilities. Thus, fishing, hunting, **snowmobiling**, motorcycling and other outdoor recreational activities are popular. On the other hand, Cold Bay is unusual in that its school does not include an indoor gymnasium or multi-purpose room suitable for recreational use. Elsewhere in rural Alaska, the school is generally the primary provider of formal recreational facilities for the use of school children and for the community at large,

As Cold Bay grows, the demand for formal indoor public recreation facilities will become more pressing. In the continued absence of a local governing body, it is probable that any such facilities will be constructed as part of the community school complex, perhaps in conjunction with new school construction or expansion, an eventual need for which was indicated in the forecast of school facility requirements.

Local Government Finances. Since Cold Bay does not have an incorporated local government, there are no local taxes or expenditures for municipal government purposes. Such community services as are provided are delivered and funded by non-local public agencies or are provided by private companies on a user charge basis, as is the case with the power and telephone utilities.

Education services at Cold Bay are provided through the Aleutian Regional School District Rural Education Attendance Area (REAA) which is wholly financed by State and federal revenues. If Cold Bay decided to incorporate as a first class city and thus establish an independent municipal school district, local residents would under present State law become liable for part of the local education cost. However, the policy trend in recent years has been toward full direct State funding of district as well as REAA school systems. Thus, it is assumed that Cold Bay will not be facing any local fiscal obligation for school construction or for educational programs, regardless of whether it continues as a member of the REAA or at some future date chooses to set up an independent local school district.

With regard to other community services, it is not presently possible to project which institutional or financial arrangements might develop at Cold Bay as it progresses from a government enclave toward a more mixed community with a significant private sector. As Cold Bay has evolved, government agencies stationing employees there have been more or less forced, in the absence of local government, to assume the burden of providing community services to serve their own employees and, in some instances, also to other community residents. However, in the future, these service providers would prefer to be relieved of such extraneous responsibilities. From time to time, most recently in summer of 1980, there has been local discussion on the issue of incorporation, but no positive steps have yet been taken. Apparently, there is no strong sense of community among local residents.

It is not presently clear under what circumstances or when the status quo regarding local government might be altered or why local residents would find incentive to initiate change in the status quo. It does seem most probable that circumstances will compel any new major private employer to accept the need to provide basic services for its employees as part of its enterprise, much as public agencies have found this step necessary in the past.

CAUSE/EFFECTS OF IMPACTS

The base case forecast anticipates some expansion of Cold Bay's traditional role as regional air transportation center for the Aleutian region,

largely in response to the added service demands stemming from domestic development of the **bottomfish** industry in the Bering Sea. The forecast also envisions some diversification of Cold Bay's economic base with the establishment of a modest scale onshore processing plant to handle the shellfish, salmon and other fisheries resources of the surrounding area.

While the possibility of a role in the region's **bottomfish** industry cannot be totally precluded, Cold Bay's position is not as advantageous as other Aleutian ports such as **Unalaska**, Akutan or St. Paul. No **bottomfish** development at Cold Bay is presumed in the base case forecast.

In all, under the base case assumptions, employment and population at Cold Bay are projected to grow at a steady pace of about 4 to 5 percent annually over the forecast period with resident population reaching an estimated 646 persons by the year 2000.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

In general terms, the most serious problem affecting the provision of community facilities and services at Cold Bay is the lack of a local government or other government agency with overriding responsibility to attend to community development needs. This situation imposes unusual burdens upon public or private employers and is an important inhibiting factor against creation of a strong private sector.

Among the more particular **infrastructural** problems **which** may arise at Cold Bay are the absence of sufficient housing, the inadequacy of the water supply and sanitary waste treatment systems, the lack of a reliable arrangement for **solid** waste disposal and inadequate physical facilities for education and recreation, Finally, the present lack of an incorporated local government means that there is no agency responsible to plan for future **land** use or community facilities and services in a coordinated manner.

SUNMARY OF IMPACTS

Cold Bay's employment and population is projected to more than double over the forecast period. This growth is almost wholly contingent upon modest economic development based upon Cold Bay's favorable access to shellfish and other fisheries resources in its vicinity. Any growth at Cold Bay will have to overcome the community's lack of local government to deal with such matters as routine maintenance or upgrading of such basic community facilities and services as water supply, sanitary and solid waste disposal, land use planning and recreation.

St. Paul

COMMUNITY FORECASTS

Significant Factors Affecting Growth

St. Paul is a traditional Aleut community whose vitality as a settlement has persisted despite limited cash employment and income prospects. St. Paul has a narrow resource base to sustain its cash economy. Historically, the settlement originated as a Russian-sponsored base for fur seal harvesting activities in the Bering Sea and even today the fur seal industry remains the main contributor to the Island's cash economy.

Several national conservation groups oppose the harvest of fur seals on St. Paul and are advocating federal legislation to prohibit such activities. Fur seal harvesting on St. Paul was recently extended for another four years. However, if the conservationist position is successful in the future, St. Paul residents would be **unable** to commercially utilize the economic resource which motivated the town's original establishment and supports its continued existence,

Within the past decade, the operations of the **Tanadgusix** Corporation, the local village corporation established under terms of the Alaska Native Claims Settlement Act, has stimulated some new basic employment in St. Paul, but corporate staffing is expected to stabilize near current levels in the future.

St. Paul holds attraction for a select group of tourist and recreational visitors wishing to observe the Island's exceptional **birdlife** and marine mammal populations. The accommodation of these visitors has potential to support some further growth in employment for **local** commercial establishments catering to tourist demands.

The realization of **full** domestic development of the Bering Sea region's **bottomfish** resources appears to **be** St. Paul's primary opportunity for future economic growth. St. Paul is located on an isolated island in the Bering Sea and has a developable natural harbor, a situation which creates some potential for the community's assuming a role as a base **of** operations and as a processing site for a part of the catch from the Bering Sea **bottomfish** grounds. If some **bottomfish** activity is based in St. Paul, then the manner in which the traditional community chooses to interrelate that development in physical, economic and social terms to the existing community becomes a decisive factor influencing future growth patterns. The St. Paul community does have a definite and strong sense of cultural identity and tradition and the desire to maintain itself as an **Aleut** village. The Island's **Aleut** residents also control local governing institutions and the local land **supply** which equips them with powerful tools for shaping the pattern of growth of any locally established bottomfish enterprise.

For many years, St. Paul has experienced a very low **labor** force participation rate, accompanied by high seasonal **unemployment** and under-employment of the local labor force. Because its local labor

force is under-utilized, St. Paul has capacity to absorb substantial job growth without any corresponding population increase. Within the **limits** of this reservoir of potential workers, it is probable that St. Paul's future population will be determined by natural increase and the net **balance** of migration of its Native residents **rather** than more directly by employment levels.

Future Employment

According to the economic assumptions of the base case, annual average full-time employment on St. Paul is forecast to increase from about 123 in 1980 to an estimated 978 by the end of the forecast period (see Table 53). However, nearly all of this employment growth is predicated on two assumptions: first, that a large scale **bottomfish** processing operation involving a total of 818 jobs will be located on St. Paul Island and, second, that no restrictions **will** be imposed upon the fur seal harvest which would adversely affect the economic viability of that industry, currently the community's economic mainstay. If there is no development within the **bottomfish** industry, it is expected that there will be little or no change in St. Paul's economic structure. Furthermore, if the commercial fur seal harvest is terminated, St. **Paul** will lose its main basic economic activity and, without another industry to supplant it, the local economy could experience a significant decline.

TABLE 53

ESTIMATED TOTAL EMPLOYMENT AND POPULATION
BASE CASE
ST. PAUL
1980 - 2000

<u>Employment Sector</u>	<u>1980</u> (actual)	<u>1985</u>	<u>1990</u> a/	<u>1995</u>	<u>2000</u>
Agriculture, Forestry & Fishing	1.0	1	134	134	134
Mining	0.0	0	0	0	0
Contract Construction	0.0	0	1	1	1
Manufacturing	1.0	1	607	607	607
Transportation, Communications & Public Utilities	1.5	2	22	22	22
Trade	18.5	20	43	45	50
Finance, Insurance & Real Estate	5.0	5	7	7	7
Services	3.5	5	25	27	29
Government	92.0	97	117	122	128
<u>TOTAL EMPLOYMENT</u>	<u>122.5</u>	131	<u>956</u>	956	978
<u>TOTAL POPULATION</u>	527	5,250	<u>1,423</u>	<u>1,423</u>	<u>1,423</u>

a/ Assuming establishment of a **bottomfish** processing plant at St. Paul by **1990** with direct employment of 133 persons in fishing and 606 persons in processing plant operations.

Source: Alaska Consultants, Inc.

Assumptions for Basic Employment

- o Fur Seal Industry. In recent years, the fur **seal** harvest has been a stable, although highly seasonal, source of **local** employment for St. Paul residents. By all reports, the fur seal population can safely continue to sustain the present harvest levels without endangering the long term viability of the resource. For the base case, it is assumed that employment in the fur seal industry will remain stable at current levels for the duration of the forecast period. However, if the present efforts of conservation interests to discontinue the harvest are eventually successful, St. Paul's local economy would lose in excess of 80 seasonal jobs.

- o Tourism. Tourism has become a seasonal industry of minor importance at **St. Paul**. The Island's extraordinary **birdlife** and marine mammal populations have prompted organized tours of visitors interested in viewing the local wildlife. St. Paul's remoteness and the high transportation costs faced by potential visitors limit growth prospects for tourism. Nevertheless, it is assumed that basic employment in the trade and service sectors will grow at a rate of 5 percent annually, largely as a result of increased purchase of goods and services by tourists. However, even by the end of the forecast period, the basic component of the trade and service sectors still amounts only to the equivalent of about 15 full-time jobs.

- o Bottomfish. There is general optimism among State, federal and industry officials that trends favor exploitation of the rich **bottomfish** resources of the Bering Sea region by American commercial fishermen and processors over the next two decades. Tempering this optimism is the fact that there is little historical experience or applicable data on which to base detailed feasibility studies or development planning for the **bottomfish** industry at Aleutian communities.

The Bering Sea region, with an estimated maximum sustained yield of about 2 million metric tons annually of **pollock**, **yellowfin** sole, Pacific Ocean perch, turbot and other species, possesses the highest potential for **bottomfish** development and the lowest capability to exploit those resources. Thus, it is evident **that** the successful and profitable development of this industry will be a complex undertaking, involving close and timely coordination among numerous government and private decision makers and large and interdependent public and private investments.

At the present embryonic stage of **bottomfish** development, there are many different opinions about the timing and the geographic and organizational form which the industry's future growth might take. For purposes of analyzing the community impacts of this industry, the key variable issues concern the relative economic advantages of floating versus shore-based

processing operations, the source and type of labor employed by the industry (particularly the extent to which the industry draws upon the resident labor **pool** or seeks to import its own permanent or transient **workforce**), and institutional arrangements for provision of **infrastructural** elements such as **public** utilities, transportation facilities, housing, community services, etc. Also, fundamental to the location of plant facilities within the region are the relative advantages to industry of different potential port sites to support a commercial fishing **fleet** and the industry's processing and transportation functions.

For St. Paul, there are many ways in which a local **bottomfish** industry could evolve from its present undeveloped status. Specific predictions about the nature and impact of **bottomfish** developments at St. Paul are thus particularly hazardous. Also, however favorable the resource and economic analysis at St. Paul may be in the abstract, any actual development will be contingent upon substantial harbor improvements and upon the positive cooperation of local government and village corporate organizations. The base case scenario presumes that the **pre-conditions** for **bottomfish** processing at St. Paul will be met and that a level of development midway between the most optimistic and most pessimistic projections will take place. The scenario does not consider that St. Paul is likely to become a transshipment port for **bottomfish** products processed

by floating processors operating at sea. Other **bottomfish** scenarios for **bottomfish** development at St. Paul are certainly feasible and **could** entail very different impacts upon the community.

Specifically, the base case scenario assumes that by **1990**, a single large **bottomfish** processing plant with an annual capability of processing 60,000 metric tons of delivered fish in the round will be established on St. Paul Island. This represents about **3** percent of the potential total harvest in the Bering Sea. The profile of plant operations and employment for a plant of **this** size, as well as the **description** of associated commercial fishing fleet operations, can be derived from prototype plant data developed by Earl Combs, Inc. According to the Combs model, a prototype plant of this capacity would require a total complement of 606 direct employees, including line workers, supervisory and maintenance workers, dock workers, warehousemen and other incidental jobs. By far the greatest number of these **plant** workers, nearly 90 percent, are employed on the fish processing **lines**. This prototype plant would ship an end product of about 20,000 metric tons annually of frozen fish fillets and fish blocks, plus miscellaneous other byproducts. Combs also estimated that the raw material for the plant could be supplied by a fleet of about 22 trawl vessels, each with a crew of six, for a **total** of 132 commercial fishermen based out of St. Paul.

Overall, the base case scenario estimated that there will be a total of 743 permanent, year-round jobs at St. Paul created directly in the **bottomfish** industry. To this total must be **added** indirect employment created in the government, transportation, trade and service sectors to facilitate the operations of the industry. It is estimated that there will be about 77 indirect jobs at St. Paul stimulated by the bottomfish industry.

- o Other. There are few additional opportunities for increases in basic employment at St. Paul, The establishment of the **Tanadgusix** Corporation, the St. Paul village corporation, following passage of the Alaska Native Claims Settlement Act did **create about five new basic jobs in the finance sector of the local** economy, but no further expansion in the Corporation's local staffing is anticipated.

The federal government has historically been the major basic employer at St. Paul. In addition to most **local** workers in the fur seal industry who are employed by the National **Marine** Fisheries Service, the U.S. Coast Guard and the National Weather Service jobs can also be counted as basic. However, in the future, it is assumed that there **will** be only minor increases, about 1 percent annually, of basic employment in the government sector.

Assumptions for Secondary Employment. With the exception of hypothesized development of the **bottomfish** industry for which secondary employment is calculated separately, secondary employment at St. Paul was assumed to remain stable in relation to basic employment over the forecast period. In the base year of 1980, the employment multiplier was observed to be 1.8, and this multiplier ratio was also applied for future employment forecasting. Because **of** the relatively **slow** growth forecast within St. Paul's traditional economy, **it** is anticipated that **less** than 20 additional jobs **will** be created in the secondary sector of the community's economy over the next two decades.

The **sectoral** distribution of secondary employment was based mainly on the current pattern of distribution with some adjustments **to** reflect new trends. Thus, the government sector, which accounted for two-thirds of secondary employment in 1980, is still expected to be the major secondary employer, providing about 50 percent of future new secondary employment. The remainder of the secondary employment was **d**istributed as follows: trade - 24 percent; services - 16 percent; **transportation** - 5 percent; and contract construction - 5 percent.

With respect to the proposed bottomfish industry development, it was assumed that the employment multiplier for this economic activity would resemble the ratio typical of comparable fishing economies such as that of **Unalaska**. This is consistent with the assumption that the industry will develop as an industrial enclave, physically and economically separate from the traditional community, and that the employer will

directly provide housing and most commercial and community services for its workforce. The bottomfish scenario envisions that direct employment will include 133 commercial fishermen operating out of St. Paul and 606 employees engaged in the operation and management of the onshore processing plant. Using an employment multiplier of 1.1, this direct employment of 739 persons is calculated to generate a total employment of 816, of whom 77 are secondary workers.

Of the secondary jobs, 20 each were assigned to the sectors of transportation, communication and public utilities, trade and services, 15 to government and 2 to the finance, insurance and real estate sector. It should be noted that these are permanent jobs and do not include the one-time employment entailed by the construction and initial set-up of the bottomfish plant and related facilities.

Future Population

The analysis of future population growth at St. Paul can be subdivided into two parts: growth in the traditional community and growth engendered by the introduction of new economic activities such as the bottomfish industry. In contrast to most communities, the destiny of the traditional community of St. Paul is governed more by cultural considerations than by the availability of employment in the cash economy. This is reflected in the dependency ratio which was 4.3 persons per employee in the base year of 1980, an exceptionally high ratio and indicative of the scarcity of full-time year-round jobs at St. Paul. By conventional measures, the population of St. Paul is severely underemployed.

There are many potential workers available to take up any suitable new jobs which may arise in the local economy. Thus, even if the **working** age population remained stable and **all** new employment (except that directly related to **bottomfish** development) projected to occur **by 2000** were absorbed within the existing labor **force**, the dependency ratio would still be a relatively high 3.2 in the year 2000. This would leave a large residue of unemployed adults potentially available for employment in a local **bottomfish** industry.

Compared to most rural Alaska Native communities, St. Paul's population in 1980 had a relatively high median age, approaching that of the State as a whole. Thus, St. Paul has a relatively balanced proportion of its population in or approaching the child-bearing years. This may be due in part to a trend toward smaller families and **in** part to the out-migration of some young adults to other parts of the State for educational purposes or for superior employment opportunities.

The demographic implication of the this **labor** force and population characteristic is that, given current trends, St. Paul is not likely to experience significant growth **due solely** to natural population increase. Moderate increase in local employment opportunities on the scale anticipated in the economic forecast (excepting **bottomfish** development) can therefore be absorbed without any resulting increase in the local population.

The development of a substantial **bottomfish** industry at St. Paul would add to local economic and population growth, although the full impact of such growth will **be** determined by the manner in which the new industry is related to the existing community and its **workforce**. On the one hand, if the new industry were developed more or less as a self-supporting enclave near but separate from the existing community and relied almost exclusively on non-'**local labor**, the impacts on the local community would be relatively small. On the other hand, **if** the new industry were **fully** integrated with the existing community, the social and economic impacts would be very substantial and would basically alter the economic structure and cultural character of the traditional village.

For the present analysis, it is assumed that the traditional community has the power to shape the pattern of **bottomfish** industrial development at St. Paul through its control **of** the institutions of local government and its ownership of local lands. **It** is further assumed that the St. **Paul** community **will** to seek to conserve, insofar as possible, the cultural character of the traditional settlement, at the same time that it seeks to obtain the economic benefits of investment in **bottomfish** development. As a result, it is assumed that the industry will develop in enclave form, with minimal direct economic and social ties to the traditional community, and that the enclave will **be** managed so as to **limit** permanent population growth.

