

CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	12/27/2011
PRACTICE: Subsurface Drain 606		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS		RATIONALE		
SOIL - EROSION					
Sheet and Rill	Moderate to Substantial Improvement		Reducing soil profile saturation increases infiltration by improving drainage and therefore decreases water runoff.		
Wind	Slight Worsening		Improving drainage may increase surface soil drying.		
Ephemeral Gully	Moderate to Substantial Improvement		Reducing soil profile saturation increases infiltration by improving drainage and therefore decreases water runoff.		
Classic Gully	Slight Improvement		Interception water and reduction of seeps that can cause gully formation.		
Streambank	Slight Improvement		Interception water and reduction of seeps that can cause streambank instability.		
Shoreline	Not Applicable		Not applicable.		
Irrigation Induced	Not Applicable		Not applicable.		
Mass Movement	Slight to Moderate Improvement		Removal of subsurface water which contributes to instability of soil mass.		
Road, Roadsides, and Construction Sites	Not Applicable		Not applicable.		
SOIL – CONDITION					
Organic Matter Depletion	Slight to Moderate Worsening		Reducing water table increases oxidation of organic matter		
Rangeland Site Stability	Not Applicable		Not applicable.		
Compaction	Slight to Moderate Improvement		Soils have less risk of compaction when they are dryer.		
Subsidence	Slight to Moderate Worsening		Lowering of water table allows the oxidation of organic matter.		
Contaminants:					
• Salts and other Chemicals	Slight to Substantial Improvement		The leached salts may be removed from the soil through drainage.		
• Animal Waste and other Organics - N	Slight to Moderate Improvement		Leached N from animal waste may be removed from the soil through drainage.		
• Animal Waste and other Organics - P	Slight to Moderate Improvement		Leached P from animal waste may be removed from the soil through drainage.		
• Animal Waste and other Organics - K	Slight Improvement		Leached K from animal waste may be removed from the soil through drainage.		
• Commercial Fertilizer - N	Slight to Moderate Improvement		Leached N from animal waste may be removed from the soil		

		through drainage.
• Commercial Fertilizer – P	Slight to Moderate Improvement	Leached P from animal waste may be removed from the soil through drainage.
• Commercial Fertilizer – K	Slight Improvement	Leached K from animal waste may be removed from the soil through drainage.
• Residual Pesticides	Slight Improvement	Increased infiltration and aerobic conditions may lead to increased pesticide degradation in the root zone.
Damage from Sediment Deposition	Not Applicable	Not applicable.
WATER – QUANTITY		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Moderate to Substantial Improvement	Interception of excessive seepage through drainage.
Excessive Runoff, Flooding, or Ponding	Moderate to Substantial Improvement	Removal of excessive surface water through drainage will reduce flooding and ponding.
Excessive Subsurface Water	Moderate to Substantial Improvement	Control of water table - subsurface water is collected and conveyed to a proper outlet.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Slight to Moderate Worsening	Water from drains increase pressure on outlets.
Inefficient Water use on Irrigated Land	Slight to Moderate Improvement	Drains can collect water for beneficial use or reuse and improved soil, water air relationship.
Inefficient Water use on Non-Irrigated Land	Slight Improvement	Drains can collect water for beneficial use or reuse and improved soil, water air relationship.
Reduced Capacity of Conveyances by Sediment Deposition	Slight Improvement	Reduces runoff containing sediment.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Improvement	Reduces runoff containing sediment.
Aquifer Overdraft	Slight Worsening	Drains intercept water that may recharge aquifers.
Insufficient Flows in Water Courses	Slight to Moderate Improvement	Water collected by drains can enhance flows in water courses.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action decreases deep percolation and promotes aerobic degradation of pesticide residues.
• Excessive Nutrients and Organics	Slight Improvement	The action collects and removes water and soluble nutrients from the site.
• Excessive Salinity	Slight to Moderate Improvement	Leaching of saline and sodic soils will be intercepted before salinity reaches groundwater.
• Harmful Levels of Heavy Metals	Slight Improvement	Heavy metals leached from the soil will be intercepted before

		reaching groundwater.
• Harmful Levels of Pathogens	Slight Improvement	Pathogens leached from the soil will be intercepted before reaching groundwater.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action decreases runoff and promotes aerobic degradation of pesticide residues. Avoid direct outlet to surface water.
• Excessive Nutrients and Organics	Slight to Moderate Worsening	Collecting and releasing nutrient laden water removed from fields to receiving surface waters.
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Runoff and resulting erosion will be decreased
• Excessive Salinity	Slight to Moderate Worsening	Percolating water picks up salts that are then collected in tile lines and outletted to surface waters.
• Harmful Levels of Heavy Metals	Neutral	The action reduces runoff and increases infiltration. Percolating water picks up metals that are then collected in tile lines.
• Harmful Temperatures	Not Applicable	Not applicable.
• Harmful Levels of Pathogens	Neutral	Limited decrease due to decreased runoff, but any infiltrating water with pathogens will be concentrated in tile lines
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
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	Improved drainage enhances growing environment for non-hydrophytes. If hydrophytes are desired, drainage will increase the problem.
Threatened or Endangered Plant		

Species:		
<ul style="list-style-type: none"> Plant Species Listed or Proposed for Listing Under the Endangered Species Act 	Not Applicable	Not applicable.
<ul style="list-style-type: none"> Declining Species, Species of Concern 	Not Applicable	Not applicable.
Noxious and Invasive Plants	Not Applicable	Not applicable.
Forage Quality and Palatability	Moderate to Substantial Improvement	Drainage improves forage quality and palatability.
Wildfire Hazard	Not Applicable	Not applicable.
ANIMALS - FISH AND WILDLIFE		
Inadequate Food	Neutral	Increase or decrease in food supply depends on plant species on the site due to soil moisture/plant relationships.
Inadequate Cover/Shelter	Neutral	Increase or decrease in cover/shelter depends on plant species on the site due to soil moisture/plant relationships.
Inadequate Water	Neutral	The action will increase available wet habitat for some species and decrease it for others.
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:		
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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	Moderate to Substantial Improvement	Quantity and quality of forage species will be improved if drainage is installed to enhance their production.
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	Substantial	Substantial if land use changes.
Land – Land in Production	Substantial increase	Substantial increase, if land brought into production.
Capital – Change in Equipment	Moderate increase.	
Capital - Total Investment Cost	Substantial.	Substantial.
Capital – Annual Cost	Negligible to slight increase.	
Capital – Credit and Farm Program Eligibility	Situational.	

Labor - Labor	Slight to moderate decrease	Slight to moderate decrease due to reduced soil wetness, better traction and reduced drag.
Labor – Change in Management Level	Negligible	
Risk - Yield	Slight Decrease	Slight decrease due to improved drainage.
Risk - Flexibility	Slight Decrease	Slight decrease due to more conductive growing conditions.
Risk - Timing	Substantial Increase	Substantial increase - practice must be installed prior to planting.
Risk – Cash Flow	Slight to Moderate Increase	Slight to moderate increase because of installation costs.
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	Not Applicable	Not Applicable
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.