

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

|  |                                   |  |  |      |            |
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| STATE  | Nebraska                          | FIELD OFFICE                           | Any  | DATE | 12/27/2011 |
| <b>PRACTICE: Irrigation Water Management 449</b> |                                   | Baseline Setting:                      |  |      |            |
|  |                                   | Appropriate Land Use(s): All Land Uses |  |      |            |
| <b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>    | <b>PHYSICAL EFFECTS</b>           |  | <b>RATIONALE</b>   |      |            |
| <b>SOIL - EROSION</b>                            |                                   |  |  |      |            |
| Sheet and Rill                                   | Not Applicable                    |  | Not applicable.  |      |            |
| Wind   | Slight to Substantial Improvement |  | Managing water to maintain surface moisture reduces soil detachment by wind. |      |            |
| Ephemeral Gully                                  | Not Applicable                    |  | Not applicable.  |      |            |
| Classic Gully                                    | Not Applicable                    |  | Not applicable.  |      |            |
| Streambank                                       | Not Applicable                    |  | Not applicable.  |      |            |
| Shoreline  | Not Applicable                    |  | Not applicable.  |      |            |
| Irrigation Induced                               | Slight to Substantial Improvement |  | Water can be managed in such a manner as to reduce or prevent erosion.       |      |            |
| Mass Movement                                    | Not Applicable                    |  | Not applicable.  |      |            |
| Road, Roadsides, and Construction Sites          | Not Applicable                    |  | Not applicable.  |      |            |
| <b>SOIL – CONDITION</b>                          |                                   |  |  |      |            |
| Organic Matter Depletion                         | Slight Improvement                |  | The action promotes optimum biomass production.                              |      |            |
| Rangeland Site Stability                         | Not Applicable                    |  | Not applicable.  |      |            |
| Compaction                                       | Not Applicable                    |  | Not applicable.  |      |            |
| Subsidence                                       | Not Applicable                    |  | Not applicable.  |      |            |
| Contaminants:                                    |                                   |  |  |      |            |
| • Salts and other Chemicals                      | Slight to Substantial Improvement |  | Water can be managed to leach salts and chemicals below the root zone        |      |            |
| • 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                  | Not Applicable                    |  | Not applicable.  |      |            |
| <b>WATER – QUANTITY</b>                          |                                   |  |  |      |            |
| Rangeland Hydrologic Cycle                       | Not Applicable                    |  | Not applicable.  |      |            |
| Excessive Seepage                                | Not Applicable                    |  | Not applicable.  |      |            |
| Excessive Runoff, Flooding, or Ponding           | Not Applicable                    |  | Not applicable.  |      |            |
| Excessive Subsurface Water                       | Slight Improvement                |  | Management of irrigation water will help reduce excess subsurface water.     |      |            |
| Drifted Snow                                     | Not Applicable                    |  | Not applicable.  |      |            |
| Inadequate Outlets                               | Not Applicable                    |  | Not applicable.  |      |            |

