

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

|   |                                   |   |     |      |            |
|---|-----------------------------------|---|-----|------|------------|
| STATE   | Nebraska                          | FIELD OFFICE  | Any | DATE | 12/27/2011 |
| <b>PRACTICE: Waste Treatment Lagoon 359</b>   |                                   | Baseline Setting:   |     |      |            |
|   |                                   | Appropriate Land Use(s): Headquarters   |     |      |            |
| <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  | Not Applicable                    | Not applicable.   |     |      |            |
| Ephemeral Gully                               | Not Applicable                    | Not applicable.   |     |      |            |
| Classic Gully                                 | Not Applicable                    | Not applicable.   |     |      |            |
| Streambank                                    | Not Applicable                    | Not applicable.   |     |      |            |
| Shoreline                                     | Not Applicable                    | Not applicable.   |     |      |            |
| Irrigation Induced                            | Not Applicable                    | Not applicable.   |     |      |            |
| 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 will allow waste application at rates and times to address the resource concern.   |     |      |            |
| Rangeland Site Stability                      | Not Applicable                    | Not applicable.   |     |      |            |
| Compaction                                    | Slight Improvement                | Storage will allow better management of waste as to rate and timing of application, which allows application when compaction is least likely. |     |      |            |
| Subsidence                                    | Not Applicable                    | Not applicable.   |     |      |            |
| Contaminants:                                 |                                   |   |     |      |            |
| • Salts and other Chemicals                   | Not Applicable                    | Not applicable.   |     |      |            |
| • Animal Waste and other Organics - N         | Slight to Substantial Improvement | Treatment reduces organic contaminants in wastes.   |     |      |            |
| • Animal Waste and other Organics - P         | Slight to Substantial Improvement | Treatment reduces organic contaminants in wastes.   |     |      |            |
| • Animal Waste and other Organics - K         | Slight to Substantial Improvement | Treatment reduces organic contaminants in wastes.   |     |      |            |
| • Commercial Fertilizer - N                   | Slight to Substantial Improvement | Treatment reduces organic contaminants in wastes.   |     |      |            |
| • Commercial Fertilizer – P                   | Slight to Substantial Improvement | Treatment reduces organic contaminants in wastes.   |     |      |            |
| • Commercial Fertilizer – K                   | Slight to Substantial Improvement | Treatment reduces organic contaminants in wastes.   |     |      |            |
| • 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                             | Neutral                           | Theoretically there will be an increase in infiltration at pond site.   |     |      |            |
| Excessive Runoff, Flooding, or Ponding        | Neutral                           | Polluted runoff is collected and stored, but less likely than storage facility.   |     |      |            |

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| Excessive Subsurface Water                               | Neutral                             | Theoretically there will be an increase in infiltration at pond site.   |
| Drifted Snow   | Not Applicable                      | Not applicable.   |
| Inadequate Outlets                                       | Not Applicable                      | Not applicable.   |
| Inefficient Water use on Irrigated Land                  | Slight Improvement                  | Lagoon contents will provide limited source of moisture.  |
| Inefficient Water use on Non-Irrigated Land              | Not Applicable                      | Not applicable.   |
| Reduced Capacity of Conveyances by Sediment Deposition   | Not Applicable                      | Not applicable.   |
| Reduced Storage of Water Bodies by Sediment Accumulation | Not Applicable                      | Not applicable.   |
| Aquifer Overdraft  | Neutral                             | Reduced infiltration at lagoon site could slightly increase overdraft.  |
| Insufficient Flows in Water Courses                      | Neutral                             | Polluted runoff will be captured before it reaches water course, but less likely than storage pond.   |
| <b>WATER – QUALITY</b>                                   |                                     |   |
| In Groundwater:  |                                     |   |
| • Harmful Levels of Pesticides                           | Not Applicable                      | Not applicable.   |
| • Excessive Nutrients and Organics                       | Slight to Moderate Improvement      | There could be some increase in infiltration of soluble contaminants in the case of seepage.  |
| • Excessive Salinity                                     | Slight Improvement                  | Storage provides flexibility in rate, timing, and location of waste application; however, there could be some increase in infiltration of soluble contaminants at storage site.   |
| • Harmful Levels of Heavy Metals                         | Slight Improvement                  | Heavy metals are rarely associated with manure; however, storage provides flexibility in rate, timing, and location of waste application. There could be some increase in infiltration of soluble contaminants at storage site.                         |
| • Harmful Levels of Pathogens                            | Slight to Moderate Improvement      | Storage provides flexibility in rate, timing, and location of waste application, reducing the potential for pathogen contamination.. Increased infiltration of pathogens at storage site is possible. Treatment tends to encourage die-off of bacteria. |
| • Harmful Levels of Petroleum                            | Not Applicable                      | Not applicable.   |
| In Surface Water:  |                                     |   |
| • Harmful Levels of Pesticides                           | Not Applicable                      | Not applicable.   |
| • Excessive Nutrients and Organics                       | Moderate to Substantial Improvement | Storage provides flexibility in rate, timing, and location of waste application, with the   |

