

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Dam 402</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	Not Applicable	Not applicable.			
Ephemeral Gully	Not Applicable	Not applicable.			
Classic Gully	Slight to Substantial Improvement	Stabilization of the gully due to the embankment.			
Streambank	Slight Improvement	Reduced peak flows downstream from embankment.			
Shoreline	Slight to Moderate Worsening	Increase in shoreline.			
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	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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 Moderate Improvement	Sediment trapped in pond area behind dam.			
<b>WATER - QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight to Moderate Worsening	Possible seepage from ponding of water.			
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	Runoff and peak flows reduced.			
Excessive Subsurface Water	Slight Worsening	Seepage from ponded water.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Not Applicable	Not applicable.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Provides permanent water storage for irrigation.			
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.			

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RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Substantial Improvement	Sediment is trapped behind embankment.			
Reduced Storage of Water Bodies by Sediment Accumulation	Neutral	Limited sediment deposition.			
Aquifer Overdraft	Slight Improvement	Seepage from the impoundment impacts recharge and water storage reduces demands on aquifer.			
Insufficient Flows in Water Courses	Slight Worsening	Controlled release of stored water provides flow downstream of structure.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Worsening	Nutrients impounded could contaminate groundwater.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Suspended Sediment and Turbidity	Slight to Substantial Improvement	Suspended sediments are trapped.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Temperatures	Neutral	Water released from impoundments may be warmer or cooler than receiving waters, depending on site conditions.			
• Harmful Levels of Pathogens	Slight to Moderate Worsening	Because of aquatic animal feed or decaying vegetation, or from excessive nutrients in runoff			
• 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 <sub>2</sub> (Carbon Dioxide)	Not Applicable	Not applicable.			
• N <sub>2</sub> O (Nitrous Oxide)	Not Applicable	Not applicable.			

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		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
• 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	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	Not Applicable	Not applicable.			
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	Slight to Moderate Improvement	Impounded water improves food availability for some fish and wildlife, but decreases food sources for other species, especially stream dwellers.			
Inadequate Cover/Shelter	Slight to Substantial Improvement	Impounded water improves cover and shelter for some fish and wildlife, but decreases it for stream species.			
Inadequate Water	Slight Improvement	Although water is impounded for lotic species, passage to upstream and downstream habitats is not possible for fish and other aquatic wildlife.			
Inadequate Space	Slight to Moderate Improvement	Ponds and adjacent areas provide additional space for wildlife and pond-dwelling species, but eliminates space for stream species.			
Habitat Fragmentation	Moderate to Substantial Worsening	Aquatic and riparian habitats are fragmented.			

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<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Imbalance Among and Within Populations	Slight to Moderate Improvement	Structures may fragment habitats and isolate subpopulations, but fish and wildlife habitat enhancement are a focus of this practice.			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Moderate to Substantial Improvement	Dams can also provide stock water.			
Stress and Mortality	Moderate to Substantial Improvement	Available water reduces stress and mortality.			
<b>HUMAN – ECONOMICS</b>					
Land - Change in Land Use	Not applicable.	Not applicable.			
Land – Land in Production	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					

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		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Mulching 484		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<b>SOIL - EROSION</b>					
Sheet and Rill	Moderate to Substantial Improvement	Soil cover reduces erosion from water.			
Wind	Moderate to Substantial Improvement	Soil cover reduces erosion from wind.			
Ephemeral Gully	Moderate to Substantial Improvement	Soil cover reduces erosion from water.			
Classic Gully	Slight Improvement	Mulching will stabilize eroding areas and reduce runoff.			
Streambank	Slight to Moderate Improvement	Mulching will stabilize eroding areas and reduce runoff.			
Shoreline	Slight Improvement	Mulching will stabilize eroding areas and reduce runoff.			
Irrigation Induced	Slight to Substantial Improvement	Surface cover reduces erosion.			
Mass Movement	Slight Worsening	Increased infiltration could exacerbate mass movement during high rainfall.			
Road, Roadsides, and Construction Sites	Moderate to Substantial Improvement	Surface cover reduces erosion.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Slight to Substantial Improvement	Decreased erosion and biomass addition from organic mulches will increase soil organic matter.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight to Moderate Improvement	Mulch cover may provide some cushion to vehicular traffic. Added biomass from organic mulches over time improve soil structure and resilience to compaction.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight to Moderate Improvement	Reduced evaporation may reduce salt build-up. Added organic matter will buffer salts.			
• Animal Waste and other Organics - N	Slight Improvement	Added carbon immobilizes some N.			
• Animal Waste and other Organics - P	Neutral	Not applicable.			
• Animal Waste and other Organics - K	Slight Improvement	Added carbon immobilizes some K.			
• Commercial Fertilizer - N	Slight Improvement	Added carbon immobilizes some N.			
• Commercial Fertilizer – P	Neutral	Not applicable.			
• Commercial Fertilizer – K	Slight Improvement	Added carbon immobilizes some K.			

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<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Residual Pesticides</li> </ul>	Slight Improvement	Soil biological activity under organic mulches increases over time, which increases pesticide breakdown.			
Damage from Sediment Deposition	Slight Improvement	Mulch cover may trap sediment, but mulch reduces soil erosion.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight Worsening	Increased infiltration results in more water moving through the profile.			
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	Increased infiltration, reduces runoff and ponding.			
Excessive Subsurface Water	Slight Worsening	Increased infiltration results in more water moving through the profile.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Slight Improvement	Reduces needed capacity of outlets due to less runoff.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Increases infiltration and decreases evaporation resulting in more available water.			
Inefficient Water use on Non-Irrigated Land	Slight to Substantial Improvement	Increases infiltration and decreases evaporation resulting in more available water.			
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Substantial Improvement	Reduces erosion which results in less sediment in conveyances.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Substantial Improvement	Reduces erosion which results in less sediment in water bodies.			
Aquifer Overdraft	Slight Improvement	Increases infiltration and reduces evaporation, reducing the amount of water needed and improving aquifer recharge.			
Insufficient Flows in Water Courses	Not Applicable	Not applicable.			
<b>WATER – QUALITY</b>					
In Groundwater:					
<ul style="list-style-type: none"> <li>Harmful Levels of Pesticides</li> </ul>	Slight Improvement	The action reduces the need for pesticide use and may increase soil organic matter and biological activity.			

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		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
• Excessive Nutrients and Organics	Slight Worsening	The action increases infiltration that contributes to nutrient leaching. Also, high organic carbon will cause microbes to immobilize nutrients.			
• Excessive Salinity	Slight Worsening	Better infiltration increases leaching potential.			
• Harmful Levels of Heavy Metals	Neutral	Higher organic matter levels may bind heavy metals but may increase infiltration.			
• Harmful Levels of Pathogens	Neutral	Better infiltration could increase leaching, but increased microbial activity increases competition with pathogens.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action reduces runoff, erosion and the need for pesticide use. Impervious mulches may increase runoff.			
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The action reduces erosion and runoff, reducing the loss of dissolved and sediment-bound nutrients from the site.			
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Less erosion and runoff reduces transport of sediment.			
• Excessive Salinity	Slight Improvement	Less runoff reduces transport potential of soluble salts.			
• Harmful Levels of Heavy Metals	Slight Improvement	Decreased erosion and runoff reduces heavy metal delivery to surface water.			
• Harmful Temperatures	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Slight Improvement	Less erosion and runoff reduces delivery of pathogens.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
<b>AIR – QUALITY</b>					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	Mulches can stabilize the soil surface, reducing the generation of particulate matter.			
