Appendix E

CRITERIA FOR RESOURCE INFORMATION SUMMARY RATINGS

Fourteen resource reports called "elements" were developed in preparation for developing Kuskokwim Area Plan alternatives (see Appendix D - Background Data and Element Reports). Elements evaluated the distribution, quantity, and quality of each of the 14 major resources in the planning area. Areas were then given suitability ratings for the resources they contained.

Suitability ratings were developed to identify areas with the physical ability to support a particular use (e.g., land that has certain slopes, vegetation, etc., that would be suitable for settlement). These suitability ratings are outlined by subunit in the resource information summary charts in Chapter 3.

A list of the major criteria for suitability ratings for each resource follows.

AGRICULTURE

The lack of detailed soil information makes it impossible to predict potential agricultural sites with precision. The agriculture potential map that was produced for this plan only provides a guide to areas that merit further research on agricultural potential, and areas where agricultural potential should be considered when land use decisions are made. Soils information was based on the 1:1,000,000 USDA Exploratory Soil Survey. The information in this survey is quite general. USDA conducted fieldwork in 1985 in some parts of the planning area under 1,000 feet elevation in order to verify the information in the initial exploratory soil survey and to identify areas with farmland potential. This potential was based on slope, soil depth, soil texture, and drainage. Though climate was not taken into account in the ratings because weather information for the region is sparse, it should be noted that the recent inclusion of climatic data into soil survey interpretations has resulted in lowering the agricultural ratings of many soils in southcentral Alaska. Overall suitability ratings for access are based on the soils ratings and proximity to access. Lands within 2 miles of an airstrip, a road, or barge traffic on the Kuskokwim river are considered to have high potential for agricultural development. Lands within 2 miles of a river routinely navigable in summer by smaller boats, OR lands 2-6 miles from an airstrip, a road or Kuskokwim barge traffic are rated moderate. Lands further from access are rated low.

Soil Suitability Ratings

Rating	Soils	Access
High	>40% of area suitable for crops	≤ 2 mi. from road, airstrip, or barge route
Moderate	>40% of area suitable for crops	≤ 6 mi. from road, airstrip, or barge route
	20-39% of area suitable for crops	≤ 6 mi. from road, airstrip, or barge route
Low	20-39% of area suitable for crops	> 6 mi. from road, airstrip, or barge route
	<20% of area suitable for crops	all areas

Overall Ratings for Agriculture Suitability

Rating	Soils	Access
High	Moderate	or Low
Moderate	High or	Moderate
Low	Moderate	Low
	Low	High, Moderate, or Low

CULTURAL AND HISTORIC

The staff in the State Office of History and Archeology in the Division of Parks and Outdoor Recreation reviewed the 1:250,000 Alaska Heritage Resources Survey (AHRS) maps to determine concentrations of known sites within the planning area. They also produced a cultural resources report for the region which was used to identify areas with potential for containing suspected but undocumented sites. Areas were ranked using the following criteria:

- Areas with high concentrations of known cultural values.
- Areas with some known cultural values and high potential to contain cultural values.
- Areas with unknown potential for cultural values.

ENERGY

Coal. resources were assessed by compiling a comprehensive data stack which included the following categories of information:

- Presence or absence of nonmarine rocks of Cretaceous or Tertiary age and their aerial extent.
- Coal occurrences and prospects including density, size, thickness, etc.
- Reserves/resources (incremental scoring based on the basis of volume, tonnage, etc
- Production (if any)
- Coal quality
- Potential for mine extraction; i.e., overburden, coal ration, open cast vs. underground
- Industry interest nominations

Scores for these seven criteria were added to obtain a score for each township in the planning area. Five distinct populations of rankings appeared which can be summarized as follows:

Very Low - Geologic environment considered unfavorable; nonmarine sedimentary rocks of Cretaceous or Tertiary age are not known or are deeply buried by younger sedimentary strata. No coal occurrences are known.

Low - Geologic environment may be favorable but existence of significant coal prospects unknown. Cretaceous-Tertiary nonmarine rocks do exist within township and define a portion of a known coal bearing province. Some thin coal seams may exist but physical characteristics may be unknown or unfavorable.

Moderate - Coal bearing nonmarine sedimentary strata underlie major parts of the township and significant coal occurrences or prospects may be present. Published coal analyses may be available which classify and rank coal according to standard ASTM/Btu classifications. However, not enough known to classify occurrences or prospects as resources or reserves.

High - Geologic environment always favorable; i.e., most if not all of township is underlain by significant coal bearing basin. Significant coal deposits recognized and measured physical characteristics show favorable Btu/ASTM classifications. In study area, they are mainly subbituminous to bituminous rank. Some resources are known and coal thicknesses are significant.

Very High - Contains virtually all favorable characteristics of coal potential including significant coal basin, significant occurrences and deposits, favorable physical characteristics, and significant resources. Subsurface and surface data allow for some reserve estimates.

