ALTERNATIVE #6 - Import Pipeline, Lake Oahe to Wahpeton

This is a Missouri River import alternative that supplies treated water through a pipeline from Lake Oahe to the Red River near Wahpeton. It incorporates four features:

Feature 5 (modified) — A 22,000-acre-foot ring-dike reservoir near Wahpeton to store and re-regulate water imported via the Lake Oahe-Wahpeton pipeline (feature 16). *Would not include the river diversion pump.*

Feature 12 — Conservation. This is about a 15-percent reduction in demand. However, it is offset by a 15- to 20-percent increase in demand during drought years.

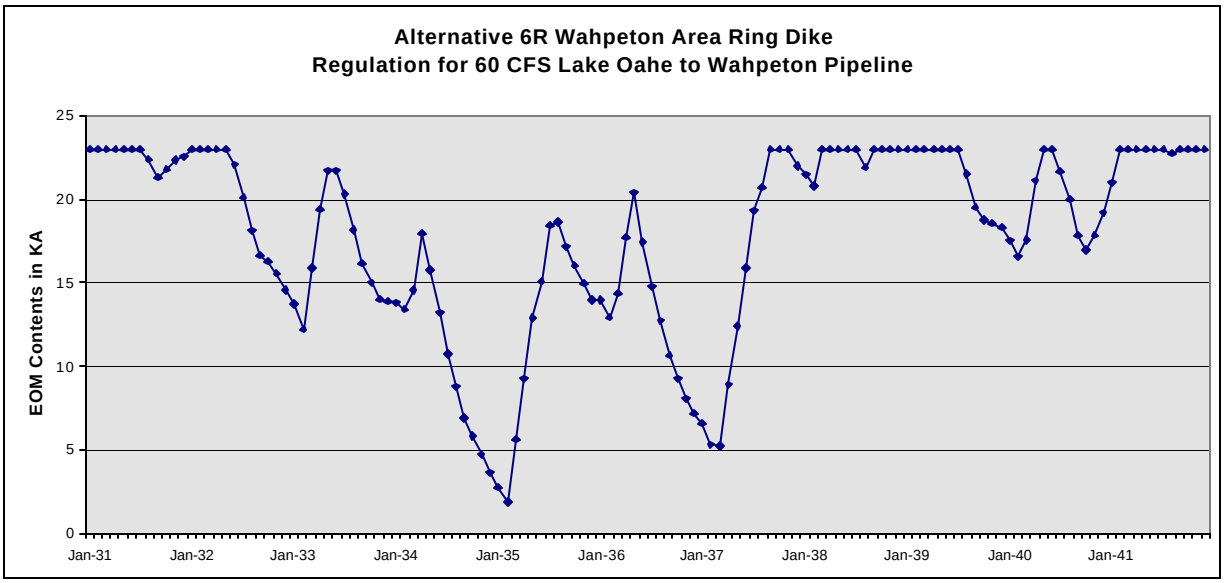
Feature 16 — A 60-cfs pipeline that transports Missouri River water from Lake Oahe, west of Linton, ND, to a surface storage reservoir near Wahpeton. Includes a biota treatment plant at Lake Oahe using the ozonation/chloramine process.

Feature 17 — Surface-water supply for rural water systems. Cost estimates included here provide for multiple river diversions, treatment plants, pumping plants, and main supply pipelines. For modeling purposes, though, the rural system shortages are consolidated demand points located at Fargo and Grand Forks.

Some shortages that existed on the Sheyenne River due to demands at Fargo, West Fargo, Moorhead, and New Industry 2 have been shifted to the Red River to be met by the import. Shifting demands to the Red River allows Lake Ashtabula to be used more effectively to meet shortages and demands that occur on the Sheyenne and Lower Red Rivers.