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Mulches can stabilize the soil surface, reducing the generation of particulate matter.			
Excessive Ozone	Neutral	There is a minimal reduction of ozone precursors through reduced surface temperatures offered by mulch material.			

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<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Excessive Greenhouse Gas:					
• CO <sub>2</sub> (Carbon Dioxide)	Slight Improvement	If used, vegetation residue stores carbon.			
• N <sub>2</sub> O (Nitrous Oxide)	Not Applicable	Not applicable.			
• 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> )	Not Applicable	Not applicable.			
Chemical Drift	Not Applicable	Not applicable.			
Objectionable Odors	Not Applicable	Not applicable.			
Reduced Visibility	Slight to Moderate Improvement	Soil erosion from wind is reduced.			
Undesirable Air Movement	Not Applicable	Not applicable.			
Adverse Air Temperature	Slight to Moderate Improvement	Materials can insulate sites from low temperatures accelerating plant germination 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		Mulching materials improve growing conditions contributing to increased plant 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 to Substantial Improvement		Thick and/or impenetrable mulch cover can prevent emergence of undesired species.	
Forage Quality and Palatability		Not Applicable		Not applicable.	
Wildfire Hazard		Not Applicable		Not applicable.	
<b>ANIMALS - FISH AND WILDLIFE</b>					
Inadequate Food		Slight Improvement		Mulching enhances production of any food species planted.	
Inadequate Cover/Shelter		Slight Improvement		Mulching enhances cover/shelter conditions.	
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.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Mulching 484</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Slight to Moderate Improvement	Soil fertility is improved which increases forage quantity and quality.			
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.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Use Exclusion 472		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<b>SOIL - EROSION</b>					
Sheet and Rill	Slight to Moderate Improvement	Control of animals, people and vehicles reduces disturbance of soil and vegetation.			
Wind	Slight to Moderate Improvement	Control of animals, people and vehicles reduces disturbance of soil and vegetation.			
Ephemeral Gully	Slight to Moderate Improvement	Control of animals, people and vehicles reduces disturbance of soil and vegetation.			
Classic Gully	Slight to Moderate Improvement	Control of animals, people and vehicles reduces disturbance of soil and vegetation.			
Streambank	Slight to Moderate Improvement	Control of animals, people and vehicles reduces disturbance of soil and vegetation.			
Shoreline	Slight to Moderate Improvement	Control of animals, people and vehicles reduces disturbance of soil and vegetation.			
Irrigation Induced	Not Applicable	Not applicable.			
Mass Movement	Not Applicable	Not applicable.			
Road, Roadsides, and Construction Sites	Slight to Moderate Improvement	Control of animals, people and vehicles reduces disturbance of soil and vegetation.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Slight to Moderate Improvement	Control of animals, people and vehicles help maintain conditions of soil and vegetation.			
Rangeland Site Stability	Slight to Substantial Improvement	Barriers reduce the excessive disturbance of soil and vegetation by facilitating the effective control of timing, frequency, duration and intensity of use of an area by animals or people.			
Compaction	Moderate to Substantial Improvement	Control of animals, people and vehicles lessens compactive forces on soil.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight to Moderate Improvement	Control of animals, people and vehicles may increase infiltration, leaching and plant uptake.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Use Exclusion 472</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
• Animal Waste and other Organics - N	Slight to Moderate Improvement	Control of animals, people and vehicles may increase infiltration, leaching and plant uptake.			
• Animal Waste and other Organics - P	Slight to Moderate Improvement	Control of animals, people and vehicles may increase infiltration, leaching and plant uptake.			
• Animal Waste and other Organics - K	Slight to Moderate Improvement	Control of animals, people and vehicles may increase infiltration, leaching and plant uptake.			
• Commercial Fertilizer - N	Slight to Moderate Improvement	Control of animals, people and vehicles may increase infiltration, leaching and plant uptake.			
• Commercial Fertilizer – P	Slight to Moderate Improvement	Control of animals, people and vehicles may increase infiltration, leaching and plant uptake.			
• Commercial Fertilizer – K	Slight to Moderate Improvement	Control of animals, people and vehicles may increase infiltration, leaching and plant uptake.			
• Residual Pesticides	Not Applicable	Not applicable.			
Damage from Sediment Deposition	Slight to Moderate Improvement	Control of animals, people and vehicles reduces erosion, runoff and resulting sedimentation.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Slight to Substantial Improvement	Barriers reduce the excessive disturbance of soil and vegetation by facilitating the effective control of timing, frequency, duration and intensity of use of an area by animals or people.			
Excessive Seepage	Slight Improvement	Control of animals, people and vehicles influences vigor and health of vegetation which in turn can influence water uptake and infiltration.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Use Exclusion 472</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Worsening	Control of animals, people and vehicles can improve vigor and health of vegetation which can increase retardance of water flows. Also, exclusion structures can trap debris further retarding flows.			
Excessive Subsurface Water	Slight to Moderate Improvement	Control of animals, people and vehicles influences vigor and health of vegetation which in turn can influence water uptake.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Slight Improvement	Control of animals, people and vehicles influences vigor and health of vegetation which can increase retardance of water flows reducing the need for larger outlets.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Slight to Substantial Improvement	Control of animals, people and vehicles influences vegetation vigor and soil structure which can help optimize water use.			
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Moderate Improvement	Control of animals, people and vehicles can improve vigor and health of vegetation which can increase retardance of sediments.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Moderate Improvement	Control of animals, people and vehicles can improve vigor and health of vegetation which can increase retardance of sediments.			
Aquifer Overdraft	Neutral	Control of animals, people and vehicles can improve soil structure and infiltration of water to the aquifer. However, the effect is countered by improved vegetation vigor which increases water uptake.			
Insufficient Flows in Water Courses	Slight to Moderate Improvement	Control of animals, people and vehicles influences vigor and health of vegetation and soil condition in uplands and riparian areas which in turn can enhance water storage and infiltration to stabilize flow in water courses.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Use Exclusion 472		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Improvement	Control of animals, people, and vehicles influences vegetation vigor and soil structure which can accelerate use and breakdown of nutrients/organics.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Slight Improvement	Control of animals, people, and vehicles influences vegetation vigor and soil structure which can accelerate attenuation of heavy metals.			
• Harmful Levels of Pathogens	Slight Improvement	Control of animals and people lessens pathogen production in sensitive areas.			
• Harmful Levels of Petroleum	Slight Improvement	Reducing vehicular access reduces the potential for petroleum contamination.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight to Moderate Improvement	Control of animals, people and vehicles influences vigor and health of vegetation and soil condition reducing runoff when applied with other management practices.			
• Excessive Suspended Sediment and Turbidity	Not Applicable	Not applicable.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Slight Improvement	Control of animals, people and vehicles improves vigor and health of vegetation and soil condition, which in turn can influence water uptake and infiltration to reduce runoff. Reducing vehicles eliminates heavy metals from brakes and fuel.			
• Harmful Temperatures	Neutral	Control of animals, people and vehicles influences vigor, health, and availability of vegetation when applied with other conservation practices			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Use Exclusion 472		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>	Slight to Moderate Improvement	Control of animals, people and vehicles influences vigor and health of vegetation and soil condition which in turn can influence water uptake and infiltration to reduce runoff and increase mortality of pathogens.			
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>	Slight Worsening	Control of animals, people and vehicles influences vigor and health of vegetation and soil condition which in turn can influence water uptake and infiltration to reduce runoff and increase trapping and breakdown of petroleum products.			
