CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	10/10/2008

PRACTICE: Irrigation System, Tailwater Recovery 447	Baseline Setting:
	Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife

RESOURCES, CONSIDERATIONS AND CONCERNS	**PHYSICAL EFFECTS**	**RATIONALE**
SOIL - EROSION		
Sheet and Rill	Not Applicable	Not applicable.
Wind	Not Applicable	Not applicable.
Ephemeral Gully	Slight Improvement	Tailwater is safely conveyed to a recovery site, therefore reducing concentrated flow.
Classic Gully	Slight Improvement	Tailwater is eliminated from gully.
Streambank	Slight Improvement	Tailwater is eliminated from over land flow.
Shoreline	Slight Improvement	Tailwater is eliminated from over land flow.
Irrigation Induced	Neutral	Captures sediment in tailwater runoff but does not reduce erosion.
Mass Movement	Not Applicable	Not applicable.
Road, Roadsides, and Construction Sites	Slight Improvement	Slight improvement where tailwater is eliminated from over land flow.
SOIL – CONDITION		
Organic Matter Depletion	Not Applicable	Not applicable.
Rangeland Site Stability	Not Applicable	Not applicable.
Compaction	Slight Worsening	Increased soil moisture in the profile may result in increased compaction during field operations.
Subsidence	Not Applicable	Not applicable.
Contaminants:		
• Salts and other Chemicals	Slight Worsening	Reuse of contaminated water increases salts in the profile.
• Animal Waste and other Organics - N	Not Applicable	Not applicable.
• Animal Waste and other Organics - P	Not Applicable	Not applicable.
• Animal Waste and other Organics - K	Not Applicable	Not applicable.
• Commercial Fertilizer - N	Not Applicable	Not applicable.
• Commercial Fertilizer – P	Not Applicable	Not applicable.
• Commercial Fertilizer – K	Not Applicable	Not applicable.
• Residual Pesticides	Slight Worsening	Reuse of contaminated water can increase pesticides in the profile..
Damage from Sediment Deposition	Slight Worsening	Sediment is trapped in tailwater recovery process.

WATER – QUANTITY		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Slight Worsening	Possible seepage from pit.
Excessive Runoff, Flooding, or Ponding	Slight Improvement	Recovery and storage of tailwater eliminates runoff and ponding.
Excessive Subsurface Water	Slight Worsening	Seepage from pit.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Slight to Substantial Improvement	Storage and reuse of tailwater reduces runoff affecting outlets.
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Storage and reuse can increases available water.
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Substantial Improvement	Sediment is trapped in pit.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Substantial Improvement	Sediment is trapped in tailwater structures.
Aquifer Overdraft	Slight to Moderate Improvement	Reuse of water requires less water to be withdrawn.
Insufficient Flows in Water Courses	Slight Improvement	Reuse of water requires less water to be withdrawn.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	Seepage that may contain pesticide residues is controlled .
• Excessive Nutrients and Organics	Slight Worsening	Nutrients impounded could contaminate groundwater.
• Excessive Salinity	Slight Worsening	The action results in water reuse, which concentrates the contaminants in water that infiltrates.
• Harmful Levels of Heavy Metals	Slight Worsening	The action reuses irrigation water that may have higher levels of heavy metals.
• Harmful Levels of Pathogens	Neutral	The action reuses irrigation water that may have higher levels of pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action retains pesticide residues for degradation.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The action traps nutrients and organics.
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Sediment is trapped as water velocity is reduced.
• Excessive Salinity	Slight Improvement	The infiltration that occurs in the tailwater pond will reduce the amount of salt leaving the field.
• Harmful Levels of Heavy Metals	Moderate to Substantial Improvement	The action captures irrigation runoff and associated metal-laden sediment.
• Harmful Temperatures	Neutral	Warm surface irrigation water is