Peat. A reconnaissance peat study was undertaken by DGGS in an initial attempt to identify potential peat resources immediately adjacent to McGrath. More systematic sampling as well as engineering, and feasibility studies will be required to determine whether or not such a resource can be economically utilized. Portions of subunits 5j and 9b west of McGrath were sampled and mapped by DGGS for peat and show some potential for the production and use of this resource for energy.

Geothermal. Only two known and one suspected hot springs are located in the planning area. Because the potential for development of these springs is low, they are not listed in the Chapter 3 resource information summary charts.

FISH AND WILDLIFE HABITAT

The Habitat Division in ADF&G determined the suitability of the land as wildlife habitat using assigned values (A1, A2, B1, B2, and C) based on the estimates of habitat quality and human use. The species distribution and life history of key species (e.g. moose, anadromous fish, caribou, bear) were first mapped using important life functions (e.g. spawning, winter concentrations, calving). The factors were then aggregated putting the highest values on biological criticality and species diversity. Subsistence information from the villages within the planning area were then added to habitat values to raise rankings of areas that receive a high level of use (Also see Appendix A: "Fish and Wildlife Habitat"). The definitions of these criteria are as follows:

Suitability Category	Definition
A-1	A discrete habitat area needed to sustain a species within a region
A-2	Special value habitat and/or harvest area
B-1	High value habitat and/or harvest area
B-2	Moderate value habitat and/or harvest area
C	Low value habitat and/or harvest area

FORESTRY

The overall ratings for suitability for timber management are a combination of vegetation ratings with ratings for access and proximity to communities.

Vegetation Type	Rating
Closed White Spruce	High
Closed Deciduous Forest	High
Open White Spruce	Moderate
Open Deciduous Forest	Moderate
Black Spruce	Low
Nonforest Types	Incapable

The criteria for the overall forestry ratings are as follows:

Vegetation Type	<6 Mi. of Pop. Center	<6 Mi. from Road or River	<2 Mi. from Road or River	2-6 Mi. from Road or River
Dense White Spruce	High	High	Moderate	Low
Dense Deciduous Forest	High	High	Moderate	Low
Open White Spruce	High	Moderate	Low	Low
Open Deciduous Forest	High	Moderate	Low	Low
Black Spruce	Very Low	Very Low	Unsuited	Unsuited
Nonforest Types	Unsuited	Unsuited	Unsuited	Unsuited

GRAZING

A map of areas with potential for grazing potential was developed to provide a rough idea of areas that could be used for grazing. This map was based on interpretations of soil characteristics and vegetation types in the USDA Exploratory Soil Survey of Alaska. Associations in which more than 60 percent of the area was judged to have good or fair suitability for reindeer grazing were rated high potential. Areas with more than 31-60 percent good or fair suitability were rated moderate, and areas with 1-30 percent good or fair suitability were rated low. Rocky, mountainous terrain with little or no vegetative cover were rated unsuited for grazing.

MATERIALS

Criteria for rating materials were based on two factors: sources of suitable gravel or riprap had been identified by DGGS and DOT/PF, and materials were located on or near the Kuskokwim River where villages use this resource or it can be barged to population centers on the delta. Ratings of high suitability were restricted to areas where the presence and quality of the resource had been documented: along the Kuskokwim River between Stony River and Lower Kalskag and in the vicinity of McGrath. The types of gravel sources that were given high ratings included active alluvium that is found on river bars, stream beds and alluvial fans; placer wastes; and some types of bedrock. Sources of riprap that were given high ratings were five sites near McGrath that had been identified by preliminary DGGS studies.

Scores for nine major criteria were added to obtain a raw score for each township in the region. The raw scores were statistically analyzed and a histogram showing percentile rankings for all the townships was developed. Much of the scoring method was dependent on the quality of the data used. The Kuskokwim River region is one of the most remote regions in the state and large areas, particularly in the southern portion of the planning area, lack good geologic data bases necessary for accurate mineral potential determinations. Hence some townships ranked low may simply reflect a basic lack of information and could still yield minerals in the future. An area receiving a high mineral rank does not necessarily predict mineral development. Other factors to be considered include access, low commodity prices, availability of energy and labor, and climatic and terrain factors. The nine major criteria used include:

- Geology
- Mineral terranes
- Mineral indicators
- Mineral occurrences
- Reserves
- Production
- Claim density
- Industry interest
- Exploration expenditures

Five distinct populations of rankings appeared which can be summarized as follows:

Very Low - Geologic environment generally unfavorable; little or no bedrock is exposed. Low potential for geologic units to host either lode or placer mineral deposits. Generally little or no mining activity, poor metallogenic production or reserves. Rank in the 42nd percentile or lower of total township population.