<b>AIR – QUALITY</b>					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	Restricting traffic on an area can result in an improved stand of vegetation, which can reduce the generation of particulates.			
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Restricting traffic on an area can result in an improved stand of vegetation, which can reduce the generation of particulates.			
Excessive Ozone	Not Applicable	Not applicable.			
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>	Slight Improvement	Vegetation removes CO <sub>2</sub> from the air and stores it in the form of carbon in the plants and soil.			
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>	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	Slight Improvement	Reduction in wind erosion potential and fugitive dust			
Undesirable Air Movement	Not Applicable	Not applicable.			
Adverse Air Temperature	Not Applicable	Not applicable.			
<b>PLANTS – SUITABILITY</b>					
Plants not Adapted or Suited	Slight to Substantial Improvement	Control of access encourages plants that are adapted and suited for the site.			
<b>PLANTS - CONDITION</b>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Use Exclusion 472</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Productivity, Health, and Vigor	Moderate to Substantial Improvement	Control of animals facilitates grazing management enhancing health and vigor of desired plant communities.			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>• Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>• Declining Species, Species of Concern</li> </ul>	Not Applicable	Not applicable.			
Noxious and Invasive Plants	Moderate to Substantial Improvement	Control of animals, people and vehicles influences vigor and health of desirable vegetation thereby reducing threat of noxious and invasive plants when applied with other conservation practices.			
Forage Quality and Palatability	Moderate to Substantial Improvement	Control of animals, people and vehicles influences quality and health of vegetation			
Wildfire Hazard	Slight to Substantial Improvement	Access by people and vehicles to high hazard areas can be restricted.			
<b>ANIMALS - FISH AND WILDLIFE</b>					
Inadequate Food	Slight to Substantial Improvement	Control of animals, people and vehicles influences vigor, health, and availability of vegetation for food.			
Inadequate Cover/Shelter	Slight to Substantial Improvement	Control of animals, people and vehicles influences vigor, health, and availability of vegetation cover/shelter.			
Inadequate Water	Slight to Moderate Improvement	Control of access protects available water sources.			
Inadequate Space	Slight to Substantial Improvement	Excluded use protects wildlife space requirements.			
Habitat Fragmentation	Slight to Substantial Improvement	Excluded use can protect connections between habitats.			
Imbalance Among and Within Populations	Slight to Substantial Improvement	Control of animals, people and vehicles facilitates the effects of other population-balancing practices and activities.			
Threatened and Endangered Fish and Wildlife Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Use Exclusion 472		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Moderate to Substantial Improvement	Control of animals influences vigor and health of vegetation.			
Inadequate Shelter	Not Applicable	Not applicable.			
Inadequate Stock Water	Not Applicable	Not applicable.			
Stress and Mortality	Moderate to Substantial Improvement	Barriers exclude livestock from unsafe areas and facilitate improved forage and water supplies.			
<b>HUMAN – ECONOMICS</b>					
Land - Change in Land Use	Not applicable.	Not applicable.			
Land – Land in Production	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Lined Waterway or Outlet 468</b>	Baseline Setting:				
	Appropriate Land Use(s): All Land Uses				
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<b>SOIL - EROSION</b>					
Sheet and Rill	Not Applicable	Not applicable.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Substantial Improvement	Shaping and lining the channel conveys runoff water without causing erosion.			
Classic Gully	Slight to Substantial Improvement	The action stabilizes existing and prevent future gully erosion.			
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	Slight to Moderate Improvement	Lining reduces erosion in road side ditches.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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 Improvement	Waterway may intercept runoff that might otherwise cause deposition.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight to Moderate Improvement	The action reduces infiltration and seepage from waterways.			
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	Waterway provides a stable conveyance and outlet for runoff, flooding and ponding.			
Excessive Subsurface Water	Slight to Moderate Improvement	The action reduces infiltration and seepage from waterways.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Slight Worsening	Provides an adequate outlet.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Lined Waterway or Outlet 468</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.			
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Moderate Improvement	Lining will stabilize waterway and reduce erosion.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Moderate Improvement	Increased stability will reduce erosion and sediment load.			
Aquifer Overdraft	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Reduced permeability in channel provides greater flows.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The action reduces the potential to contaminate groundwater.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	The action reduces erosion and sediment load.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Temperatures	Neutral	The action conveys water quickly and will not result in increased surface water temperatures.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• 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 <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> )	Neutral	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Lined Waterway or Outlet 468</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
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.			
<b>PLANTS – SUITABILITY</b>					
Plants not Adapted or Suited	Not Applicable	Not applicable.			
<b>PLANTS - CONDITION</b>					
Productivity, Health, and Vigor	Not Applicable	Not applicable.			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Slight to Moderate Worsening	If food sources exist they will be eliminated.			
Inadequate Cover/Shelter	Slight to Moderate Worsening	If cover/shelter exist they will be eliminated.			
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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Lined Waterway or Outlet 468</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<b>HUMAN – ECONOMICS</b>					
Land - Change in Land Use	Not applicable.	Not applicable.			
Land – Land in Production	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Smoothing 466</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Neutral	Reshaping the land surface may decrease the degree of slope, however, the slope length may be increased.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Slight Improvement	Creating a more uniform surface may increase infiltration and decrease concentrated flow.			
Classic Gully	Not Applicable	Not applicable.			
Streambank	Not Applicable	Not applicable.			
Shoreline	Not Applicable	Not applicable.			
Irrigation Induced	Slight Improvement	Concentrated flow is reduced and there is more uniform water distribution.			
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 and aerates the soil.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight to Moderate Worsening	Equipment used for smoothing 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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Smoothing 466</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
WATER – QUANTITY					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight to Substantial Improvement	Creates a more uniform surface and removal of depressions reduces seepage.			
Excessive Runoff, Flooding, or Ponding	Slight to Substantial Improvement	Creates a more uniform surface and removal of depressions improves drainage.			
Excessive Subsurface Water	Slight to Substantial Improvement	Creates a more uniform surface and removal of depressions reduces subsurface water.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Not Applicable	Not applicable.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Improves uniformity of water distribution.			
Inefficient Water use on Non-Irrigated Land	Slight to Substantial Improvement	Improved water distribution.			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Not Applicable	Not applicable.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Slight Improvement	Removing irregularities on the land 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 groundwater.			
• Excessive Salinity	Neutral	The action causes a decrease in ponding and a more uniform infiltration.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Slight Improvement	Removing irregularities on the land surface reduces runoff.			
• Excessive Nutrients and Organics	Slight Improvement	The action smoothes the surface which increases infiltration and reduces transport of nutrients to surface waters.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Smoothing 466</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Land surface is formed to a non-erosive grade.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Slight Improvement	Smoothing uneven land allows the application of practices that can reduce sheet, rill and ephemeral gully erosion and increase infiltration.			
• Harmful Temperatures	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
AIR – QUALITY					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Neutral	Equipment operations temporarily produce particulate emissions and exhaust emissions.			
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Worsening	Equipment operations can produce particulate emissions and exhaust emissions.			
Excessive Ozone	Not Applicable	Not applicable.			
Excessive Greenhouse Gas:					
• CO <sub>2</sub> (Carbon Dioxide)	Slight Worsening	Some carbon may be lost due to soil disturbance.			
• 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> )	Neutral	Not applicable.			
Chemical Drift	Not Applicable	Not applicable.			
Objectionable Odors	Not Applicable	Not applicable.			
