

CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	12/27/2011
PRACTICE: Irrigation Land Leveling 464		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Slight Improvement	Reshaping the surface of the land provides the opportunity for more uniform flow.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Slight Improvement	Reshaping the surface of the land provides the opportunity for more uniform flow.			
Classic Gully	Not Applicable	Not applicable.			
Streambank	Not Applicable	Not applicable.			
Shoreline	Not Applicable	Not applicable.			
Irrigation Induced	Slight to Substantial Improvement	Creates non-erosive field slopes.			
Mass Movement	Not Applicable	Not applicable.			
Road, Roadsides, and Construction Sites	Not Applicable	Not applicable.			
SOIL – CONDITION					
Organic Matter Depletion	Slight to Moderate Worsening	The process of cuts and fills alters the soil profile.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight to Moderate Worsening	Equipment used for cuts and fills will cause compaction, which may be substantial in the short term.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight Worsening	Cuts may alter the soil profile moving salts into the root zone from deeper layers.			
• 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	Not Applicable	Not applicable.			
Damage from Sediment Deposition	Slight to Substantial Improvement	The action redistributes sediment on the field, restoring grades.			
WATER – QUANTITY					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Not Applicable	Not applicable.			
Excessive Runoff, Flooding, or Ponding	Slight Improvement	Uniform slopes reduce ponding. May increase runoff.			
Excessive Subsurface Water	Slight to Moderate Improvement	Because of more uniform			

		infiltration and less ponding
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Not Applicable	Not applicable.
Inefficient Water use on Irrigated Land	Moderate to Substantial Improvement	Leveling facilitates more uniform application of irrigation water.
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.
Reduced Capacity of Conveyances by Sediment Deposition	Slight Improvement	Decrease in runoff because of slope change and uniform application.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Improvement	Decrease in runoff because of slope change and uniform application.
Aquifer Overdraft	Slight Improvement	More efficient application require less aquifer withdrawals.
Insufficient Flows in Water Courses	Not Applicable	Not applicable.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	A uniform surface reduces deep percolation.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The action smoothes the surface which reduces ponding and the transport of nutrients to ground water.
• Excessive Salinity	Slight to Moderate Improvement	Uniform surface eliminates ponding and associated infiltration, decreasing salt transport to ground water.
• Harmful Levels of Heavy Metals	Slight Improvement	The uniform surface grade reduces ponding and excessive infiltration of contaminated water.
• Harmful Levels of Pathogens	Slight to Moderate Improvement	The uniform surface grade reduces ponding and excessive infiltration of contaminated water.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	A uniform surface reduces the amount of runoff.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The uniform surface that results from this practice increases infiltration and reduces the potential for transport of nutrients to surface water.
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Land surface is formed to a non-erosive grade.
• Excessive Salinity	Neutral	The action allows more efficient use of irrigation water, but does not affect the amount of salt leaving the field.
• Harmful Levels of Heavy Metals	Slight Improvement	Uniform surface reduces transport to surface water.
• Harmful Temperatures	Not Applicable	Not applicable.

• Harmful Levels of Pathogens	Slight to Moderate Improvement	Uniform surface reduces transport to surface water
• Harmful Levels of Petroleum	Slight Improvement	Uniform surface reduces transport to surface water
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 ₂ O (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 – SUITABILITY		
Plants not Adapted or Suited	Not Applicable	Not applicable.
PLANTS - CONDITION		
Productivity, Health, and Vigor	Slight to Moderate Improvement	Site modification to improve irrigation application enhances the health and vigor of desired species.
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	Slight Improvement	Improved irrigation efficiency improves crop health and vigor which decrease weed competition.
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	Neutral	Hydrologic regime and micro-topography are altered and plant and animal diversity is reduced.
Inadequate Water	Not Applicable	Not applicable.
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	Not Applicable	Not applicable.

Proposed for Listing Under the Endangered Species Act		
• Declining Species, Species of Concern	Not Applicable	Not applicable.
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	Slight increase	
Capital – Change in Equipment	Moderate increase.	
Capital - Total Investment Cost	Moderate.	
Capital – Annual Cost	Slight to moderate increase.	
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Negligible	
Labor – Change in Management Level	Moderate to substantial	Moderate to substantial due to high level of technology to develop and maintain.
Risk - Yield	Slight to Moderate Decrease	Slight to moderate decrease due to increased irrigation efficiency.
Risk - Flexibility	Substantial Decrease	Substantial decrease due to uniform and efficient application of irrigation water.
Risk - Timing	Substantial Increase	Substantial increase - practice must be applied prior to planting crop.
Risk – Cash Flow	Slight to Moderate Increase	Slight to moderate increase due to application cost.
Profitability – Change in Profitability	Situational	Slight decrease to moderate increase.
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Increase	Construction impacts (mechanical) where disturbance is below previous plow zone.
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Slight to Substantial Decrease	This practice facilitates gravity flow of irrigation water, reducing pumping requirements.
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.