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**ENVIRONMENTAL
STATEMENT**

EAGLE BAY

HIGHWAY BRIDGE



**DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, OMAHA
CORPS OF ENGINEERS, OMAHA, NEBRASKA**

EAGLE BAY HIGHWAY BRIDGE

(X) Draft () Final Environmental Statement

Responsible office. U.S. Army Engineer District, 6014 U.S. Post Office and Court House, Omaha, Nebraska 68102 (1-402-221-3900) is the lead agency with the entire project coordinated with the Federal Highway Administration and the State Highway Department, Bismarck, North Dakota.

1. Name of action. (X) Administrative () Legislative

2. Description of action. The proposed project will provide for the construction of a bridge 4,500 feet in length across the Little Missouri River Arm of Lake Sakakawea, and construction of 20.7 miles of two lane hard-surfaced roadway to connect the proposed bridge with State Highway 22 near Mandaree, North Dakota and State Highway 8 near Twin Buttes, North Dakota.

3. a. Environmental impacts. Construction will improve the continuity of travel, enhance social and business opportunities, and open the Fort Berthold Indian Reservation for tourism. However, it will require a commitment of 490 acres for project purposes, terrestrial habitat will be altered, and aquatic flora and fauna will be temporarily disturbed.

b. Adverse environmental effects. The commitment of land for roadway surface will be approximately 90 acres. During construction, emissions, noise, temporary water turbidity, and soil erosion will not be completely eliminated. The roadway and construction activities will cause intrusions into fish and wildlife habitat.

4. Alternatives. No development, ferry boat service, a roadway paralleling the Little Missouri River Arm of Lake Sakakawea from Twin Buttes to North Dakota Highway 22 near the Lost Bridge, and four alternate lake crossings, used with three alternate roadways.

5. Comments requested.

a. Government agencies.

Environmental Protection Agency
U.S. Department of Interior
U.S. Department of Agriculture
U.S. Department of Transportation

U.S. Coast Guard
Federal Highway Administration
U.S. Department of Commerce
U.S. Department of Housing and Urban Development
North Dakota Game and Fish Department
State Historical Society of North Dakota
Columbia Fisheries Program Office
North Dakota State Planning Division
North Dakota Highway Department
Bureau of Indian Affairs
Arthur A. Link, Governor of North Dakota
Lt. Governor Wayne Sanstead
Senator Milton Young
Senator Quentin Burdick
Congressman Mark Andrews
Dunn County Commission, Manning, North Dakota
Mercer County Commission, Stanton, North Dakota
McKenzie County Commission, Watford City, North Dakota
Halliday City Council, Halliday, North Dakota
New Town City Council, New Town, North Dakota
Killdeer City Council, Killdeer, North Dakota
Watford City, City Council, Watford City, North Dakota

b. Citizen groups.

North Dakota Wildlife Federation
North Dakota Association of Soil Conservation Districts
North Dakota Natural Science Society
American Fisheries Society
Institute of Ecological Studies
Tribal Business Council for the Three Affiliated Tribes,
Fort Berthold Indian Reservation
Halliday Civic Club, Halliday, North Dakota

EAGLE BAY HIGHWAY BRIDGE

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I. PROJECT DESCRIPTION

AUTHORIZATION

1.01 The Government, under the authority of Public Law 91-611, authorized the construction of bridges across the Missouri River, Lake Oahe, at a location midway between Bismarck, North Dakota and Mobridge, South Dakota, and across the Little Missouri River Arm, Lake Sakakawea in the vicinity of Charging Eagle Bay in Dunn County, North Dakota.

1.02 The construction of roadways to connect the proposed bridges with existing North Dakota State highways will be accomplished under the normal Federal Aid Highway Program. All geographic references are located in the State of North Dakota, unless otherwise stated.

PROJECT PURPOSE

1.03 The proposed project consists of constructing a bridge across Lake Sakakawea, Little Missouri River Arm, with connecting roads to North Dakota State Highways 8 and 22. The proposed Charging Eagle Bay Bridge and connecting roadway will provide a crossing between the southern and western segments of the Fort Berthold Indian Reservation and shorten the travel distance from Twin Buttes to New Town by 35 miles and from Halliday to New Town by 7 miles.

LOCATION

1.04 The proposed project is located in west-central North Dakota in Dunn and McKenzie Counties. It will be located approximately 9 miles northwest of Twin Buttes and connect the bridge to North Dakota State Highway 8 to the southeast and North Dakota State Highway 22 to the northwest. The entire project area is within the Fort Berthold Indian Reservation. The project area map, page 50, shows the location of the alternative routes.

PROJECT FEATURES

1.05 Data provided by the preliminary design analysis and cost estimates indicate that the most desirable type of structure for this bridge crossing might be one of two types, either a welded steel-plate girder or a post-tensioned concrete girder. The piers used will be of a hammerhead shape or other single-shaft type of structure, which will be able to withstand heavy ice

pressures. The proposed bridge will be 4,500 feet long, have a 36-foot wide roadway, which will provide two 12-foot driving lanes with 6-foot shoulders, and match the width of the approach roadways. One side of the roadway will have a concrete brush curb and a barrier-type traffic rail. The other side of the roadway will have a 4-foot wide sidewalk to accommodate the proposed North Country Trail. On the inside of the sidewalk there will be a barrier-type traffic rail and on the outside a pedestrian-type railing. The proposed bridge will provide a minimum of 20-feet vertical clearance over the normal operating pool level of 1850 feet mean sea level (m.s.l.) for the passage of pleasure boats and fishing craft.

1.06 The use of causeways to reduce the length of the bridge required was not considered to be practical or economically feasible because of the steep valley and deep water depths. Scour problems under the bridge are not expected due to the low velocities of flow. The primary concern will be the provision of a heavy riprap protection for the banks near the ends of the bridge to prevent wave erosion of the banks.

CONNECTING ROADS

1.07 The proposed bridge will require construction of 20.7 miles of two-lane rural roadway to connect with existing State highways. The finished roadway will provide two 12-foot driving lanes and 6-foot shoulders. It will be built with geometric standards for a 60 mile an hour speed. It will have a 44-foot graded roadbed with 6 to 1 slopes.

1.08 The right-of-way required will be 100 feet on each side of the centerline, or a total width of 200 feet. This will be the minimum right-of-way width. In many areas the roadway will require large cuts or heavy fills. In these cases, the 200-foot minimum right-of-way will be exceeded.

1.09 The State Highway Department is required by the Bureau of Indian Affairs to erect fences on the right-of-way boundary whenever the roadway is constructed through all lands owned by Indians. These fences will be included as part of the project, and cattle passes will also be built where necessary. Fee patent lands on the reservation owned by non-Indians are not fenced. The landowner is paid for moving his own fence, and the owner must make his own arrangements to move the fence.

COSTS

1.10 The construction cost of the bridge is estimated at \$15,550,000 as of April 1974, plus \$1,100,000 for engineering and design and \$933,000 for supervision and administration. An additional \$5,350,000 would be required for construction of the roadway. The present estimated project cost for the bridge and roadway is \$20,900,000.

1.11 Although the Corps of Engineers is a cosponsor with the Federal Highway Administration and the North Dakota Highway Department, the project is, in fact, a highway project. The procedures for benefit-cost analysis of highway projects have never been established, since they are not normally required. In this instance, the Corps of Engineers will follow the lead of the Federal Highway Administration, rather than expend all of the effort needed to develop a benefit-cost analysis procedure.

1.12 The project is presently in the design stage. Construction is scheduled to begin in Fiscal Year 1977.

II. ENVIRONMENTAL SETTING WITHOUT THE PROJECT

GEOGRAPHY

2.01 The Fort Berthold Indian Reservation lies in west-central North Dakota and is the home of the Mandans, the Arikara, and the Hidatsa Tribes, now known collectively as the Three Affiliated Tribes. It is an area relatively isolated from large population, manufacturing, and marketing centers. Agriculture is the primary sector of the economy.

2.02 The Fort Berthold Indian Reservation area includes five North Dakota counties--McLean, Mountrail (lying east and north of the Garrison Reservoir), McKenzie, Dunn, and Mercer (lying west and south). The area is basically rural with the population nearly equally divided between scattered small settlements of less than 1,000 population, the farm population supported by relatively large (particularly in acreage) agricultural units, and seven larger towns (none of which have a population which exceeds 2,000). There is no dominant town within the area, while full-convenience shopping services are nearly equally provided by the perimeter towns of Williston, Minot, Dickinson, and Bismarck. New Town, established as a result of inundation of Sanish, Elbowoods, and VanHook, although not located on the reservation proper, is the hub of Indian activities of a tribal or Federal nature. Numerous small towns, such as Watford City, Killdeer, Parshall, Arnegard, Alexander, Beulah, Halliday, and Garrison provide varying degrees and types of secondary services.

2.03 Lake Sakakawea was created upon completion of the Garrison Dam and is located approximately 60 miles north-northwest of Bismarck, or approximately 60 miles south of Minot. Lake Sakakawea is 178 miles long and extends to Buford. At a water surface elevation of 1837.5 feet m.s.l., the lake has a 1,340 mile shoreline and encompasses 323,000 acres.

2.04 There are two bridges across Lake Sakakawea between Williston and Garrison. These are the Four Bears Bridge located on State Highway 23 near New Town and Lost Bridge located on Little Missouri River Arm approximately 16 miles north of Killdeer on State Highway 22. North Dakota State Highway 8 previously crossed the Missouri River midway between Garrison and New Town. The bridge at this location was inundated by the waters of Lake Sakakawea and was not replaced.

2.05 Lake Sakakawea completely dominates the physical aspects of the reservation proper, effectively separating it into five geographical segments. The center of this area, which had previously been relatively contiguous, was the sheltered Missouri River valley.

2.06 Over the area, average (50 year) total precipitation ranges from 14.12 to 16.88 inches, while that for the growing season (April through September) is 11.04 to 13.45 inches. Temperatures tend to be extreme in the winter, with the mean for January varying by location from 6.4 to 11.2 degrees F. Summers are relatively cool and uniform with long-term average July temperatures of about 70 degrees F.

2.07 Topographic relief in Dunn and McKenzie Counties varies from 1850 feet m.s.l. along the shores of Lake Sakakawea to an elevation of 2100 feet m.s.l. at the tops of adjacent butte peaks.

2.08 The terrain in the Little Missouri River breaks is rugged and scenic, consisting of extensive badlands which abruptly give way to the rolling lands of the mixed grass prairie. The drainage in the area of the proposed bridge is defined by broad canyons. The bottom lands have been inundated by the reservoir and wave action has eroded the shoreline in a great number of areas to the extent of creating many high perpendicular cliffs.