Reduced Visibility	Slight to Moderate Worsening	soil surface disturbed, increase fugitive dust			
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 Substantial 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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Smoothing 466</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Not Applicable	Not applicable.			
Noxious and Invasive Plants	Slight to Substantial Improvement	Improved irrigation efficiency improves crop health and vigor which decreases weed competition.			
Forage Quality and Palatability	Not Applicable	Not applicable.			
Wildfire Hazard	Not Applicable	Not applicable.			
ANIMALS - FISH AND WILDLIFE					
Inadequate Food	Neutral	Smoothing activities are temporary.			
Inadequate Cover/Shelter	Neutral	Smoothing activities are temporary.			
Inadequate Water	Not Applicable	Not applicable.			
Inadequate Space	Slight Worsening	The action causes a decrease in diversity			
Habitat Fragmentation	Slight Worsening	Land disturbance will diminish microtopography.			
Imbalance Among and Within Populations	Slight Worsening	The action causes a decrease in diversity			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	When threatened or endangered species are present, protection and recovery are addressed in the planning process.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Neutral	When threatened or endangered species are present, protection and recovery are addressed in the planning process.			
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	Not applicable.	Not applicable.			
Land – Land in Production	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Smoothing 466</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Labor - Labor		0	Slight to moderate increase.		
Labor – Change in Management Level		0	Not applicable.		
Risk - Yield		Not applicable.	Not applicable.		
Risk - Flexibility		Not applicable.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Decrease		
Risk – Cash Flow		Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase		
Profitability – Change in Profitability		Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Not applicable.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Not Applicable	No		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Land Leveling 464</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<b>SOIL - EROSION</b>					
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.			
<b>SOIL – CONDITION</b>					
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.			
<b>Contaminants:</b>					
• 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.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Land Leveling 464</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Land Leveling 464</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
<ul style="list-style-type: none"> <li>• Excessive Nutrients and Organics</li> </ul>		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.		
<ul style="list-style-type: none"> <li>• Excessive Suspended Sediment and Turbidity</li> </ul>		Slight Improvement	Land surface is formed to a non-erosive grade.		
<ul style="list-style-type: none"> <li>• Excessive Salinity</li> </ul>		Neutral	The action allows more efficient use of irrigation water, but does not affect the amount of salt leaving the field.		
<ul style="list-style-type: none"> <li>• Harmful Levels of Heavy Metals</li> </ul>		Slight Improvement	Uniform surface reduces transport to surface water.		
<ul style="list-style-type: none"> <li>• Harmful Temperatures</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>• Harmful Levels of Pathogens</li> </ul>		Slight to Moderate Improvement	Uniform surface reduces transport to surface water		
<ul style="list-style-type: none"> <li>• Harmful Levels of Petroleum</li> </ul>		Slight Improvement	Uniform surface reduces transport to surface water		
<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		Not Applicable	Not applicable.		
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>• CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>• N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>• CH<sub>4</sub> (Methane)</li> </ul>		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		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	Site modification to improve irrigation application enhances the health and vigor of desired species.		
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Land Leveling 464</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
• 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 Proposed for Listing Under the Endangered Species Act	Not Applicable	Not applicable.			
• 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	Not applicable.	Not applicable.			
Land – Land in Production	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Land Leveling 464</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Precision Land Forming 462</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Neutral	Reshaping the surface of land may reduce the degree of slope, however, slope length may be increased.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Slight to Moderate Improvement	Creating a more uniform surface may increase infiltration and decrease concentrated flow.			
Classic Gully	Moderate to Substantial Improvement	Land forming is used to reshape and fill gully.			
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	Slight to Moderate Improvement	Reshaping road sides and construction will reduces runoff causing erosion			
SOIL – CONDITION					
Organic Matter Depletion	Slight to Moderate Worsening	The process of land forming alters the soil profile and aerates the soil.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight Worsening	Use of heavy equipment during land forming may cause compaction. Mitigation and appropriate timing are part of practice design.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight Improvement	Smoothing causes a more uniform infiltration			
• Animal Waste and other Organics - N	Slight Improvement	Smoothing causes a more uniform infiltration.			
• Animal Waste and other Organics - P	Slight Improvement	Smoothing causes a more uniform infiltration.			
• Animal Waste and other Organics - K	Slight Improvement	Smoothing causes a more uniform infiltration.			
• Commercial Fertilizer - N	Slight Improvement	Smoothing causes a more uniform infiltration.			
• Commercial Fertilizer – P	Slight Improvement	Smoothing causes a more uniform infiltration.			
• Commercial Fertilizer – K	Slight Improvement	Smoothing causes a more uniform infiltration.			
• Residual Pesticides	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Precision Land Forming 462</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Damage from Sediment Deposition	Slight to Moderate Improvement	The action redistributes sediment on the field, restoring grades.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight to Substantial Improvement	Creates a more uniform surface and removal of depressions.			
Excessive Runoff, Flooding, or Ponding	Slight to Substantial Improvement	Creates a more uniform surface and removal of depressions will eliminate ponding.			
Excessive Subsurface Water	Slight to Substantial Improvement	Creates a more uniform surface and removes depressions to improve drainages.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Not Applicable	Not applicable.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Slight to Substantial Improvement	Because of improved water distribution.			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Not Applicable	Not applicable.			
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides	Slight Improvement	Reshaping the surface of the land reduces deep percolation.			
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The action smooths the surface which reduces ponding and the transport of nutrients to ground water.			
• Excessive Salinity	Slight Improvement	The action causes a decrease in ponding and a more uniform infiltration.			
• Harmful Levels of Heavy Metals	Slight Improvement	The uniform surface grade reduces ponding and excessive infiltration of contaminated water.			
• Harmful Levels of Pathogens	Slight Improvement	The uniform surface grade reduces ponding and excessive infiltration of contaminated water.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Precision Land Forming 462</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
• Harmful Levels of Pesticides	Slight Improvement	Reshaping the surface of the land reduces erosion.			
• Excessive Nutrients and Organics	Slight Improvement	The action smoothes the surface which increases infiltration and reduces transport of nutrients to surface waters.			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Land surface is formed to a non-erosive grade.			
• Excessive Salinity	Neutral	The action will not appreciably alter runoff and runoff-related contaminants.			
• Harmful Levels of Heavy Metals	Slight Improvement	Smoothing uneven land allows the application of practices that can reduce sheet, rill and ephemeral gully erosion and increase infiltration.			
• Harmful Temperatures	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
<b>AIR – QUALITY</b>					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Neutral	Equipment operations temporarily produce particulate emissions and exhaust emissions.			
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 <sub>2</sub> (Carbon Dioxide)	Slight Worsening	Some carbon may be lost due to soil disturbance.			
• 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	Neutral	Increased generation of particulates and ozone precursors during construction.			
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>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Precision Land Forming 462</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Productivity, Health, and Vigor	Moderate to Substantial Improvement	Site modification to improve irrigation application enhances the health and vigor of desired species.			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Precision Land Forming 462</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Land Clearing 460		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<b>SOIL - EROSION</b>					
Sheet and Rill	Neutral	Establishment of temporary vegetative cover is needed to protect the treated area from erosion until the planned use is in place.			
Wind	Neutral	The action requires that temporary cover will be established as necessary to control wind erosion on the cleared area until the planned land use is in place.			
Ephemeral Gully	Neutral	The action requires that temporary cover will be established as necessary to control water erosion on the cleared area until the planned land use is in place.			
Classic Gully	Neutral	Clearing will reduce vegetation resulting in a short term increase of erosion.			