Consistent with local demographic patterns and development policies, it is concluded that the population of the traditional community at St.

Paul will remain stable over the term of the forecast at about 525 residents. With regard to the future population which might be added at St. Paul due to the establishment of a bottomfish industry operation by 1990, a dependency ratio of 1.1 was used to project an incremental population impact of 898 additional persons by 1990 and remaining at that level thereafter (see Table 53).

IMPACT ASSESSMENT

Social Impacts

The base case scenario assumes that St. Paul will seek to pursue the benefits of economic development mainly through entrepreneurial participation in the establishment of a local bottomfish processing plant. It is also assumed that St. Paul will be successful in seeking to contain the social impacts of this economic development upon the traditional community by using its political authority and local ownership of developable land to foster an enclave type development. This will tend to shield the traditional community from physical and social interaction with the workforce brought in to operate the plant. Such a development strategy will also help limit the demands made upon local government and local resources to provide new facilities and community services, thereby easing social impacts upon the community.

Impacts on Community Infrastructure

Housing and Residential Land. Most housing units in St. Paul are in **sound condition**. However, despite recent construction programs, the number of occupants per unit remains significantly higher than the Statewide average, indicating that there is **still** some residential overcrowding. In view of the fact that the base case forecast does not foresee any gains in population within the traditional settlement of St. Paul, it is expected that future housing demand will only be for new dwellings needed to relieve overcrowding, plus replacement of obsolete houses and not due to population growth. There is ample land for housing development within the **Ellerman** Heights subdivision where most recent new housing construction has taken place.

The premise that no new housing **will** be needed for new residents presumes that the St. Paul community will successfully seek to exclude residential development stemming from the development of a **bottomfish** industry from the traditional settled area, requiring instead that housing facilities for non-local **bottomfish** industry employees be provided by the employing firm away from town in the vicinity of the plant complex.

Utilities

- o Water. Present rates of water consumption at St. Paul are well within the capacity of the existing supply, storage and distribution system. Two deep wells provide the community's

water supply which is stored in three gravity tanks with a storage capacity of 600,000 gallons. Except for growth attributable to **bottomfish** development, water consumption rates are expected to remain at current levels.

Bottomfish development by 1990 at the **level** described for the base case scenario would nearly triple the level of domestic water consumption at St. Paul (see Table 54). This increased level of demand could be met through extension of the existing community distribution system, possibly with some development of additional groundwater sources, or through development of an independent source of supply near the site of the **bottomfish** plant complex.

Like other sectors of the seafood processing industry, the **bottomfish** industry is a large water user. However, **bottomfish** processing does not require fresh water. **In** fact, use of salt water for processing is preferred because it results in a finished product of superior quality. Therefore, it **is** assumed that water for the plant's processing requirements will be provided by a separate system of salt water wells to be installed by the plant developer. It may be noted that the seal processing operations at St. Paul already use salt water from a salt water intake.,

TABLE 54

ESTIMATED CAPACITY REQUIREMENTS
 WATER SUPPLY SYSTEM
 BASE CASE
 ST. PAUL
 1985 - 2000
 (000's of gallons per day)

<u>Year</u>	<u>Domestic capaci ty</u>	<u>Industri al Capaci ty</u>	<u>Total Capaci ty</u>
1985	66	0	66
1990	178	0	178
1995	178	0	178
2000	178	0	178

Source: Alaska Consultants, Inc.

- o Sewer. Apart from any future growth needs, St. Paul's existing sewer system is prone to occasional failure, resulting in the discharge of raw sewage into Village Cove. St. Paul has three independent sewage collection **systems** delivering domestic wastes to septic tanks with drain fields. Two of these systems require the use of lift stations. On occasion, the lift station pumps fail and the overflow is carried via a bypass to beach **outfalls** on Village Cove.

The base case scenario projects a tripling of the volume of domestic sewage once the **bottomfish** plant is established (see Table 55). This increase would probably be beyond the capacity of the present type of treatment system, i.e. a septic tank/drain field process, and would probably require installation of a sewage treatment **plant**. Also a factor in favor of an upgraded system is the public health hazard which could arise from contamination of the waters of Village Cove through the discharge of untreated sewage.

Bottomfish processing results in a prime end product which uses only 30 to 40 percent of the raw fish. Process design usually seeks **to** recover maximum economic value from raw materials through fabrication of formulated fish products from meat fragments and by incorporation of fish waste reduction plants into plant operations. The scenario assumes **that** the processing plant will be designed to convert its raw materials

TABLE 55

ESTIMATED CAPACITY REQUIREMENTS
 DOMESTIC SEWAGE TREATMENT
 BASE CASE
 ST. PAUL
 1985 - 2000

 (000' s of gallons)

<u>Year</u>	<u>Daily Treatment Capacity</u>	<u>Peak Hourly Capacity</u>
1985	66	8
1990	178	22
1995	178	22
2000	178	22

Source: Alaska Consultants, Inc.

into marketable end products to the maximum extent feasible and that any residue of industrial waste will be treated onsite at the plant and disposed of in an environmentally acceptable manner.

- o Electric Power. The assessment of the St. Paul power system recently prepared by Management and Planning Services concluded that the system is adequate for present needs as well as for some modest increase in demand. Power consumption rates at St. Paul are presently well below the per capita standard of consumption assumed for forecasting future capacity requirements, probably because of the lack of non-seasonal industrial users.

Based on current consumption levels, it is not expected that St. Paul will need any additional generating capacity beyond the two units now being installed, until construction of the projected bottomfish processing plant begins. At that time, it is estimated that another 3,000 to 4,000 kilowatts of generating capacity will be demanded for residential and industrial use. Most of this additional capacity will be demanded to serve the needs of the processing plant which will rely heavily upon electric power for the freezing and cold storage of its products (see Table 56).

TABLE 56
 ESTIMATED CAPACITY REQUIREMENTS
 ELECTRIC POWER SYSTEM
 BASE CASE
 ST. PAUL
 1985 - 2000

Year	Estimated Capacity Requirements in kw's
1985	1,969
1990	5,336
1995	5,336
2000	5,336

Source: Alaska Consultants, Inc.

There are a number of shortcomings in St. Paul's existing electric power system which may need corrective action in the future, regardless of future demand levels. Several of the smaller generating units are not in good working order, some underground sections of the distribution system are thought to suffer power leakages, and problems have been noted with the piping valves and pumps for the diesel fuel storage tanks, a matter of particular concern since the storage tanks are not diked.

o Solid Waste Disposal. The disposal of solid wastes at St. Paul is not likely to pose any serious difficulties in the future (see Table 57). The main needs **will** be additional equipment to collect trash and to operate the sanitary landfill in an acceptable manner. It is not expected that the processing plant would add appreciably to the volume of solid wastes. St. Paul's emergence as a fishing port of some scale can be expected to bring a set of environmental sanitation problems common to small boat harbors such as disposal of waste oils and general housekeeping for the harbor environs.

o Communications. Telephone service at St. Paul is currently confined to long distance service through the **Alascom** satellite system and a very limited **local** telephone network. There is no general community telephone system but the City is seeking to attract a telephone utility to provide this service. The base

TABLE 57
 ESTIMATED DISPOSABLE SOLID WASTES
 BASE CASE
 ST. PAUL
 1985 - 2000

<u>Year</u>	<u>Annual Tonnage</u>	<u>Annual Volume (cubic yards)</u>
1985	600	3,640
1990	1,710	10,370
1995	1,710	10,370
2000	1,710	10,370

Source: Alaska Consultants, Inc.

case scenario assumes **that** a community telephone system **will** be operational by 1985. It is estimated that a system with capacity for 200 telephone lines would be adequate for initial requirements and allow for some future expansion in demand (see **Table 58**).

Public Safety

- o Police. Responsibility for providing police protection at St. Paul is now divided between the City of St. Paul, although its police chief position is now vacant, and a State trooper. These two positions are adequate for St. Paul's present and future needs, pending construction of the projected new **bottomfish** processing plant. At that time, it is probable that St. Paul will need to add two positions to its police department in order to maintain a standard level of service for all local residents, including the plant **workforce**.

- o Fire Protection. St. Paul has a well-staffed but ill-equipped and ill-housed volunteer fire department. A new fire station and modern firefighting equipment are needed to provide a satisfactory level of fire protection for the existing community. When the **bottomfish** plant is built, it would be advantageous for the City and processing plant to cooperate to develop an industrial **firefighting** capability able to respond to potential fires at the industrial processing plant complex.

TABLE 58

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
BASE CASE
ST. PAUL
1981 - 2000

	<u>Increase in Number of Telephones</u>
1981-1985	158
1986-1990	0
1991-1995	0
1996-2000	0

Source: Alaska Consultants, Inc.

Health and Social Services. Health care at St. Paul is provided by the U.S. Public Health Service. Local medical personnel include a mid-level practitioner and a nurse's aide. Until recently, St. Paul also had a resident physician, an unusual feature for a town of this size. However, the community is now periodically serviced **out of** Anchorage by visiting physicians. Emergencies and cases requiring specialized care are usually transferred to Anchorage.

The main building of the community health clinic is more than fifty years old, **with** an addition built **in** 1968. The maintenance requirements for the clinic are high and it is likely that a new facility will have to be constructed within a few years.

In the future, it is assumed that the U.S. Public Health Service **will** continue to be the main funder of health care services for St. Paul residents, whether services are provided directly by it or under contract. It is also assumed that a small clinic will be incorporated into the **bottomfish** plant complex to attend to the medical needs of the **plant** workforce.

Various social service assistance is provided to the community by visiting staff of the Alaska Department of Health and Social Services and the Aleutian-Pribilof Islands Association. St. Paul's population is nearly large enough **to** justify a full-time resident social worker and it is assumed that one will be stationed locally within a few years.

Education. Assuming that the **bottomfish** industry develops at St. Paul as an enclave, it is anticipated that there will be little change from present enrollment levels at the St. Paul School system (see Table 59). The existing school complex is fairly new, was recently renovated, and is generally in excellent condition. Its capacity is more than adequate for present enrollment levels and it is expected that these facilities will be satisfactory for St. Paul's educational program needs for the indefinite future.

Recreation. St. Paul has modest but adequate facilities for a variety of indoor and outdoor athletic activities and other indoor recreation. It is assumed that the City will not be called upon to serve the recreation needs of the **workforce** associated with the **bottomfish** plant complex. Therefore, it is not expected that any major new improvements to recreation facilities **will** be demanded, except to raise the quality of recreation **opportunities** enjoyed by residents of the traditional community.

Local Government Finances. The institutional and financial arrangement for provision of community services and facilities at St. Paul are in transition and, as a result, the City's recent financial history does not provide as a sound basis for projecting its future revenue situation. **While** steps have been taken to transfer responsibility for more community services from the National Marine Fisheries Service to local government, the revenue sources available to the City of St. Paul are very limited and insufficient to fund a normal level of community services. In FY

TABLE 59
 SCHOOL ENROLLMENT FORECAST
BASE CASE
 ST. PAUL
 1985 - 2000

<u>Year</u>	<u>Elementary Enrollment</u>	<u>Secondary Enrollment</u>	<u>Total Enrollment</u>
1985	63	42	105
'1990	63	42	105
1995	63	42	105
2000	63	42	105

Source: Alaska Consultants, Inc.

1979, the City operated at a deficit. Sales taxes and various user charges provided about half of the City's revenues, while intergovernmental revenues provided the balance. There is no local property tax and such a tax would not be likely to generate significant revenue at St. Paul's present level of economic development.

Without a radical improvement in economic and income conditions at St. Paul, it will not be feasible for the local government to operate on a self-funded basis. If further **services** are to be transferred to local control, appropriate subsidies will be needed or services will deteriorate. A recent analysis of community **services** at St. Paul prepared for the National Marine Fisheries Service indicated that a direct subsidy to the City of over \$400,000 annually in present dollars would be needed indefinitely to **enable** the City to provide the added services which might be transferred.

Private economic development in the fisheries industry holds some potential to improve the City's fiscal position, as long as the revenues generated are in excess of **new** service requirements. Fisheries development could generate City income from increased sales taxes, raw fish taxes and real property taxes. The National Marine Fisheries Service study concluded that private fisheries development offered the best possibility to create a tax base at St. Paul adequate to support the operations of a local government which would not require exceptional subsidies beyond those provided by the usual State and federal funding assistance programs.

CAUSE/EFFECTS OF IMPACTS

The primary impetus for community growth and change at St. Paul in the base case is expected to stem from the community's efforts to promote development of a **local** bottomfish processing plant. Such a plant could require an on-site workforce of about 600 plant employees, plus a fleet of about 22 fishing vessels to supply fish for processing. Aside from fisheries development, the base case analysis does not anticipate any events which imply major changes in the economic or social character of the community.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

Development of a local **bottomfish** processing industry will necessitate some improvements in those basic utilities systems used in common by the community and the processing plant. Through careful planning, the City may be able to coordinate installation of these support facilities to improve services to the local community as well. Construction of a small boat harbor is also viewed as a pre-condition for **bottomfish** development. The **City's** present financial capabilities to pay for future community facilities and services are very limited and it is expected that major financial assistance from federal and State governments will continue to be essential.

SUMMARY OF IMPACTS

Under the premises of the base case, it is expected that St. Paul will be able to realize opportunities to improve the local standard of living, and to fund and deliver an improved level of local government services. This will be achieved by exploiting its potential to take part in development of a shore-based **bottomfish** processing industry in its sector of the Bering Sea. Through attentive local control of development, these improvements may be accomplished without major adverse social impacts on the traditional community.

PROJECTIONS OF GROWTH - EXPLORATION ONLY SCENARIO

The exploration only scenario assumes that the proposed St. George Basin OCS Lease Sale No. 70 will **take** place as scheduled in December 1982. Exploration activities will begin in the year following the sale and will extend over a period of five years. This scenario assumes that two semi-submersible exploration rigs will be committed to the sale tracts and that a total of 21 offshore exploratory wells will be drilled at an estimated cost of about \$250 million. Table 60 presents the direct OCS employment for various activities as estimated by the Alaska OCS Office for each year of the exploration phase.

Logistic support functions for St. George Basin exploration activities under this scenario are divided between **Unalaska** and Cold Bay. Because of its superior existing airport facilities and its more direct location on air routes between Anchorage or Seattle and the offshore lease tracts, Cold Bay is assumed to be a safer, more economical and more efficient transfer point for offshore personnel and light supplies in transit by plane and helicopter for offshore destinations. On the other hand, **Unalaska's** superior port facilities and marine transportation services, water supply and other community **infrastructural** elements make that community a more advantageous base for provision of logistic and other support functions dependent upon marine transportation supply routes and services.

TABLE 60
 ST. GEORGE BASIN SALE 70
 EXPLORATION ONLY SCENARIO
ESTIMATED EMPLOYMENT BY ACTIVITY
 (man years)

<u>Year</u>	<u>Drilling Rigs (Mining)</u>	<u>Shore Bases (Mining)</u>	<u>Supply/Support (Transportation)</u>		<u>Total</u>
			Aircraft	Vessels	
1982	(Sale)				
1983	101	30	16	41	188
1984	168	30	26	68	292
1985	202	30	30	80	342
1986	168	30	26	68	292
1987	67	30	5	15	117
1988	(Shutdown)				

Source: U.S. Bureau of Land Management, Alaska OCS Office.

Under the exploration only scenario, the search for oil and gas in the St. George Basin results in no commercial discoveries of hydrocarbon resources and, thus, no production. Exploration efforts terminate after the 1987 season and no further activity occurs on the leased tracts.

The exploration only scenario does not result in construction of any major new industrial support facilities. Rather, it is assumed that existing airport and port facilities can be adapted for use during the relatively low level of activity experienced during exploration. As a result, the exploration only scenario has little permanent physical effect upon the physical development of Unalaska or Cold Bay.

Unalaska

COMMUNITY FORECASTS

Significant Factors Affecting Growth

Under the exploration only scenario, onsite exploration activities are initiated in 1983, the year after the lease sale, rise to a peak two years later and then decline until the shutdown of exploration at the end of the 1987 season. This scenario stimulates some growth at Unalaska due to that community's role as the onshore base for marine support functions for offshore operations. All direct employment at Unalaska stemming from the St. George Basin sale is associated with operation of the temporary marine service base established at Unalaska or with

operations of the supply vessels some of whose crew members are assumed to reside at Unalaska. As the transient offshore rig personnel, who account for more than half of all direct OCS employment, are routed to and from their work stations via the Cold Bay airport, this component of OCS operations **does** not have any impact upon Unalaska.

The direct OCS **employment** stationed at Unalaska also stimulates a small amount of local secondary employment.

At the close of exploration, there are no residual growth impacts, as employment and population levels revert to the levels projected for the base case forecast.