2.09 Considerable amounts of sand and gravel-bearing lands are located in the Little Missouri River area. This resource will probably be used as the source of aggregate for construction of the bridge and roadway.

LAND USE

2.10 Urban. Land used for urban purposes is limited to widely dispersed, small rural towns, primarily residential in content. Commercial use is generally limited to a small central business district, and a few businesses located along the major highway or access routes to the town. Industrial usage, if it exists, is generally located on the fringes of town and along major access routes to the town.

2.11 Agricultural. Agriculture in this area is based primarily on wheat, small grains, and beef cattle.

2.12 The five-county area has three major land resource types, as shown by the plate on page 7. These are characterized by distinct geographic separations, dominant enterprise types, and settlement patterns.

2.13 The part of the study area lying east and north of the Garrison Reservoir is made up of the southern edge of the glacial drift prairie. This area is characterized by dark brown soils in a gently undulating prairie and is cut by water courses whose deeper, lower reaches are used for livestock grazing. Small grains alternated with fallow dominate the cropped acreage with wheat being the principal crop.

2.14 West and south of the reservoir lies the Missouri plateau. This consists of moderately rolling plains cut through by occasional deep water courses. About one-third of this area, which consists of a high plain, is relatively level and is devoted to small grains. The other two-thirds is in the immediate vicinity of major drainages and is devoted to range-livestock production.

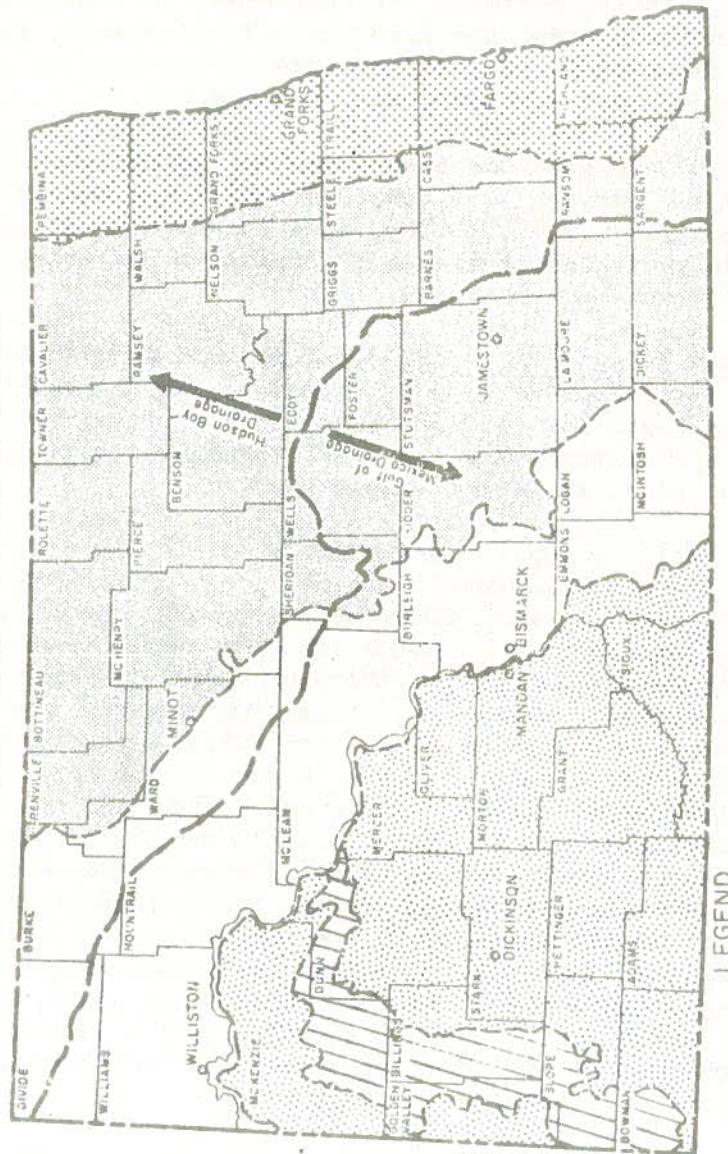
2.15 The badlands area consists of the Little Missouri drainage and the lower reaches of its tributaries. This is a scenic area, where geologic erosion has exposed broad canyons, gorges, and gullies. Essentially, all of the area is in native grass, and range-livestock production is the only economic activity of consequence.

2.16 The average farm size, number of acres of cropland, and rangeland in the counties in the vicinity of the proposed project are as follows:

<u>County</u>	<u>Average Size Farm</u>	<u>Cropland</u>	<u>Rangeland</u>
Dunn	1,756	487,887	942,629
McKenzie	1,875	535,281	1,145,976
Mountrail	1,015	725,554	401,473
Mercer	899	343,052	283,677
McLean	875	966,678	275,497

2.17 The total acreage in agricultural use in the area is nearly evenly divided between crop and grazing land, with that devoted to nonagricultural use being only slightly more than 2 percent. This nonagricultural use consists of towns and national memorial sites.

NORTH DAKOTA MAJOR LAND RESOURCE AREAS



- LEGEND**
- Badlands
 - Missouri Plateau
 - Glacial Drift Prairie - Dark Brown Soils
 - " " - Black Soils
 - Red River Valley of the North
 - Continental Divide

2.18 In comparison, the Indian trust land is devoted mainly to grazing, with the cropland being concentrated in the upper benches of the eastern, northern, and northeastern segments, as well as some in the extreme northern part of the western segments. Grazing lands dominate large sections, over three-fourths of all trust lands, of the western and southern segments.

2.19 The five-county area has been experiencing continuing adjustments since 1930. Between 1950 and 1970, the total number of farms decreased from 6,758 to 4,769, or a decrease of approximately 29 percent. As indicated, the area's population decline has been mostly at the expense of the farms.

2.20 Recreation and tourism. This area is endowed with numerous resources for outdoor recreation development. Lake Sakakawea dominates these resources in importance. Other recreation resources include historical sites, Indian cultural attractions, badlands, grasslands, and rugged isolation.

2.21 Several small recreation areas are presently located along the shoreline of Lake Sakakawea, in close proximity to the proposed crossing. This crossing will allow access to both sides of the lake for recreation purposes. There are four areas located on the southern shores of the Little Missouri River Arm and two areas on the northern shores. The three recreation areas on the southern shores are the Little Missouri Corps' Recreation area, located 12 miles north of Werner; Charging Eagle Corps' Recreation area (also referred to as the Halliday Park and Marina), located 23 miles north-northwest from Halliday; and the Red Butte Bay Corps' Recreation area, located 21 miles north-northeast from Halliday. The two northern recreation areas are the Watford Public Park and the McKenzie Marine Club. Both are located on McKenzie Bay, which is 18 miles southeast of Mandaree. Existing facilities at these areas may include the following: boat dock, boat ramp, trailer space, cabin rental, drinking water, pit toilets, flush toilets, tables, picnic shelters, fireplaces, concession, water skiing, swimming beach, fishing, and camping.

2.22 The project will improve access to the area along Charging Eagle Bay. This will encourage the development of facilities oriented towards serving highway traffic, tourists, and recreational uses. The present traffic projections indicate that any such development would probably be limited in size.

2.23 Outdoor recreation agencies are presently conducting a feasibility study for a proposed hiking, bicycling, and horse-back riding trail, called the North Country Trail. This program came into being on 2 October 1968 when the Congress of the United States enacted the National Trails System Act. The North Country Trail is one of the 14 trails being studied. The information concerning the trail is in the preliminary stages and is subject to revision at any time. The proposed trail is to extend from the Appalachian Trail in Vermont approximately 3,200 miles through the States of New York, Pennsylvania, Ohio, Michigan, Wisconsin, and Minnesota to the Lewis and Clark Trail in North Dakota.

2.24 Originally, it was thought that the Garrison Dam would probably be the terminus for the North Country Trail because it could make direct contact with the Lewis and Clark Trail. During the course of the study, however, it was decided that a routing, which would take the trail through some of the scenic and historic areas around Lake Sakakawea, should be considered as an alternative in case the proposed Lewis and Clark Trail is not located in this area.

2.25 It was proposed, therefore, that the trail be routed around the south side of Lake Sakakawea to Four Bears Memorial Park. In following this routing, the traveler would be taken through nine public use areas developed by the Corps along the shores of the lake. The trail would be inside the Fort Berthold Indian Reservation boundary for much of its length from Beaver Creek Bay to Four Bears Memorial Park. Much of the reservoir's scenic shoreline could be viewed from the trail in the reservation. Views of the main body of the lake and Little Missouri River Arm could be seen while crossing on the Charging Eagle Bay Bridge. An alternative to this crossing is a loop around the south side of Little Missouri River Arm to the bridge crossing at Lost Bridge Public Use Area. This would provide access for a future connection with such attractions as the Theodore Roosevelt National Memorial Park, the Little Missouri National Grasslands, and North Dakota Badlands, as well as the Killdeer Battlefield Historic Site.

2.26 Although the Fort Berthold Indian Reservation area has physical features that offer commercial recreation potential and the national demand for outdoor recreation is growing, there are several obstacles to recreation development that must be overcome: (1) the rugged, isolated beauty of the area is not universally admired; (2) there is no terminal recreation area (such as the Black Hills of South Dakota) in all of North Dakota or

eastern Montana to attract visitors; (3) the area is not traversed by a major east-west highway; and (4) the Fort Berthold Indian Reservation area is facing stiff competition from many other areas in the development of tourism.