Streambank	Neutral	Clearing will reduce vegetation resulting in a short term increase of erosion.			
Shoreline	Neutral	Clearing will reduce vegetation resulting in a short term increase of erosion.			
Irrigation Induced	Not Applicable	Not applicable.			
Mass Movement	Slight Worsening	Clearing may remove root systems holding the soil in place.			
Road, Roadsides, and Construction Sites	Slight to Moderate Worsening	Clearing may remove root systems holding the soil in place.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Moderate Worsening	Organic material may be removed by clearing.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight Worsening	Clearing may allow for increased vehicle traffic.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• Animal Waste and other Organics - N	Not Applicable	Not applicable.			
• Animal Waste and other Organics - P	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Clearing 460</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
• 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	Neutral	Vegetation established as part of this practice will control erosion in the long term, but there may be a slight increase in sediment in the short term.			
WATER – QUANTITY					
Rangeland Hydrologic Cycle	Not Applicable	Not Applicable			
Excessive Seepage	Not Applicable	Not applicable.			
Excessive Runoff, Flooding, or Ponding	Slight Worsening	Removal of vegetation may increase runoff.			
Excessive Subsurface Water	Neutral	Removal of vegetation may decrease evapotranspiration.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Neutral	Removal of vegetation may increase runoff. This will require more outlets short term.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.			
Reduced Capacity of Conveyances by Sediment Deposition	Slight Worsening	Reduction in vegetation may increase erosion and downstream sedimentation.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Worsening	Reduction in vegetation may increase erosion and downstream sedimentation.			
Aquifer Overdraft	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Removal of vegetation may increase runoff and downstream flows.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Clearing 460</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>	Neutral	Land clearing activities often involve motorized equipment which may deposit oils and other petroleum products on the ground surface.			
In Surface Water:					
<ul style="list-style-type: none"> <li>Harmful Levels of Pesticides</li> </ul>	Slight Worsening	Removal of trees, stumps, and other vegetation increases runoff and erosion.			
<ul style="list-style-type: none"> <li>Excessive Nutrients and Organics</li> </ul>	Slight Worsening	Removal of permanent vegetative cover may increase runoff and erosion and the delivery of sediment-attached nutrients to surface water.			
<ul style="list-style-type: none"> <li>Excessive Suspended Sediment and Turbidity</li> </ul>	Slight Worsening	Removal of trees and vegetation will increase runoff and erosion. Mitigation is part of practice design.			
<ul style="list-style-type: none"> <li>Excessive Salinity</li> </ul>	Neutral	Removal of cover may increase transport of salinity if contained in runoff and erosion related sediments.			
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>	Slight Worsening	Removal of cover may increase runoff and erosion.			
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>	Slight to Moderate Worsening	Removal of canopy cover reduces the amount of shade and cooling effects on streams and water courses. Mitigation is part of practice design.			
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>	Slight Worsening	removal of cover may increase runoff and erosion			
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>	Slight Worsening	removal of cover may increase runoff and erosion			
<b>AIR – QUALITY</b>					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight Worsening	Equipment operations can produce particulate emissions and exhaust emissions.			
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight Worsening	Equipment operations can produce particulate emissions and exhaust emissions.			
Excessive Ozone	Neutral	There is a short-term increase in vehicle emissions and ozone precursors from land clearing equipment.			
Excessive Greenhouse Gas:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Clearing 460</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
• CO <sub>2</sub> (Carbon Dioxide)	Slight Worsening	Carbon can be released with the disposal of material if the material is burned and/or soil surface disturbed.			
• 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	Slight Worsening	fugitive dust during construction			
Undesirable Air Movement	Slight Worsening	Reduction in canopy increases wind speeds.			
Adverse Air Temperature	Slight to Moderate Worsening	Removal of tall vegetation eliminates shade and increases temperatures.			
<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	Removal of undesirable plants will provide a better growing environment for desired plant species.			
Threatened or Endangered Plant Species:					
• Plant Species Listed or Proposed for Listing Under the Endangered Species Act	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.			
• Declining Species, Species of Concern	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.			
Noxious and Invasive Plants	Slight to Moderate Worsening	Undesired species can colonize areas left bare.			
Forage Quality and Palatability	Not Applicable	Not applicable.			
Wildfire Hazard	Moderate to Substantial Improvement	Activities reduce fuel load buildup.			
<b>ANIMALS - FISH AND WILDLIFE</b>					
Inadequate Food	Slight to Moderate Worsening	Clearing removes tree-related food.			
Inadequate Cover/Shelter	Slight to Moderate Worsening	Removal of vegetation will reduce cover/shelter.			
Inadequate Water	Not Applicable	Not applicable.			
Inadequate Space	Moderate Worsening	Loss of habitat occurs as land is disturbed.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Clearing 460</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Habitat Fragmentation	Moderate Worsening	Clearing will fragment habitats.			
Imbalance Among and Within Populations	Not Applicable	Not applicable.			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Slight to Moderate Worsening	Removal of vegetation will reduce shelter.			
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.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

<b>STATE</b>	<b>WASHINGTON</b>	<b>FIELD OFFICE</b>	<b>ALL</b>	<b>DATE</b>	<b>9/2008</b>
<b>PRACTICE: Land Clearing 460</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Reclamation, Landslide Treatment 453</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Grazed Range, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<b>SOIL - EROSION</b>					
Sheet and Rill		Slight to Moderate Improvement		The establishment of vigorous vegetative cover will reduce erosion from water.	
Wind		Slight to Moderate Improvement		The establishment of vigorous vegetative cover will reduce erosion from wind.	
Ephemeral Gully		Slight to Moderate Improvement		The establishment of vigorous vegetative cover will reduce erosion from water.	
Classic Gully		Not Applicable		Not applicable.	
Streambank		Not Applicable		Not applicable.	
Shoreline		Not Applicable		Not applicable.	
Irrigation Induced		Not Applicable		Not applicable.	
Mass Movement		Slight to Substantial Improvement		The action will increase vegetation, water management and stabilization of slopes.	
Road, Roadsides, and Construction Sites		Slight to Substantial Improvement		The action will increase vegetation, water management and stabilization of slopes.	
<b>SOIL – CONDITION</b>					
Organic Matter Depletion		Slight to Substantial Improvement		Site modifications including vegetation establishment increases on-site organic matter.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Neutral		Site modifications may include revegetation or other features that impact compaction.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Neutral		In some cases the loose talus may contain salts or other material that must be removed to re-establish vegetation.	
• 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.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Reclamation, Landslide Treatment 453</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Grazed Range, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
Damage from Sediment Deposition		Moderate to Substantial Improvement		The action is designed to reduce sedimentation from land slides.	
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle		Not Applicable		Not applicable.	
Excessive Seepage		Slight to Substantial Improvement		Removal of water to stabilize slopes reduces seepage.	
Excessive Runoff, Flooding, or Ponding		Not Applicable		Not applicable.	
Excessive Subsurface Water		Slight to Substantial Improvement		Removal of water to stabilize slopes reduces seepage.	
Drifted Snow		Not Applicable		Not applicable.	
Inadequate Outlets		Slight Improvement		Water control measures will reduce runoff.	
Inefficient Water use on Irrigated Land		Not Applicable		Not applicable.	
Inefficient Water use on Non-Irrigated Land		Not Applicable		Not applicable.	
Reduced Capacity of Conveyances by Sediment Deposition		Slight to Moderate Improvement		Increased stability will reduce erosion and sediment load.	