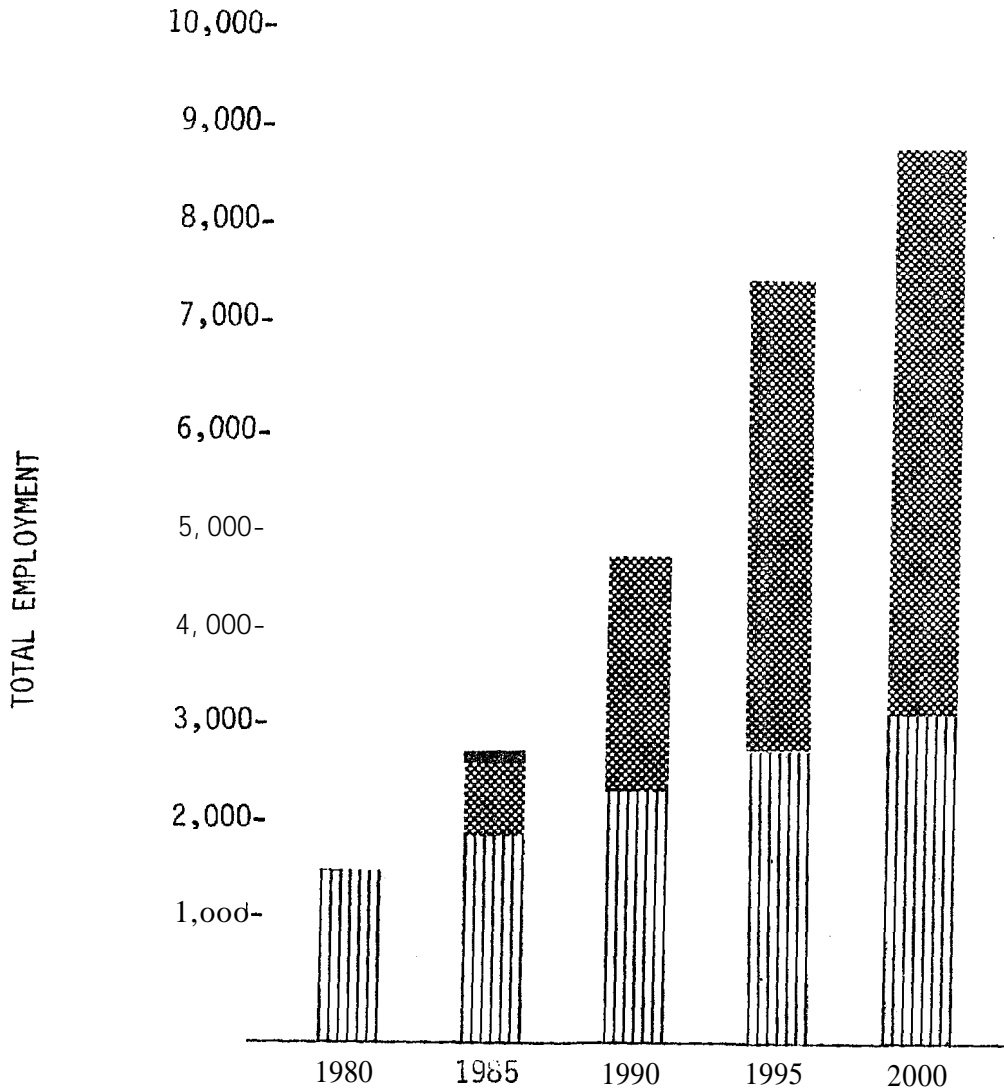
Future Employment

The proposed St. George Basin OCS lease sale coincides with the onset of a period of extremely rapid growth in Unalaska's employment base caused by the development of a shore-based **bottomfish** processing industry.

This latter event is chiefly responsible for the forecasted tripling in Unalaska's base case employment in the 1980 decade from 1,600 in 1980 to 2,661 in 1985 to 4,780 by 1990. The OCS employment impacts at Unalaska are very minor compared to the expected impacts of **bottomfish** development (see Figure 11). In 1985, the expected peak year of exploration activity, the OCS-related employment of 70 jobs accounts for less than 3 percent of the total employment of 2,731 (see Tables 61 and 62). Thus, the numerical impact of exploration following the St. George Basin lease

FIGURE 11

TOTAL EMPLOYMENT, 1980-2000
BASE CASE AND OCS EXPLORATION ONLY SCENARIO



KEY : Traditional Economy |||||
Bottomfish Scenario ▒▒▒▒▒
Exploration Only Scenario ■

Source: Alaska Consultants, Inc.

TABLE 61

ESTIMATED DIRECT AND INDIRECT OCS-RELATED EMPLOYMENT AND POPULATION
EXPLORATION ONLY SCENARIO, ST. GEORGE BASIN SALE 70
CITY OF UNALASKA

<u>Year</u>	<u>Direct Employment</u>		<u>Indirect a/ Employment</u>	<u>Total Employment</u>	<u>Total b/ Population</u>
	Shore Base	Marine Transportation			
1982	(Sale)				
1983	30	14	9	53	106
1984	30	23	11	64	128
1985	30	28	12	70	140
1986	30	23	11	64	128
1987	30	5	7	42	84
1988	(Shutdown)				

a/ Employment multiplier: 1.2.

b/ Dependency ratio: 2.0.

Source: Alaska Consultants, Inc.

TABLE 62
 ESTIMATED TOTAL EMPLOYMENT AND POPULATION
 EXPLORATION ONLY SCENARIO, ST. GEORGE BASIN SALE 70
 CITY OF **UNALASKA**
 1980 - 2000

<u>Employment Sector</u>	<u>1980</u> (actual)	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Agriculture, Forestry & Fishing	150	277	Same as Base Case		
Mining	2	32			
Contract Construction	12	117			
Manufacturing	1,166	1,768			
Transportation, Communications & Public Utilities	57	124			
Trade	60	158			
Finance, Insurance & Real Estate	27	45			
Services	44	114			
Government	82	147			
<u>TOTAL EMPLOYMENT</u>	<u>1,600</u>	<u>2,731</u>			
<u>TOTAL POPULATION</u>	<u>1,288</u>	<u>3,085</u>			

Source: Alaska Consultants, Inc.

sale is verysmall compared to other economic forces which are expected to affect Unalaska's future growth.

In view of the new employment opportunities projected to arise at Unalaska, it is likely that this economic growth will be accompanied by a large influx of workers from outside the region. Thus, it is likely that most of the jobs in the OCS sector, as in other areas of the local economy, will be filled for the most part by new or short-term residents of the community.

Future Population

The population impacts of the exploration only scenario are in rough proportion to the employment impacts. At the brief peak of exploration activity, it is estimated that total OCS-related population will amount to about 140 persons or less than 5 percent of the total community population and less than 8 percent of the projected population growth between 1980 and 1985. The OCS-related population impact, like employment, is expected to be short-lived, spanning only the five years of the active exploration phase.

IMPACT ASSESSMENT

The incremental impact of an exploration only scenario upon the community of Unalaska will be marginal and momentary compared to the impact of the growth factors otherwise at play in the base case. Perhaps the most

significant feature of the OCS impacts is **that they** come at a time when the capacities of the community to absorb growth are strained to the utmost by rapid expansion of the fishing industry. **In** this context, any added growth, even the modest and temporary growth envisioned under the exploration only scenario, may be magnified in consequence, especially for those community facilities and services more sorely strained such as housing, water supply and waste disposal.

Expectations are also a telling factor in the social impact experienced by the community. In retrospect, after exploration shuts down, it may become clear that there was actually little material impact upon the **community** and its resources from the OCS lease **sale**. **However**, in **prospect**, it is reasonable for local communities to bear in mind the optimistic assessment of the St. George Basin's **oil** and gas resources which prompted the federal government and the petroleum industry to place high priority on the area's potential. **In** this perspective, the imminence of offshore oil and gas development of unknown scale on top of a booming fishing industry may aggravate community concern and anxieties about the adverse consequences of runaway growth and about the possible adverse consequences of oil and gas development upon the fishing industry.

If the development of the **bottomfishery** were not to materialize on the scale or schedule assumed in the base case forecast, then OCS development would loom relatively larger in scale compared to the base case. It would also probably be easier to absorb since it would not be stacked upon the rapidly expanding fishing industry.

In view of the upward growth trend projected under the base case forecast, it is foreseeable that over the long run, any added capacity in public facilities, utilities and services developed to meet the demands of OCS-related growth would be quickly absorbed by continuing growth after the close of OCS exploration activities.

PROJECTIONS OF GROWTH - MEAN SCENARIO

The mean OCS scenario assumes that the tracts leased in OCS Sale No. 70 will attract a greater level of exploration effort than was assumed under the exploration only scenario. This reflects higher industry expectations about the recoverable oil and gas resource potential of the St. George Basin.

As with the exploration only scenario, **Unalaska** and Cold Bay are selected as the initial shore bases of operations for marine and air support functions respectively. Initial exploration results are positive and justify construction of a permanent marine shore base at **Unalaska** to support ongoing confirmation drilling and later field development. In **1985**, the busiest exploration year, as many as five semi-submersible exploration rigs are simultaneously active. Over the five-year exploration phase, a total of 55 exploration and delineation wells are drilled at an estimated cost of about \$644 million.

Early discoveries of reserves of commercial value support a decision to invest in production facilities. The first steps toward installation of offshore production platforms are taken by 1985, three years after the sale date. Ultimately, **11** offshore production platforms are commissioned for St. George Basin development. Under the premises of the mean scenario, all offshore oil and gas production is piped ashore by a network of ⁷⁰⁰ miles of submarine trunk pipelines to product handling facilities for transshipment to domestic markets.

The assumed location for the sites of both the required crude oil terminal and the LNG plant and terminal is the vicinity of **Makushin Bay**, an undeveloped and remote natural harbor on the southwest coast of **Unalaska** Island about 40 miles from **Unalaska**. Construction of the crude oil terminal (estimated capacity 500,000 to 1,000,000 barrels per day) and LNG complex (estimated capacity 0.5 to 1.0 billion cubic feet per day) is a multi-year labor intensive project employing nearly 1,500 workers.

As there is no overland connection between **Unalaska** and **Makushin Bay**, it is necessary to station the construction **workforce** on site. **Al so**, construction materials and equipment are delivered by marine shipping directly to the plant construction sites. As was the case in the exploration phase, Cold Bay continues to serve as the transfer point for the offshore platform workforce. **Thus, the** brunt of the direct impact of the construction phase, both onshore and offshore, bypasses **Unalaska**.

The construction and field development stages are essentially completed by 1990 although it is assumed that, under favorable circumstances, first production of oil and gas may take place as early as 1989.

Because the mountainous terrain makes construction of a road between **Makushin Bay** and **Unalaska** prohibitively costly and climatic conditions preclude reliable daily air service, the **Makushin Bay** terminal facilities are designed to be staffed and operated as remote facilities. The operations **workforce** is sheltered in employer-provided camp facilities during duty tours. During their off-time, the **Makushin Bay** workers

return to their permanent homes at Unalaska or at other settlements outside the region. Those Makushin Bay employees residing at Unalaska constitute the largest share of the lasting employment impact of the St. George Basin sale upon Unalaska.

Both oil and gas production from the St. George Basin are assumed to extend well beyond the end of the century. Oil production begins in 1989 and continues for 24 years, but the production schedule is heavily skewed toward the first few years. Peak production of 242 million barrels is reached by 1991 and it is estimated that more than 80 percent of the sale tracts' ultimate production of 1,200 million barrels of oil will be recovered by 1995. The rate of natural gas production is typically less accelerated. Peak production of about 256 billion cubic feet annually is reached by 1993. Total production over the 32 year life of the gas fields is estimated at 3.66 trillion cubic feet. Cumulatively, about 37 percent of total production is reached by 1995 and 68 percent by 2000.

Oil production is shut down in 2011 and gas production in 2019.

Tables 63, 64 and 65 indicate the total direct employment estimates for the mean scenario of Sale No. 70 for the exploration, construction and development phases respectively, as calculated by the Alaska OCS Office.

TABLE 63
 ST. GEORGE BASIN SALE 70
 MEAN SCENARIO, EXPLORATION PHASE
ESTIMATED EMPLOYMENT BY ACTIVITY
 (man years)

<u>Year</u>	<u>Drilling Rigs (Mining)</u>	<u>Shore Bases (Mining)</u>	<u>Supply/Support (Transportation)</u>		<u>Total</u>
			Aircraft	Vessels	
1982	(Sale)				
1983	269	30	36	108	443
1984	438	30	52	174	694
1985	505	30	60	200	795
1986	438	30	52	174	694
1987	202	30	30	80	342
1988 (Exploration Concluded)					

Source: U.S. Bureau of Land Management, Alaska OCS Office.

TABLE 64

ST. GEORGE BASIN SALE 70
 MEAN SCENARIO, CONSTRUCTION PHASE
ESTIMATED EMPLOYMENT BY FACILITY

<u>Year</u>	<u>Platform Installation</u>	<u>Shore Base</u>	<u>Offshore Pipeline</u>	<u>Oil Terminal</u>	<u>LNG Plant & Terminal</u>	<u>Total</u>
1982	(Sale)					
1983		37				37
1984		111				111
1985	531	222				753
1986	1,089					1,089
1987	2,762		488	1,029	442	4,721
1988	1,912		488	1,029	442	3,871
1989	956			1,029	442	2,427
1990	213			1,029		1,242

Source: U.S. Bureau of Land Management, Alaska OCS Office.

TABLE 65

ST. GEORGE BASIN SALE 70
MEAN SCENARIO, DEVELOPMENT PHASE
ESTIMATED EMPLOYMENT BY ACTIVITY
1982 - 2000

Year	Development	Supply/Support		Shore Bases	Headquarters	Oil Terminal	LNG Terminal	Production	Total
	Drilling	(Transportation)							
	(Mining)	Aircraft	Vessels						
1982	(Sale)								
1983									
1984									
1985		20	40						60
1986		20	160						180
1987	471	40	320	30					861
1988	723	50	400	30	16	60	160		1,439
1989	460	60	440	30	31	120	320	627	2,088
1990	307	60	220	30	101	120	320	627	1,784
1991	161	60	220	30	132	120	320	627	1,671
1992	307	60	220	30	132	120	320	627	1,812
1993	491	60	220	30	132	120	320	627	2,000
1994	368	60	220	30	132	120	320	627	1,878
1995	245	60	220	30	132	120	320	627	1,755
1996	130	60	220	30	132	120	320	627	1,640
1997	307	60	220	30	132	120	320	627	1,816
1998	491	60	220	30	132	120	320	627	2,000
1999	368	60	220	30	132	120	320	627	1,878
2000	245	60	220	30	132	120	320	627	1,755

Source: U.S. Bureau of Land Management, Alaska OCS Office.

Unalaska

COMMUNITY FORECASTS

Significant Factors Affecting Growth

Although **Unalaska** plays a more prominent role than any other existing **Aleut** an region settlement in activities associated with the St. George Basin sale, certain key features or premises of the mean scenario serve to shield **Unalaska** from the most exaggerated and short-term impacts of OCS development. The most important consideration is that the major oil and gas handling facilities are remote from **Unalaska** which is therefore almost unaffected by the most labor-intensive and potentially disruptive single event of the OCS scenario--major onshore facilities construction and operation. Second, the use of Cold Bay's superior airport facilities for personnel transport and air logistic support diverts a great volume of air traffic from **Unalaska**, along with the responsibility for providing for a large transient population. By the same token, the fact that the offshore platform **workforce** is home-based in Anchorage, Kenai and other oil industry centers means that virtually none of these workers, who account for the largest part of the permanent OCS workforce, take up residency in **Unalaska**.

Finally, although the oil and gas terminal facilities are situated on **Unalaska** Island at **Makushin** Bay, it is reasonable to assume that the **availability** of direct air service to Cold Bay and points beyond

combined with the lack of overland access to **Unalaska**, will result in a **substantial** share of the permanent operating workforce, about half, choosing to maintain their households outside the region. In sum, because of these mitigating factors, no more than 20 to 25 percent of the direct OCS employment is assigned to **Unalaska** for the exploration and production phases and, during the construction phase when OCS employment reaches its peak, as **little** as 3 to 5 percent of **the** OCS workforce is resident in **Unalaska**. Under this scenario, the boom-bust cycle of growth sometimes imputed to OCS onshore development does not materialize at **Unalaska**.

It is noteworthy that only a small fraction of the direct OCS employment growth assigned to **Unalaska** stems from jobs actually located in the community. **In** fact, only about 30 of the 320 OCS jobs permanently added to the City's employment base are at **Unalaska**. The remainder of the OCS employees living at **Unalaska** are engaged at the oil or LNG terminals at **Makushin** Bay or in offshore vessel support operations, but resident at **Unalaska**. Thus, the physical impact of OCS industrial operations at **Unalaska** is far less than the number of OCS-related employees would suggest,

All OCS employees residing at **Unalaska** are presumed to live in private households and to exert an employment multiplier equivalent to other permanent residents of the community. Therefore, the secondary employment they stimulate is also significant.

Future Employment

The employment impacts of the exploration, construction and development phases of the mean scenario are presented separately in Tables 66 through 68 and summarized in Table 69. The **scale** and timing of the employment impacts is determined by **Unalaska's** role in the total OCS development process. For the most part, **Unalaska** serves as a bedroom community for a share of the OCS employees working at the **Makushin Bay** terminal sites and for a part of the offshore boat crews. The only OCS **industrial** activity of importance actually taking place at **Unalaska** is operation of the marine service base.

Direct local OCS employment at **Unalaska** begins at less than 100 jobs in the year following the lease sale (1983), climbs steadily to a peak of about 400 toward the end of the decade when development activities climax, and then falls off to stabilize at about 320 for the rest of the forecast period (see Figure 12). The primary source of **employment** for these residents is the oil and gas terminal at **Makushin Bay** which employs an estimated 220 **Unalaska** residents.

Since it is assumed that these OCS employees with their families are residents of **Unalaska** by choice, it is expected that they will be a relatively stable and permanent component of the community's employment base, exhibiting relatively **little** turnover. The added purchasing power of these OCS employees will also generate employment in the secondary economy at a rate comparable to other community residents. It is

TABLE 66

ESTIMATED DIRECT AND INDIRECT OCS-RELATED EMPLOYMENT AND POPULATION
 EXPLORATION PHASE
 MEAN SCENARIO, ST. GEORGE BASIN SALE 70
 CITY OF UNALASKA
 1982 - 1988

<u>Year</u>	<u>Direct Employment</u>		<u>Indirect a/ Employment</u>	<u>Total Employment</u>	<u>Total b/ Population</u>
	Shore Base	Marine Transportation			
1982	(Sale)				
1983	30	36	13	79	158
1984	30	57	17	104	208
1985	30	65	19	114	228
1986	30	57	17	104	208
1987	30	28	12	70	140
1988	(Shutdown)				

a/ Employment multiplier: 1.2.

b/ Dependency ratio: 2.0.

Source: Alaska Consultants, Inc.

TABLE 67

ESTIMATED DIRECT AND INDIRECT OCS-RELATED EMPLOYMENT AND POPULATION
 CONSTRUCTION PHASE
 MEAN SCENARIO, ST. GEORGE BASIN SALE 70
 CITY OF UNALASKA
 1982 - 1991

Year	Direct Employment		Indirect a/ Employment	Total Employment	Total b/ Population
	Resident	Non-Resident			
1982	(Sale)				
1983	1	37	4	42	51
1984	2	109	11	122	146
1985	4	218	23	245	294
1986	29		9	38	76
1987	29		9	38	76
1988	29		9	38	76
1989	29		9	38	76
1990	29		9	38	76
1991	--		--	--	--

a/ Employment multiplier: residents - 1982-1985: 1.2.
 1986-1990: 1.3.
 non-residents - 1.1.

b/ Dependency ratio: residents: 2.0.
 non-residents: 1.1.

