CHAPTER 9
PLAN SELECTION

9.1 GENERAL

In previous Chapters various factors were analyzed / considered for each alternative. These factors included capital costs, operation and maintenance costs, user density and location, operational control, water rights and environmental concerns.

The factor that impacts the user the most is the final costs per month, which is directly influenced by all of the factors listed. The project area has a median income level which necessitates that a project of this nature must be as economical as can be achieved.

A listing of 2000 median incomes is shown in Table 9.1.1. Poverty Rate Median Household Income Level is $25,492 or less.

Table 9.1.1
Average Median Household Income
by County

Dawson County	$31,393
Garfield County	25,917
McCone County	29,718
Prairie County	25,451
Richland County	32,110
Average	28,920

2000 Median Incomes

9.2 DESIGN ALTERNATIVES

The design alternates considered were:

A) Water plant located at Devils Creek in Garfield County
B) Water plant located near Nelson Creek, Rock Creek or Bear Creek in the Big Dry Arm of Fort Peck Lake
C) Missouri River
    1) water treatment plant at Highway 13 crossing
    2) purchase water from the Fort Peck Tribes MR&I project
D) Purchase water from the City of Wolf Point
E) Upgrade the Town of Circle's water treatment system

Project cost estimate with operation maintenance and replacement costs are included for the following: A (water treatment plant located at Devils Creek in Garfield County), B (water treatment plant located near Nelson Creek, Rock Creek or Bear Creek in the Big Dry Arm of Fort Peck Lake), C1 (Missouri River – water treatment plant at Highway 13

crossing) and C2 (Missouri River – purchase water from the Fort Peck Tribes System). The other alternatives were dropped for the reasons outlined in Chapter 8.

9.3 EVALUATION OF ALTERNATIVES:

Table 9.3.1 summarizes the economic evaluation for each alternative. Table 9.3.2 analyzes each alternative for several factors.

Economic Evaluation: Each alternative is rated by their present worth of project cost plus operation, maintenance and replacement costs.

Water Quality: Each alternative is rated by their water quality as presented in Chapter 4 of this report.

Risk Potential of Source Contamination: Each alternative is rated by the risk of contamination of the source supply by such things as pesticides, nitrates, etc. (lowest to highest risk).

Availability of Supply: Each alternative is rated by the availability of supply (highest potential to lowest) with regard to such items as current appropriation and the ability for expansion.

Site Topography: Each alternative is rated by the potential of the site topography to enhance the system's operations.

TABLE 9.3.1
ECONOMIC EVALUATION

	A	B	C1	C2
Total Project Cost	$64,124,000	$61,834,600	$62,690,500	$59,476,600
*Present Worth Annual OM & R Cost (P/A, 5%, 40)	11,170,000	11,170,000	11,170,000	16,730,000**
Total Present Worth * 40 Years	$75,294,000	$73,004,000	$73,860,500	$76,206,600

** This value includes the purchase of water from the Tribes.

Water Quality
All alternates utilize a surface water source. Alternates A and B will have lower turbidity spikes since they are in the Fort Peck Reservoir and alternates C1 and C2 are in the Missouri River and are susceptible to higher turbidity levels based on rainfall and snow melt.

Risk Potential of Source Contamination
Alternates A and B are considered to contain less risk because they are surface water in a large body of water and there are less discharge sources to be protected. Surface water is judged more susceptible to contamination due to the accessibility; speed and lack of

natural filtration barriers, Alternate C1, C2 are in the Missouri River, which would have a potential for a sudden water quality change due to a small or unauthorized discharge upstream.

Availability of Supply

The alternates using Missouri River water and Fort Peck Lake are considered to have the same availability of water but the chance of low flow in the river is possible due to the operation of the dam. The overall volume of water needed at full build out, which is currently projected at 734 acre feet is less than 0.01% of the annual water flow in the Missouri River.

Site Topography

Alternate A would be pumping mostly from lower elevation to higher elevations and is not centrally located.

Alternate B would be pumping from a central location and would have some higher elevation pumping.

Alternates C1 and C2 would be pumping from lower elevations to higher elevations and would be located on the outside edge of the service area.

Each factor was scored from best = 1 to worst = 5 and the total for each alternative was divided by the number of factors. If two alternates were the same for a factor, they were given an equal point value.

TABLE 9.3.2
ANALYSIS OF ALTERNATES

	A	B	C1	C2
Economic (Total Present Worth)	3	1	2	4
Water Quality	1	1	2	2
Risk Potential of Source Contamination	1	1	2	2
Availability of Supply	1	1	2	2
Site Topography	3	1	2	2
Number of Rural Users Supplied	1	1	1	1
Combined Evaluation	10	6	11	13
Total divided by 4	2.5	1.0	2.75	3.25

It is expected that during the design process, that additional rural sign-ups will occur. This would likely add to the total project cost, but is difficult to estimate. The nature of a regional water system design allows 10% to 15% increase in users in the core area without significant cost increase.

9.4 ALTERNATE SELECTION:

The alternate that appears to have the highest rating is Alternate B, which locates the water treatment facility in the Big Dry Arm of the Fort Peck Lake. The possibility of a major user (the coal development) was not factored in the costs but should this

development take place it will be a significant positive impact on the project, both from a large user base and a potential source of construction funding.

Following the selection of the preferred alternative, a revised estimate of probable cost was done to update the final users as of 5/10/06, the price of pipe and construction and that revised cost will be utilized in the rate determination and the funding package analysis in the other chapters. The revised opinion of probable cost for this alternate is $82,148,000.