Feature 5 Summary: Ring Dike Reservoir on the Red River

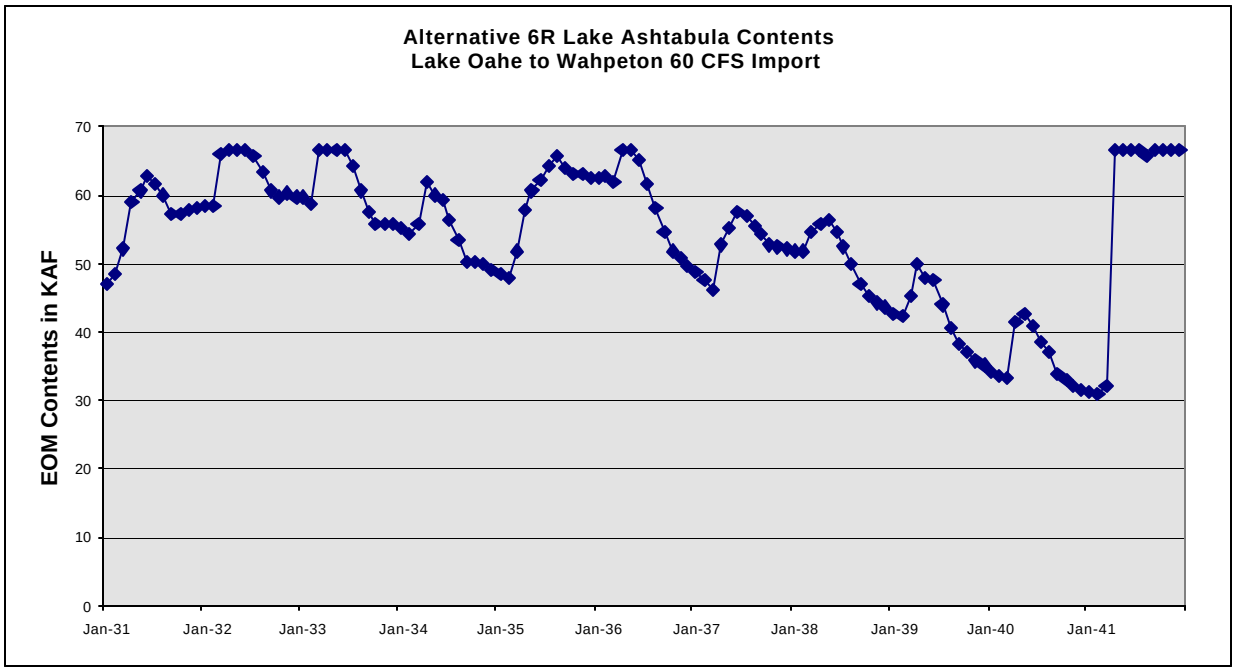
For this alternative, a 22,000 acre-foot reservoir is used at the terminal end of the import pipeline. Future studies should investigate the appropriate size of reservoir necessary to make an efficient import system. No ring dike diversion pump is included in this estimate since the ring dike is solely used for import re-regulation and release to help meet demands and allow the import to operate at a steady rate.



Feature 16 Summary: Pipeline Import from Lake Oahe to Wahpeton

This pipeline import uses Lake Oahe near Linton, ND as the supply pool. A biota treatment plant and pumping plant are located at the lake. The 60 cfs capacity pipeline supply follows a direct route to Wahpeton and utilizes a booster pump and a couple of elevated storage tanks to control pipe pressures. The pipeline ranges in diameters from 60 inch to 45 inch.

Using this import allows some changes in releases from Lake Ashtabula. The Thomas Acker allocation is modified somewhat to allow more efficient use of the reservoir. The effect of this can be seen in the following chart of Lake Ashtabula end-of-month contents. Compared to other previous alternatives, the contents of the lake do not have such a wide range of fluctuation.



Feature 17 Summary: Rural Water Systems

This feature includes an estimate for rural water diversions from the surface water supply, same as in Alternative 2.

Cost estimates given below are based on operating both the import pipeline and the biota treatment plant at a steady rate year-round.