Source: Alaska Consultants, Inc.

TABLE 68

ESTIMATED DIRECT AND INDIRECT OCS-RELATED EMPLOYMENT AND POPULATION
DEVELOPMENT PHASE
MEAN SCENARIO, ST. GEORGE BASIN SALE 70
CITY OF UNALASKA
1985 - 2000

Year	Direct Employment					Indirect a/ Employment	Total Employment	Total b/ Population
	Shore Base	Marine Transportation	Oil Terminal	LNG Terminal	Total			
1985		15			15	3	18	36
1986		45			45	14	59	118
1987	30	90			120	36	156	312
1988	30	112	30	80	252	76	328	656
1989	30	125	60	160	375	112	487	974
1990	30	70	60	160	320	96	416	832
1991	30	70	60	160	320	128	448	896
1992	30	70	60	160	320	128	448	896
1993	30	70	60	160	320	128	448	896
1993	30	70	60	160	320	128	448	896
1994	30	70	60	160	320	128	448	896
1995	30	70	60	160	320	128	448	896
1996	30	70	60	160	320	128	448	896
1997	30	70	60	160	320	128	448	896
1998	30	70	60	160	320	128	448	896
1999	30	70	60	160	320	128	448	896
2000	30	70	60	160	320	128	448	896

a/ Employment multiplier: 1985: 1.2.
1986-1990: 1.3.
1991-2000: 1.4.

b/ Dependency ratio: residents: 2.0.

Source: Alaska Consultants, Inc.

TABLE 69

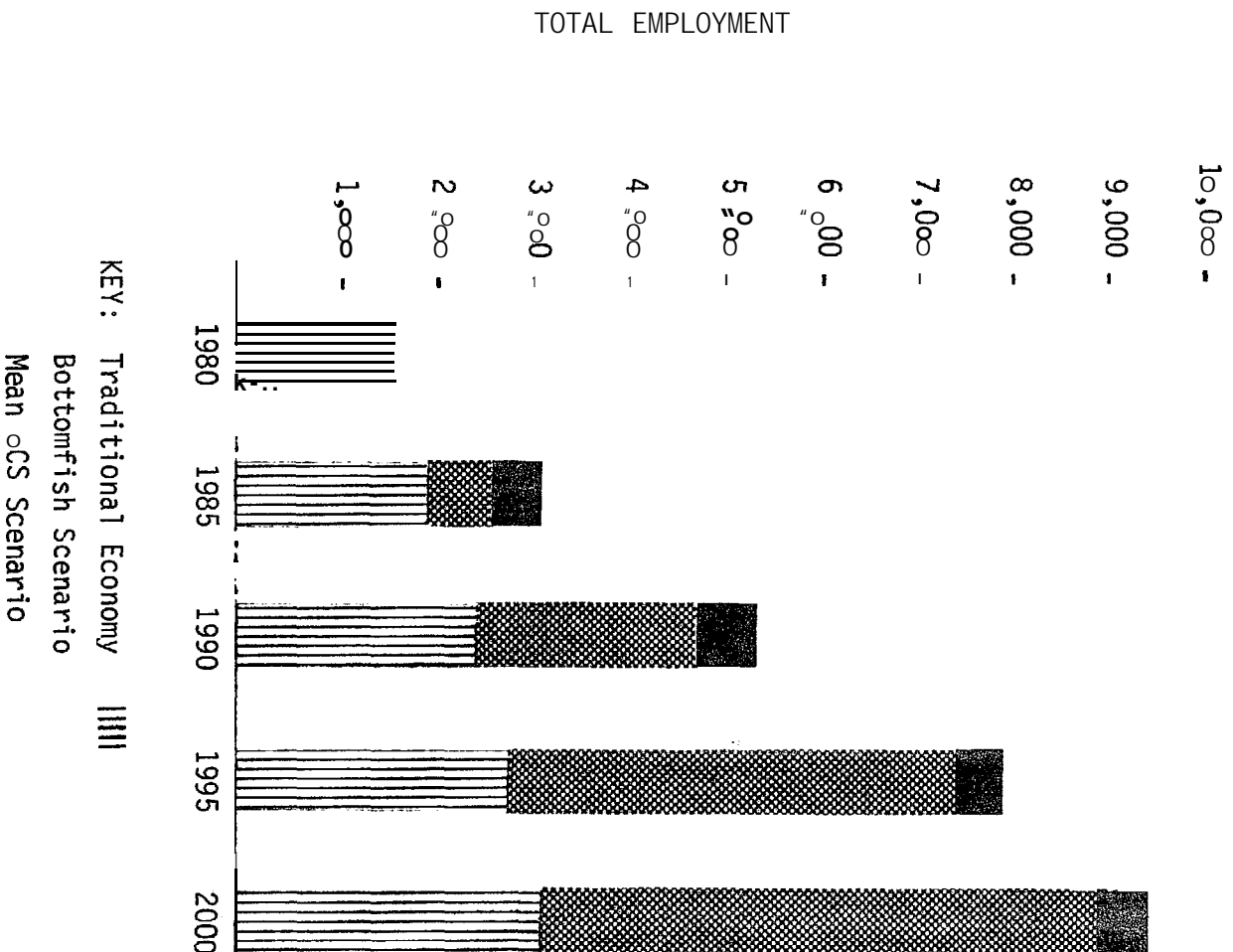
ESTIMATED TOTAL DIRECT AND INDIRECT OCS-RELATED EMPLOYMENT AND POPULATION
MEAN SCENARIO, ST. GEORGE BASIN SALE 70
CITY OF UNALASKA

<u>Year</u>	<u>Di rect Employment</u>		<u>I ndi rect Employment</u>	<u>Total Employment</u>	<u>Total Popul ation</u>
	<u>Resi dent</u>	<u>Non-Resi dent</u>			
1982	(Sale)				
1983	67	37	17	121	209
1984	89	109	28	226	343
1985	114	218	45	377	558
1986	132		31	163	326
1987	207		57	264	528
1988	281		85	366	7 2 3
1989	404		121	525	1,050
1990	349		105	454	908
1991	320		128	448	896
1992	320		128	448	896
1993	320		128	448	896
1994	320		128	448	896
1995	320		128	448	896
1996	320		128	448	896
1997	320		128	448	896
1998	320		128	448	896
1999	320		128	448	896
2000	320		128	448	896

Source: Alaska Consultants, Inc.

FIGURE 12

TOTAL EMPLOYMENT, 1980-2000
BASE CASE AND MEAN OCS SCENARIO



Source: Alaska Consultants, Inc.

estimated that by **the** end of the 1980 decade, the OCS industry will support about 128 additional jobs **in** various trades and services and local commerce and government services.

The impact of the mean scenario upon the community of **Unalaska** is closely tied to the assumed pattern of physical development for the offshore **oil** and gas industry. Under this scenario, no major OCS facilities are assigned to **Unalaska**. Consequently, **Unalaska's** involvement is largely a result of the residential preferences of individual oil industry employees rather than the direct and inflexible result of the location of OCS facilities at **Unalaska**. The optional aspect of **Unalaska's** OCS involvement would seem to automatically limit community impacts to a tolerable scale. That is, if the strains of rapid community growth caused by development in **the** bottomfish or OCS industry make **Unalaska** an unattractive community to OCS workers, they have the option to establish their households in Anchorage or elsewhere, as it is assumed that many of their co-workers will and as, for example, workers on the North Slope now commonly do.

Alternatively, if airport improvements and other favorable factors were **to make Unalaska** a preferred location for provision of air services, **then OCS impacts** upon the community will be compounded by additional **local employment** and the need to accommodate a large number of off-duty or in-transit offshore workers. Likewise, the location of one or both of the product handling facilities at a location easily accessible to **Unalaska** would make the community susceptible to the intensive impacts

of the construction phase and to a higher level of long-term direct economic impact. Also, construction and submarine **pipelaying** activities in **Unalaska** Bay followed by crude oil or **LNG** tanker traffic might disrupt fishing fleet activities and threaten the community's fishing economy. Finally, the availability of oil industry jobs at **Unalaska** could compete with the processing industry for skilled and unskilled labor, with inflationary effects upon local wage scales.

Future Population

The mean scenario is forecast to add about 896 permanent residents to the population of **Unalaska** (see Tables 70 and 71). By rural Alaska standards, this is a middle-sized town and is only slightly less than **Unalaska's** estimated 1980 permanent resident population of 1,288 persons. All of the OCS-related population growth takes place before the end of the first decade. Because the OCS employment avoids the fluctuations and transiency which sometimes characterize OCS onshore development, it is expected that the OCS-dependent population will be long-term residents.

While the OCS population is substantial compared to the 1980 base population, it is small compared to the growth projected to accrue to **Unalaska** from **bottomfish** development in the Bering Sea region. Thus, even during 1980-1990 decade, when OCS impact peaks and before the full impact of bottomfish development hits **Unalaska**, the OCS-related population accounts for less than 20 percent of the total growth over the base. Because of the steep rise in **bottomfish** development employment and

TABLE 70
 ESTIMATED TOTAL EMPLOYMENT AND POPULATION
 MEAN SCENARIO, ST. GEORGE BASIN SALE 70
 CITY OF UNALASKA
 1980 - 2000

<u>Employment Sector</u>	<u>1980</u> (actual)	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Agriculture, Forestry & Fishing	150	277	547	869	1,064
Mining	2	32	32	33	33
Contract Construction	12	336	281	394	396
Manufacturing	1,166	1,768	3,023	4,517	5,436
Transportation, Communications & Public Utilities	57	174	460	567	651
Trade	60	154	303	508	635
Finance, Insurance & Real Estate	27	44	72	111	131
Services	44	111	214	357	450
Government	82	142	302	517	619
<u>TOTAL EMPLOYMENT</u>	<u>1,600</u>	<u>3,038</u>	<u>5,234</u>	<u>7,873</u>	<u>9,415</u>
<u>TOTAL POPULATION</u>	<u>1,288</u>	<u>3,503</u>	<u>7,186</u>	<u>11,482</u>	<u>14,117</u>

Source: Alaska Consultants, Inc.

related population growth projected under the base case, the OCS-related population comprises a steadily declining increment to the base case population projection. In 1985, the mean scenario adds about 558 persons to the base case forecast of 2,945 residents, an increase of about 19 percent. By the end of the forecast period, the mean scenario adds about 896 residents to the projected base case population of 13,221 or an increase of less than 7 percent.

IMPACT ASSESSMENT

Social Impacts

While the influx of about 900 new residents within a few years to an otherwise stable settlement of **Unalaska's** 1980 size would ordinarily cause highly visible social impacts, the timing **of** the St. George base sale in relation to large scale bottomfish development under the mean scenario makes it virtually impossible to isolate qualitative changes in community life which can fairly be attributed to OCS development. Projected fishing industry development dwarfs OCS growth. The diminished visibility **of** OCS activities and the generally disorganized social order could serve to diffuse specific community concerns about OCS impacts. The main social impact of the mean scenario would be its tendency to intensify the growth management problems which would prevail under the base case.

Impacts on Community Infrastructure

Housing and Residential Land. It is assumed that all OCS-related residents (except the small temporary construction crew for the service base) will live in households rather than group quarters. Thus, their housing demands are felt within the private housing market at Unalaska. It is estimated that OCS-related growth will create a demand for about 358 added housing units at Unalaska between 1983 and 1990, an amount almost equal to the total 1980 housing unit inventory (see Table 71). However, OCS-related demand accounts for only about 20 percent of the total projected increase in housing demand for that decade, as OCS-growth is overshadowed by expansion of the bottomfish industry. As the OCS population stabilizes after 1990, there is no added demand for housing after that date.

In view of the undeveloped state of Unalaska's construction industry and the competing demands by other residential and industrial construction projects which will be felt during this time, it is foreseeable that Unalaska may experience a severe housing shortage as new demand outstrips the pace of construction of new housing.

It is estimated that OCS development will require an additional 54 acres of land to be committed to residential development by 1990.

TABLE 11

FORECAST OF NET CHANGE IN DEMAND
FOR HOUSING UNITS AND RESIDENTIAL LAND
MEAN OCS SCENARIO
CITY OF UNALASKA
1981 - 2000

	OCS Increment		Total	
	Net Change Demand for Housing Units	Net Change Demand for Residential Land (acres)	Net Change Demand for Housing Units	Net Change Demand for Residential Land (acres)
1981-1985	127	19.0	562	84.2
(One & Two Family)	(63)	(12.6)	(280)	(56.0)
(Multi-family)	(32)	(3.2)	(141)	(14.1)
(Mobile Homes)	(32)	(3.2)	(141)	(14.1)
1986-1990	236	35.4	1,129	169.4
(One & Two Family)	(118)	(23.6)	(565)	(113.0)
(Multi-family)	(59)	(5.9)	(282)	(28.2)
(Mobile Homes)	(59)	(5.9)	(282)	(28.2)
1991-1995	- 5	-0.8	1,237	185.5
(One & Two Family)	(- 3)	(-0.6)	(618)	(123.6)
(Multi-family)	(- 1)	(-0.1)	(310)	(31.0)
(Mobile Homes)	(- 1)	(-0.1)	(309)	(30.9)
1996-2000	0	0.0	834	125.1
(One & Two Family)	(0)	(0.0)	(417)	(83.4)
(Multi-family)	(0)	(0.0)	(208)	(20.8)
(Mobile Homes)	(0)	(0.0)	(209)	(20.9)
TOTAL	358	53.6	3,762	564.2
(One & Two Family)	(178)	(35.6)	(1,880)	(376.0)
(Multi-family)	(90)	(9.0)	(941)	(94.1)
(Mobile Homes)	(90)	(9.0)	(941)	(94.1)

Source: Alaska Consultants, Inc.

Utilities

- o Water. The mean scenario assumes that **Unalaska** will be the source of supply for fresh water for all offshore operations. However, the combined industrial and residential water consumption stemming from OCS development **is** very slight compared to consumption requirements **of** the fish processing industry. OCS demand does not account for more than one to three percent of total water demand projected for the mean scenario (see **Table 72**). It is not anticipated that meeting the water supply needs of the OCS industry will present any problems beyond those experienced under the base case forecast.

- o Sewer. The existing sewage collection and treatment facilities at **Unalaska** are seriously inadequate. The base case forecast indicates that a major sanitary facilities construction project will be demanded to meet the requirements of base case growth.

The incremental **impact** of the mean scenario will require an increase of about 15 percent in the design capacity of the sanitary waste treatment system over the base case by 1990 (see **Table 73**).

- o Electric Power. The mean scenario is projected to raise power capacity requirements at **Unalaska** by about 43 percent in 1985

TABLE 72
 ESTIMATED CAPACITY REQUIREMENTS
 WATER SUPPLY SYSTEM
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000
 (000' s of gallons per day)

<u>Year</u>	<u>OCS Increment</u>			<u>Total Capaci ty</u>
	<u>Domesti c Capaci ty</u>	<u>Industri al Capaci ty</u>	<u>Tot al</u>	
1985	70	360	430	19, 222
1990	114	430	544	20, 649
1995	112	157	269	21, 902
2000	112	157	269	23, 267

Source: Alaska Consultants, Inc.

TABLE 73

ESTIMATED CAPACITY REQUIREMENTS
 DOMESTIC SEWAGE TREATMENT
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000
 (000' s of gal lons)

<u>Year</u>	<u>OCS Increment</u>		<u>Total Requirements</u>	
	Daily Treatment Capaci ty	Peak Hourly Capaci ty	Daily Treatment Capaci ty	Peak Hourly Capaci ty
1985	70	9	438	55
1990	114	14	899	112
1995	112	14	1, 435	179
2000	112	14	1, 765	221

Source: Alaska Consultants, Inc.

and by about 28 percent in 1990 over the base case demand.

This disproportionate increase in power demand is accounted for partly by residential and commercial growth, but mostly by operation of the marine service base (see Table 74).

- o Solid Waste Disposal. Under the mean scenario, incombustible materials and toxic materials which cannot be safely disposed of at sea are returned to **Unalaska** for disposal. These and other solid wastes add considerably to the volume of solid wastes to be disposed of at **Unalaska** over the short run, that is, through 1990. The OCS scenario increase the tonnage of solid wastes from 20 to 36 percent during the development phase when offshore activities are at a peak. However, over the longer run, the mean scenario accounts for a steadily dwindling share of **Unalaska's** solid waste. (see Table 75).

Maintenance of an adequate solid waste disposal operation has long been recognized as a problem at **Unalaska**. This problem will become more acute under the base case and **will** be further aggravated by the impact of OCS development.

- o Communications. While the mean scenario will add to the substantial increase in the demand for telephone service already projected under the base case forecast (see Table 76), it is not anticipated that there will be any difficulties in providing the facilities for this service.

TABLE 74

ESTIMATED CAPACITY REQUIREMENTS
 ELECTRIC POWER SYSTEM
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000
 (kw's)

<u>Year</u>	<u>OCS Increment</u>	<u>Total Requirements</u>
1985	4,709	15,753
1990	6,655	30,205
1995	6,610	46,308
2000	6,610	56,189

Source: Alaska Consultants, Inc.

TABLE 75

ESTIMATED DISPOSABLE SOLID WASTES
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000

Year	OCS Increment		Total	
	Annual Tonnage	Annual Volume (cubic yards)	Annual Tonnage	Annual Volume (cubic yards)
1985	1,200	5,810	4,570	26,230
1990	1,540	7,040	9,090	52,800
1995	1,260	6,820	13,990	83,960
2000	1,260	6,820	17,160	103,160

Source: Alaska Consultants, Inc.

TABLE 76

ESTIMATED CAPACITY REQUIREMENTS
 TELEPHONE SYSTEM
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000

<u>Year</u>	<u>OCS Increment Increase in Number of Telephones</u>	<u>Total Increase in Number of Telephones</u>
1981-1985	159	703
1986-1990	295	1,411
1991-1995	- 6	1,546
1996-2000	0	1,042

Source: Alaska Consultants, Inc.

