PRRIP – ED OFFICE **7/11/2016**

TO: GOVERNANCE COMMITTEE
FROM: GEORGE OAMEK, EXECUTIVE DIRECTOR'S OFFICE
SUBJECT: IRRIGATION RETIREMENT THROUGH LAND PURCHASES
DATE: JULY 11, 2016

Acquiring Water Through Irrigation Retirement

This memorandum examines a water acquisition strategy involving purchasing irrigated cropland in a fee simple manner, retiring its irrigation right or certification, and subsequently selling it as dryland cropland while retaining a permanent easement in favor of the Platte River Recovery Implementation Program (PRRIP or Program). This would preclude future irrigation on the affected parcels. In effect, it would be a less damaging version of a "buy and dry" strategy employed by many Colorado municipalities.[1]

For purposes of this reconnaissance-level analysis, it is assumed that the Program would purchase approximately 8,500 acres of irrigated cropland in increments of 500 acres and 1,000 acres over 11 years, 2016-2026. Given the additional assumptions described below, this is anticipated to provide approximately 5,000 acre-feet of Program score at Grand Island.

Offsetting these purchases is the sale of dryland cropland without irrigation potential. It is assumed that irrigated parcels are converted to dryland over the course of one year, so if 500 acres of irrigated cropland is purchased this year, the Program would sell 500 acres of dryland cropland next year.

The price the Program effectively pays for water is the difference in the value of the irrigated cropland and the dryland cropland, plus transaction costs. In theory, this approach is similar to the water banking strategy implemented by the Central Platte NRD, in which the NRD purchases the irrigation easement without having to buy, and subsequently sell, the parcel of land. The difference is that the buy-and-dry approach discussed here would work through established land markets with relatively high numbers of bona fide transactions, reducing the likelihood that the Program would pay more than value of the water for irrigation when the strategy is fully implemented. This method also protects against long term issues such as courts invalidating easements because the easement value paid is claimed to be insufficient at a later date.

1 "Buy and dry" is a loaded term that for many, especially Coloradoans, carries a negative image of the economic demise of rural communities. Crowley County, Colorado is an often-cited example of how reductions in irrigated farmland and associated enterprises can damage a rural community. This issue is important and more fully discussed below.

1.0 Method of Analysis

This analysis prepares a financial pro forma of these water transactions over the 50-year period of analysis 2016-2065. Although the land purchases are assumed to be only over the period 2016-26, a 50-year period is considered because some administrative costs are assumed to continue past 2026 and for consistency with the period of analysis used for other options considered by the Program.

For every year from 2016 to 2026, expenditures for irrigated land sales are tracked, as well as other costs associated with the land transactions, including surveying, title costs, property taxes, and other incidental costs. Offsetting these costs are revenues from dryland cropland sales. It is assumed that administrative costs associated with an acquire and retire program would continue through the remainder of the planning period. Annual costs, net of dryland cropland sales, are summed for each year, with their totals over the period 2016 through 2065 discounted into their present value, assuming a discount rate of 3%. This present value is subsequently amortized into an annual equivalent value, which is then divided by the Program score to estimate the cost of the acquire and retire program on a dollar per acre-foot per year basis ($/acre-foot/year). This format allows for immediate cost comparison with other water acquisition strategies being considered by the Program.

2.0 Assumptions Used in the Analysis

2.1 Irrigated and Dryland Land Prices

For purposes of this analysis, irrigated land price was assumed to be valued at $7,000 per acre.

For 2015-16, irrigated land prices in Central Nebraska are reported to range from $6,600 per acre for gravity irrigated cropland to $7,400 per acre for sprinkler irrigated lands. The midpoint of this range is $7,000.[2] In practice, the Program will likely target marginally productive acres, so this price assumption may be somewhat conservative on the high side.

Dryland land prices are assumed to be $3,500 per acre, which is the mid-range of transactions of dryland cropland with and without irrigation potential.

Although these prices are arguable, it should be noted that the expected difference between irrigated cropland value and dryland cropland value is the net cost to the Program. Here, the difference is $3,500 per acre.

2.2 Depletions and Transit Losses

Regardless of whether the irrigated cropland was irrigated by surface water or groundwater, there will be losses experienced between its former place of use and the critical habitat areas, including depletion losses between the farm and the river (for

[2] Cornhusker Economics, 2016 (Preliminary)

groundwater) and transit losses in the river itself (for both surface water and groundwater). For purposes of this analysis, it is assumed that 40 percent losses represent the average loss per transaction, for all transactions.

2.3 Consumptive Use

It is assumed that only the consumptive use portion of the irrigated water usage could be counted towards the acre-foot yield, or score, associated with the transactions. For this analysis, consumptive use is assumed to be 0.95 acre-feet per acre, representative of irrigated areas in Central Nebraska.

2.4 Land Taxes

As part of this buy and sell strategy, the Program will temporarily own real estate and will pay property taxes on those holdings. For this analysis, a property tax of $20 per acre was assumed, representative of dryland cropland in Central Nebraska. Since the irrigated cropland would be converted to dryland cropland, taxes for irrigated cropland were not considered.

Property taxes were assumed to be paid for one year, one-half in the year the land is purchased and one-half in the year the land is sold.

2.5 Other Expenditures

As part of any land transaction, there will be surveying expenditures, title searches, and other up-front costs. To retire irrigated land, there would also likely be some form of de-certification process, as well. For purposes of this analysis, these costs were collectively assumed to be 2.5 percent of the transaction cost. Therefore, for a $1,000,000 land transaction, about $25,000 would be needed for these up-front costs.

In addition, it was assumed that a composite sum of $50,000 per year would be needed as a contribution towards managing the land and Program's overall water portfolio.