ESTIMATE WORKSHEET

ALTERNATIVE #6
Lake Oahe to Wahpeton
Pipeline Import

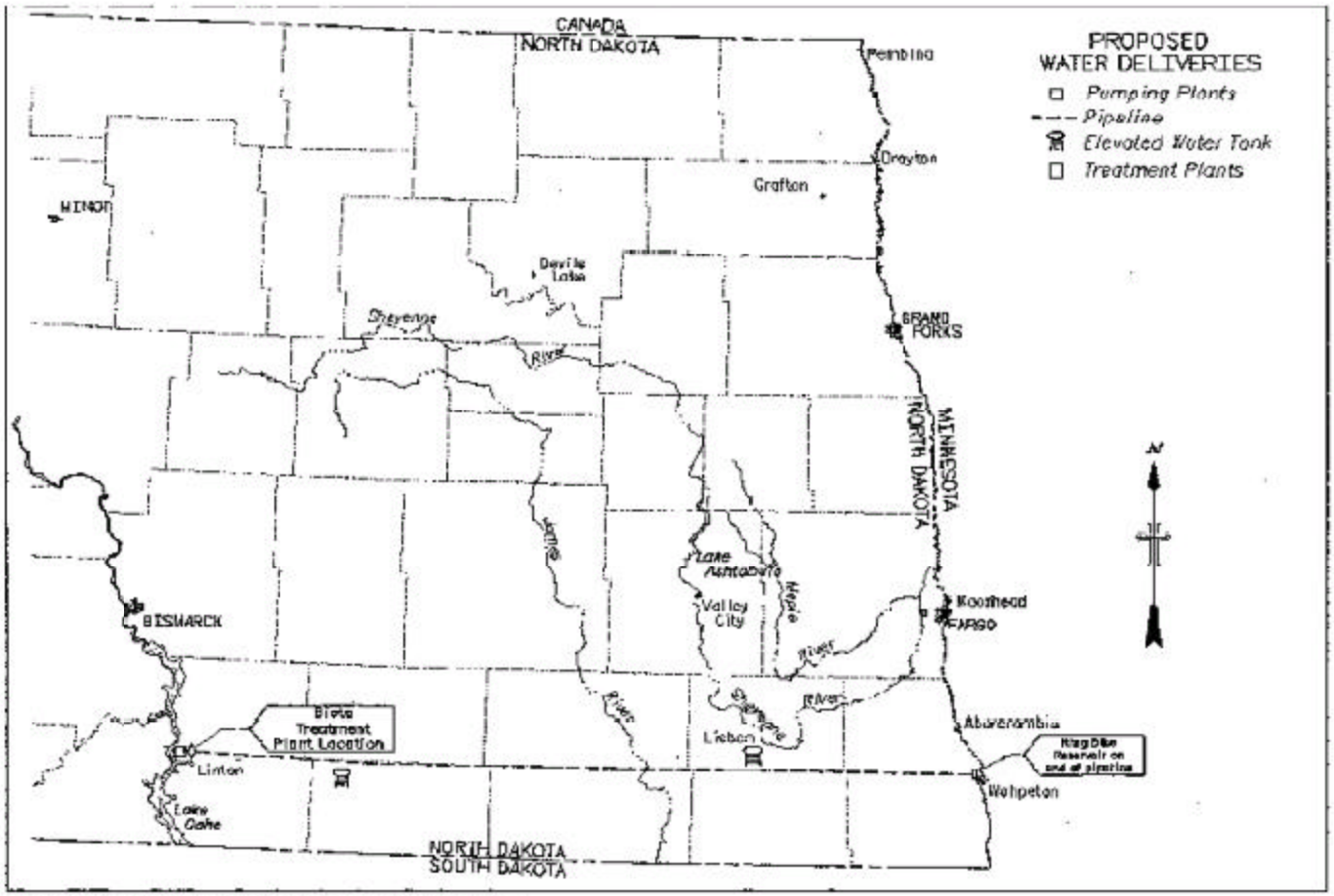
PROJECT: Red River Valley Water Supply

DIVISION:

FILE: ALT_COST.WK4

DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	LIFE	Annual Operation	Annual Maintenance	Annual Replacement	Annual Energy	TOTAL ANNUAL
Feature 5											
Ring Dike Reservoir for Pipeline Regulation		22,000	Ac-Ft	LS	$26,490,000		$1,000		$8,600		$9,600
ROW and Relocations				LS	$2,320,000						
Feature 16											
Pumping Plant and Pipeline		60	cfs	LS	$450,000,000		$282,000	$92,000	$798,100	$1,960,000	$3,132,100
Biota Treatment Plant, Ozone		60	cfs	LS	$12,400,000		$910,000				$910,000
Feature 17											
Agassiz, Tri County, Walsh Rural Diversion & Treatment Plant		0.785	MGD	LS	$18,499,000		$91,996	$4,028	$141,738	$113,795	$351,557
Cass Rural Water Diversion & Treatment Plant		2.628	MGD	LS	$20,735,000		$192,198	$9,802	$178,572	$274,570	$655,142
Dakota Rural Water Diversion & Treatment Plant		0.95	MGD	LS	$8,421,000		$125,464	$3,544	$119,185	$121,627	$369,820
Grand Forks Traill and Traill Diversion & Treatment Plant		2.86	MGD	LS	$19,338,000		$207,149	$10,760	$188,201	$300,241	$706,352
Langdon Rural Diversion & Treatment Plant		0.35	MGD	LS	$18,613,000		$62,002	$2,317	$128,546	$73,060	$265,924
Southeast and Ransom Sargent Diversion and Treatment Plant		1.3	MGD	LS	$19,079,000		$128,923	$6,374	$156,609	$169,391	$461,297
											$0
Water Treatment Chemical Cost Savings using Missouri River Water	Supply						($1,021,200)				($1,021,200)
						Subtotal	$979,533	$128,825	$1,719,550	$3,012,684	$5,840,591
										Unlisted Items'+/- 20%	$1,169,409
Existing GDU Supply Works, Continuing O&M										GDU Assigned Cost	$2,139,000
Mobilization (+/- 5%)					Included Above				**TOTAL ANNUAL OM&R**		**$9,150,000**
SUBTOTAL					$595,895,000						
Unlisted Items (+/- 20%)					Included Above						
CONTRACT COST					$595,895,000				**ANNUALIZED CAPITAL COST**		**$42,500,000**
Contingencies (+/- 25%)					Included Above						
FIELD COST					$595,895,000						
USBR Invest., Mitig., Engr. & Constr. Mgt. (+/- 33%)					Included Above				**TOTAL ANNUALIZED COST**		**$51,650,000**
TOTAL ESTIMATE					**$595,900,000**						

QUANTITIES		PRICES	
BY		BY	CHECKED
R. Burnett		K. Copeland	
DATE	APPROVED	DATE	PRICE LEVEL
			Appraisal



ALTERNATIVE 6 – Import to Upper Red River

Modified Thomas–Baker Plan to meet Sheyenne River needs.