Public Safety

- o Police. It is anticipated that under the base case, the existing police force and law enforcement facilities will be greatly enlarged. Due to mean scenario growth, it is estimated that two to three additional police officers and perhaps two additional jail cells will be needed to maintain established standards of law enforcement.

- o Fire Protection. Under the base case forecast, it is already assumed that **Unalaska** will find it necessary to establish additional fire stations in order to maintain an adequate level of fire protection for residential areas. The base **case** also assumes that the fire department will develop the capacity to deal with the potential fire hazards associated with a greatly enlarged waterfront industrial area and busy port area. It is not expected that the OCS industry will add appreciably to the improvements which will be demanded under the base case forecast.

Health and Social Services. It is not expected that the mean scenario will add measurably to the demand for health and social services beyond the base case requirements.

Education. It is estimated that the increase in school enrollment stemming from the mean scenario will call for 5 new classrooms by 1990

in addition to the approximately 20 classrooms which will be needed for the base case. The mean scenario does not have any added impact on school enrollments after 1991 (see Table 77).

Recreation. Apart from minor increases in the amount of land which will be needed for development of neighborhood parks and playgrounds, the mean scenario will not significantly add to the base case's requirements for recreational facilities.

Local Government Finances. In view of the massive growth forecast to take place at Unalaska and uncertainty about the roles which will be assumed by federal and State governments in financing the massive capital improvements program which will be need to accommodate bottomfish development under the base case, it is difficult to prepare reliable quantitative forecasts of the fiscal impact of OCS development upon Unalaska. If the assumption is made that OCS residents will generate tax revenues and expenditure requirements in a proportion comparable to the base year population of 1980, then it would not appear that OCS development would adversely affect Unalaska's financial condition (see Tables 78 and 79). However, it should to be noted that the mean scenario does not include any major additions of taxable industrial real property to the City's tax base to offset the costs of providing services to the OCS-related population. Under the mean scenario, Unalaska acquires about 900 added residents but little new non-residential property tax base. For this reason, OCS development may adversely affect Unalaska's fiscal status, unless extra non-local sources of revenue are made

TABLE 77
 SCHOOL ENROLLMENT FORECAST
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000

Year	OCS Increment			Total		
	Elementary Enrollment	Secondary Enrollment	Total Enrollment	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1985	25	16	41	255	169	424
1990	71	47	118	561	373	934
1995	70	46	116	896	596	1,492
2000	70	46	116	1,101	734	1,835

Source: Alaska Consultants, Inc.

TABLE 78

FORECAST OF GENERAL FUND REVENUES
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000
 (in \$000's)

Year	OCS Increment General Fund Revenues			Total General Fund Revenues		
	Property Tax	Other Revenues	Total Revenues	Property Tax	Other Revenues	Total Revenues
1985	\$ 37	\$ 442	\$ 479	\$ 382	\$4,539	\$4,921
1990	106	1,263	1,369	841	10,000	10,841
1995	105	1,246	1,351	1,343	16,071	17,317
2000	105	1,246	1,351	1,652	19,640	21,292

Source: Alaska Consultants, Inc.

TABLE 79

FORECAST OF GENERAL FUND OPERATING EXPENDITURES
 MEAN OCS SCENARIO
 CITY OF UNALASKA
 1985 - 2000

Year	OCS Increment			Available for Capital Improvements	Total			Available for Capital Improvements
	Operating Expenditures		Total		Operating Expenditures		Total	
	City Operations	School Support			City Operating	School Support		
1985	\$ 292	\$ 36	\$328	\$ 151	\$2,992	\$ 368	\$3,360	\$1,561
1990	833	103	936	433	6,591	811	7,402	3,439
1995	822	101	923	428	10,529	1,294	11,823	5,494
2000	822	101	923	428	12,945	1,591	14,536	6,756

Source: Alaska Consultants, Inc.

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available to absorb part of the cost of providing facilities and services to OCS-related residents.

CAUSE/EFFECTS OF IMPACTS

Under the assumptions adopted for the mean scenario, the only OCS industrial facility sited at Unalaska is the marine service base which is estimated to employ 30 persons on a permanent basis. The service base itself has only very minor residential or industrial impacts upon Unalaska. However, Unalaska is also the nearest community to the oil and gas terminal facilities at Makushin Bay and is effectively the home port for vessels engaged in various offshore support activities. For these reasons, Unalaska has potential to emerge as a "bedroom community" for a part of the OCS workforce permanently employed at job sites easily accessible to Unalaska. For the impact analysis, it is assumed that some of these workers will prefer the convenience of establishing households at Unalaska rather than to travel to home bases outside the region, so long as community living conditions at Unalaska are satisfactory for their needs. However, if living conditions at Unalaska are made intolerable by rapid growth, these OCS workers have the option exercised by many of their co-workers of establishing their permanent homes elsewhere than Unalaska.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

Even under the base case impact analysis, it appears that Unalaska will confront severe community development and financial problems as its population soars from 1,288 residents in 1980 to 6,280 by 1990 and 13,221 by the year 2000. The mean scenario is projected to add another 896 residents between 1983 and 1990, at a time when nearly all elements of the community infrastructure will already be overtaxed by rapid **growth**. **The impact analysis indicates that the mean scenario will** particularly affect the demand for housing, power and sanitary waste treatment facilities as well as the community's overall financial capacity.

SUMMARY OF IMPACTS

The indirect growth prompted by the mean scenario will compound the already extreme growth management problems expected to besiege **Unalaska** if the bottomfish industry expands in the Aleutian region as forecast for the base case. The growth impetus of the St. George Basin lease sale will have run its course by 1990, before the full brunt of **bottomfish** development is felt at **Unalaska**. While the projected scale of OCS-related **growth is substantial in its own** right for a town of **Unalaska's** size at the beginning of the forecast period, the visibility of any impacts attributable to OCS development will be greatly diminished by developments in the fishing industry.

APPENDIX X

Introduction

This appendix presents the methods, standards and assumptions which were developed and applied to forecast future employment and population and related future demands for local government services and facilities, for the Aleutian region communities of **Unalaska**, St. Paul and Cold Bay. These methods, standards and assumptions were developed and modified during the course of the study as additional data and assumptions were supplied by the Bureau of Land Management's Alaska OCS Office or by other subcontractors at work on related studies and as empirical data were collected during field research by Alaska Consultants staff.

Economy and Population

FORECASTING METHODS

There are several commonly used forecasting techniques employed to project future growth or decline in the economy and population of local areas. Perhaps the simplest method is by extrapolation of past trends of growth or decline into the future. However, this technique is practical only in economically mature and populous areas which have shown steady growth or decline and where the economic structure has been relatively stable over time.

A second method involves projections based upon relationships to growth in other geographic areas. Projections for industries and population for a region, the State or the nation are correlated with the local area. However, although this method provides a valuable check against projections obtained by other methods, it is not a reliable means of forecasting in small local areas subject to sudden change.

The third method which is often used in large communities is a projection based upon net migration and natural growth. This method of forecasting is commonly called the natural increase or cohort-survival method due to the technique of projecting the natural increase element of population. This method is most properly made use of where natural growth rather than economic change is expected to be the main impetus for population growth,

A fourth method is to derive future population estimates from future employment estimates. This method, which may be termed the population/employment ratio method, assumes that the population of employable age in the labor force is a fairly constant proportion of the total population. Therefore, population forecasts can be derived directly as a statistical proportion of the future employment figure. The simplest means of applying this technique may overlook such variables as productivity, market trends and the decline or expansion of extractive industries. In any case, the ratio of total community employment to total community population is an important factor in forecasting population and is an important feature of the economic base method discussed below.

The input-output approach is the most sophisticated method employed to define and measure the economic structure of a community as the basis for forecasting future population. The input-output methods clearly are well suited to comparative statics and, through the use of models, can be adapted to dynamic problems. While this method is ideally suited to measure and distribute the effects of major industrial impacts, the detailed information necessary to employ this method effectively is not available in a suitable form for the communities under study.

Another method of forecasting employment and population growth or decline is the economic base method. This method stresses the importance of export activities as the determining factor in regional and community economic growth. Within a specialized economy, regions or cities must both import and export goods and services to prosper. In exchange for imports, these regions or communities must in turn export to other regions. In this method of analysis, the basic or primary sector of regional or community economic activity comprises the production of goods and services for export. The non-basic or secondary sector of regional community activity comprises the production of goods and services for local purchase and consumption.

The economic base method is derived from modern theories of international and interregional trade and it makes use of such economic concepts as the multiplier. For technical reasons, the method is restricted in its breadth of application. Difficulties are sometimes encountered in allocating activities to basic and secondary sectors, external money

flows into a region are not always easily accounted for and the treatment of indirect effects is necessarily unclear. **As** a general rule, the smaller the economic region, the more sensitive its economy will be to fluctuations in its particular economic support base. Conversely, in populous, economically diversified regions, the multiplier tends to approximate that of the nation. Thus, the economic base method can provide a useful explanation of economic development in small communities where the flow of goods and services within the community is limited and can be traced.

Although economic base studies have used various units such as jobs, payroll, value added, value of production and dollar income and expenditure accounts **to measure** economic activity, most studies have relied upon employment as the sole or primary unit of measure. In this study, where the economic base method is used, employment is used as the primary unit of measure and as the basis for forecasting the magnitude of future economic and population growth or decline.

In the economic base forecast, the activities of certain employers are classified as basic (exogenous). This group is composed of employees engaged in export industries or performing labor based upon demand determined by forces outside the city or region. All other employees are classified as secondary (**endogenous**). The fortunes of the employees of these secondary industries are determined by internal forces which are expressed by a numerical multiplier linking the export sector to total regional or community employment.

In a simple economic model, secondary employment is shown as a function of total employment

$$Y_s = f(Y_t)$$

and

$$Y_t = Y_s + E$$

where: Y_t = total community or regional employment

Y_s = total community or regional secondary employment

E = total community or regional basic employment. This is the sum of all basic employment as arrayed in the Standard Industrial Classification Manual by the following **divisions**: Agriculture, Forestry and Fishing; Mining; Contract Construction; Manufacturing; Transportation, Communication and Public Utilities; Trade; Finance, Insurance and Real Estate; Service; and Government.

In its simplest form, the economic base model hypothesizes a homogeneous relationship expressing secondary employment as a constant proportion, k , of total employment

i.e.: $Y_s = k Y_t$

so that: $Y_t = \left(\frac{1}{1 - k} \right) E$, ME

and so that m , the multiplier, $\frac{1}{1 - k} = \frac{1}{1 - \left(\frac{Y_s}{Y_t} \right)} = \frac{Y_t}{E} = \frac{Y_s + E}{E} = 1 + \frac{Y_s}{E}$.

The multiplier is estimated by observing the historic relationship between the activities of the export sector and total regional activities.

Then, given the summed estimates of the future magnitude of basic employment as foreseen in each SIC division, the application of the multiplier yields a **forecast of total employment as a reflection of total regional or community economic activity. Furthermore, total regional or community employment can be multiplied by a population dependency ratio, gained by observing the historic relationship of total employment to total population,** to produce a forecast of total population.

Under some circumstances, structural change in the local economy may alter the balance between the basic and secondary economies. For example, expansion in local commerce to provide a wider range of consumer goods and services would magnify the multiplier effect of basic employment upon the secondary economy. Conversely, where the mix of new basic employment includes a disproportionate share of temporary, seasonal or unattached workers, the employment multiplier may be depressed. Sometimes, rapidly expanding economies can exhibit both of these tendencies, for example, at Unalaska, where the bottomfish and oil and gas industries have potential to cause rapid economic change. In such instances, the employment multiplier can be varied over time to reflect the dynamic impact of such changes.

PRESENT EMPLOYMENT ESTIMATES

Based upon a review of existing local economies and political organization, a precise geographic definition of the areas to be studied was determined. The areas of study were defined as the cities of Unalaska and St. Paul

and the settlement of Cold Bay. Unfortunately, these areas do not conform to the statistical areas used by the Alaska Department of Labor's publications. As a result, there are no published data series for community employment by economic sector for economic base trend analysis. However, unpublished data were obtained for the City of Unalaska from the Department of Labor and were used, along with other data, for the economic analysis.

Within these areas of study, informal interviews of employers and other knowledgeable individuals were conducted. From a review of published and unpublished materials and the interviews, the basis of the present economic activities and the potential for future growth or decline of the Unalaska, St. Paul and Cold Bay areas were assessed. The process of investigation was carried out for each of these local economies.

Since none of the communities under study were populous, informal interviews of all employers were conducted during the development of the baseline description. Among the information obtained were the following items:

- o The number of full-time and part-time salaried employees.
- o The number of months worked by the employees.
- o The product(s) or service(s) produced or delivered.
- o The quantities of product produced by major manufacturers such as fish processing plants.
- o The months during which the product is produced.

- o The suppliers to the major manufacturing plants such as the number and type of fishing vessels (to estimate the number of jobs in fishing).
- o The percent of the firm's business (revenues) resulting from activities (sales) related to firms and individuals outside the region or the local area.
- o The plans of the firms regarding expansion or retrenchment which would result in increased or decreased employment.
- o The views of the owners or operators of the firm regarding future prospects of their firm and their industry, estimates and timing of major growth or decline in terms of employment and opinions on future **seasonality**.

These employer interviews, together with published and unpublished employment data provided by the Employment Security Division of the Alaska Department of Labor were relied upon to assemble the total picture of current and past employment patterns.

The total employment in each of the geographic areas was then arrayed by major industrial sector in conformance with the Office of Management and Budget's Standard Industrial Classification Manual. The SIC Manual defines industries in accordance with the composition and structure of the economy and covers the entire field of economic activity. The following base year data necessary for the forecasting process is produced:

- o Total employment.
- o The distribution of basic and secondary employment by industrial sector.
- o The employment multiplier.

The base year (1980) annual average full-time employment for each of the three communities was tabulated as shown in Tables 3, 21 and 25.

From the ratio of basic and secondary employment, the base year employment multiplier can be derived for each community by the formula:

$$m = \frac{Y_t}{E}$$

In the conventional economic base forecast, it is usually reliable to assume that the employment multiplier and the distribution of service employment among the various employment sectors will remain constant in the model throughout the forecast period. However, it should be recognized that there are factors which affect the multiplier and the distribution of service employment. Among these factors which can be taken into account in the forecast are the following:

- o A lag which sometimes occurs in service employment, especially at the start of a period of rapid growth or decline in basic industry.
- o Changes in consumer habits which result in more or fewer purchases locally. Often, improved local retail and service facilities can increase local purchases.

To account for these factors, the structure of employment in communities which have experienced rapid growth or decline in the past can be reviewed, together with retail and service trends during various periods of growth, and corrective adjustments in the structure of service employment can be based upon these comparisons. This was the procedure followed in the economic and population forecasts where the introduction of new economic activities seemed capable of altering historic economic patterns.

FORECAST OF EMPLOYMENT

Because of extreme variations in their demographic and economic characteristics and their economic prospects, the three communities treated in this report (Unalaska, St. Paul, Cold Bay) are not suited to a uniform employment and population forecasting methodology. Therefore, different forecasting methods were used according to the individual character of each community, with the choice of methods governed by the demographic and economic structure of the individual town.

The total employment forecast was built up from a series of three separate employment forecasts. First, the primary future community employment and population was forecast, based on expected patterns of economic growth or decline within the communities' established economic structures. Second, where applicable, the contribution of the domestic bottomfish industry to the local basic economies was calculated and combined with the primary forecast to yield a forecast of total non-OCS employment and

population, Finally, for Unalaska, the contribution of the specified OCS scenarios for the proposed St. George Basin lease sale to local employment and population growth was calculated and served as the basis for estimating the **incremental** impact of OCS development activities **upon** that community.

The primary employment and population forecasts for **Unalaska** were developed by the **economic base method**. The choice of this method was justified by the nature of that community's economy. **Unalaska** already has an established and substantial economic base and it was feasible on the basis of historic trends and analysis of prospects for expansion of traditional industries, to apply this method to forecast future employment in the traditional economy.

However, because of the extraordinary growth potential of the bottomfish industry and the oil and gas industry at **Unalaska**, it appears likely that the town's economic structure will depart from some of its historic patterns during the forecast period. That is to say, it seems likely that the numerical values for employment multipliers and dependency ratios for these new industries will differ from the values that now prevail. Fortunately, the economic base method allows these values to be varied over time. In the forecast for **Unalaska**, the estimated direct employment for these two new industries were calculated separately. Then, with the aid of multipliers and ratios calibrated to reflect the characteristics of these industries and their dynamic trends, the indirect employment and population expected to arise from these industries was

forecast. In effect, the forecasts for the **bottomfish and oil** and gas industries were treated as separate economic scenarios to be incorporated into the primary forecast prepared for the traditional economy.

Because of St. Paul's isolation and because of the overriding importance of cultural rather than economic motives in its demographic trends, the economic base method of forecasting future employment and population growth is not well suited to that community. Historically, St. Paul's population has been relatively unaffected by fluctuations in the availability of local employment. An insufficient number of full-time jobs has not promoted major population **outmigration**, nor has the seasonal availability of surplus employment opportunities attracted new permanent residents. Therefore, as a result of its isolation, its economic structure and its cultural orientation, St. Paul's permanent population has been and, unless circumstances change radically, is expected to remain insulated from short-term economic fluctuations. St. Paul's history suggests that a version of the cohort-survival or natural increase method of forecasting future population is generally best suited to that community, as long as no major changes in the economic structure of the community are expected.

Cold Bay is not a community with an economic base and **local** government providing for a community of public interests in the conventional sense. Cold Bay is essentially a remote and unincorporated outpost almost exclusively engaged in providing certain specialized transportation and communications services for its region. Its resident population is

highly dependent upon specific decisions of State and federal governmental agencies and private firms to maintain or expand these services. There seems little likelihood that a more diversified, balanced, full-fledged community will emerge, short of a radical change in the economic function of the community.

In view of the narrow band of economic activities performed at Cold Bay, a simplified version of the economic base method was employed. That is, employment and population forecasts for Cold Bay were based on an evaluation of the prospects for expansion of present public and private activities. This evaluation was, in turn, derived from interviews with appropriate governmental agencies and private firms with operations based at Cold Bay to obtain their best estimates of their long-term requirements for personnel to be stationed at Cold Bay.