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|   |                                     | potential for reductions of contaminants available for transport.   |
| • Excessive Suspended Sediment and Turbidity                      | Neutral                             | Better timing of waste application due to storage will minimize risk of runoff.   |
| • Excessive Salinity  | Slight to Moderate Improvement      | Storage provides flexibility in rate, timing, and location of waste application, with the potential for reductions of contaminants available for transport. |
| • Harmful Levels of Heavy Metals                                  | Not Applicable                      | Not applicable.   |
| • Harmful Temperatures  | Not Applicable                      | Not applicable.   |
| • Harmful Levels of Pathogens                                     | Moderate to Substantial Improvement | Storage provides flexibility in rate, timing, and location of waste application, with the potential for reductions of contaminants available for transport. |
| • Harmful Levels of Petroleum                                     | Not Applicable                      | Not applicable.   |
| <b>AIR – QUALITY</b>  |                                     |   |
| 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   | Neutral                             | There is a decrease in potential ozone precursor emissions.   |
| Excessive Greenhouse Gas:   |                                     |   |
| • CO <sub>2</sub> (Carbon Dioxide)                                | Slight to Moderate Improvement      | Anaerobic conditions provide for a temporary sequestration of carbon. Field management of nutrients optimizes the storage of soil carbon.                   |
| • N <sub>2</sub> O (Nitrous Oxide)                                | Slight to Moderate Improvement      | Reduction in N in waste results in less N volatilization  |
| • CH <sub>4</sub> (Methane)                                       | Slight Worsening                    | Breakdown and decay of organic material is conducive to the formation of CH <sub>4</sub>  |
| Ammonia (NH <sub>3</sub> )  | Slight to Moderate Improvement      | Proper nutrient management reduces NH <sub>3</sub> production.  |
| Chemical Drift  | Not Applicable                      | Not applicable.   |
| Objectionable Odors   | Slight Worsening                    | Type of lagoon and location will determine odor production, however, a correctly sited and managed facility will be relatively odor free.                   |
| Reduced Visibility  | Not Applicable                      | Not applicable.   |
| Undesirable Air Movement  | Not Applicable                      | Not applicable.   |
| Adverse Air Temperature   | Not Applicable                      | Not applicable.   |
| <b>PLANTS – SUITABILITY</b>                                       |                                     |   |
| Plants not Adapted or Suited                                      | Not Applicable                      | Not applicable.   |
| <b>PLANTS - CONDITION</b>   |                                     |   |
| Productivity, Health, and Vigor                                   | Slight to Moderate Improvement      | Storage allows nutrient   |

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|   |                                  | application at a rate, time, and location most suited to the plant needs.                                 |
| 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.   |
| <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 | 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. |
| <b>ANIMALS – DOMESTIC</b>   |                                  |   |
| 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.   |
| <b>HUMAN – ECONOMICS</b>  |                                  |   |
| Land - Change in Land Use   | Not applicable.                  | Not applicable.   |
| Land – Land in Production   | Slight decrease                  | Slight decrease, structure build on cropland.   |
| Capital – Change in Equipment   | Substantial increase.            |   |
| Capital - Total Investment Cost   | Substantial.                     | Substantial.  |
| Capital – Annual Cost   | Moderate increase.               |   |
| Capital – Credit and Farm Program Eligibility   | Situational.                     |   |
| Labor - Labor   | Slight to moderate increase      | Slight to moderate increase due to bi-annual pumpouts.  |
| Labor – Change in Management Level  | Moderate to substantial increase | Moderate to substantial increase for timing and management of waste.                                      |
| Risk - Yield  | Not applicable.                  | Not applicable.   |
| Risk - Flexibility  | Moderate to Substantial Increase | Moderate to substantial increase  |

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|  |                                | because of design criteria.   |
| Risk - Timing  | Substantial Increase           | Substantial increase, depending on state and/or federal laws.   |
| Risk – Cash Flow   | Substantial Increase           | Substantial increase due to implementation costs.   |
| Profitability – Change in Profitability  | Slight to moderate decrease.   |   |
| <b>HUMAN - CULTURAL</b>  |                                |   |
| Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT | Slight to Substantial Increase | Construction impacts (mechanical); inundation.  |
| <b>HUMAN – ENERGY</b>  |                                |   |
| Depletion of Fossil Fuel Resources   | No Effect                      | Regular maintenance of this practice requires pumping; however it facilitates benefits from fertilizer credits. |
| Underutilization of Non-Fossil Energy Resources                                  | Slight to Moderate Increase    | Potential methane production is not utilized.   |

## 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.  |