Reduced Storage of Water Bodies by Sediment Accumulation		Slight to Moderate Improvement		Increased stability will reduce erosion and sediment load.	
Aquifer Overdraft		Not Applicable		Not applicable.	
Insufficient Flows in Water Courses		Not Applicable		Not applicable.	
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides		Not Applicable		Not applicable.	
• Excessive Nutrients and Organics		Not Applicable		Not applicable.	
• Excessive Salinity		Not Applicable		Not applicable.	
• Harmful Levels of Heavy Metals		Not Applicable		Not applicable.	
• Harmful Levels of Pathogens		Not Applicable		Not applicable.	
• Harmful Levels of Petroleum		Not Applicable		Not applicable.	
In Surface Water:					
• Harmful Levels of Pesticides		Not Applicable		Not applicable.	
• Excessive Nutrients and Organics		Not Applicable		Not applicable.	
• Excessive Suspended Sediment and Turbidity		Moderate to Substantial Improvement		Erosion control and increased cover will reduce runoff and sediment.	
• Excessive Salinity		Not Applicable		Not applicable.	
• Harmful Levels of Heavy Metals		Moderate to Substantial Improvement		Increased vegetation increases infiltration and reduces runoff and erosion.	
• Harmful Temperatures		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Reclamation, Landslide Treatment 453</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Grazed Range, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
• Harmful Levels of Pathogens		Slight Improvement	Because of increased cover and reduced infiltration		
• Harmful Levels of Petroleum		Slight Improvement	Because of increased cover and reduced infiltration		
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		Neutral	There is a short-term increase in motor vehicle emissions from equipment. There is a minimal reduction of ozone precursors through reduced surface temperatures offered by shade or ground cover, and minimal biofiltering of ozone concentrations due to interception by vegetation.		
Excessive Greenhouse Gas:					
• CO <sub>2</sub> (Carbon Dioxide)		Neutral	If used, vegetation removes CO <sub>2</sub> from the air and stores it in the form of carbon in the plants and soil.		
• 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		Not Applicable	Not applicable.		
PLANTS – SUITABILITY					
Plants not Adapted or Suited		Substantial Improvement	When species are selected for stabilization, they are adapted and suited.		
PLANTS - CONDITION					
Productivity, Health, and Vigor		Moderate to Substantial Improvement	Vegetative cover species will be selected and maintained at optimal conditions for the intended purpose.		
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Reclamation, Landslide Treatment 453</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Grazed Range, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		Not Applicable	Not applicable.		
Noxious and Invasive Plants		Moderate to Substantial Improvement	Vegetation is installed and managed to control undesired species.		
Forage Quality and Palatability		Not Applicable	Not applicable.		
Wildfire Hazard		Not Applicable	Not applicable.		
ANIMALS - FISH AND WILDLIFE					
Inadequate Food		Slight to Moderate Improvement	Increased quality and quantity of vegetation provides more food for wildlife.		
Inadequate Cover/Shelter		Slight to Moderate Improvement	Increased quality and quantity of vegetation provides more food for wildlife.		
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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		Not applicable.	Not applicable.		
Land – Land in Production		Not applicable.	Moderate to substantial increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		Substantial.	Slight to moderate.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Land Reclamation, Landslide Treatment 453</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Grazed Range, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Negligible to slight.		
Labor - Labor		0	Slight to moderate increase.		
Labor – Change in Management Level		0	Not applicable.		
Risk - Yield		Not applicable.	Not applicable.		
Risk - Flexibility		Not applicable.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Decrease		
Risk – Cash Flow		Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase		
Profitability – Change in Profitability		Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Not applicable.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Not Applicable	No		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Anionic Polyacrylamide (PAM) Erosion Control 450</b>		Baseline Setting: Irrigated cropland.			
		Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
SOIL - EROSION					
Sheet and Rill		Slight to Moderate Improvement		Application aggregates soil particles making them less susceptible to detachment from flowing water.	
Wind		Slight to Moderate Improvement		Application aggregates soil particles making them less susceptible to detachment from wind energy.	
Ephemeral Gully		Slight to Moderate Improvement		Application aggregates soil particles making them less susceptible to detachment from concentrated flow.	
Classic Gully		Not Applicable		Not applicable.	
Streambank		Not Applicable		Not applicable.	
Shoreline		Not Applicable		Not applicable.	
Irrigation Induced		Slight to Substantial Improvement		Pam reduces sediment transport.	
Mass Movement		Not Applicable		Not applicable..	
Road, Roadsides, and Construction Sites		Slight to Substantial Improvement		Pam reduces sediment transport.	
SOIL – CONDITION					
Organic Matter Depletion		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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.	
WATER – QUANTITY					
Rangeland Hydrologic Cycle		Not Applicable		Not applicable.	
Excessive Seepage		Not Applicable		Not applicable.	
Excessive Runoff, Flooding, or Ponding		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Anionic Polyacrylamide (PAM) Erosion Control 450</b>		Baseline Setting: Irrigated cropland.			
		Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Excessive Subsurface Water	Not Applicable	Not applicable.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Not Applicable	Not applicable.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.			
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Substantial Improvement	Pam reduces sediment transport off of the field that otherwise would deposit in conveyance ways.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Substantial Improvement	Pam reduces sediment transport off of the field that otherwise would deposit in water bodies.			
Aquifer Overdraft	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Not Applicable	Not applicable.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Slight Worsening	The action increases infiltration.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Slight to Substantial Improvement	The action decreases runoff and erosion.			
• Excessive Nutrients and Organics	Slight to Moderate Improvement	Because irrigation-induced erosion is reduced, there is less delivery of sediment-attached nutrients to be carried off-site to surface water.			
• Excessive Suspended Sediment and Turbidity	Moderate to Substantial Improvement	The action reduces erosion and sediment load			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Slight Improvement	PAM will reduce transport of heavy metals attached to soils.			
• Harmful Temperatures	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
AIR – QUALITY					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Anionic Polyacrylamide (PAM) Erosion Control 450</b>		Baseline Setting: Irrigated cropland.			
		Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)		Slight to Substantial Improvement	The action reduces the susceptibility of soil to wind erosion.		
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)		Slight to Substantial Improvement	The action reduces the susceptibility of soil to wind erosion.		
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		Slight to Moderate Improvement	Reduce fugitive dust emissions		
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		Not Applicable	Not applicable.		
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		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:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Anionic Polyacrylamide (PAM) Erosion Control 450</b>		Baseline Setting: Irrigated cropland.			
		Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		Not applicable.	Not applicable.		
Land – Land in Production		Not applicable.	Moderate to substantial increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		Substantial.	Slight to moderate.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Negligible to slight.		
Labor - Labor		0	Slight to moderate increase.		
Labor – Change in Management Level		0	Not applicable.		
Risk - Yield		Not applicable.	Not applicable.		
Risk - Flexibility		Not applicable.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Decrease		
Risk – Cash Flow		Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase		
Profitability – Change in Profitability		Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01		
HUMAN - CULTURAL					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Not applicable.	No		
HUMAN – ENERGY					
Depletion of Fossil Fuel Resources		Not Applicable	No		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Irrigation Water Management 449		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
<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.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<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>	
Inadequate Outlets		Not Applicable		Not applicable.	
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>					
In Groundwater:					
• 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.	
In Surface Water:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Management 449</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
• 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.		
• 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		
AIR – QUALITY					
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.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<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>			
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:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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 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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<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>		
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.		Moderate to substantial increase.		
Capital – Change in Equipment	0		Substantial.		