3.0 Results of the Analysis

Table 1 shows the financial pro forma. The top portion of the table shows the assumptions used in the analysis and the calculations used to estimate that approximately 5,000 acre-feet might be available from this example water acquisition strategy. The lower portion of the table calculates expenditures for irrigated cropland and incidental expenses, and revenues from dryland cropland sales. The net cost is summed for each year of the analysis 2016-65.

The bottom portion of Table 1 shows the present value calculations. The present value of this strategy is estimated to be about $27.9 million, translating to an annual equivalent cost of $1.1 million. Based on a Program score of 4,845 acre-feet, or annual water cost of $223 per acre-foot per year.

4.0 Conclusions

Based on the assumptions discussed above, it appears an acquire and retire strategy is economically competitive with water leasing and, in the short term, possibly slightly less expensive. In addition, the easement to retire irrigation is permanent rather than limited by the lease term. A major shortcoming of such a strategy, however, is cash flow. These are inherently up-front costs and whether the signatories would be willing and/or able to finance these costs is uncertain.

4.1 Why Acquire and Retire?

Given the negative image associated with such a water acquisition strategy, why would the Program consider it? For the following reasons:

- For completeness, in the sense that all water acquisitions options should be identified and assessed at some minimal level to determine their potential for the Program.
- Acquiring water by reducing consumptive use is an approach supported by some stakeholders in the Program
- Based on the above assumptions, acquire and retire appears economically feasible, although its financial feasibility is uncertain due to cash flow needs.
- The water lease market is promising but evolving slowly. A acquire and retire strategy would likely reach target water levels more quickly at a comparable economic cost.
- Third party impacts concerning rural economies are legitimate but could be partially mitigated by a number of measures, such as spreading the purchases acres over a wide geographic area and targeting the least productive parcels.
- The third party impacts are not likely to be any greater than for a lease program that involves reducing irrigated acreage.
- Given the aging demographics of individual farmers, the desire for farmers' heirs to eventually want to "cash out", and low commodity prices, there is an anecdotal evidence that a significant amount of irrigated cropland may change hands in the next decade. Alternatively stated, there may be opportunities to buy land at reasonable terms in the not-too-distant future.

4.2 Third Party Impacts

Impacts to rural economies would stem from reduced spending and lower yields on acres converted to dryland production. These would affect input suppliers and output processors, with associated multiplier impacts to the regional and State economy.[3] Several considerations with respect to these impacts include:

[3] If desirable at this level of analysis, we can also estimate the indirect and induced impacts to regions' employment and income. It will be very small for this example but possibly more significant if we look at a more extensive acquire and retire program.

- The converted acres will continue to be profitably farmed by local operators, albeit at a less intensive level.
- The number of irrigated acres converted to dryland will likely be a very small percentage (less than 1%) of the irrigated land in the region or county. In addition, it is likely these will be the most marginally productive acres.
- Policies can be implemented to distribute irrigated land acquisitions over time and over a wide geographic area in a manner that minimizes impacts to communities and to land markets.

Table 1. Pro Forma Analysis of an Acquire and Retire Strategy

Note: Analysis extends through 2065 but the years 2029-65 are not shown because of space constraint and they look like year 2028. However, present value is based on the period 2016-65.

Price per acre, irrigated	$ 7,000		Irrigated land is sold the next year as dryland										
Price per acre, dryland	$ 3,500												
Depletion and other transit losses	40%												
Consumptive use (acre-feet/acre)	0.95												
Dryland property tax ($/acre)	$ 20.00												
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Irrigated acres purchased	500	500	500	500	1,000	1,000	1,000	1,000	1,000	1,000	500		
Acre-feet acquired	475	475	475	475	950	950	950	950	950	950	475		
Acre-feet scored	285	285	285	285	570	570	570	570	570	570	285		
Cumulative acre-feet scored	285	570	855	1,140	1,710	2,280	2,850	3,420	3,990	4,560	4,845	4,845	4,845
Dryland cropland sales		500	500	500	500	1,000	1,000	1,000	1,000	1,000	1,000	500	-
Expenditures for irrigated land	$ 3,500,000	$3,500,000	$3,500,000	$ 3,500,000	$ 7,000,000	$ 7,000,000	$ 7,000,000	$ 7,000,000	$ 7,000,000	$ 7,000,000	$ 3,500,000	$ -	$ -
Surveying, title work, other up-front	$ 87,500	$ 87,500	$ 87,500	$ 87,500	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 175,000	$ 87,500	$ -	$ -
Property taxes	$ 250	$ 500	$ 500	$ 500	$ 750	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 750	$ 250	$ -
Administrative cost	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Subtotal expenditures	$ 3,637,750	$3,638,000	$3,638,000	$ 3,638,000	$ 7,225,750	$ 7,226,000	$ 7,226,000	$ 7,226,000	$ 7,226,000	$ 7,226,000	$ 3,638,250	$ 50,250	$ 50,000
Dryland cropland sales revenue	0	$1,750,000	$1,750,000	$ 1,750,000	$ 1,750,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 1,750,000	$ -
Annual net cost	$ 3,637,750	$1,888,000	$1,888,000	$ 1,888,000	$ 5,475,750	$ 3,726,000	$ 3,726,000	$ 3,726,000	$ 3,726,000	$ 3,726,000	$ 138,250	$ (1,699,750)	$ 50,000
Cumulative cost	$ 3,637,750	$5,525,750	$7,413,750	$ 9,301,750	$ 14,777,500	$ 18,503,500	$ 22,229,500	$ 25,955,500	$ 29,681,500	$ 33,407,500	$ 33,545,750	$ 31,846,000	$ 31,896,000
Discounted annual expenditures (3%)	**$ 27,856,137**												
Annual equivalent cost	**$1,082,643**												
Cost per acre-foot per year	**$ 223**												