		re-used rather than discharged to streams or other water bodies.
• Harmful Levels of Pathogens	Slight Improvement	Because of reduced sediment yields and runoff
• Harmful Levels of Petroleum	Slight to Moderate Improvement	Because of reduced sediment yields and runoff
AIR – QUALITY		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Not Applicable	Not applicable.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Not Applicable	Not applicable.
Excessive Ozone	Not Applicable	Not applicable.
Excessive Greenhouse Gas:		
• CO_2 (Carbon Dioxide)	Not Applicable	Not applicable.
• N_20 (Nitrous Oxide)	Not Applicable	Not applicable.
• CH_4 (Methane)	Not Applicable	Not applicable.
Ammonia (NH_3)	Not Applicable	Not applicable.
Chemical Drift	Not Applicable	Not applicable.
Objectionable Odors	Not Applicable	Not applicable.
Reduced Visibility	Not Applicable	Not applicable.
Undesirable Air Movement	Not Applicable	Not applicable.
Adverse Air Temperature	Not Applicable	Not applicable.
PLANTS – SUITABLIITY		
Plants not Adapted or Suited	Not Applicable	Not applicable.
PLANTS - CONDITION		
Productivity, Health, and Vigor	Slight to Substantial Improvement	Increased water availability and managed application enhances plant growth, health and vigor.
Threatened or Endangered Plant Species:		
• Plant Species Listed or Proposed for Listing Under the Endangered Species Act	Not Applicable	Not applicable.
• Declining Species, Species of Concern	Not Applicable	Not applicable.
Noxious and Invasive Plants	Not Applicable	Not applicable.
Forage Quality and Palatability	Not Applicable	Not applicable.
Wildfire Hazard	Not Applicable	Not applicable.
ANIMALS - FISH AND WILDLIFE		
Inadequate Food	Not Applicable	Not applicable.
Inadequate Cover/Shelter	Not Applicable	Not applicable.
Inadequate Water	Slight Improvement	Water is temporarily provided during the irrigation season.
Inadequate Space	Not Applicable	Not applicable.
Habitat Fragmentation	Not Applicable	Not applicable.
Imbalance Among and Within Populations	Not Applicable	Not applicable.
Threatened and Endangered Fish and Wildlife Species:		
• Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance

		species of concern.
• Declining Species, Species of Concern	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
ANIMALS – DOMESTIC		
Inadequate Quantities and Quality of Feed and Forage	Not Applicable	Not applicable.
Inadequate Shelter	Not Applicable	Not applicable.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Not Applicable	Not applicable.
HUMAN – ECONOMICS		
Land - Change in Land Use	Slight to Substantial	N/A if no change in crops irrigated, substantial if water use changes.
Land – Land in Production	Not applicable	Not applicable
Capital – Change in Equipment	Substantial increase.	
Capital - Total Investment Cost	Substantial.	
Capital – Annual Cost	Slight to moderate increase.	
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Negligible	
Labor – Change in Management Level	Negligible	
Risk - Yield	Slight to Moderate Decrease	Slight to moderate decrease due to increased irrigation efficiency.
Risk - Flexibility	Slight Decrease	Slight decrease due to more efficient use of water.
Risk - Timing	Not applicable.	Not applicable.
Risk – Cash Flow	Moderate Increase	Moderate increase due to construction cost.
Profitability – Change in Profitability	Situational	Moderate decrease or increase.
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Increase	Construction impacts (mechanical).
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Slight to Substantial Decrease	This practice facilitates gravity flow of irrigation water, reducing pumping requirements due to collection and reuse of tailwater.
Underutilization of Non-Fossil Energy Resources	Not Applicable	Not applicable.

Human Considerations Explanation

Considerations	Physical effects indicate:
Land - Change in Land Use	The degree to which implementing the conservation practice is expected to cause a change from one land use to another.
Land - Land in Production	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of land in production.
Capital - Change in Equipment	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of capital equipment required for farm or ranch operations.
Capital - Total Investment Cost	A qualitative measure of the increase in total investment dollars required in order to implement the conservation practice.
Capital - Annual Cost	A qualitative measure of the expected change in annual capital costs required in order to operate and maintain the conservation practice.
Capital - Credit & Farm Program Eligibility	Included to make conservation planners aware of the potential availability of funding for implementing conservation practices.
Labor – Labor	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of overall farm or ranch labor required for operations.
Labor - Change in Management Level	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of required active management on a farm or ranch.
Risk – Yield	The degree to which risk, as related to crop or livestock yields, is expected to increase or decrease as a result of implementing the conservation practice.
Risk – Flexibility	The degree to which risk, as related to the flexibility of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice. For example, converting from flood irrigation to a sprinkler system gives a farmer an increase in flexibility of irrigation, which results in a decrease in the level of risk associated with inflexibility of operations.
Risk – Timing	The degree to which risk, as related to the timing of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
Risk - Cash Flow	The degree to which risk, as related to cash flow in farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
Profitability - Change in Profitability	The degree to which farm or ranch profitability is expected to increase or decrease as a result of implementing the conservation practice.
Cultural Resources and/or Historic Properties Present or Suspected to be Present	The degree to which implementation of the conservation practice is expected to increase or decrease the risk of cultural resource disturbance, degradation, or loss.
Depletion of Fossil Fuel Resources	Inefficient use of fossil-originated energy sources (diesel, gasoline, propane, natural gas, coal), lubricants, and other materials.
Underutilization of Non-Fossil Energy Sources	Available and cost-effective alternative energy sources (solar, wind, biofuel, hydroelectric, geothermal) are not being used or are being used inefficiently.