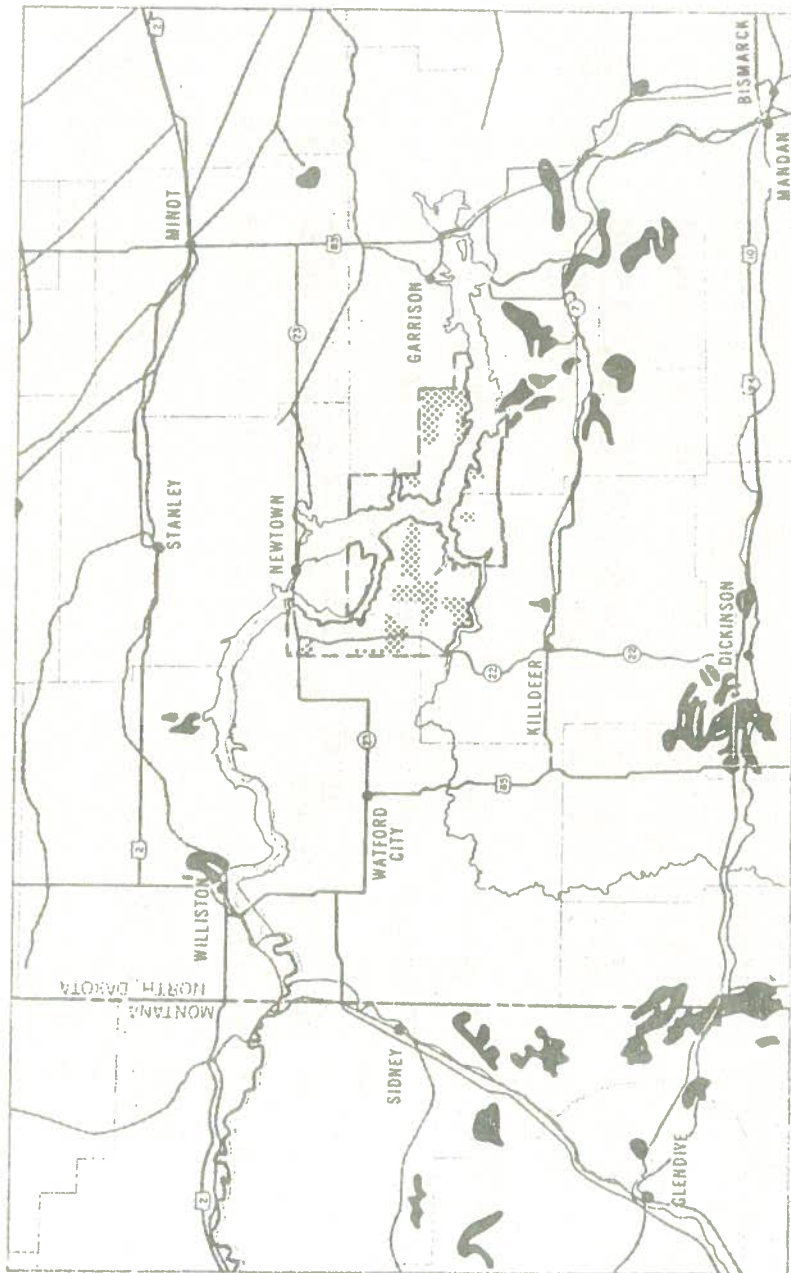
2.27 Mineral extraction. A tremendous stockpile of low-cost heat energy is contained in the lignite coal reserve of the southern portion of the area (see map, page 11), which can be extracted by strip mining methods. Further advancements in the technology of lignite use and product extraction methods may further enhance its economic utility. At present, there are no underground coal mines in the five-county area.

2.28 The rapid increase in the demand for electricity has resulted in the construction of numerous steam generating plants over the Nation. Increased mining and use of North Dakota coal, associated with the construction of several steam-generating plants in the area east and south of Mercer County, and extensive expansion of mining in Mercer County and other counties in central North Dakota in the past decade, is resulting in increased interest in the extensive lignite potential in the southern portions of the Fort Berthold area. In 1971, Mercer County produced 3,104,000 short tons of lignite with an average shipping value of \$1.78 per ton, or \$5,525,125. During 1971, the strip mines in McClean County produced 19,000 short tons that had an average shipping value of \$4.36 per ton, or \$82,840. There are no mines in Dunn, McKenzie, or Mountrail Counties.

2.29 Lignite resources are summarized on page 12, which shows nearly 24 billion tons of measured or indicated lignite resources in the five-county area. More than 13 billion tons of this is in beds that are more than 5 feet thick, and should be economically recoverable with present technology, although at present some may not be economically competitive with other areas currently being exploited in North Dakota. Interest in expansion remains keen and new explorations and negotiations are continuing. In 1970, 38,000 acres of Indian lands were opened by permit for exploration in the eastern segment with an advance royalty of \$1.12 offered per acre.

2.30 In addition to these vast measured and indicated reserves, there are other estimated lignite resources for which adequate measurements are not available; the addition of these brings the total to an estimated 165 billion tons. Though these measured and inferred resources for the five-county area are indeed of

MAJOR STRIPPABLE LIGNITE DEPOSITS FORT BERTHOLD RESERVATION AREA



LEGEND

- Area showing greatest apparent lignite potential within Ft. Berthold Reservation.
- Known strippable lignite deposit.

Adapted from Bureau of Mines
and U.S.G.S. maps.

Estimated Original Lignite Reserves in Fort Berthold
Reservation Area as Determined by Exploration and Mapping
(In Million Short Tons)

Reserves by Type and Thickness of Bed	County				Five County Area	Within Fort Berthold Reservation Only
	Dunn	McKenzie	McLean	Mountrail		
<u>Measured & Indicated</u>						
2½ to 5 ft.	4,026.70	2,486.50	1,340.86	504.15	10,347.53	2,580.60
5 to 10 ft.	1,878.30	2,877.04	1,512.35	436.02	9,185.82	1,212.40
More than 10 ft.	1,113.89	334.27	410.96	313.09	4,443.71	45.90
Total	7,018.89	5,697.81	3,264.17	1,253.26	23,977.06	3,838.90
<u>Inferred Reserves</u>						
2½ to 5 ft.	60,000.32	23,803.51	7,927.40	13,813.88	119,283.71	10,253.00
5 to 10 ft.	3,377.68	2,665.46	4,433.35	310.64	16,470.40	736.30
More than 10 ft.	645.36	16.34	853.49	- -	5,262.62	72.20
Total	64,023.36	26,485.31	13,214.24	14,124.52	141,016.73	11,061.50
Grand Total	71,042.25	32,183.12	16,478.41	15,377.78	164,993.79	14,900.40
Total Coal in Beds 2½ to 5 feet thick	- - - - -	- - - - -	- - - - -	- - - - -	129,631.24	12,833.60
Total Coal in Beds 5 to 10 feet thick	- - - - -	- - - - -	- - - - -	- - - - -	25,656.22	1,948.70
Total Coal in Beds more than 10 feet thick	- - - - -	- - - - -	- - - - -	- - - - -	9,706.33	118.10
Grand Total	- - - - -	- - - - -	- - - - -	- - - - -	164,993.79	14,900.40

Source: Geological Survey Circular 226 (1953)
U.S.Bureau of Mines Preliminary Report 142 (1961)

considerable significance, adequate information on the economics of recovery of a major portion of the lignite deposits of the area is lacking.

2.31 The development of the area's coal resources have been concentrated in Mercer County, which has become one of the Nation's largest coal producing counties. Though this county shows the greatest development potential, Dunn County has the largest basic reserves. Much of the reserves in these two counties are located in close proximity to a branch line of the former Northern Pacific Railway. The availability of abundant water for those areas in close proximity to the Garrison Reservoir increases the potential for these lignites for use in local thermal generation and production of liquid and gaseous fuels, as well as petro-chemicals.

2.32 Some uses that would utilize significant quantities of coal are technically feasible, but not yet competitive. Among these are gasification of coal to produce gas and petroleum products. Coal supply and other factors are favorable for construction of plants to produce a synthetic high BTU gas.

2.33 Known gas and oil fields in the area have had a stable production and income generating capacity during the past decade. Although oil reserves in the known fields for the immediate area of the reservation have been fairly well defined, recent exploration has not been encouraging.

2.34 There are many factors which will affect the rate of development of the mineral resources. Foremost of these is the demand for heat energy sources. If, as is expected, these demands will double or triple in the next two decades, and if currently estimated costs for production of nonlignite fuels are as high as anticipated, interest in future lignite development may be expected to increase rapidly.

2.35 The future growth of the five-county area has a firm foundation in its large reserves of fossil fuel energy - principally, lignite. This available energy supply offers opportunities for greatly expanding the industrial economy of the area and along with other available mineral resources comprises an important basis for industrial growth.

2.36 The increase in strip mining will also promote an increase in concern for the environment unless suitable reclamation techniques are instituted. Adverse effects associated with strip mining will include some or all of the following:
(1) increased silting and sedimentation in streams; (2) changes

in the groundwater table; (3) decrease in chemical stream quality; (4) alteration or destruction of fish and wildlife habitat; and (5) water uses by populations affected by the mining.

2.37 The adverse effects of strip mining can be abated; however, reclamation requires extensive planning for actions both before and after stripping. Reclamation is also a liability to the objectives of the coal companies for reclamation not their business, and at present there is no monetary return on reclaiming the land.

FLORA

2.38 The proposed route will cross both the original mixed grass prairie and the Little Missouri River breaks. Trees are sparse throughout the area, because the forests of the Little Missouri River flood plain died as a result of inundation by the waters of Lake Sakakawea. The few trees near the lake are limited to the valleys and draws which afford an environment more habitable than that of the plains. Remnants of the flood plain understory are also found in the sheltered breaks area. Major species of trees which are interspersed throughout the Little Missouri River breaks are elm, green ash, boxelder, hackberry, cottonwood, aspen, cedar, juniper, chokecherry, and wild plum.

2.39 Shrubs which may be found are wild rose, buckbrush or wolfberry, buffaloberry, creeping juniper, several species of sage brush, rabbitbrush, skunkbrush, and poison ivy.

2.40 Herbs include many asters, several species of prairie cone-flowers, ragweed, scurf-pea, milkvetch, saltbush, chickweed, dandelion, locoweed, yarrow, milkweed, prairie birdsfoot trefoil, prairie plantain, prickly pear, cactus, thistles, gumweed, golden rod, and many others.

2.41 Little club moss can also be found growing on the hillsides.

2.42 Native grasses include western wheatgrass, blue grama, green needlegrass, western needlegrass, needle-and-thread grass, Junegrass, prairie sandgrass, little bluestem, plains muhly, threadleaf sedge, side oats grama, and blue grass.

2.43 The predominance of plant species within the areas of the Little Missouri River breaks depends more upon the availability of preferred climatic and soil conditions, rather than upon the succession of species.

FAUNA

2.44 Mammals. Mule deer, white-tailed deer, and antelope are the only big game animals found near the project area. White-tailed deer are found in the sparsely wooded areas of the Little Missouri River breaks, while mule deer utilize the open prairie along the reservoir. Antelope are found primarily on the open prairie rangeland.

2.45 A number of horses roam in this area, but none are wild mustangs. These horses are owned by individual members of the tribe, and, in most cases, carry the brands of their owners.

2.46 Fur bearers and other small mammals that occur in the project area include striped and spotted skunks, weasels, minks, beavers, muskrats, badgers, coyotes, red foxes, bobcats, jackrabbits, cottontail rabbits, prairie dogs, ground squirrels, and numerous small rodents.

2.47 Reduced numbers of mink, beaver, muskrat, and white-tailed deer have resulted from the loss of flood plain and riverine habitat.

2.48 Birds. Upland game birds found in the Little Missouri River area are the pheasant, sharptailed grouse, and Hungarian partridge. The pheasant and Hungarian partridge are introduced species.

2.49 The Little Missouri River breaks provides many nongame species of birds with habitat for nesting and feeding. It also provides cover for numerous migratory species of songbirds.