Traditional Economy

Based upon the economic research done for each community, the significant factors which would affect future growth or decline in basic industries were identified and analyzed, annual growth rates by sector were estimated and future basic employment by industry sector was forecast. In a hypothetical example, the derivation of future community basic employment can be shown as follows:

<u>Industrial Classification</u>	<u>Base Year Basic Employment</u>	<u>Forecast Growth %</u>	<u>Year 1 Basic Employment Forecast</u>
Agriculture, Forestry and Fishing	110	5	116
Mining	4	2	4
Contract Construction	5	4	5
Manufacturing	97	5	102
Transportation, Communication and Public Utilities	12	5	13
Trade	24	4	25
Finance, Insurance and Real Estate	2	4	2
Service	16	4	17
Government	60	3	62
<u>TOTAL</u>	330		346

The sum of the basic employment forecasts by industry sector in any given year equals total basic employment in that year. Next, total basic **employment** can be multiplied by the employment multiplier to produce a projection of total employment, as represented by the following formula:

$$Y_t = mE$$

Secondary employment is then derived through the following formula:

$$Y_s = Y_t - E.$$

In order to derive total employment by industrial sector, secondary employment can be distributed as in the base year, if it is assumed to have a constant distribution over time. Alternatively, if it is

concluded that the structure of the secondary economy will change over time in response to local economic development, then the distribution of secondary employment can be varied to reflect anticipated trends. If it is assumed that the community in the hypothetical example has an employment multiplier of 1.67, then the following estimate of total employment by industry sector for basic and secondary employment is obtained:

<u>Industry Classification</u>	<u>Base Year Secondary Employment Distribution</u>	<u>Forecast Secondary Employment</u>	<u>Forecast Basic Employment</u>	<u>Forecast Total Employment</u>
Agriculture, Forestry and Fishing	0.0	0	116	116
Mining	0.5	1	4	5
Contract Construction	4.5	10	5	15
Manufacturing	1.4	3	102	105
Transportation, Communication & Public Utilities	8.2	19	13	32
Trade	20.9	49	25	74
Finance, Insurance & Real Estate	5.9	14	2	16
Service	17.7	41	17	58
Government	40.9	95	62	157
<u>TOTAL</u>	<u>100.0</u>	232	346	578

Bottomfish Employment

At present, a negligible part of the **bottomfish** resources in the Bering Sea is harvested by domestic fishermen, **but** some projections (including the projection on which this report's bottomfish scenario was based) estimate that by the end of the century, the Bering Sea **bottomfish** industry will be totally controlled by domestic fishermen and processors. Such forecasts imply a type and scale of economic development which is without precedent in the Aleutian region and thus hard to forecast in exact terms. Indeed, the forecast of future **local** employment in the **bottomfish** industry in the Aleutian region is highly speculative, even more so than for the OCS scenarios for which there is at least some comparative basis in Alaska and elsewhere. Therefore, the forecasting methodology has been structured to identify the significant variable assumptions and the values attached to them. This will make clear how the quantitative forecasts for each community were arrived at and will allow substitution of different numerical values for the key variables if indicated by further information *or* by the judgment of other knowledgeable analysts.

The bottomfish scenario incorporates certain **employment** assumptions mandated by the Bureau of Land Management's Alaska OCS Office for the use of a number of its subcontractors. The common point of departure was the projection of total regional employment in the bottomfish industry in the Aleutian region through the year 2000 prepared for BLM by Earl Combs, Inc. The Combs' regional forecast assumed that the

harvest and processing of Bering Sea groundfish resources would be **totally domestic by 2000, a reversal** of the status quo in which harvest of **these resources is almost totally** dominated by the foreign fishing **fleet**. The Combs' forecast assumed that processing of the domestic harvest would be evenly split between shore-based and catcher/processor or sea-based operations. Combs also developed separate employment growth projections for the two sectors of the industry, reflecting the different use of labor in shore-based and sea-based operations. Table 32 presents Combs' regional projections for direct employment in the **bottomfish** industry for the shore-based and sea-based sectors respectively. At the Alaska OCS Office's direction, Combs' regional direct employment estimates were used as the basis for forecasting the economic impact of this new industry upon the communities under study.

In order to assess the prospective impacts of the **bottomfish** industry upon the communities, additional assumptions were needed. Of the total direct employment generated in the region, a suitable share had to be allocated to each community and the residency status of local employees had to be determined as a basis for evaluating their effects on the secondary economic and upon community services. Because of fundamental differences in their economy structures, different approaches were devised for Unalaska and for Cold Bay/St. Paul.

For Unalaska, the bottomfish industry projected by Combs (40 percent of the region's shore-based employment) represents a major change in the community's historic economic pattern to a much greater degree than

occurred during the rapid growth of the shellfish industry at Unalaska in the 1970's. Nevertheless, the pattern of labor force management established successfully for the shellfish industry at Unalaska (and for the fish processing industry generally in remote areas of Alaska) suggests the direction that a successful strategy for development of the bottomfish industry may take. It is assumed that, especially during the early stages of development, the bottomfish industry will find it necessary to rely upon a mobile, relatively low-skilled, low-paid transient labor force to manage its labor-intensive processing operations. Consistent with this assumption, it is also assumed that at the outset, only managerial and supervisory employees and some technicians and skilled maintenance workers will be full-fledged local residents of households. In the absence of other available housing, the remaining plant workforce will occupy group housing provided by major employers. However, it is assumed that, as the new industry becomes established and its workforce stabilizes, an increasing if minor share of the plant workforce will become bona fide and permanent residents of the community.

The specific quantitative premises used to calculate forecast bottomfish-related employment at Unalaska were as follows:

- o Forty percent of the total shore-based direct regional employment in the bottomfish industry forecast by Combs will be locally based at Unalaska.
- o In 1985, when the bottomfish industry is first becoming established at Unalaska, only ten percent of the direct local employees will be members of households living in conventional

- housing. The remaining ninety percent of the industry workforce will reside in company-provided group housing. Over the forecast period, the share of the direct **local** workforce dwelling in households will rise to fifteen percent by 1990, twenty percent by 1995 and twenty-five percent by 2000, while the share residing in group housing will decline correspondingly.
- o Furthermore, it assumed that the employment multiplier for **bottomfish** employees (all of whom are basic employees) living in households will be the same as for other permanent resident employees, but that the multiplier for **bottomfish** employees living in group housing will be quite low, estimated at **1.1**. This low multiplier reflects the **relatively** low earnings and low local expenditures of a relatively transient **workforce** occupying company-provided living **facilities**.
 - o Only a small share, estimated at ten percent, of the sea-based bottomfish employment in the Aleutian Region is assumed to take up permanent residence at **Unalaska**. According to the Combs' analysis, each catcher/processor vessel would spend about nine separate month-long trips per year away at sea. Under these working conditions, it is assumed that only a small proportion of the catcher/processor crews would choose to take up permanent residency with their families at **Unalaska**.

In the case of Cold Bay and St. Paul, it was assumed that any **bottomfish** industrial operation established at either of those communities would, in view of the existing pattern of economic and community development, take

the form of an essentially self-contained enclave development. Thus, any local economic impacts at these communities would be limited to employment of **surplus and unemployed local** labor, with otherwise little **direct impact** upon the local economy. Following the **assumptions** proposed by Combs, the prototype shore-based **bottomfish plant** would have a capacity of 60,000 metric tons annually. Such a plant would require a total of 606 employees for processing operations and would be supplied with raw fish by a fleet of nine fishing vessels employing an additional 54 persons. It was further assumed that the sea-based sector of the **bottomfish** industry would have negligible employment impact upon the communities of Cold Bay and St. Paul.

OCS Employment

As stipulated by Alaska OCS Office, two OCS **petroleum** development scenarios for Sale 70 -- an exploration only scenario and a mean scenario -- were developed for analysis for the community of **Unalaska**. No analysis of OCS impacts was undertaken for Cold Bay or St. **Paul**.

Since consistency among the various related socioeconomic studies was desired by the Alaska OCS Office, it provided the basic scenario assumptions about recoverable reserves and levels of exploration and development effort, including manpower schedules by task. The Alaska OCS Office **also** supplied some premises for Sale 70 about the location of onshore OCS support facilities and about the residency characteristics **of the** OCS workforce for use in common by all contractors. Additional assumptions,

such as those governing the local employment multipliers, dependency ratios, household characteristics and housing requirements of the OCS workforce were developed by Alaska Consultants based on its field research into the structure of Unalaska's labor force and population and based on prevailing trends elsewhere in comparable OCS provinces. In some instances where empirical data could not be used to project the outcome of some features of the scenario, it was necessary to rely upon the contractor's best judgment.

The raw estimates of employment in man-months were supplied by Alaska OCS Office for each scenario. The estimates were subdivided by type of activity (i.e. drilling, marine and air transportation, facility construction and operation, etc.) for each phase of each scenario for the life of the operations. However, the present analysis only concerned itself with OCS employment through the year 2000, which was the term of the local socioeconomic impact analysis. Table 60 presents the Alaska OCS Office's total direct employment estimates for the exploration only scenario. Tables 60, 64 and 65 display the Alaska OCS Office employment estimates for the mean scenario of Sale 70 for the exploration, construction and development phases respectively.

The above estimates include all direct OCS-related employment attributed to the scenario for Sale 70. Thus, they cover both offshore and onshore employment temporarily and permanently based at Unalaska as well as onshore employment based at other localities within the Aleutian region.

In order to forecast OCS employment and population impacts upon Unalaska specifically, it was necessary to disaggregate total employment to determine what part should be assigned to Unalaska on a temporary or permanent basis.

For the exploration **only scenario**, it is assumed that Unalaska serves as **the site of the advance marine service base** from which supplies and services are provided to the exploratory rigs active in the lease area. Because of its superior airport facilities, its nearness to the lease tracts, and the preference of operators to minimize their capital and labor costs during the exploration phase, it is assumed that Cold Bay will be the air support base through which all offshore personnel in transit will be routed. As the offshore crews engaged in exploratory drilling are usually experienced crews who specialize at that activity and are mobilized through Cold Bay, it is not anticipated that they will cause any economic impact upon Unalaska.

The transportation sector employment during exploration includes helicopter support crews who will be located at Cold Bay and work boat crews for the supply boats and anchor and tug boats working offshore and based at Unalaska. Consistent with these premises, all aviation support employment is assigned to Cold Bay and part of the marine transportation employment is assigned to Unalaska. By Alaska OCS Office stipulation, a minimum of 25 percent of total transportation employment is assumed to be held by residents of the region which, in practical terms, means residents of Unalaska. Therefore, through the exploration period, 25 percent of the

total transportation employment (all of it in the marine transportation sector) is assigned as resident local employment to Unalaska, while the remainder of the transportation **workforce** is stationed at Cold Bay or travels to residences outside the region when off duty.

It is assumed that all employees working at the advance service base **itself** will be residents of Unalaska for the duration of the exploration phase and will secure living quarters in the private housing as is the usual practice for such workers.

Under the mean scenario, sufficient recoverable reserves are discovered to justify production. This requires construction and operation of a variety of onshore and offshore facilities, including production platforms, submarine pipelines, oil and gas processing and shipping facilities and service base facilities. Depending upon the location of construction activities and upon provisions made for accommodating the construction **workforce**, these facilities will have varying effects upon Unalaska's economy. Because all offshore personnel are routed through Cold Bay and require specialized occupational skills and experience not **likely to be** found locally, it is assumed that all offshore construction work involved in platform installation and submarine **pipelaying** will be performed by non-local employees who travel via Cold Bay to residences outside the region between duty tours. Thus, none of these offshore construction workers affect Unalaska's economy.

With reference to the crude oil terminal facilities and the LNG plant and terminal facilities needed to support production under the mean scenario, the Alaska OCS Office specified that these facilities will be located at Makushin Bay, a relatively protected, ice-free deep-water harbor on Unalaska Island about 40 miles by air southwest of Unalaska. Makushin Bay is not a settled area and does not have an airport. It is not connected by road to Unalaska and, because of the intervening mountainous terrain, it is not likely to be in the future.

Under these circumstances, it is reasonable to expect that construction crews will be temporary and that it will be necessary for the construction contractors to provide on-site quarters with related facilities for their entire workforce. Also, because of occupational skill requirements, union work rules and the absence of any labor surplus at Unalaska, it can reasonably be assumed that the bulk of this construction work force will be drawn from a non-local labor pool. Consistent with this premise, the Alaska OCS Office has specified that two percent of the total construction workforce for onshore facilities would be resident in the region (effectively, at Unalaska) and that resident employment would sustain itself at the peak annual level reached so long as there remained OCS-related onshore construction employment in the region.

Under the mean scenario, development of the advance and, later, permanent marine service bases at Unalaska also entails some construction activity, though at a lesser level than other major onshore facilities. Since the service base facilities are to be located at Unalaska, all construction

employment for this project is classified as local in nature regardless of whether it involves permanent or temporary residents.

Because of the superior arrangements for transfer of offshore work crews through Cold Bay, it is assumed that offshore platform workers will continue to be marshaled through Cold Bay and will reside in Anchorage, Kenai or elsewhere outside the region. Thus, these offshore activities have no direct impact upon **Unalaska**. By the same token, **all** air transportation support facilities services and related employment for offshore activities are concentrated at **Cold Bay**. Administrative staff are assumed to be headquartered in Anchorage, which is the managerial center of the **oil** and gas industry in Alaska.

Throughout the production period, as for the exploration phase, it is assumed that 25 percent of all transportation service employment is based in **Unalaska** and is thus counted as local employment.

Finally, it is assumed that a part of the long-term permanent work force engaged in day-to-day operations of the oil terminal and the **LNG** plant and terminal at **Makushin Bay** will become residents of the **Unalaska** community and add their purchasing power to that community's economic base. Because of the lack of overland access and chronically poor local flying conditions, it is thought that daily commuting between **Unalaska** and **Makushin Bay** would be **infeasible** from the standpoint of cost, reliability and safety. Therefore, while on duty, all terminal employees will be housed in company-provided living facilities at **Makushin Bay**.

The forecast incorporates the premise set out by the Alaska OCS Office that, **during time off duty** tour, 50 percent of the permanent operating workforce for the terminal facilities will be residents of Unalaska. The remaining half of the plant and terminal workforce is assumed to return to residences elsewhere in the region or outside the region between tours of duty.

PRESENT POPULATION ESTIMATES

The base year population figures were obtained from the preliminary 1980 Census data counts. As a check, the census figures were compared with other recent local population estimates. To clarify census figures and to aid in their interpretation, interviews were held with city and/or other local officials and with other sources having knowledge of recent changes in local populations. In Unalaska, where a large share of the local population does not live in households but in employer-provided group quarters, estimates were made of the population in households and in group quarters,

The base year household population estimate was then divided by the base year employment estimate, excluding workers resident in group quarters. The product of this division is a dependency ratio for estimating total household population from total employment in future years.

For example, if the household population in a hypothetical community is assumed to be 1,200 people including 500 employees, the following dependency ratio is obtained:

$$\frac{\text{Estimated Base Year Population}}{\text{Estimated Base Year Employment}} = \frac{1,200}{500} = 2.2 \text{ Dependency Ratio.}$$

Although this ratio can be employed as a constant throughout the forecast period, it should be recognized that it is subject to change, especially if there is a heavy influx of new residents with markedly different family characteristics. Factors can be statistically identified in similarly situated communities at various levels of growth which evidence different ratios. Some of these factors are as follows:

- o Changes in the composition of population as a result of birth rates, death rates and migration.
- o Variations in the pattern of **seasonality** of employment resulting in a greater or lesser year-round population.
- o Entry into or withdrawal from the **workforce** and **employment** of household members, especially wives.
- o Changes in the rates of unemployment and underemployment.

FORECAST OF POPULATION

The dependency ratio obtained by the method previously described can be employed to forecast total household population on an annual basis throughout the forecast period. The household population is combined with the population forecast for persons living in group housing to arrive at an estimate of total **population**.

Although dependency ratios are subject to change based upon a number of factors, a constant dependency ratio was **used throughout the forecast period with the following exceptions.** Where the economic base method of forecasting employment and population was used, the dependency ratio prevailing in the base year was used to estimate the population changes associated with the primary economy (i.e. exclusive of direct **bottomfish** and OCS employment), including all secondary employment.

The forecast of basic employment for the **bottomfish** and OCS industries distinguished between two groups of employees: those who were members of households and those who were living in group housing. The dependency ratio supplied for the direct employees in these two industries were set at 2.0 for employees resident in households and 1.1 for employees in group housing.

For a number of reasons, it was assumed that the dependency ratio of new household residents drawn to Aleutian communities for employment opportunities **would** be lower than for the general population or for the current local population. Factors contributing to a low dependency ratio included a presumed selective in-migration of unmarried young adults in response to economic opportunities; a statistical imbalance of males over females in the **bottomfish** and OCS industries' workforce; the high cost and scarcity of private housing; a relatively low rate of new family formation related to the two previously cited factors; a high rate of labor force participation reflective of the age of the in-migrant population **and** of the expected high **rate of** working couples. The employed population

living in group housing is made up almost wholly of unattached individuals and this justifies the unusually low dependency ratio for those employees.

Housing and Residential Land Use

In order to forecast the future local demand for housing, it was necessary to subdivide the projected increase in shore-based population into two sub-groups possessing distinctly different housing needs: those new residents living in households (i.e. a mix of family and unrelated individual households) and those residents living in group quarters (i.e. bunkhouses and dormitories, construction camps, military compounds and other similar types of housing). This subdivision was necessary because it was judged that group housing would play a large role in meeting the housing needs of new resident employees in some economic activities and that these employees would, as a statistical group, place different demands upon the system of public services and facilities than residents living in conventional housing. (It should also be noted that the population living aboard floating processor ships stationed at any of the study communities was not included within the resident population, although the needs of this population group for certain services was considered.