Capital - Total Investment Cost	Substantial.		Slight to moderate.		
Capital – Annual Cost	0		Situational.		
Capital – Credit and Farm Program Eligibility	0		Negligible to slight.		
Labor - Labor	0		Slight to moderate increase.		
Labor – Change in Management Level	0		Not applicable.		
Risk - Yield	Not applicable.		Not applicable.		
Risk - Flexibility	Not applicable.		Not applicable.		
Risk - Timing	Not applicable.		Moderate Decrease		
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.		Moderate Increase		
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.		0.01		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.		No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable		No		
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.		Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Tailwater Recovery 447</b>		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.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Tailwater Recovery 447</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
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 increase 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.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Tailwater Recovery 447</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
<ul style="list-style-type: none"> <li>Excessive Suspended Sediment and Turbidity</li> </ul>		Slight Improvement	Sediment is trapped as water velocity is reduced.		
<ul style="list-style-type: none"> <li>Excessive Salinity</li> </ul>		Slight Improvement	The infiltration that occurs in the tailwater pond will reduce the amount of salt leaving the field.		
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>		Moderate to Substantial Improvement	The action captures irrigation runoff and associated metal-laden sediment.		
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>		Neutral	Warm surface irrigation water is re-used rather than discharged to streams or other water bodies.		
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>		Slight Improvement	Because of reduced sediment yields and runoff		
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>		Slight to Moderate Improvement	Because of reduced sediment yields and runoff		
<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		Not Applicable	Not applicable.		
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement	Increased water availability and managed application enhances plant growth, health and vigor.		
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		Not Applicable	Not applicable.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Tailwater Recovery 447</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		Not applicable.	Not applicable.		
Land – Land in Production		Not applicable.	Moderate to substantial increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		Substantial.	Slight to moderate.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Negligible to slight.		
Labor - Labor		0	Slight to moderate increase.		
Labor – Change in Management Level		0	Not applicable.		
Risk - Yield		Not applicable.	Not applicable.		
Risk - Flexibility		Not applicable.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Decrease		
Risk – Cash Flow		Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Irrigation System, Tailwater Recovery 447		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Profitability – Change in Profitability		Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Not applicable.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Not Applicable	No		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Irrigation System, Surface & Subsurface 443		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
<b>SOIL - EROSION</b>					
Sheet and Rill		Not Applicable		Not applicable.	
Wind		Slight Improvement		Wetting the surface reduces soil detachment by wind.	
Ephemeral Gully		Not Applicable		Not applicable.	
Classic Gully		Slight Worsening		Tailwater runoff may cause gully erosion.	
Streambank		Slight Worsening		Over land return flows cause erosion on streambanks.	
Shoreline		Slight Worsening		Over land return flows cause erosion on streambanks.	
Irrigation Induced		Slight Worsening		Corrugates and Furrow irrigation may cause erosion.	
Mass Movement		Not Applicable		Not applicable.	
Road, Roadsides, and Construction Sites		Not Applicable		Not applicable.	
<b>SOIL – CONDITION</b>					
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		Neutral		The action should allow better management of salts, but the degree of impact depends on water management.	
• 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 to Moderate Improvement		System permits better management of pesticides in the root zone.	
Damage from Sediment Deposition		Slight Worsening		Surface applied irrigation water may contain sediments.	
<b>WATER – QUANTITY</b>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Surface &amp; Subsurface 443</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
Rangeland Hydrologic Cycle		Not Applicable	Not applicable.		
Excessive Seepage		Slight Improvement	Because of more uniform infiltration.		
Excessive Runoff, Flooding, or Ponding		Slight Improvement	More uniform applications reduces ponding and excessive tailwater runoff.		
Excessive Subsurface Water		Slight Improvement	A more uniform and efficient irrigation prevents losses to deep percolation.		
Drifted Snow		Not Applicable	Not applicable.		
Inadequate Outlets		Slight Worsening	Tailwater runoff may adversely impact outlets.		
Inefficient Water use on Irrigated Land		Slight to Substantial Improvement	Water is applied more efficiently and uniformly.		
Inefficient Water use on Non-Irrigated Land		Not Applicable	Not applicable.		
Reduced Capacity of Conveyances by Sediment Deposition		Slight Improvement	Water is applied in such away as to reduce erosion.		
Reduced Storage of Water Bodies by Sediment Accumulation		Slight Improvement	Water is applied in such away as to reduce erosion.		
Aquifer Overdraft		Slight Improvement	More efficient application of irrigation water reduces aquifer withdrawals.		
Insufficient Flows in Water Courses		Slight Improvement	More efficient application of irrigation water requires smaller diversion from streams.		
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides		Slight Improvement	Efficient and uniform irrigation reduces deep percolation.		
• Excessive Nutrients and Organics		Slight Improvement	The action improves water use efficiency resulting in decreased deep percolation.		
• Excessive Salinity		Slight Improvement	Efficient and uniform irrigation reduces transport to ground water.		
• Harmful Levels of Heavy Metals		Slight Improvement	Efficient and uniform irrigation reduces transport to ground water.		
• Harmful Levels of Pathogens		Slight Improvement	Efficient and uniform irrigation reduces transport to ground water.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Surface &amp; Subsurface 443</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>		Slight Improvement	Efficient and uniform irrigation reduces transport to ground water.		
In Surface Water:					
<ul style="list-style-type: none"> <li>Harmful Levels of Pesticides</li> </ul>		Slight Improvement	Efficient and uniform irrigation reduces runoff and erosion.		
<ul style="list-style-type: none"> <li>Excessive Nutrients and Organics</li> </ul>		Slight Improvement	Efficient and uniform irrigation reduces transport of nutrients to surface water.		
<ul style="list-style-type: none"> <li>Excessive Suspended Sediment and Turbidity</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Excessive Salinity</li> </ul>		Slight Improvement	The action allows more efficient application of irrigation water, which reduces the potential for runoff from the field.		
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>		Slight Improvement	Efficient and uniform irrigation reduces transport to surface water.		
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>		Neutral	Conservation irrigation systems minimize affects to surface water quality.		
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>		Slight Improvement	Efficient and uniform irrigation reduces transport to surface water		
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>		Slight Improvement	Efficient and uniform irrigation reduces transport to surface water		
AIR – QUALITY					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)		Slight to Moderate Improvement	An irrigation application moistens the soil surface and reduces the erodibility of the soil. Increased production from irrigation lowers the soil wind erodibility group by one class.		
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)		Slight to Moderate Improvement	An irrigation application moistens the soil surface and reduces the erodibility of the soil. Increased production from irrigation lowers the soil wind erodibility group by one class.		
Excessive Ozone		Not Applicable	Not applicable.		
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>		Not Applicable	Not applicable.		
Ammonia (NH <sub>3</sub> )		Not Applicable	Not applicable.		
Chemical Drift		Not Applicable	Not applicable.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Irrigation System, Surface & Subsurface 443		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
Objectionable Odors		Slight Worsening		Agricultural wastes and byproducts in open systems can increase VOCs and particulates.	
Reduced Visibility		Slight Worsening		fine particulates created	
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 Substantial Improvement		Increased water availability and managed application enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		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		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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral		Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.	
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		Neutral		Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Irrigation System, Surface & Subsurface 443		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<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.	Moderate to substantial increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		Substantial.	Slight to moderate.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Negligible to slight.		
Labor - Labor		0	Slight to moderate increase.		
Labor – Change in Management Level		0	Not applicable.		
Risk - Yield		Not applicable.	Not applicable.		