2.50 Turkey vultures, several large hawks, both the golden and bald eagles, and the great horned owl are among the larger birds found in the area.

2.51 Lake Sakakawea accommodates thousands of migrating geese and ducks. The sheltered flats and bays have replaced the riverbanks and sandbars as resting and preening areas.

2.52 Other water birds found in the project area include the grebes, cormorants, white pelicans, gulls, and terns. Among the common shorebirds are the avocets, killdeer, sandpipers, greater and lesser yellowlegs, bitterns, and great blue herons.

2.53 Reptiles and amphibians. The only venomous snake in the project area is the prairie rattler. The bullsnake, plains garter snake, red-sided garter snake, western hognosed snake, and western green snake may also be found. The snapping turtle, spiny softshell turtle, western painted turtle, and the prairie skink also occur in the region.

2.54 Amphibians that live in the area are the leopard frog, boreal chorus frog, tiger salamander, great plains toad, Dakota toad, and Rocky Mountain toad. Most species of reptiles and amphibians are not common to the area.

2.55 Species of fish which inhabit Lake Sakakawea are the northern pike, walleye, sauger, white bass, coho salmon, channel catfish, crappie, bluegill, yellow perch, bullhead, carp, buffalo, drum, carpsucker, redhorse, gar, sturgeon, goldeye, shad, and numerous chubs, shiners, and minnows.

2.56 Lake Sakakawea presently supports a population of paddlefish which annually migrate up the Yellowstone River into Montana to spawn. Construction of the mainstem dams and lack of suitable spawning areas below Lake Sakakawea have prevented the paddlefish from reproducing as it normally would. At present, the paddlefish is classified as a nongame fish in North Dakota.

2.57 Threatened and endangered species. Whooping cranes have been sighted several times near the Missouri River valley in recent years and are believed to annually migrate through this area. The project is also located within the range of the peregrine falcon. No black-footed ferrets (associated with prairie dog communities) have been reported in the Little Missouri River area, but it is probable that this extremely rare mammal is a visitor to parts of project lands.

PROTECTION FOR WILDLIFE OF ENDANGERED, RARE, OR UNKNOWN STATUS

2.58 The animals listed below and their status in each of the six mainstem Missouri River projects are coded from 1 to 6, beginning at Lewis and Clark Lake and progressing upstream. These projects are as follows:

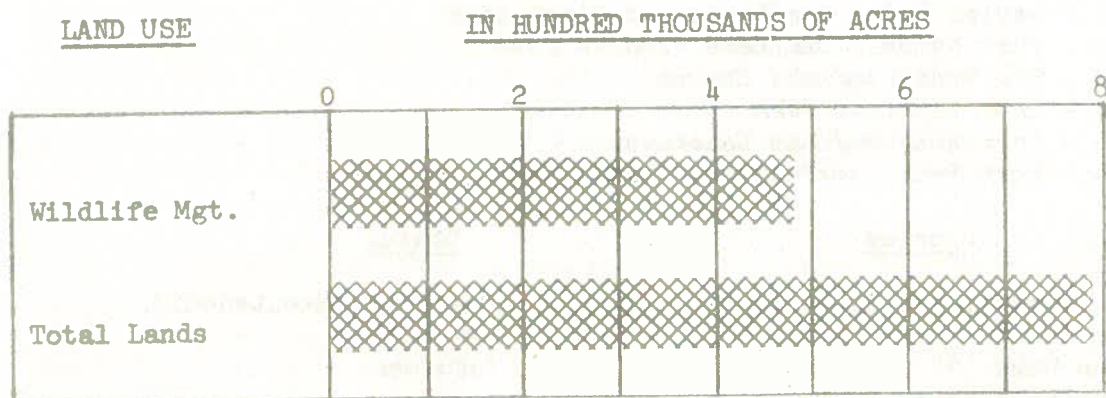
- 1 - Gavins Point Dam/Lewis and Clark Lake
- 2 - Fort Randall Dam/Lake Francis Case
- 3 - Big Bend Dam/Lake Sharpe
- 4 - Oahe Dam/Lake Oahe
- 5 - Garrison Dam/Lake Sakakawea
- 6 - Fort Peck Dam/Fort Peck Lake

<u>Species</u>	<u>Status</u>
Paddlefish 1, 2, 3, 4, 5, 6	Unknown (Threatened?)
Sharp-shinned hawk 5	Unknown
Pigeon hawk 6	Unknown
Ferruginous hawk 5, 6	Unknown
Prairie falcon 2, 3, 4, 5, 6	Rare
Peregrine falcon 3, 5, 6	Endangered
Bald eagle 1, 2, 3, 4, 5, 6	Unknown
Western burrowing owl 2, 3, 4, 5, 6	Rare
Mountain plover 5, 6	Unknown
Osprey 5, 6	Unknown
Long billed curlew 6	Unknown
Greater prairie chicken 3, 4, 5	Rare
Whooping crane 4, 5	Endangered
Canada goose (maximus) 5	Unknown
Blacktail prairie dog 2, 3, 4, 5, 6	Rare
Black-footed ferret 2, 3, 4, 5, 6	Endangered
Swift fox 3, 4, 5, 6	Unknown

2.59 Steps to preserve the above species have been primarily directed toward allocating land for wildlife use. Lands are leased to State and other Federal agencies for wildlife management as shown on following graphics.

LAND ALLOCATION FOR WILDLIFE

<u>Project</u>	<u>Acres Leased</u>	
	<u>States</u>	<u>Federal</u>
Lewis and Clark Lake	9,768	230
Lake Francis Case	17,045	
Lake Sharpe	1,200	
Lake Oahe	24,000	2,540
Lake Sakakawea	31,600	9,500
Fort Peck Lake	<u>115</u>	<u>385,691</u>
TOTAL	83,613	397,961



2.60 Some specific actions or policies relating to habitat preservation for threatened or endangered species are:

- Prairie dog towns which are associated with the black-footed ferret and burrowing owl, when identified, are withdrawn from other land use allocations. No eradication practices are allowed on project lands. An island has been set aside in the Big Dry Arm-Fort Peck Lake for prairie dogs. It is called Prairie Dog Island.
- An eagle sanctuary covering 300 acres was established below Fort Randall Dam in 1970. Subsequently, the National Wildlife Federation has purchased riverfront land all the way downstream to the Nebraska border.
- At Lake Audubon (a subimpoundment of Lake Sakakawea) whooping cranes, in their southern migration, stop almost every fall for 2 or 3 days before proceeding on their way. A captive flock of Canadian geese, subspecies Branta maximus, has been established. At last estimate there were 400 birds in the flock.
- Project personnel have cut ledges in the chalk bluffs below Fort Randall Dam to encourage nesting activities of the prairie and peregrine falcons.
- The undisturbed prairies around the larger impoundments provide favorable habitat for several of the threatened species. Populations appear to be increasing.

- Previous Master Plans have reserved land not needed for other uses to wildlife management. Implementation of recent regulations has led to greater reliance on the natural sciences for identifying and allocating lands for endangered species preservation.

HISTORICAL AND ARCHEOLOGICAL

2.61 Recorded history of the area is dated from the 1790's when early explorers traversed the area and slightly later when the Lewis and Clark expedition traveled on their Missouri River voyage through the Louisiana Territory. However, definitive history begins with the Treaty of Fort Laramie of 1851, which defined the boundaries of the Gros Ventre (a misnomer for the Hidatsa), Mandan, and Arikara Indian Nations, now called the Three Affiliated Tribes. These boundaries established a vast area of land vaguely described as the entire right bank of the Missouri River from the mouth of the Heart River to the mouth of the Yellowstone River, and from the mouth of the Powder River to the headwaters of the Heart River.

2.62 When the military post of Fort Berthold was established on the Missouri River in 1845, the Mandan and Hidatsa Tribes were concentrated in that immediate vicinity, while the Arikaras were living near the mouth of the Knife River. In 1866, another treaty was signed by the Three Tribes (never ratified by the U.S. Senate) which added a large tract on the eastern portion of the reservation. Between 1870 and 1910, a succession of executive orders and congressional acts reduced the reservation from its original size of roughly 13,500,000 acres to a gross area (including white-owned land) of 643,368 acres, just before the building of the Garrison Dam.

2.63 The history of the Fort Berthold Reservation during the 19th century differs from most of the reservations of the plains in that there were no hostile outbreaks against the U.S. Government, but rather a persistent loyalty and dependence. Some chronicles indicate that they were ill rewarded for their cooperation, particularly when compared with the more war-like Sioux.

2.64 The Three Tribes, although inheritors of an agricultural tradition of many generations, had always supplemented their crop production by hunting. With this base, their mode of life was less nomadic than that of other plains Indians and relatively permanent settlements were established along the river bottoms.

2.65 Allotment of reservation land to individual Indians began about 1890 with 949 allotments in the Missouri River valley completed by 1895. Subsequent allotments were made in 1910, 1912, and 1915, while the final allotments in the upland rangelands west of the Missouri River were made between 1925 and 1929.

2.66 Agricultural use of the area's lands began as early as 1880. By 1888, large numbers of cattle were grazing on the reservation; many cattle in the area west of the Missouri River were owned by non-Indians in order that the tribe would realize a monetary benefit.

2.67 The settlement of the area by non-Indians began with cattle ranching operations in the 1880's. With the construction of the Northern Pacific and Great Northern Railroads in the 1880's, settlement of the perimeter areas of the present reservation proceeded rapidly. Maximum settlement on small farms was realized by about 1915, when final sale of former reservation lands was completed. The white settlers were dominated by immigrants and first generation Americans of Scandinavian and German stock, who quickly organized religious, educational, and trade services in the communities in which they settled. Within the space of a single generation, this stock had changed the basic pattern of most of the reservation from one of extensive livestock operations to one of relatively intensive crop production. Though they were quick to adapt to a severe and nonfamiliar environment, realization of a settlement density beyond a reasonable productive expectancy became apparent and by the mid-1920's, a limited outmigration began.

2.68 The droughts of the 1930's, which reduced the area's crop production substantially, further emphasized the settlement density problem and migration continued. Mechanization of agriculture and greater economic opportunity elsewhere encouraged further migration, resulting in a trend both off the farm and out of the area which shows little sign of diminishing.

2.69 The most recent substantive historical factor for the area centers around the building of the Garrison Dam and the inundation of the Missouri River bottom through the whole breadth of the area. The construction was vigorously opposed by the Three Tribes and resulted in the physical relocation of over 90 percent of their families, as well as all of their community facilities, such as schools, churches, shopping facilities, and government headquarters. In addition, it resulted in both reducing and altering the Indian's economic base, as well as changing the

geography of the reservation from a relatively contiguous land mass to five reduced segments, each separated from the other by effective water barriers.