Historically, within the fish processing industry, the provision of group housing has resulted in large part from the **seasonality** inherent in the past pattern of exploitation of traditional fisheries resources. However, recent trends in the fishing and processing industry have been toward

year-round operations where feasible. Thus, **where the fish processing industry formerly processed** only salmon during the summer season, the trend has been to diversify into king crab, tanner crab and other commercial species with the result that the commercial fishing and seafood processing industry has become a more year-round enterprise. **Similarly**, fishing ports such as **Unalaska** which have in the past **primarily** relied upon the king crab and tanner crab stocks, have lately sought to expand into salmon processing during the off-season. It is assumed that this trend toward permanent employment in a diversified fisheries and processing industry will continue and that the availability of permanent full-time jobs will encourage and allow new job holders to take up permanent residence in conventional housing and that the number of employees dwelling in group housing will not increase as a result of expansion in the traditional fisheries. The housing needs of new employees in the **bottomfish** industry are treated separately.

In remote areas of Alaska, **group** housing has been and promises to remain a significant style of housing in situations where the demand for labor is seasonal, temporary or transient. In such situations, it is often advantageous or **necessary** for large employers to provide living quarters for all or part of their **workforce**. As previously noted, it is assumed that group housing will be provided by major employers in those industries for a substantial share of their employees. The estimated number of employees allotted to group housing depends on many factors such as the size of the community, the stage of industrial development and the nature of the industrial task at which the workforce is employed. For example,

it is plausible that the proportion of shore-based bottomfish processing plant workers residing in group quarters may be relatively high during the early stage of that industry's development but that an increasing portion of this plant workforce may prefer to acquire homes as the financial feasibility and longevity of that industry is confirmed. In a similar pattern, it may be assumed that the temporary workforce engaged in constructing shore-based OCS industrial facilities will be sheltered in contractor-provided living facilities at the worksite, while the permanent operating workforce taking up local residence will choose to live in households.

The total increase in population estimated to be living in households was divided by the estimated average family size or number of persons per household to obtain the projected number of new housing units which would be needed to satisfy the future demand for conventional housing units. The remainder of the forecast population increase was assigned to group housing.

The distinction between persons living in households and persons living in group housing is important for a number of other reasons bearing upon future demand for community facilities and services. For instance, households will most often be composed of families and related individuals while group quarters will most often be occupied by unattached individuals. Consequently, residents of households will affect certain public services (e.g. education, social services, public safety) very differently than residents of group housing.

In order to provide a basis for forecasting the residential land required to accommodate future growth, the number of housing units was estimated for three categories of types of units: one and two family homes; multi-family units; and mobile homes or trailers. The selection of the housing type mix appropriate for each community for each component of population growth was governed by an evaluation of the specific physical constraints (terrain and soils conditions, land availability, etc.) at each community and by the social and economic characteristics of the new residents. This latter factor was viewed as especially important at **Unalaska** where the working conditions of the **bottomfish** and oil and gas industries were expected to result in demand for an unconventional **mixture of private housing together with a large share of industry-provided housing.**

For purposes of forecasting future residential land requirements, existing local zoning and subdivision ordinances were not viewed as reliable predictors of future land use densities. Two of the settlements being studied, Cold Bay and St. Paul, do not administer local zoning or subdivision ordinances. **Unalaska** does have a recent comprehensive plan which provides broad guidelines for future community growth and the forecast of future residential land use was checked for consistency with those guidelines.

The forecast of future residential land use was obtained by converting the estimate of future housing demand for new residents by type of housing unit into a forecast of land use demand by using the following

generalized assumptions about the average residential unit densities for each housing type: one and two family units at 5 units per acre; multi-family units at 10 units per acre; and mobile homes and trailers at 10 units per acre.

Community Facilities and Services

A series of assumptions has been made and standards developed for assessing future needs for a range of community facilities and services in the communities under study in both the non-OCS and OCS cases. These assumptions and standards and the methodology employed in forecasting are contained in the following pages.

PUBLIC SAFETY

Police

The following basic assumptions have made for police protection:

- o Police protection services will continue to be provided by the cities of Unalaska and St. Paul for areas within their corporate limits.
- o Law enforcement at Cold Bay and in the unincorporated areas outside these communities will continue to be provided by the State of Alaska.

To **arrive at reasonable standards for police protection, commonly** used nationwide standards for the number of law enforcement officers and jail cells needed to serve a **given** number of people were obtained. **These** standards were then reviewed in relation to existing conditions in the communities under study and special situations in the communities were noted.

Nationwide, the desired ratio of law enforcement officers to population is one for every 500 people. According to the Alaska Department of Public Safety, when a community reaches a size where it becomes desirable to have an officer on duty 24 hours per day, 7 days per week, a minimum of 6 officers (mathematically, 5,75) must be hired when factors such as annual leave, sick leave and others are taken into account. A similar situation exists with support personnel.

According to the Alaska Department of Public Safety, a commonly used standard for jail cells is one for every 500 people. However, since State law requires that male, female and juvenile offenders be separated during incarceration, a minimum sized jail in Alaska should have at least three cells.

On the basis of the foregoing, the following standards were derived for policemen and jail cells in the non-OCS case:

- o Existing relationships between population and the number of public safety officers at Cold Bay and St. Paul are assumed **as**

the base from which forecasts are made, with an additional officer to be required for each successive increment of 500 population. At **Unalaska**, because the population is expected to include a high proportion of unattached **adults** and transients with a higher frequency of law enforcement problems, the standard was set at one additional officer for each addition of 300 persons.

- o At Cold Bay and St. Paul, one jail cell for every 500 people, except that the minimum jail size shall be three cells. At **Unalaska**, one added jail cell for every 300 new persons.

In the various OCS scenarios, offshore personnel are assumed not to have a significant impact on local law enforcement requirements at **Unalaska** as it is assumed that these people will be shuttled directly in and out of Cold Bay with essentially no layover time. However, all onshore personnel, at **Unalaska** including construction crews in camps, are assumed to have an impact on local police protection capabilities comparable to the non-OCS case, i.e. one additional officer and one additional jail cell for each successive growth of 300 persons,

Fire Protection

Fire protection is a normal responsibility of Alaska cities and one which is exercised by the cities of **Unalaska** and St. Paul. In addition, unincorporated areas such as Cold Bay may form volunteer fire departments or, if they are within organized boroughs, they may elect to have this

service provided by the borough **on** a service area basis. At Cold Bay, the State Division of Aviation has provided fire protection service **for the airport and associated housing areas also since Statehood and it assumed** that this organization will continue to play the lead role in fire protection for that community.

The State has no established qualitative fire protection standards except that an individual fire department must be registered with the Division of Fire Protection to be eligible to receive State revenue sharing funds for firefighting purposes. However, the Insurance Services Office, on behalf of fire insurance companies and as an aid to the underwriting of fire insurance premiums, publishes comprehensive fire protection guidelines to enable the classification of communities throughout the United States in relation to the adequacy of their fire defenses and their physical characteristics. Based upon the extent to which local fire departments meet these standards, individual communities are graded on a class 1 (best) to a class 10 (worst) scale and local insurance rates are adjusted to reflect these differences in fire protection capability. Present ratings for the communities under study are 8 to 10 within the City of Unalaska and 10 automatically at St. Paul and Cold Bay, since those settlements' fire departments have never been formally inspected. It is likely that Cold Bay's rating would improve to at least 9 if it was officially inspected.

According to the Insurance Services Office, the minimum criteria for a recognized fire department are as follows:

- o Organization: The department shall **be** organized on a sound, permanent basis under applicable state and/or local laws. The organization shall include one person (usually with the title of Chief) responsible for the operation of the department.
- o Membership: The department shall have an active membership which provides a response of at least 4 members to alarms.
- o Training: Training shall be conducted for all active members.
- o Apparatus: Response to any alarm or fire shall be with at least one piece of apparatus suitably designed and equipped for fire service. Provisions **shall be** made for the housing and maintenance of apparatus.
- o Alarm Notification: Means **shall** be provided for 24-hour receipt of alarms and immediate notification of members.

In addition to minimum criteria for fire departments, the Insurance Services Office also establishes minimum criteria for water supplies for fire fighting purposes, quoted as follows:

"A minimum recognized water supply usually contemplates a network of mains and hydrants capable of delivering at least 250 gallons per minute (over and above normal consumption) for a period of at least two hours. Where there are numerous commercial buildings, this minimum might be converted to at least 500 gpm for one hour (the same total quantity of water but available at a greater flow rate for a shorter period of time).

. . . the small settlement of a few hundred people and comprised of the usual number of small mercantile structures in a central commercial district would require 500 gpm in residential sections (well spaced or scattered **small** single family dwellings). **In the** commercial district, water in the range of 1,000 to 3,000 gpm would be required. A school complex serving the settlement and the surrounding territory probably would need something on the order of 3,000 to 5,000 gpm if there is a large building such as a **gymnasium.**"

A **great deal of flexibility is built into guidelines developed by the** insurance Services Office. This is necessary since firefighting requirements for individual communities vary greatly depending on population densities, land use patterns and the natural terrain, all of which affect running distances and response times for **firefighting** equipment. In addition, water requirements vary according to the character and scale of an area to be served. For example, the flow of water required to service **low** density residential areas is much less than that needed in a typical waterfront industrial area.

Recognizing that precise standards for fire protection are not generally applicable, the following standards are nevertheless offered.

- o All communities to have at least one **fire** station with at least two fire trucks. The capacity of the fire trucks and the need for additional equipment will be determined primarily by fire flow requirements.
- o Additional fire stations (each with at least two fire trucks) to be required where areas of concentrated development are beyond a 2 to 4 mile, radius of existing fire stations. (The actual distance may vary according to possible response time) .
- o Established fire **flow** requirements for various areas of each community are assumed to remain approximately the same except in developing residential areas where a water flow minimum of 500 gallons per minute is assumed.

The fire protection service for each of the communities under study falls short of these standards in some respect, most often in regard to response time or availability of water for firefighting purposes, with detrimental effects on their insurance ratings.

In **both** the non-OCS and OCS cases, future demands for land will be estimated and additional firefighting capabilities needed to service population growth will be determined. In the OCS cases, it is assumed that major onshore oil and gas-related facilities such as an LNG plant or an oil terminal would provide their own fire protection capabilities. However, facilities with relatively **low** inherent fire risks, such as service bases, would depend on municipal fire protection services.

HEALTH

The standards used to determine existing and future needs for medical facilities and services in the communities under study are those developed by South Central Health Planning and Development, Inc. These standards have been adopted and are used by the State of Alaska for various sized communities in **Alaska** and are summarized on the following two pages (see Tables A-1 and A-2) .

At present, al^l three of the study communities are below the service population threshold for hospital facilities or full-time services of a **physician** or dentist. **Unalaska** and St. Paul do have local clinics staffed by resident trained medical personnel and visiting physicians and

TABLE A-1

COMMUNITY LEVELS FOR
ASSESSMENT OF HEALTH RESOURCES

Criteria	Level I Village	Level II Subregional	Level III Regional	Level I Urban	Level V Metropolis
Population	25 - 80	500 - 2,500	2,000 - 200,000	100,000 - 500,000	500,000 +
Isolation/Transportation Network	Distances from other communities resources great; transportation alternatives and reliability limited	Semi-regular transportation network to: 1) outlying villages & 2) regional center	Moderately reliable transportation network to: 1) subregional center & outlying villages 2) urban centers	Continuously reliable statewide transportation center	National international network
Communications	Unreliable radio contact; one or no phone services	Reliable radio; minimal phone service	Reliable radio; some television, statewide phone network	Radio, television, statewide phone network	All communications media; statewide phone network
Economic Development	Minimal or no services	Basic commercial services to outlying villages	Service and commercial center for majority of villages in the region	Statewide, financial & commercial center	Statewide, financial & commercial center
Examples	Eek, Egegik	Unalaska	Bethel, Homer	Anchorage	Seattle

Source: South Central Health Planning and Development, Inc.

TABLE A-2

INDICATORS OF AVAILABILITY

<u>Level One</u>	<u>Level Two</u>	<u>Level Three</u>	<u>Level Four</u>
perant public health nurse <u>a/</u>	1 mid-level practitioner	1 primary care M. D. per 3,500 people (no less than 2)	1.3 physicians per 1,000 (less than half specialists) people
Health aide and apprentice <u>b/</u>	1 public health nurse	3 acute care beds per 1,000 people	3 acute inpatient beds per 100 people
Health care space	1 EMT 11	community health health center and psychologist	paramedics and advanced life support inpatient psychiatric beds
Health care trained person	1 dentist extender	1 dentist per 4,000 people	long term alcoholism treatment beds
Health care diagnostic X-ray capability	1 behavioral health counselor or social worker	X-ray technician	neonatal beds/live births
Health care daily itinerant behavioral health care visits	medical laboratory capability (microscope and refrigerator)	detox capability	therapeutic radiation capability
Health care communications	home health aide or long term care alternative	Class 4 emergency room (AMA)	surgical capacity
Health care health care representative health care decision-making group		mobile e.m.s. capacity with EMT trained attendants	1 CAT Scanner per 250,000 residents
		medical technologist	pathology and autopsy capability
		1 optometrist	blood bank
		short term shelter care	specialists/population
		itinerant M. D. specialist visits	

Definition to include audiology testing, immunization.
 Range of services provided by health aide as described in Guidelines for Primary Health Care.

Source: South Central Health Planning and Development, Inc.

dentists. Cold Bay's health services are limited to a physician's assistant at the Air Force Station and a visiting public health nurse.

The most critical element involved in health care is the presence of a physician. On average, it is assumed that one physician requires a practice of a minimum of 1,500 people. However, physicians are reluctant to work alone since there are occasions when back-up assistance is required and time is also needed away from the practice for vacations, conferences, education and other purposes. Therefore, physicians in isolated Alaska communities commonly practice in pairs. To support these two physicians, a population base of 3,500 people is generally required.

In some areas, the practice need not be confined to permanent residents nor need it be precisely 3,500. It may be economically feasible to have a practice for two physicians with a population base of closer to 3,000 people or less. A significant portion of the patient load in Unalaska, for example, is made up of fishermen, processing plant workers and other transient workers and visitors who are not permanent residents but are part of the local health care clientele load.

It is assumed that each addition of an increment of 1,500 people above a population of 3,000 would require another physician in the communities under study.

In regard to hospital beds (used as a measure of hospital facility needs), acute care beds are general hospital beds as distinguished

from long-term care or nursery beds. South Central Health Planning and Development, Inc. estimates the maximum capable of being adequately funded to be 3 to 3.5 acute care beds per 1,000 people in communities of at least 3,000 persons where the services of a physician are available.

In the non-OCS case and the OCS cases, 3.5 acute care beds per 1,000 people will be used as a standard for projection for communities with a population of more than 3,000. Given the high incidence **of** injury inherent in heavy construction projects and in the fishing and seafood processing industry and a high frequency of illness within a substantial transient workforce, the upper range of the standard for hospital beds is deemed to be warranted at **Unalaska.**

EDUCATION

It is assumed that education facilities in the communities under study will continue to be provided by existing authorities, i.e. the **Unalaska** City School District, the Aleutian Region School District at Cold Bay and the **Pribilof** Schools Regional Education Attendance Area at St. Paul.

Generally, students make up a reasonably consistent proportion of a community's population, although recently a declining one due to the nationwide drop in birth rates. A comparison of **school** enrollment as a proportion of total population for five boroughs in Southeast and **Southcentral** Alaska (**Ketchikan** Gateway Borough, City and Borough of

Sitka, Kenai Peninsula Borough, Kodiak Island Borough and Matanuska-Susitna Borough) indicated that students accounted for an average of 27.2 percent of the the total population of these areas in 1970. By 1977, this had declined to 23.2 percent and would have declined even more significantly had it not been for the inclusion of the Kodiak Island Borough (where the closure of the Naval Station during this period resulted in an increase in the proportion of students to total population). Some further decline in the student to total population ratio is anticipated. For example, students accounted for only 18.3 percent of Anchorage's population and for 19.8 percent of that of the Ketchikan Gateway Borough in 1977, However, continued declines should be much less dramatic and student to population ratios are then expected to stabilize.

Among the study area communities, the student populations at Cold Bay and St. Paul account for nearly 25 percent of the total population. In view of the general decline in student population ratios observed elsewhere in the State, it is assumed that this ratio will decline to 20 percent by 1985 and remain stable thereafter for those communities. At Unalaska, the 1980 student population was approximately 13 percent of the total population. This low ratio reflected the unusually high number of transients and unattached adults in Unalaska's population. Since this demographic trait is expected to remain a feature of Unalaska's future population, the current ratio of 13 percent was used to forecast future school enrollments during the forecast period.

In the various OCS cases, assuming that most offshore population and temporary construction camp personnel are discounted, no significant changes in ratios of students to total population are anticipated at Unalaska which could be attributed to OCS development.

Once total school enrollment has been forecasted, allocation of students **between elementary and** high school grades is necessary since standards for the number of students per classroom normally differentiate between the two levels. Approximately 60 percent of school students in Alaska are usually enrolled in the elementary grades. This proportion has been slightly lower recently as the "peak" student years are now in high school. The enrollment pattern in the study communities' school systems is reasonably close to this 60/40 ratio, after recent additions to grade offerings at Cold Bay and St. Paul are considered. Therefore, the forecast of future school enrollment allots students to elementary and secondary grades in that proportion.

According to the National Education Association, there are no established national or State standards for the number of students per classroom. Nevertheless, a standard used by many Alaska school districts is 25 students per classroom for the elementary (K-6) grades and 20 students per classroom for the high school grades.

To determine future classroom needs in all cases, the following assumptions have been made:

- o Student enrollment will be divided on a 60 percent elementary (K-6) and 40 percent high school (7-12} basis throughout the forecast period.
- o Standards of 25 students per classrooms for elementary grades and 20 students per classroom for high school grades will apply throughout the forecast period.
- o For purposes of estimating teacher staffing requirements, it is further assumed that the number of added teachers will be required to the number of added classrooms.

RECREATION

The cities of Unalaska and St. Paul operate some recreational facilities while at unincorporated Cold Bay, the federal government provides most recreational facilities. However, as elsewhere in Alaska, much of the recreation function in these communities is associated with the schools. Also, outdoor recreational activities which need no formal recreational facilities are highly popular.

The following standards suggested by the National Recreation and Park Association are basic standards which are slightly modified to apply to the communities of Unalaska, Cold Bay and St. Paul.