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| Inefficient Water use on Irrigated Land                  | Slight to Substantial Improvement | Managed application of water for irrigation will increase the efficiency of use.   |
| Inefficient Water use on Non-Irrigated Land              | Not Applicable                    | Not applicable.  |
| Reduced Capacity of Conveyances by Sediment Deposition   | Slight to Substantial Improvement | Managed irrigation water will reduce the amount of sediment available for deposition.  |
| Reduced Storage of Water Bodies by Sediment Accumulation | Slight to Substantial Improvement | Managed irrigation water will reduce the amount of sediment available for deposition.  |
| Aquifer Overdraft  | Slight to Moderate Improvement    | More efficient application of irrigation water reduces aquifer withdrawals.  |
| Insufficient Flows in Water Courses                      | Slight to Moderate Improvement    | More efficient application of irrigation water requires smaller diversion from streams.  |
| <b>WATER – QUALITY</b>                                   |                                   |  |
| <b>In Groundwater:</b>                                   |                                   |  |
| • Harmful Levels of Pesticides                           | Slight to Substantial Improvement | Controlling the volume, frequency, and application rate of irrigation water reduces deep percolation.  |
| • Excessive Nutrients and Organics                       | Slight to Substantial Improvement | Water is applied at rates and times that minimize nutrient transport to ground water.  |
| • Excessive Salinity                                     | Slight to Substantial Improvement | Water is applied at rates that minimize salinity transport to ground water.  |
| • Harmful Levels of Heavy Metals                         | Slight to Moderate Improvement    | Water is applied at rates that minimize heavy metal transport to ground water.   |
| • Harmful Levels of Pathogens                            | Slight to Moderate Improvement    | Water is applied at rates that minimize pathogen transport to ground water.  |
| • Harmful Levels of Petroleum                            | Slight Improvement                | Water is applied at rates that minimize petroleum transport to ground water.   |
| <b>In Surface Water:</b>                                 |                                   |  |
| • Harmful Levels of Pesticides                           | Slight to Substantial Improvement | Controlling the volume, frequency, and application rate of irrigation water reduces runoff and erosion that may carry pesticides into surface water. |
| • Excessive Nutrients and Organics                       | Slight to Substantial Improvement | Water is applied at rates that reduce the potential for erosion and detachment, and minimize nutrient transport to surface water.                    |
| • Excessive Suspended Sediment and Turbidity             | Slight to Substantial Improvement | Water is applied at rates that minimize soil erosion.  |
| • Excessive Salinity                                     | Slight to Moderate Improvement    | Water is applied at rates that minimize salinity transport to surface water.   |

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| • Harmful Levels of Heavy Metals  | Slight to Substantial Improvement | Water is applied at rates that minimize heavy metals transport to surface water.  |
| • Harmful Temperatures  | Neutral                           | Conservation irrigation systems minimize affects to surface water quality.  |
| • Harmful Levels of Pathogens   | Slight to Substantial Improvement | Water is applied at rates that minimize pathogens transport to surface water  |
| • Harmful Levels of Petroleum   | Slight to Substantial Improvement | Water is applied at rates that minimize petroleum transport to surface water  |
| <b>AIR – QUALITY</b>  |                                   |   |
| Particulate Matter less than 10 Micrometers in Diameter (PM 10)                 | Slight to Substantial Improvement | Maintaining adequate soil moisture content reduces the potential soil erodibility and increases crop growth and residue production. |
| Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)               | Slight to Substantial Improvement | Maintaining adequate soil moisture content reduces the potential soil erodibility and increases crop growth and residue production. |
| Excessive Ozone   | Not Applicable                    | Not applicable.   |
| Excessive Greenhouse Gas:   |                                   |   |
| • CO <sub>2</sub> (Carbon Dioxide)  | Not Applicable                    | Not applicable.   |
| • N <sub>2</sub> O (Nitrous Oxide)  | Not Applicable                    | Not applicable.   |
| • CH <sub>4</sub> (Methane)   | Not Applicable                    | Not applicable.   |
| Ammonia (NH <sub>3</sub> )  | 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   | Slight to Moderate Improvement    | Timing of water use can decrease temperatures and maintain plant vigor and growth.  |
| <b>PLANTS – SUITABILITY</b>   |                                   |   |
| Plants not Adapted or Suited  | Not Applicable                    | Not applicable.   |
| <b>PLANTS - CONDITION</b>   |                                   |   |
| Productivity, Health, and Vigor   | Slight to Substantial Improvement | Managed application of water 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   | Slight Improvement                | Improved irrigation efficiency improves crop health and vigor which decreases weed competition.                                     |
| Forage Quality and Palatability   | Slight to Substantial Improvement | Water is managed to optimize  |