2.70 Many old Indian villages were located near the Little Missouri River and Missouri River, the majority of which have been inundated by the waters of Lake Sakakawea.

2.71 Archeological information provided by the State Historical Society of North Dakota shows that the area of the proposed Charging Eagle Bay Bridge (Sections 4 and 5, Township 147 N., Range 92 W.) was surveyed for historical and archeological sites in 1950 and 1951. The survey was conducted by the Smithsonian Institute in conjunction with the Garrison Reservoir Project and was restricted to the Federal lands directly associated with the project. The sites reported by the survey in Sections 4 and 5, Township 147 N., Range 92 W have been inundated by Lake Sakakawea.

2.72 No historic sites listed in the Historic Register are located in the project areas. In the event that archeological remains are encountered during construction, all activities will cease in that area, and the find will be immediately reported to the State Historic Preservation Officer.

POPULATIONS

2.73 The population in this area of North Dakota reached its peak in 1930, and the decline since that time is expected to continue until 1980.

2.74 This general population decline caused by both lack of employment opportunities and the shift to fewer, but larger farms and ranches, has resulted in an older than average population. There are fewer people in the younger age labor force and, therefore, a declining birth rate. Lignite coal mining and power generation may affect the population in the general area. This would mainly affect the communities adjacent to the mines and generating plants.

2.75 The Indian population has shown a continuous increase since 1910, and has doubled since 1930 (from 1,376 to 2,706). Two primary factors account for this increase in population - the birth rate for the Indians is much higher than for the whole area population and the outmigration rate is also somewhat lower for the Indians.

2.76 At the time of the filling of Lake Sakakawea, the Indian population of the Fort Berthold Reservation was subjected to a forced relocation from its concentration along the Missouri River bottom lands to a scattered settlement pattern in more isolated areas throughout the reservation. The result of the forced relocations and the subsequent moves toward small communities by Indians has been extreme disruption of the reservation's economic and social structure.

2.77 In 1969, the Indian population of the southern segment of the Fort Berthold Indian Reservation and the subagency at Twin Buttes consisted of 50 families, or approximately 400 individuals.

2.78 The following three charts illustrate the population densities and population changes.

POPULATION DENSITY -
FORT BERTHOLD RESERVATION AREA - 1940-1970

<u>County</u>	<u>Land Area in Square Miles</u>	<u>Population per Square Mile</u>			
		<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>
Dunn	1,996	4.2	3.6	3.2	2.4
McKenzie	2,721	3.1	2.5	2.7	2.3
McLean	2,090	7.7	9.0	6.7	5.3
Mercer	1,041	9.2	8.3	6.5	5.8
Mountrail	1,817	5.8	5.2	5.5	4.5
TOTAL	9,665	5.5	5.3	4.6	3.7

RURAL POPULATION ONLY
(Excluding places of over 1,000 population)

Dunn	1,996	4.2	3.6	3.2	*
McKenzie	2,721	2.7	2.0	2.0	*
McLean	2,090	7.2	7.6	5.8	*
Mercer	1,041	9.2	5.7	4.1	*
Mountrail	1,817	5.2	4.4	3.0	*
TOTAL	9,665	5.1	4.4	3.5	

* Not available for 1970

Source: U.S. Census and North Dakota Business and
Industrial Development Department unpublished data.

INDIAN POPULATION BY AREA OF RESIDENCE -
FORT BERTHOLD RESERVATION AREA

<u>Segment</u>	<u>1956</u>		<u>1969</u>	
	<u>population</u>	<u>percent</u>	<u>population</u>	<u>percent</u>
Western	675	37.9	854	31.5
Southern	364	20.5	327	12.1
Eastern)	639	35.9	589	21.7)
Northeastern)			311	11.5)
Northern	101	5.7	628	23.2
TOTAL	1,779	100.0	2,709	100.0

Of the 930 increase in population between 1956 and 1969, 531
or 57.1 percent were in the New Town area in the Northern Segment.

Source: MRBI and BIA unpublished data.

Fort Berthold Reservation Population Changes - 1960-1968
(With Comparisons by County, Indian, and State)

	County			Total Five Counties	Indian Only	State of No. Dak.
	Dunn	McKenzie	McLean			
1960 Population	6,350	7,296	14,030	6,805	10,077	44,558
Natural Increase - 1960-68 (Births - deaths)	705	549	1,038	625	774	3,691
Percent of 1960 Population	11.1	7.5	7.4	9.2	7.7	8.3
1968 Potential Population (1960 Population plus natural increase)	7,055	7,845	15,068	7,430	10,851	48,249
1968 Estimated Population	5,000	6,800	13,600	7,100	9,300	41,800
Percent Change - 1960-68	-21.3	-6.8	-3.1	+4.3	-7.7	-6.2
Net Migration Number	-2,055	-1,045	-1,468	-330	-1,551	-6,440
Migration as Percent of 1960 Population 1/	-32.4	-14.3	-10.5	-4.8	-15.4	-14.5
						-12.2
						-9.1

1/ Preliminary 1970 census reports indicate a considerably smaller population count for the five county study area than earlier projections. The resulting migration rates for the decade are therefore, likely to be much higher than those derived for the 1960-68 time period. The indicated migration for the 10 years in the study area is - 45%, for the State - 37%.

Source: 1960 Census; unpublished BIA, North Dakota State Board of Health and North Dakota Business and Industrial Development Department.

EMPLOYMENT AND INCOME

2.79 Economic indicators show that this area is lagging behind the State of North Dakota. The retail trade of the area has hardly been holding its own over the past 7 years, while that for the State has been increasing substantially during the same time period.

2.80 The labor force of the study area is approximately 15,000, of which 929 are Indian. The Indian labor force represents both a special asset and a special need. The Indians have a much higher unemployment rate (as high as 70 percent) than the general area rate (5 percent).

2.81 Incomes in the study area fluctuate widely due to a high dependence on semiarid agriculture and its associated industries. The per capita income for the Indians was approximately one-third that of the average for the study area, and even a smaller fraction when compared to the State and the Nation. Although the actual per capita income for the Indians has increased substantially since 1959, the gap between Indian and non-Indian per capita incomes appears to be ever widening.

ECONOMICS

2.82 The economy of west-central North Dakota is agriculturally oriented. Cattle grazing and wheat production are the major businesses. The rural communities are oriented towards serving the needs of the surrounding farms and ranches.

2.83 The two resources which offer the most potential for development are lignite coal beds and recreation and tourism.

2.84 The suitability of using coal to generate electric power has been proven by the three generating plants in operation near Center and Stanton, which are located approximately 60 miles southeast of Twin Buttes. Two of these plants are planning to expand their facilities to provide increased generating capacity.

2.85 Consideration is being given to locating a coal gasification plant in the vicinity of either Halliday-Dodge, Beulah, Center, or Riverdale-Underwood. It is expected this facility would employ approximately 600 people.

2.86 The coal gasification plant would also have significant water demands. The only water source in this region capable of supplying large water demands is Lake Sakakawea.

III. RELATIONSHIP OF PROPOSED ACTION TO LAND USE PLANS

3.01 The present land use in this area is primarily agricultural. Grazing and haying are the predominate uses.

3.02 Several small recreation areas are located along the shoreline of Lake Sakakawea.

3.03 This project will improve access to present recreation areas located on Charging Eagle Bay. It will make possible development of recreational areas on the west side of the bay, now practically inaccessible. It is expected that this project will have little or no effect on land use, except in the vicinity of Charging Eagle Bay.

3.04 The development of recreation facilities will perhaps occur at an earlier date than if this project were not undertaken. However, as the demand for recreation increases, those developments would be undertaken without this project.

IV. THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

SUMMARY OF IMPACTS

1. Continuity of travel
2. Access to recreation areas
3. Economic benefits
4. Tourism
5. Social opportunities
6. Esthetic values
7. Land acquisition
8. Agricultural lands
9. Wildlife and vegetation
10. Air and water quality

BENEFICIAL ASPECTS

4.01 Continuity of travel. North-south travel will be improved by providing a crossing of Lake Sakakawea in this area. However, the greatest benefits are to those 400 people who live in the southern segment of the reservation or at the subagency office at Twin Buttes. The proposed roadway and bridge will provide a more direct route from Twin Buttes to Mandaree or New Town. It would be 30.7 miles in length, and effect a savings in travel of approximately 35 miles. However, a motorist traveling from Halliday to Mandaree or New Town would experience a savings of only 7 miles. A road parallel to the Little Missouri River Arm of Lake Sakakawea would be approximately 47 miles in length and result in a savings of 18 miles to motorists traveling between Twin Buttes and Mandaree or New Town. There would be no mileage savings to motorists traveling between Halliday and Mandaree or New Town. To commute between Twin Buttes and Mandaree or New Town under existing conditions, it is necessary to travel south from Twin Buttes to Halliday, then west and north to the sub-agency office in Mandaree, or the main Bureau of Indian Affairs Office at New Town. The mileage under present conditions between Twin Buttes and Mandaree is 65 miles, and the distance between Twin Buttes and New Town is 100 miles.

4.02 At present, buslines serve all areas of the reservation. Bus service is available 3 days a week between Twin Buttes and New Town and from Mandaree or Parshall to New Town, 5 days a week. New Town also has bus service for inner city transportation. These buslines were initiated by the Three Affiliated Tribes for the purpose of lessening individual travel costs to communities now separated by Lake Sakakawea. However, the proposed crossing will solve this problem of separation in only the southern segment of the reservation. Travel between the cities of Minot, Williston, Dickinson, and Bismarck-Mandan will not be appreciably affected by the proposed crossing, and the north-south traffic network will not be restored as it was before Lake Sakakawea inundated the North Dakota Highway 8 bridge crossing between Halliday, North Dakota and Parshall, North Dakota.

4.03 The North Dakota Highway Department has estimated that traffic using the proposed route will average 300 cars per day. In 20 years, 1994, the average daily traffic is expected to increase to 400 vehicles per day.

4.04 The following is a listing of traffic volumes at existing Missouri River crossings in North Dakota from the North Dakota Highway Department.