- o Neighborhood Parks: 21.5 acres per 1,000 people serving a population of 500 to 10,000 people.
- o Play Lots and Other Neighborhood Recreation Areas: 0.5 acres per 1,000 people serving a population of 250 to 2,500 people.

Therefore, a total of 3 acres per 1,000 people is assumed to be required in outdoor neighborhood park and recreation areas. These outdoor areas are assumed to accommodate all outdoor basketball courts, volleyball courts, baseball or softball diamonds, tennis courts, jungle gyms, etc. However, while national standards provide adequate guidelines for local parks and recreation, the combination of isolation, geography, climate and local desires for parks and recreation facilities in Alaska must also be taken into account.

Most isolated Alaska **communities** feel deprived without a reasonably full range of parks and recreation facilities. For example, the national standard for 50 meter swimming pools is one per 20,000 people. However, almost every coastal Alaska coastal community of 2,000 **people** has a swimming pool as well as every major high school in the urban areas of the State. Perhaps a more extreme deviation from national standards occurs with indoor basketball courts where most Alaska communities of any size have an indoor facility of some description.

Thus, in addition to outdoor recreation facilities, indoor basketball courts and swimming pools are needed and desired recreation facilities in the communities under study. These facilities provide recreation alternatives, especially during the long inclement Alaska winters.

Also, swimming pools permit the **local** populations to learn to swim and to develop swimming skills. In areas where a large proportion of the people work on boats or on the waterfront, these skills may be necessary for

survival and they cannot be easily learned in the frigid ocean waters, streams or lakes of Alaska.

Therefore, the following minimum standards are assumed to apply to the communities under study:

- o Indoor Basketball Courts: One for every 500 people.
- o Swimming Pools: One for every community of 2,000 to 15,000 residents, plus an additional pool in conjunction with each added high school complex.

There must also be some provision for those not desiring strenuous indoor recreation. **In most** Alaska communities, this form of recreation is provided through a community center or, as they are often called, a community hall. **Thus**:

- o Community Center: One for every 25,000 people, except that every community of 2,000 residents or more **shall** have a community recreational center of appropriate size.

These standards will be applied in both the non-OCS and the OCS cases.

UTILITIES

Water

Unalaska, Cold Bay and St. Paul have community water systems. Water usage in the coastal municipalities under study can be separated into two basic classes of service. These are domestic and, at Unalaska, industrial, which is a major consumer of water during the processing season. Excluding industrial consumption, the baseline data indicate that local water consumption at Unalaska and Cold Bay is currently in the range of 200 gallons per person per day and at St. Paul about 135 gallons. However, because of sketchy water consumption data, these figures must be viewed as approximate.

Present rates of water usage in coastal communities such as those under study are estimated by the U.S. Public Health Service to be approximately 120 gallons per person per day in domestic use. Many local utilities in Alaska estimate usage at approximately 125 gallons per person per day and this figure was used to forecast future increments in domestic water consumption. This higher figure is believed to be warranted as the communities under study receive significant numbers of transient visitors. Thus, the estimate of future water consumption for domestic purposes is calculated by multiplying the estimated annual average population by 473 liters (125 gallons) per person per day by the number of days in the year to arrive at estimated total annual domestic water use.

Current industrial water use for a typical large processing plant at Unalaska is estimated by engineers to peak at about 3,000,000 gallons per day. Water consumption for the established processing industry is forecast to maintain its current proportion of total community water consumption. Thus, it is assumed in the non-OCS case that, exclusive of the bottomfish industry, added industrial activity such as expansion in fishing and fish processing results in water usage proportionate to the water usage resulting from the added population derived from the expanded industrial activity. Industrial water consumption for the bottomfish processing plants is estimated at levels consistent with data for that industry.

Forecast increases in population in the non-OCS case are based upon growth in existing economic sectors plus the bottomfish industry, and the distribution of employment (and therefore population) among these economic sectors was not significantly altered in forecasting future employment (and population). Therefore, it is assumed that the increase in domestic water consumption in the future provides an indication of potential industrial water consumption in the established processing industry.

In the OCS cases, however, due to fluctuations in demand during the exploration and development phases, forecasts of water requirements call for estimates based upon assessments of water usage of individual industrial activities as well as resulting domestic demands.

In the OCS cases, it is assumed that the per capita usage of water for **domestic purposes** will remain at 125 gallons per person per day. It is also assumed that normal water usage in all of the onshore OCS facilities will be 125 gallons per day per onsite employee. Offshore requirements on all boats, barges, rigs and platforms for general use are assumed to be 100 gallons per day per onsite employee. On the other hand, the water requirements for exploration wells drilled from rigs and development wells **drilled** from platforms were derived from the estimates provided by the Gulf of Alaska Operators Committee. (Alaska Consultants, **Inc., July 1976**).

Approximately 40,000 gallons per day per offshore rig operation, including supply boats, was estimated by **ARCO** to be the offshore consumption. Of this amount 30,000 gallons is estimated to be drill water. Workover well drilling was assumed to require only 12.5 percent of normal platform consumption on average during the workover periods.

The supply of water to offshore activities and to onshore service bases during construction and operations is assumed to be provided by the City of **Unalaska**.

Sewer

None of the three communities under study possess satisfactory sewage treatment facilities. It is assumed that these facilities will be brought up to standard for the base case forecast.

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According to the U.S. Public Health Service, the quantities of domestic wastewater can be assumed to equal domestic water use and, since industrial wastes are not run through the sewage collection system and treatment plants in the communities under study, domestic wastewater can be assumed to equal total **wastewater**. Therefore, given a per capita consumption of 125 gallons per day of water usage and a peak flow being an estimated three times the average flow, a treatment plant would be required to have the capacity to process approximately 15.63 gallons per person per hour or:

- o $125 \text{ gallons/day} \div 24 \text{ hours/day} = 5.21 \text{ gallons/hour} \times 3 = 15.63$ gallon capacity to accommodate peak loads.

Therefore, it is assumed that sewage treatment plants must have the capacity to accommodate 15.63 gallons of wastewater per person.

It is also assumed that industrial wastes produced at seafood processing plants will be processed by the industries generating the industrial waste.

Electric Power

Electric power is distributed to the communities by municipal (Unalaska), private (Cold Bay) and federal (St. Paul) utilities operators, supplemented in each community by a variety of independent private or public systems. Because of the diversity of systems, it is difficult to accurately

determine current demand and consumption. Therefore, for forecasting purposes, the standard for future demand used for forecasting was the same standard adopted for the Lower Cook Inlet Sale #60 socioeconomic impact analysis.

In calculating future electric capacity requirements for the non-OCS case, an installed capacity of 3.75 KW per person is assumed. This factor includes capacity for both residential and industrial users. It is based on provision of service for the same basic household functions currently being serviced and for existing or projected non-OCS industrial requirements.

In view of the rising cost of energy, it is also assumed that, to the degree feasible, wherever multiple local power and distribution systems exist, they will be consolidated into a single community-wide system. For example, it is assumed that the numerous separate industrial generation systems and the community system at Unalaska will be consolidated into a single generation and distribution system.

As an empirical check, the forecast factor of 3.75 KW per person was compared with recent actual total capacity and consumption data for Unalaska and was found compatible with actual conditions. Also, industrial demand which might stem from new shore-based bottomfish processing plants was estimated according to data obtained from industry sources and was found to be comparable to existing industrial users. Therefore, bottomfish industry power requirements are treated similar to other non-OCS uses.

In the OCS cases, 3.75 KW per person of installed capacity is demanded for each new resident. It is also assumed that construction site and construction camp activities will require 3 KW per person. Service bases are assumed to have a demand for electric power exceeding the overall 3 KW per person standard. Approximately 650 KW is required to drive the pumps for loading water, fuel, and powdered mud and cement on board the supply vessels. This block of power is sufficient to accommodate two berths. Additional increments of two berths will require 650 KW to power similar equipment.

Communications

Telephone service in the communities of Unalaska and Cold Bay is currently provided by the Interior Telephone Company. St. Paul has no local telephone service although there are a few long distance subscribers. The Alaska Public Utilities Commission, the Municipality of Anchorage's Telephone Utility and the Southeastern Telephone Company were contacted in an attempt to derive standards for future levels of telephone service which are likely to be demanded in these communities.

According to the Anchorage Telephone Utility, in order to determine future levels of demand, the number of lines (excluding extensions) is estimated by using past trends and applying them to forecasts of population growth. The consulting engineers for the Southeast Telephone Company employ a linear trend equation based upon past lines installed.

Both means of **forecasting are short range and depend upon yearly installation figures.** A relationship, however, was found between telephone **lines in use and** housing units. In the three communities under study, the number of lines per housing unit was between 1.1 and 1.2. Using Anchorage as a comparison, Anchorage has approximately 2 telephone lines per housing unit. On the other hand, in 1970 Anchorage had only 0.57 telephone lines per housing unit (or, with the military housing units totally discounted, 0.89). This represents a growth rate of over 15 percent per year. However, Anchorage's unique function as the hub of Alaska's communications and transportation and its Statewide appeal as a retail and services area must be taken into account,

In both the non-OCS and OCS cases, it is assumed that 1.25 lines will be required initially for each housing unit added. However, housing units do not include group housing such as construction camps or cannery barracks as a basis for calculating future requirements. It is also assumed that telephone equipment and services will be provided by the existing telephone utility companies.

Where local service is not now provided, as at St. Paul, it is assumed that a standard level of service will be installed before 1985.

Solid Waste Disposal

The standards for solid waste disposal are based upon disposal records of the Municipality of Anchorage and trends of solid waste generation in

Anchorage. According to the Solid Waste Division of the Public Works Department, the average Anchorage resident generated 5.35 **pounds of solid waste** per day during **1977**. This has been projected to increase at an average rate of 2 percent per year through 1985, then at an average rate of 1 percent through 1990. Thereafter, it is assumed that no increase in the per person rate of **solid waste** generation will occur.

In terms of sanitary landfills, the Municipality records an average density of 330 pounds per cubic yard delivered and 800 pounds per cubic **yard in place**. These standards are assumed for the forecast of the non-OCS cases in the communities under study.

In the OCS cases, the same standards as the non-OCS case are assumed. **In** addition, it is assumed that **all** OCS onshore support facilities will generate 6.5 pounds per day per employee of additional non-toxic **solid waste**.

Offshore, **all** combustible materials are assumed to be incinerated and only non-combustible materials are returned **to** shore for disposal. This is estimated to be one ton per week per semi-submersible rig, platform rig or barge operation, including any refuse from supporting boats during the exploration and development phases. Furthermore, the average density of this solid waste is estimated to be approximately 4,000 pounds per cubic yard since it is composed in **large** part of **steel** items such as used drill bits. Upon completion of development, one-quarter of the amount generated by maximum platform activity is assumed to return from the platforms during the production phase.

In terms of tonnage and density, there is a limited amount of toxic solid waste returning to shore for disposal. Generally, this is in the form of used oil or oiled materials. Onshore, some used oil plus sediment materials, sludge, scum and other wastes from the manufacture of LNG and the treatment of crude oil are toxic. The quantities are small and can be disposed of by the community in an environmentally sound manner on a small specially prepared site.

Local Government Finances

Where applicable, the following standards, methods and assumptions will be employed to forecast community revenues and expenditures. The resulting surplus or deficit calculated provides an indication of the community's ability to fund capital improvements or upgrade services employing its current rates and measures to **Capture** revenues.

The following assumptions are made:

- o Forecasts of revenues are made using current rates and measures as a basis for projection. A 5-year average or an average appropriate to reflect recent circumstances will be utilized.
- o The existing level of service is used as the basis for projection. Despite a level of service which may be less than desired, expenditures for services are maintained at current levels.
- o Current State statutory limitations on taxation of certain oil and gas properties by local governments will continue to be in

force. Although local government units theoretically have the power to levy property taxes of up to 30 mills, in reality their taxing ability may fall far short of this because of limitations on the taxation of certain oil and gas properties as defined in Title 43.56 of the Alaska Statutes. These limitations are set forth in Section 29.53.045 of the Alaska Statutes, which is quoted in part:

- "(a) A municipality may levy and collect taxes on taxable property taxable under AS 43.56 only by using one of the methods set out in (b) or (c) of this section.
- "(b) A municipality may levy and collect tax on the full and true value of taxable property taxable under AS 43.56 as valued by the Department of Revenue at a rate not to exceed that which produces an amount of revenue from the total municipal property tax equivalent to \$1,500 a year for each person residing within its boundaries.
- "(c) A municipality may levy and collect a tax on the full and true value of that portion of taxable property taxable under AS 43.56 as assessed by the Department of Revenue which value, when combined with the value of property otherwise taxable by the municipality, does not exceed the product of 225 percent of the average per capita assessed full and true value of property in the State multiplied by the number of residents of the taxing municipality."

Title 29.53.055 of the Alaska Statutes states that there is no limitation on taxes levied or pledged to pay or secure the payment of the principal and interest on bonds. In this regard, Chapter 94 SLA 1977 stressed that the per capita limitation did not include debt service. AS 29.53.055 is quoted as follows:

NO LIMITATION ON TAXES TO PAY BONDS. The limitations provided for in Sec. 45 or 50 of this chapter do not apply to taxes levied or pledged to pay or secure the payment of the principal and interest on bonds. Taxes to

pay or secure the payment of principal and interest on bonds may be levied without limitation as to rate or amount, regardless of whether the bonds are in default or in danger of default.

Therefore, at the extreme, AS 43.56 serves only to limit municipal operating budgets.

- o The limitation imposed in AS 29.53.045(b) is used in this study as the upper limit of municipal property tax revenues. Therefore, a total property tax equivalent to \$1,500 a year for each person residing within the municipal boundary is assumed as the upper limit of property tax revenues.
- o It is also assumed that the excise tax limitation imposed in AS 43.56.030 cited below will remain in effect throughout the planning period.

AS 43.56.030(2): . . .all other taxes imposed by a municipality on or with respect to the property subject to tax under this chapter or exempted from taxation by Section 20 of this chapter, including, but not limited to,

- (A) taxes on the retail sale or use of the property except for the retail sales tax on the first \$1,000 of each sale;
- (C) taxes on the sale or use of services used in or associated with the property or in its maintenance or operation except for the sales tax on the first \$1,000 of each sale;
- (E) any license, excise, fee, charge or other tax on or pertaining to the property or services.

As a result of this limitation, significant revenues are not forthcoming from oil and gas activities. Therefore, a projection

of current sales tax revenues on a per capita basis is assumed to be representative of the future receipts from this revenue source.

- o It is assumed that current federal law prohibiting State or **local government taxation of properties beyond the three mile limit** or revenue sharing from **oil** and gas development on the Outer Continental **Shelf** will remain in effect throughout the planning period.

REVENUES

Revenues are grouped and forecasted under the headings of property taxes and other revenues such as **sales** taxes, intergovernmental revenue and miscellaneous revenues. Revenues are projected in constant dollars as of **1980**.

Property Tax Revenues

The non-OCS property tax revenue estimates are based upon per capita **additions** to assessed valuation. Thus, each new **resident** is assumed to add to the assessed value **of** the community an amount **equal** to the total assessed value in the base year divided by **the** total population. The total assessed value is then multiplied by the current **millage** rate to obtain the forecast of uninflated property tax revenue for each year.

Sales Tax Revenues

Sales tax **revenues in the** non-OCS case are based upon current per capita additions to sales tax receipts. Thus, each new resident is assumed to add to the **total** sales tax receipts of the community an amount equal to the total sales tax receipts in the base year divided by the total population.

In the OCS cases, sales tax **revenue estimates are based upon** per capita additions to sales tax receipts as the estimates are in the base case. However, in the OCS cases where major construction activities take place onshore, it is assumed that the construction workers **will** live in camps with accommodations of excellence. It is assumed that, on average, an employee residing in a camp will spend only 1/10 as much as an employee with a permanent residence outside the construction camp. Therefore, in the calculation of sales tax revenue only 10 percent of the workers resident in construction camps **will** be counted.

Intergovernmental Revenues

In the non-OCS case and the OCS cases, intergovernmental revenues estimates are based upon per capita additions to intergovernmental revenues. Thus, each new resident is assumed to add to the intergovernmental revenues transferred to the community an amount **equal** to the total value of intergovernmental revenues in the base year divided by the population.

Other Revenues

In the non-OCS case, other revenues estimates are based upon per capita additions to the **total** of other revenues such as license fee, permits, interest earnings, rentals, etc. Thus, each new resident is assumed to add to other revenues of the community an amount **equal** to the **total** value other revenues in the base year divided by the **total** population.

In the OCS cases, other revenues estimates are based upon per capita receipts as are the estimates in **the base** case. However, in the OCS case where construction activities take place onshore, it is assumed that the construction workers **will live** in construction camps of excellence with a wide range of recreation facilities and services. Thus, it is assumed that on average an employee residing within a camp **will** contribute **little** to the generation of these revenues. Therefore, in the calculation of other revenues on a per capita basis **only** 10 percent of the workers resident in construction camps **will** be counted.

EXPENDITURES

Operating Expenditures

In the non-OCS case, the operating budget is forecast on a per capita basis.

In the OCS cases, the operating budget is also forecast on a per capita basis. However, where construction activities take place onshore, it is assumed that construction workers in camps will not require the same expenditures as those resident in the community outside the camps. It is estimated that the expenditures required per employee resident in the construction camps will be approximately 1/5 as much as a worker residing outside the camp. Therefore, in calculating operating expenditures on a per capita basis, 20 percent of the workers resident in construction camps will be counted.

Debt Service

Debt service is the amount necessary to pay or secure the payment of the principal and interest of bonds. In all cases only existing debt service requirements to maturity will be listed.

School Support

Funds provided to support local school districts are calculated on a per student basis. It is assumed that a proportionate share of the support of schools will be maintained for local, State and federal support throughout the planning period,

Surplus or Deficit

In the non-OCS case and the OCS cases, the total of revenues is subtracted from the total of expenses to produce a surplus or a deficit of funds. A surplus represents funds available for additional capital improvements or additional operating expenditures. A deficit indicates the inability to provide for the same level of community services and to provide added capital improvements.

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