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|   |                                     | forage quality and palatability.  |
| Wildfire Hazard   | Not Applicable                      | Not applicable.   |
| <b>ANIMALS - FISH AND WILDLIFE</b>  |                                     |   |
| Inadequate Food   | Not Applicable                      | Not applicable.   |
| Inadequate Cover/Shelter  | Not Applicable                      | Not applicable.   |
| 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 Proposed for Listing Under the Endangered Species Act | Not Applicable                      | Not applicable.   |
| • Declining Species, Species of Concern   | Not Applicable                      | Not applicable.   |
| <b>ANIMALS – DOMESTIC</b>   |                                     |   |
| Inadequate Quantities and Quality of Feed and Forage  | Moderate to Substantial Improvement | Production will be improved with uniform and consistent application of water.               |
| Inadequate Shelter  | Not Applicable                      | Not applicable.   |
| Inadequate Stock Water  | Not Applicable                      | Not applicable.   |
| Stress and Mortality  | Not Applicable                      | Not applicable.   |
| <b>HUMAN – ECONOMICS</b>  |                                     |   |
| Land - Change in Land Use   | Not applicable.                     | Not applicable.   |
| Land – Land in Production   | Not applicable                      | Not applicable  |
| Capital – Change in Equipment   | Slight Increase.                    |   |
| Capital - Total Investment Cost   | Not applicable.                     |   |
| Capital – Annual Cost   | Slight increase                     | Slight increase, offset by effective and efficient use of irrigation water.                 |
| Capital – Credit and Farm Program Eligibility   | Situational.                        |   |
| Labor - Labor   | Slight to moderate increase         | Slight to moderate increase to monitor soil moisture and crop condition.                    |
| Labor – Change in Management Level  | Slight to moderate increase         | Slight to moderate increase from timing practices, require above average management skills. |
| Risk - Yield  | Slight to Moderate Decrease         | Slight to moderate decrease due to effective management of soil moisture.                   |
| Risk - Flexibility  | Slight to Moderate Decrease         | Slight to moderate decrease due to the effective management of soil moisture.               |
| Risk - Timing   | Substantial Increase                | Substantial increase - practice must be implemented in a planned and efficient manner.      |
| Risk – Cash Flow  | Slight to Moderate Decrease         | Slight to moderate decrease from higher yields and reduced costs.                           |
| Profitability – Change in Profitability   | Slight to moderate increase.        |   |
| <b>HUMAN - CULTURAL</b>   |                                     |   |

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| Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT | Not applicable.                | Not applicable.   |
| <b>HUMAN – ENERGY</b>  |                                |   |
| Depletion of Fossil Fuel Resources   | Slight to Substantial Decrease | Optimizing water use for irrigation reduces energy needs. |
| Underutilization of Non-Fossil Energy Resources                                  | Not Applicable                 | Not applicable.   |

## Human Considerations Explanation

| <b>Considerations</b>   | <b>Physical effects indicate:</b>  |
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| <b>Land - Change in Land Use</b>  | The degree to which implementing the conservation practice is expected to cause a change from one land use to another.   |
| <b>Land - Land in Production</b>  | The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of land in production.   |
| <b>Capital - Change in Equipment</b>  | 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.  |
| <b>Capital - Total Investment Cost</b>  | A qualitative measure of the increase in total investment dollars required in order to implement the conservation practice.  |
| <b>Capital - Annual Cost</b>  | A qualitative measure of the expected change in annual capital costs required in order to operate and maintain the conservation practice.  |
| <b>Capital - Credit &amp; Farm Program Eligibility</b>                                  | Included to make conservation planners aware of the potential availability of funding for implementing conservation practices.   |
| <b>Labor – Labor</b>  | 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.  |
| <b>Labor - Change in Management Level</b>   | 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.  |
| <b>Risk – Yield</b>   | 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.   |
| <b>Risk – Flexibility</b>   | 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. |
| <b>Risk – Timing</b>  | 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.   |
| <b>Risk - Cash Flow</b>   | 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.  |
| <b>Profitability - Change in Profitability</b>  | The degree to which farm or ranch profitability is expected to increase or decrease as a result of implementing the conservation practice.   |
| <b>Cultural Resources and/or Historic Properties Present or Suspected to be Present</b> | The degree to which implementation of the conservation practice is expected to increase or decrease the risk of cultural resource disturbance, degradation, or loss.   |
| <b>Depletion of Fossil Fuel Resources</b>   | Inefficient use of fossil-originated energy sources (diesel, gasoline, propane, natural gas, coal), lubricants, and other materials.   |
| <b>Underutilization of Non-Fossil Energy Sources</b>                                    | Available and cost-effective alternative energy sources (solar, wind, biofuel, hydroelectric, geothermal) are not being used or are being used inefficiently.  |