MISSOURI RIVER CROSSINGS

<u>Location</u>	<u>Highway</u>	<u>Average Daily Traffic</u>	
		<u>1974</u>	<u>1994</u>
Memorial Bridge (Bismarck)	Old U.S. #10	13,000	13,000
Grant Marsh Bridge (Bismarck)	I-94	7,320	16,700
Washburn Bridge (Washburn)	200A	400	700
Four Bears Bridge (near New Town)	ND #23	600	1,100
Lewis and Clark Bridge	U.S. #85	1,350	2,600

LITTLE MISSOURI RIVER CROSSINGS

<u>Location</u>	<u>Highway</u>	<u>Average Daily Traffic</u>	
		<u>1974</u>	<u>1994</u>
Lost Bridge (North of Killdeer)	ND #32	200	320
South of Watford City	U.S. #85	700	1,400
At Medora	Old U.S. #10	600	1,000
At Medora	I-94	1,150	3,860
Proposed Charging Eagle Bay Bridge - est.		300 est.	400

4.05 Access to recreation areas. The project will not require the use of any lands presently used for recreation purposes and will improve access to present recreation areas located on Charging Eagle Bay. However, the bridge and roadways are not essential for recreational development. No Corps owned land other than that in the immediate vicinity of the proposed bridge site will be developed for recreation in order to maintain the landscape in its natural scenic state. These lands are available for primitive uses, such as hiking, camping, and horseback riding.

4.06 Economic benefits. Use of the proposed route and recreation areas will offer an opportunity to the residents of the area to establish businesses along the proposed route which would provide for services associated with tourism and recreation. Businesses operated on Corps' project land will be limited and subject to regulations imposed by the Corps.

4.07 During construction of the proposed project, local communities will benefit by the opportunity for employment and the impact of contractor's payrolls on local businesses. It is estimated that 30 to 40 percent of the contract cost will be labor costs.

4.08 The proposed project is located in an area where considerable unemployment and substandard living conditions exist. Although the project will provide immediate employment, this employment will terminate upon completion of the project and these same conditions will continue as they presently exist.

4.09 Each phase of the project, such as the roadway, bridge superstructure, and the bridge substructure, will be built by private contractors who have their own main crew. This crew would include trained equipment operators, foremen, and skilled workmen. The contractors are also required to hire a certain number of people under the Equal Employment Opportunity Program, so the contractor will be hiring local peoples on the project as unskilled and semiskilled workers.

4.10 The proposed bridge will enable people from the west segment of the reservation to have the opportunity for employment at the lignite coal mines, electrical power generating plants or the coal gasification plant, if one is located within reasonable traveling distance.

4.11 Tourism. Many individuals are interested in the project because it will open the scenic reservation area for tourism. Businessmen and travelers with leisure time might take this route for enjoyment of the scenic landscape.

4.12 Social opportunities. Travel between the southern and western segments of the Fort Berthold Indian Reservation will be reduced in both time and distance. This convenience will improve the opportunities for more frequent visits among relatives and friends; improve opportunities for meetings and other social functions; and provide better access to health care facilities.

4.13 The Indians have, for the most part, retained a tribal or clan-like social life. The present transportation system makes social activities difficult.

DETRIMENTAL IMPACTS

4.14 Esthetic values. The construction of the proposed highway and bridge will cause a loss in the esthetic value of the immediate region's landscape. Improved access for tourism and recreation in this scenic area will promote the growth of facilities associated with these activities. The growth, location, and quality of these facilities might also become objectional unless construction restrictions are enforced to regulate planned construction and to insure and maintain quality structures. Construction on Corps' project lands will be limited and subject to Corps' regulations.

4.15 Land acquisition. Negotiations for right-of-way and relocation assistance are covered under Public Law 91-646 that lands

must be appraised based on fair market value. The appraisals will also be reviewed by the Bureau of Indian Affairs in Aberdeen, South Dakota prior to any negotiations or ownership contracts in order that they may ascertain whether or not the appraised value is fair to the owners. Relocation assistance will provide for safe, decent, and sanitary housing for the occupants of homes, if they are involved and for the costs of relocating other items of personal property. Under the present proposal, no one will require relocation.

4.16 Regarding the taking of Indian lands, Title 25, U.S. Code, Section 357, states that lands allotted in severalty (individual, sole ownership) to Indians may be condemned for any public purpose under the laws of the State or territory where located in the same manner as land owned in fee (absolute and legal possession) may be condemned and the money awarded as damages shall be paid to the allottee. However, according to the Bureau of Indian Affairs in Aberdeen, the law regarding tribal trust land is obscure, and that unless Congress has by specific authority provided that tribal lands may be acquired as part of a project, the courts will not recognize the authority of the States. The greater majority of lands that the proposed project involves is tribal trust land.

4.17 Agricultural lands. Under present conditions, 13 miles of the proposed route will follow county roads, 3.5 miles will follow an unimproved road, and 3.5 miles will be built where there are no roads. The proposed route will cause a minimum loss of 24½ acres per section, or a total of 490 acres. These 490 acres will be a minimum total, because areas where the right-of-way will exceed 200 feet due to heavy cuts and fills were not considered. Since this area is primarily open rangeland, approximately 440 acres will no longer be available for grazing. The roadway width will be 36 feet wide and utilize 90 acres, leaving approximately 400 acres as the total area of greenbelt.

4.18 Sand and gravel pits may require the taking of additional grazing lands.

4.19 Wildlife and vegetation. There will be a greater amount of general intrusion into the natural environment of the area. The proposed project will traverse the rolling to hilly prairie lands and travel through the Missouri River valley breaks area where the terrain is unfavorable for road construction. The canyons and gullies also create an environment where trees and shrubs

are able to survive. The vegetative cover in these valleys provide habitat for the remnants of the flood plain forest wildlife. Construction activity and the subsection of exposed soil areas to possible erosion prior to establishment of vegetative cover, will have a temporary adverse impact on both fisheries and wildlife. Some increase in road kills of wildlife will occur. Road kills will have an effect on those species whose range or territory is interrupted by the proposed route. Improved access will also play a major role in drawing hunters to the area.

4.20 The North Dakota Highway Department will revegetate the 200-foot right-of-way according to their specifications. The contractor will be given the option of using two seed mixtures.

4.21 These are labeled as Class I and Class IV seed mixtures. The kinds of grasses included in the mixtures are as follows:

<u>Percent</u> <u>By Weight</u>	<u>Kind of Grass</u>	<u>Percent</u> <u>Pure Live Seed</u>
<u>Class I</u>		
40	Brome grass	80
40	Crested wheatgrass	80
20	Slender or intermediate wheatgrass	75
<u>Class IV</u>		
50	Brome grass	80
50	Crested wheatgrass	80

4.22 According to specifications, these mixtures will be sown at 25 pounds per acre. When Class I and Class IV mixtures are specified, 30 pounds of rye seed per acre are required to be added to the mixture. If seeding is performed before 15 July, 20 pounds of oats seeds may be substituted for the rye seed. However, on Corps' project lands the 200-foot right-of-way will be seeded to a variety of grasses and small shrubs native to the area.

4.23 Air and water quality. During construction, the potential for erosion will exist because this activity requires disturbing areas presently covered with vegetation. Until a new grass cover can be established, these areas will be subject to erosion. The severity will depend on the length of exposure, the area exposed,

especially where large cuts and fills occur, and the protective measures employed during construction. Construction of the bridge piers will also cause temporary turbidity which will affect the water quality.

4.24 Construction activities will have an adverse effect on the quality of the air. Operation of equipment will produce noise, fumes, and dust. Because this region is sparsely populated, the noise, air, and water pollution produced will affect mainly the wildlife. Although not considered significant, the increased traffic levels will cause an increase in air pollution.

4.25 The traffic along this project will not be of sufficient volume to produce noise that would exceed standards compatible for rural land uses.

REMEDIAL, PROTECTIVE, AND MITIGATIVE MEASURES

4.26 General. Contract plans and specifications for the construction of the proposed project will include provisions to insure that construction activities are in compliance with the State Air and Water Quality Regulations. Specifically, measures will be taken to mitigate the following adverse impacts.

4.27 Air quality. During construction, dust will be controlled by use of water. Emissions from construction equipment must be in compliance with the State Air Quality Regulations.

4.28 Water quality. Provisions will be included in the contract to limit the area of open excavation. Temporary dikes, seeding, mulching, and grading will be used to control erosion from these open areas when necessary. Permanent erosion control measures will include additional seeding and mulching of all disturbed areas. Sodding will be used in ditch bottoms where it is necessary to control water erosion. Topsoil will be removed and stockpiled for restoration purposes. Where large culverts or bridges are installed, riprap will be used on streambanks to control erosion. To prevent erosion of the approach embankments of the bridge across Charging Eagle Bay, the slopes will be flattened and riprapped.

4.29 During the construction of the bridge piers, there will be some pollution and siltation of Lake Sakakawea. It is planned that the majority of underwater pier construction will be done when Lake Sakakawea is at its lowest seasonal water surface elevation. This is normally 1837.5 feet m.s.l.

4.30 All work activities in and over water will also be in compliance with State and Federal regulations.

4.31 Land acquisition. A fair market value will be paid to the landowners for the land acquired to construct this project. Former landowners may be permitted to harvest hay from that portion of the highway right-of-way outside the boundaries of Lake Sakakawea. The mowing date for any given year would be coordinated with personnel of the State Game and Fish Department. The State will erect fences on the right-of-way boundary whenever the roadway is constructed through Indian lands acquired for the project. Cattle passes also will be built where necessary. No known occupied businesses or residences will require relocation.

4.32 Wildlife and vegetation. The construction of this project will require removal of trees and shrubs in several areas. After completion of construction, the topsoil will be replaced. Ditches and slopes will be reseeded with grasses. Benefits may result to ground nesting birds, including some upland game species. Prohibition of grazing on right-of-way and delayed mowing of right-of-way specifically to protect nesting birds are normal State highway practices. Recent research has shown that highway rights-of-way are probably more valuable to nesting birds than the adjacent grazed or cultivated lands. Ditches and slopes on Corps' project grounds will be revegetated with native grasses and shrubs. Mowing and grazing on Corps' lands will be prohibited to provide year-round wildlife habitat.

4.33 Noise standards. Noise standards for North Dakota are being investigated by various departments dealing with environmental affairs. In the absence of such State laws, regulations governing Federal aid highway construction will apply. Safety requirements pertaining to noise control will be required as listed in Engineering Manual 385-1-1 (General Safety Requirements).

V. ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT
BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

LOSS OF LAND RESOURCES

5.01 Approximately 490 acres of land will be committed to the highway and right-of-way. However, 18 percent, or 90 acres, of this total will be required for the roadway. The remaining 82 percent of the right-of-way acreage will remain as a greenbelt.

QUALITY OF AIR AND WATER

5.02 The emissions and noise of construction equipment cannot be completely eliminated. There will also be a slight decrease in local air quality due to traffic on the new road. The temporary increase in turbidity of Lake Sakakawea cannot be avoided due to placement of the bridge piers. Erosion will occur until such time as vegetation is reestablished. However, remedial actions provided in the plans and specifications are designed to help in controlling erosion losses.