Low - Geologic environment may be favorable, but generally poor or moderate; few or no known mineral occurrences or geochemical anomalies. Geophysical anomalies may exist, but bedrock indicators for such anomalies generally unfavorable. Seldom occurs in mineral terrane. No production or reserves of minerals. Rank in 43-72 percentile or lower of total township population.

Moderate - Geochemical environment generally favorable; low claim density, geochemical or geophysical anomalies can exist and generally contain one or more mineral occurrences. Townships may be on trend with group of townships defining mining district or mineral belt. Can obtain modest mineral production or reserves. Rank in 73-92 percentile of total township population.

High - Geologic environment very favorable and usually includes mineral terranes that contains some or all of the following: geochemical anomalies, geophysical target areas, significant mineral occurrences or deposits, and mining claim activity. About 10 percent of the townships with this ranking have had past metal production or contain proven reserves or minerals. Ranks in the 92-97.5 percentile bracket of total township population.

Very High - Geologic environment very favorable and always part of significant mineral terranes. Contains significant geophysical and geochemical anomalies, mineral occurrences, and deposits, high claim density, and have been nominated by the mineral industry for activity or selection interests. About 90 percent of townships with this rank have sustained past or present metal production and contain significant reserves of mineral resources. Rank comprises top 2.5 percentile of total township population.

OIL AND GAS

Because so little is known about the oil and gas potential in the planning area, each resource information summary chart in Chapter 3 only notes whether a subunit is within the currently mapped estimated Holitna or Lake Minchumina sedimentary basin boundaries. These are the areas with the greatest likelihood of containing oil and gas.

RECREATION

Three criteria were used to rate sites for non-consumptive recreation value. A checklist for each of the three criteria was completed for each location. The final rating for the site or area was based on the highest ranking of the three criteria. For example, if a river was rated moderate because of its existing uses for recreation but low because it was distant from the villages, its final ranking was moderate. Ratings for recreation were based on statewide comparisons and for this reason only a small portion of the planning area was rated high for recreation.

The criteria for the overall recreation ratings are as follows:

Criteria	High	Moderate	Low
Existing and potential use for recreation.	Area currently receives intensive use; or moderate use that is likely to become intensive in the long term (by 2007).	Area receives moderate use which is likely to stay the same over the short term (by 1997); or low use that is likely to become moderate use over the long term (by 2007).	Area receives low level of use which is not likely to change over the long term (by 2007).
Location in relation to villages (provides for recreational experiences close to residences).	Easily accessible and within 1 hour travel of communities on foot, skis, boat, snowmachine, ORV, or automobile [not airplane] with population over 1,000.	Easily access. village with pop. over 500 and under 1,000 and within one hour travel. of village.	Easily accessible to village with population under 500 and within one hour travel
Economic value of site for commercial recreation.	High potential for commercial recreation.	Moderate potential for commercial recreation.	Low potential for commercial recreation.

SETTLEMENT

Two groups of criteria were used to determine whether lands are appropriate for settlement. These include: the physical features of the land and resources that affect building a house or cabin and using it without detriment to the surrounding land or water, and the social and economic constraints that affect the safety and cost of settlement. Lands were evaluated for their suitability to provide sites for remote residences for private recreation cabins. Many physical land characteristics such as slope, elevation, and permafrost generally coincide with the vegetation patterns in the region. The overall ratings use vegetation types as a proxy for more detailed information on physical characteristics. Vegetative types are combined with access data in the overall ratings.

These ratings do not systematically consider amenity values such as good views or proximity to fishing streams. However, amenity values can strongly affect desirability of a particular site. Therefore, amenities were considered when specific sites were selected for presentation in the alternatives and the draft plan.

Overall Rating	Characteristics
High	Closed white spruce, hardwood, or mixed hardwood-white spruce forests within 2 miles of boat, plane, or road access or trail from existing community.
Moderate	Open white spruce forests within 2 miles of boat, plane, or road access or trail from adjacent community.
Low	Closed white spruce, hardwood, or mixed forests more than 2 miles from access.
Or	
	Shrublands within two miles of access
Very low	Shrublands more than 2 miles from access.
Or	
	Black spruce lands within 2 miles of access.
Unsuited	Black spruce lands more than 2 miles from access and all unvegetated lands (glaciers, barrens, recent burns, etc.)

IMPORTANT TRAILS AND PUBLIC ACCESS

Several sources of information were used to determine important trails and public access. Anchorage DGGS staff compiled information from USGS maps, DOT/PF trails and airport maps, and contacts with individuals within the region. DGGS staff in Fairbanks contacted miners to determine major cat trails used by the mining community. Finally, BLM provided information on the Iditarod National Historic Trail System and the race trail. This information was compiled in the trails and transportation element as well as on working maps. Some of these trails are shown in Chapter 3 unit maps and in Appendix C.