WILDLIFE AND VEGETATION

5.03 The project will intrude into an area of wildlife range. It is expected that the roadway with its increased traffic will have some effect on the movement of wildlife. Improved access will also encourage hunters to utilize the area. Any trees and shrubs which will be removed, will not be replaced on State right-of-way outside Corps' project lands.

VI. ALTERNATES CONSIDERED

6.01 Locations being considered for the proposed bridge crossing consist of four alternate lake crossings. In addition, there are three corridor locations. The lake crossings, or alignments, are numbered 1 through 4, and the corridor, or route locations, are designated A, B, and C on the map provided on page 50.

6.02 Route A can be considered the northern corridor. Route B is located approximately midway between Routes A and C. Route C is the southern corridor which generally parallels the Little Missouri River.

6.03 In general, Route A is the shortest of the alternate connecting road alignments. Routes A-1, A-2, and A-3 seem to be the most compatible with the existing road development in the area. The main reason why Route A is the shortest is that it will follow an existing hard-surfaced Indian service road for some 10 miles from Highway 22 east through Mandaree. It is possible that additional portions of this route will be hard surfaced by the time the bridge is completed, since the Fort Berthold Agency is involved in an extensive reservation road improvement program.

6.04 Routes B and C would involve construction of major portions of new roadways where none presently exist. This new construction would undoubtedly affect the environment, more so than Route A, which follows an existing roadway. Portions of all of the routes would cross some very rugged badlands on one or both sides of the reservoir. Building a roadway in rough terrain will be quite costly, and the possibility of unstable soil conditions causing future maintenance problems is present. Erosion in rugged terrain may be difficult to control, as well as having adverse effects on aquatic wildlife. Those routes which primarily follow the valleys will undoubtedly have the greatest impact on the terrestrial wildlife of the area since the valleys support a better vegetative growth than rugged terrain. All of the routes considered follow the valleys as much as possible, since construction is easier and less costly in favorable terrain.

6.05 The required length of connecting roadways and the estimated cost of constructing these roadways for each alternate route are as follows:

<u>Location</u>	<u>Construction Length</u>	<u>Estimated Cost</u>
A-1	18.5 mi.	\$10,070,600
A-2	21.1 mi.	6,100,300
A-3	20.7 mi.	5,350,000
A-4	23.5 mi.	11,817,200
B-2	26.0 mi.	7,942,000
B-3	25.6 mi.	7,148,300
B-4	28.4 mi.	13,615,000
C-4	24.9 mi.	12,652,200

6.06 Each of the four bridge sites can be used with Route A. On Route B the feasible bridge sites are locations 2, 3, and 4. Bridge Site 4 is the only feasible lake crossing for Route C. Bridge Site 1 is the furthest downstream from the four alternate crossing locations. Progressing upstream along the Little Missouri River valley, Sites 2, 3, and 4 are encountered in that order. It is found that the water depths and width of the valley generally decrease in going from Site 1 to Site 4. The following is a listing of the maximum water depths and water surface widths for each site, assuming the reservoir pool is at elevation 1854 feet m.s.l.:

<u>Bridge Site</u>	<u>Water Surface Width</u>	<u>Water Depth</u>
1	5120 feet	109 feet
2	4430 feet	91 feet
3	4060 feet	86 feet
4	3760 feet	62 feet

6.07 The required bridge lengths and estimated cost of constructing the bridges for each bridge site are as follows:

<u>Bridge Site</u>	<u>Required Bridge Length</u>	<u>Estimated Cost</u>
1	5600 feet	\$19,076,200
2	4900 feet	15,851,700
3	4500 feet	15,550,000
4	4254 feet	14,018,900

6.08 Characteristics of the proposed approach roads through the Little Missouri River breaks to the bridge sites are as follows:

Bridge SiteFeatures

- 1 The terrain is extremely rugged on both approaches to the bridge.
- 2 The terrain on the west approach is hilly. \$500,000 loose riprap would be needed to protect the sandy soil of the peninsula on this approach. The terrain on the east approach is rough.
- 3 The terrain of the west approach is hilly to rough. The terrain of the east approach is rough with the exception of a valley approximately 3 miles long, which leads out of the breaks.
- 4 The terrain on the west approach is extremely rugged.

6.09 The total length of the project and the total estimated project cost, including bridge and connecting roads are as follows:

<u>Location</u>	<u>Construction Length</u>	<u>Estimated Cost</u>
A-1	18.5 mi.	\$29,146,800
A-2	21.1 mi.	21,952,000
A-3	20.7 mi.	20,900,000
A-4	23.5 mi.	24,836,100
B-2	26.0 mi.	23,793,700
B-3	25.6 mi.	22,698,300
B-4	28.4 mi.	27,633,900
C-4	24.9 mi.	26,671,100

6.10 The North Dakota Highway Department recommended the construction of Route A-3 because (1) it is least costly; (2) the terrain is more favorable; (3) it is more compatible with the existing roadway network; (4) it provides better access to present recreation areas; and (5) it better serves local traffic.

6.11 The alternates of a ferry and a road paralleling the southern side of the Little Missouri River Arm of Lake Sakakawea were not included as "alternates" by the North Dakota Highway Department when selection of the recommended route was made.



Figure 1. Terrain of west approach -
Alternate A-3, 1973.



Figure 2. Terrain of east approach -
Alternate A-3, 1973.

ALTERNATES

6.12 Alternate A-1. This route would begin at North Dakota Highway 22, 1 mile west of Mandaree and continue easterly and southeasterly to North Dakota Highway 8, 1 mile west of Twin Buttes. The length of this route is approximately 28.5 miles, but the actual construction length would be only 18.5 miles. Routes A-1 through A-4 would all connect with an existing Indian service road east of Mandaree. The Indian service road is hard surfaced for approximately 10 miles east of State Highway 22.

6.13 The terrain along this route varies from steep and hilly to rolling prairie on the north side of Lake Sakakawea to very rugged badlands on the south side. The crossing of the Little Missouri River Arm at this location would be the longest terrain, the most difficult, and the water the deepest of any of the alternates considered. For these reasons, Route A-1 was not selected.

6.14 Alternate A-2. This route would begin at North Dakota Highway 22, 1 mile west of Mandaree and continue easterly and southeasterly to North Dakota Highway 8, 1 mile west of Twin Buttes. The length of this route is approximately 31 miles. No construction is contemplated on the first 10 miles of this route. The overall length of this route is 31 miles, but the actual construction length is 21.1 miles. The west approach to the bay comes in over steeply rolling to hilly terrain and makes its final approach to the bay along the top of a long, narrow peninsula formed by Squaw Creek to the north and Charging Eagle Bay to the south. The crossing ends at a point just north of the Halliday Recreation Association Marina on the east side. On this west approach, the greatest problem involved in design of the roadway would be protection of the banks along this peninsula to hold it intact against erosion from wave action. The soil of the peninsula is very sandy and considerable erosion has taken place since the bay was formed. About \$500,000 of loose rock riprap would be needed to protect the portion of the road on this peninsula from further erosion. On the eastern approach to the bay, the terrain can be described as very rough and broken, typical badlands prevail until the route gets out of the river valley.

6.15 Protection and maintenance of the riprapped banks on the peninsula and unstable lands on the eastern approach prevented this alignment from being selected.

6.16 Alternate A-3. This route will begin at North Dakota Highway 22, 1 mile west of Mandaree and continue easterly and southeasterly to North Dakota Highway 8, 1 mile west of Twin Buttes. This route follows the same location as Route A-2 for approximately the first 19 miles, but then branches off to the south of Route A-2 for some 6 miles, crosses the reservoir to the south and west of the Route A-2 crossing, and then rejoins Route A-2 about 6 miles west of Twin Buttes. The overall length of this route is about 31 miles, with actual construction length being 20.7 miles. No construction is contemplated on the first 10 miles of this route. The crossing of the Little Missouri River Arm on this location is from a large, wide peninsula between Squaw and Moccasin Creeks on the west to a point approximately 1 mile south of the Charging Eagle Corps' Recreation Area on the east side. The wide peninsula on the west side of the proposed crossing is presently undergoing erosion at an undertermined rate. Protecting this location would be minimal compared to protecting the peninsula in alignment with Route A-2. The west approach to the bay can be described as rough to hilly terrain. The east approach to the bay of Alternate A-3 is basically rough and broken terrain. The route will have to traverse these badlands for only a short distance before following a valley approximately 3 miles in length that leads out of the Little Missouri River breaks to the plains. A problem that will be confronted following a valley which naturally conducts heavy and rapid runoff to the bay will be the need to maintain riprapping in eroding and crucial areas in order to avoid serious erosion of the roadway. This alternate was recommended because: (1) The terrain is more favorable;; (2) It is more compatible with the existing road network; (3) It is the least costly; (4) It will better serve local traffic; and (5) It will provide better access to recreation areas. However, this alternative was estimated to have the most effect on wildlife.

6.17 Alternate A-4. This route would begin and terminate at the same locations as Routes A-1, A-2, and A-3. The crossing of Lake Sakakawea would be accomplished at Bridge Site 4. This route would begin at North Dakota Highway 22, 1 mile west of Mandaree and continue southeasterly to Bridge Site 4, then continue east to North Dakota Highway 8. This route would be approximately 34 miles in length with the actual construction length being 23.5 miles. The west approach road to this bridge site would have to be constructed through very hilly terrain and approximately 2 miles of badlands at its roughest. The east approach road to the bridge site would also have to be constructed through approximately 1 mile of severe badlands

before reaching a plateau which leads out of the Little Missouri River breaks. Alignment 4 was not selected because of the severe topography and unstable soil conditions.

6.18 Alternates B-2, B-3, B-4, and C-4 would require more new road construction than would Route A. The approach roads or bridge alignments would also have the same effects as sited for Alignments 2, 3, and 4 in Alternates A-2, A-3, and A-4.

6.19 Alternate B-2. This route would begin at North Dakota 22 about 3 miles north of the Lost Bridge or 8 miles south of Mandaree, and continue easterly and southeasterly for approximately 13 miles. It then turns to follow the same line as Alternate A-2. The terrain is rolling to very hilly prairie on the first 13 miles of this route. The overall construction length of Route B-2 would be 26 miles.

6.20 Route B-3. This route follows the same alignment as B-2 for approximately the first 13 miles, then branches off to follow the same line as Route A-3. The overall construction length of Route B-3 would be 25.6 miles.

6.22 Route B-4. This route follows the same alignment as Routes B-2 and B-3 for approximately the first 11 miles, then turns to the south to follow the same location as Route A-4. The construction length of Route B-4 would be 28.4 miles.

6.22 Route C-4. This route begins at the same point as Routes B-2, B-3, and B-4, but turns immediately to the southeast for about 5 miles, then continues east-south-east for about 10 miles, where it joins Routes A-4 and B-4. The terrain of Route C is rolling to hilly prairie changing to very rugged badlands just prior to joining Routes A-4 and B-4. The overall construction length of Route C-4 would be 24.9 miles.

6.23 Do nothing. The alternate to do nothing would mean that the present travel patterns would be maintained in their present manner and the division of the Fort Berthold Indian Reservation would remain. It would also mean that none of the beneficial or detrimental effects of the project would be experienced.

6.24 Road parallel to the Little Missouri River Arm. This road would begin approximately 3 miles south of Twin Buttes on North Dakota Highway 8. It would follow the creek valleys through the badlands of Hans Creek and skirt the badlands adjacent to the Little Missouri River Arm until reaching the badlands of Jim's

Creek. Here it would also follow the creek valleys through the badlands and then connect with North Dakota Highway 22 approximately 3 miles south of the Lost Bridge. This would require about 28 miles of new construction. The distance from Twin Buttes to Mandaree would be approximately 47 miles in length and effect a savings of approximately 18 miles, as compared with a savings of 35 miles for A-3, the proposed roadway and bridge. This road would probably have as great an environmental impact as the proposed route since it would require negotiating the badlands and valleys of the Little Missouri River breaks in two areas.

6.25 The estimated cost for this location would be approximately \$8,000,000. The costs and construction of this road would be the responsibility of the State of North Dakota.

6.26 Ferry boat. A crossing of Lake Sakakawea could be accomplished by use of a ferry boat. The most probable location for a ferry crossing would be in the vicinity of the North Dakota Highway 8 bridge, 18 miles north of Halliday, which was inundated by Garrison Reservoir. A ferry at this location could connect the west, south, and east segments of the Fort Berthold Indian Reservation. The operation of a ferry would undoubtedly be on a fixed time schedule. This would cause delays in travel time and there would probably be certain hours during the night when the ferry would not operate. The operation of a ferry would be limited to the period of time when there is no ice on the water. A ferry could operate for approximately 7 months during the year. There would be approximately 5 months when it would not be possible to cross Lake Sakakawea.

6.27 The fluctuating water level causes the shoreline to change. To accommodate a ferry, a dock would need to be constructed so that it could operate at any given water level. Roads to the ferry landings would also have to be constructed. A ferry would result in a limited time period for operation. Inconvenience experienced due to delays and lack of crossings during certain periods of the year would be encountered using this alternate.

VII. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM
USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE
AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

7.01 The proposed project could provide a shorter route for local traffic originating mainly from the southern and western segments of the Fort Berthold Indian Reservation. The proposed project will also provide a small economic gain to the traveling public while providing scenic views of the reservation lands.

7.02 The project will benefit the residents of the Fort Berthold Indian Reservation by giving them the opportunity to improve their social life and open new areas for employment opportunities. The traffic generated in this area will offer opportunities for business and commercial enterprises to serve tourists and recreational activities.

7.03 The long-term effect on wildlife will be of a general intrusion on the habitat and will affect the movement of some species. The project will provide better access to hunters. There will also be some loss of wildlife due to collisions with vehicles. The vegetation of the right-of-way will become a greenbelt. Any future increases in recreation, tourism, traffic, or population will cause a reduction in native vegetation, and an even greater intrusion on the wildlife of the area.

VIII. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS
OF RESOURCES WHICH WOULD BE INVOLVED IN THE
PROPOSED ACTION SHOULD IT BE IMPLEMENTED

8.01 The time, money, materials, and supplies used in the construction of the proposed facility are irretrievable commitments of resources.

8.02 The use of land for this project is not an irretrievable commitment of resources. Approximately 18 percent of the land resources will be used for roadway and 82 percent of the land right-of-way will be essentially a greenbelt. It is recognized that it would be very expensive and very unlikely that the proposed facility would be removed and the land used for other purposes. However, this option is always open.

8.03 The project will improve access between the southern and western segments of the Fort Berthold Indian Reservation, to areas along Lake Sakakawea, and through the reservation itself. This may encourage development of facilities orientated towards serving highway traffic, tourists, and recreational uses. The present traffic projection of 300 cars per day indicates that such developments would be limited in size.

IX. COORDINATION WITH OTHERS

PUBLIC PARTICIPATION

9.01 The Subcommittee on Flood Control, Rivers and Harbors of the Committee on Public Works of the United States Senate held a public hearing in Bismarck, North Dakota on 24 October 1970. Senator Jennings Randolph, Chairman of the Committee on Public Works, presided at the public hearing.

9.02 A public hearing on proposed alternative routes for the project was held at Halliday, North Dakota on 21 September 1972 and at Mandaree, North Dakota on 21 September 1972.

GOVERNMENT AGENCIES

9.03 On 21 January 1972, State and local agencies were requested to comment on the proposed project route locations. The list of agencies who were asked to comment, a copy of the letter requesting their comments and copies of their responses are on file. Their views and comments were used in preparing the original draft environmental statement.

9.04 The original draft environmental statement was circulated for comment by the North Dakota Highway Department. The comments, including those from Omaha District, Corps of Engineers, which the North Dakota Highway Department received, are on file. These comments were included in the rewrite of this draft environmental statement, which has been prepared in order to follow the Corps' guidelines, which are also acceptable to the Federal Highway Administration.

9.05 The rewrite following the Corps' guidelines was determined necessary to meet the lead agency requirement of the public law.

9.06 This draft environmental statement has been sent to the following Government agencies:

- Environmental Protection Agency
- U.S. Department of Interior
- U.S. Department of Agriculture
- U.S. Department of Transportation
- U.S. Coast Guard
- Federal Highway Administration
- U.S. Department of Commerce
- U.S. Department of Housing and Urban Development

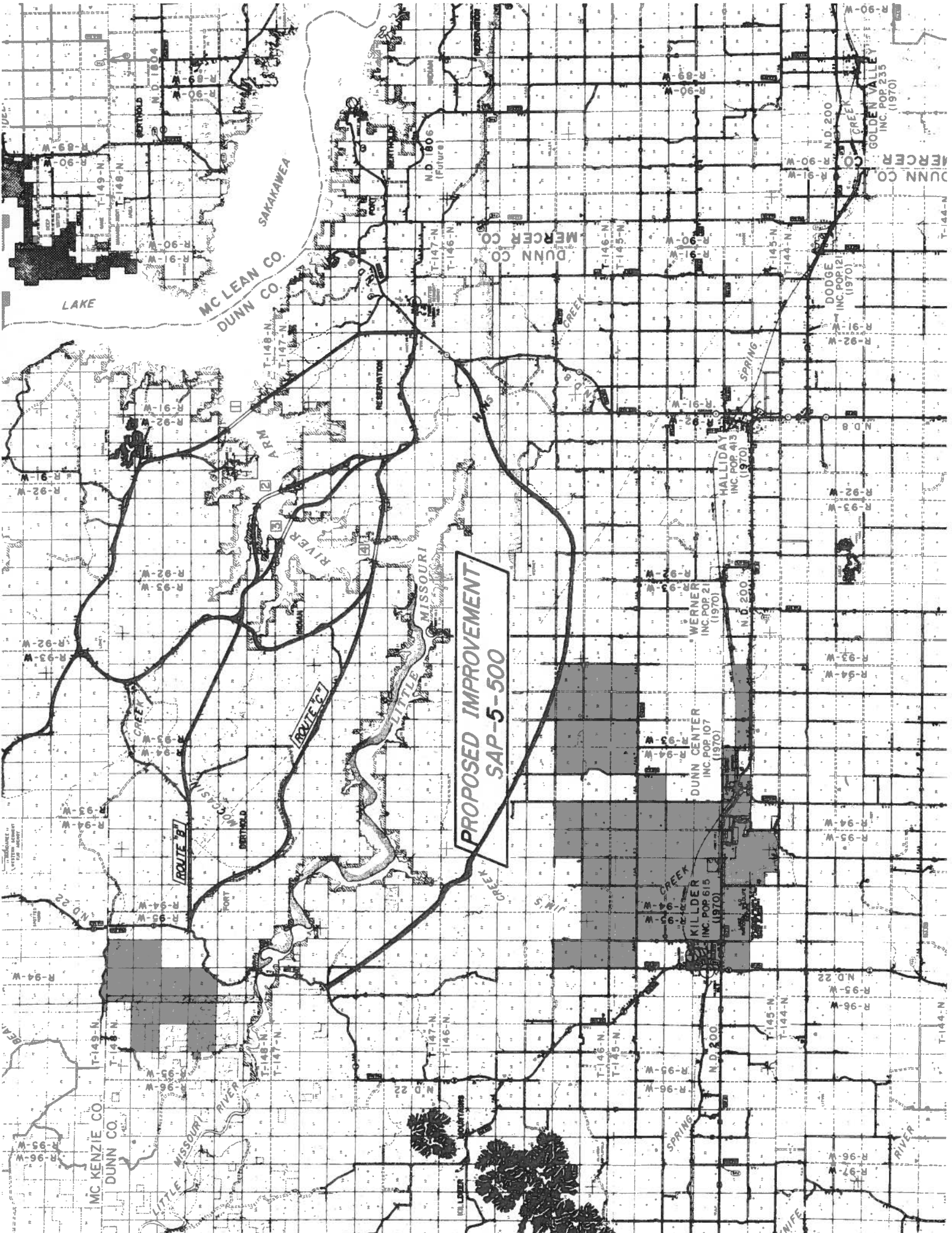
North Dakota Game and Fish Department
State Historical Society of North Dakota
Columbia Fisheries Program Office
North Dakota State Planning Division
North Dakota Highway Department
Bureau of Indian Affairs
Arthur A. Link, Governor of North Dakota
Lt. Governor Wayne Sanstead
Senator Milton Young
Senator Quentin Burdick
Congressman Mark Andrews
Dunn County Commission, Manning, North Dakota
Mercer County Commission, Stanton, North Dakota
McKenzie County Commission, Watford City, North Dakota
Halliday City Council, Halliday, North Dakota
New Town City Council, New Town, North Dakota
Killdeer City Council, Killdeer, North Dakota
Watford City, City Council, Watford City, North Dakota

CITIZEN GROUPS

9.07 The draft environmental statement will be sent to citizen groups indicating an interest in the proposed project. Their reviews and comments will be summarized and copies of their replies will be attached to the final environmental statement.

9.08 This draft environmental statement has been sent to the following citizen groups:

North Dakota Wildlife Federation
North Dakota Association of Soil Conservation Districts
North Dakota Natural Science Society
American Fisheries Society
Institute of Ecological Studies
Tribal Business Council for the Three Affiliated Tribes,
Fort Berthold Indian Reservation
Halliday Civic Club, Halliday, North Dakota



PROPOSED IMPROVEMENT
SAP-5-500

ROUTE B

ROUTE C