Risk - Flexibility		Not applicable.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Decrease		
Risk – Cash Flow		Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase		
Profitability – Change in Profitability		Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Not applicable.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Not Applicable	No		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Irrigation System, Sprinkler 442		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
<b>SOIL - EROSION</b>					
Sheet and Rill		Not Applicable		Not applicable.	
Wind		Slight to Substantial Improvement		Wetting the surface 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		Erosion reduced due to proper application of irrigation water.	
Mass Movement		Neutral		Over wetting of soil mass not practicable.	
Road, Roadsides, and Construction Sites		Neutral		Establishment of vegetation after construction may cause slight amount of soil erosion for a short duration.	
<b>SOIL – CONDITION</b>					
Organic Matter Depletion		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Slight Worsening		There will be crusting of soil surface during seed germination and wheel compaction due to movement of the irrigation system.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Slight to Substantial Improvement		Improved irrigation allows the leaching of salt 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		Neutral		Application of sprinkler applied pesticides according to plan should have a neutral effect.	
Damage from Sediment Deposition		Neutral		Properly applied irrigation water will not cause deposition of soil	
<b>WATER – QUANTITY</b>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Sprinkler 442</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
Rangeland Hydrologic Cycle		Not Applicable	Not applicable.		
Excessive Seepage		Neutral	Properly applied sprinkler irrigation will not increase groundwater.		
Excessive Runoff, Flooding, or Ponding		Slight to Moderate Improvement	Conversion from surface to sprinkler will reduce surface runoff.		
Excessive Subsurface Water		Slight Improvement	More uniform applications reduces subsurface flows.		
Drifted Snow		Not Applicable	Not applicable.		
Inadequate Outlets		Slight to Substantial Improvement	Conversion from surface to sprinkler eliminates tailwater runoff.		
Inefficient Water use on Irrigated Land		Substantial Improvement	More uniform application of water.		
Inefficient Water use on Non-Irrigated Land		Not Applicable	Not applicable.		
Reduced Capacity of Conveyances by Sediment Deposition		Slight to Substantial Improvement	Reduction in tailwater runoff.		
Reduced Storage of Water Bodies by Sediment Accumulation		Slight to Substantial Improvement	Reduction in tailwater runoff.		
Aquifer Overdraft		Slight to Substantial Improvement	More efficient application of irrigation water reduces aquifer withdrawals		
Insufficient Flows in Water Courses		Slight Improvement	More efficient application of irrigation water requires smaller diversion from streams		
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides		Slight to Moderate Improvement	Efficient and uniform irrigation reduces deep percolation.		
• Excessive Nutrients and Organics		Slight Improvement	The action improves water use efficiency resulting in decreased deep percolation.		
• Excessive Salinity		Slight to Moderate Improvement	Efficient and uniform irrigation reduces transport to ground water.		
• Harmful Levels of Heavy Metals		Slight Improvement	Uniform water application reduces the potential for deep percolation.		
• Harmful Levels of Pathogens		Slight Improvement	Uniform water application reduces the potential for deep percolation.		
• Harmful Levels of Petroleum		Slight Improvement	More efficient irrigation system reduces leaching.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Sprinkler 442</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
In Surface Water:					
• Harmful Levels of Pesticides		Slight to Moderate Improvement	Efficient and uniform irrigation reduces runoff and erosion.		
• Excessive Nutrients and Organics		Slight to Moderate Improvement	Erosion and runoff are reduced by the efficient application of irrigation water.		
• Excessive Suspended Sediment and Turbidity		Not Applicable	Not applicable.		
• Excessive Salinity		Slight to Moderate Improvement	The action allows more efficient application of irrigation water, which reduces the potential for runoff from the field.		
• Harmful Levels of Heavy Metals		Slight Improvement	More efficient application reduces potential runoff.		
• Harmful Temperatures		Neutral	Reduced runoff of higher temperature water is likely.		
• Harmful Levels of Pathogens		Slight to Moderate Improvement	Reduced runoff because of more efficient application		
• Harmful Levels of Petroleum		Slight to Moderate Improvement	Reduced runoff because of more efficient application		
AIR – QUALITY					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)		Slight to Moderate Improvement	An irrigation application moistens the soil surface and reduces the erodibility of the soil. Increased production from irrigation lowers the soil wind erodibility group by one class.		
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)		Slight to Moderate Improvement	An irrigation application moistens the soil surface and reduces the erodibility of the soil. Increased production from irrigation lowers the soil wind erodibility group by one class.		
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		Neutral	Agricultural wastes and byproducts delivered through sprinklers will increase VOCs and particulates.		
Reduced Visibility		Not Applicable	Not applicable.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Sprinkler 442</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
Undesirable Air Movement		Not Applicable		Not applicable.	
Adverse Air Temperature		Slight to Moderate Improvement		Sprinklers used for crop cooling and frost protection.	
<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		Increased water availability and managed application enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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.	
<b>ANIMALS - FISH AND WILDLIFE</b>					
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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral		Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.	
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		Neutral		Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.	
<b>ANIMALS – DOMESTIC</b>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Sprinkler 442</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Headquarters, Mined, Pasture, Recreation, Urban, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</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.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Microirrigation 441</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	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	Slight to Substantial Improvement	No tailwater runoff.			
Mass Movement	Not Applicable	Not applicable.			
Road, Roadsides, and Construction Sites	Not Applicable	Not applicable.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Neutral	The action limits the wetted area in the soil profile as compared to other irrigation methods. The compaction during field operations should be limited.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight Improvement	Improved irrigation allows the limited leaching of salt 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	Slight to Moderate Improvement	System permits better management of pesticides in the root zone, and area of application is reduced.			
Damage from Sediment Deposition	Neutral	Properly applied irrigation water will not cause deposition of soil			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight to Substantial Improvement	Small irrigation applications and improved uniformity reduces seepage.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Microirrigation 441</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
Excessive Runoff, Flooding, or Ponding		Slight to Substantial Improvement	More uniform applications reduces ponding and excessive tailwater runoff.		
Excessive Subsurface Water		Slight to Substantial Improvement	A more uniform and efficient irrigation prevents losses to deep percolation.		
Drifted Snow		Not Applicable	Not applicable.		
Inadequate Outlets		Substantial Improvement	No tailwater runoff impacting outlets.		
Inefficient Water use on Irrigated Land		Slight to Substantial Improvement	Water is applied more efficiently and uniformly.		
Inefficient Water use on Non-Irrigated Land		Not Applicable	Not applicable.		
Reduced Capacity of Conveyances by Sediment Deposition		Slight to Substantial Improvement	Water is applied in such away as to eliminate erosion.		
Reduced Storage of Water Bodies by Sediment Accumulation		Slight to Substantial Improvement	Water is applied in such away as to eliminate erosion.		
Aquifer Overdraft		Slight to Substantial Improvement	More efficient application of irrigation water reduces aquifer withdrawals.		
Insufficient Flows in Water Courses		Slight to Substantial Improvement	More efficient application of irrigation water requires smaller diversion from streams.		
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides		Slight to Substantial Improvement	Efficient and uniform irrigation reduces deep percolation.		
• Excessive Nutrients and Organics		Slight to Substantial Improvement	The action improves water use efficiency resulting in decreased deep percolation.		
• Excessive Salinity		Slight to Substantial Improvement	Efficient and uniform irrigation reduces soluble contaminant transport to ground water. Magnitude of effect depends on previous irrigation method.		
• Harmful Levels of Heavy Metals		Slight Improvement	Uniform water application reduces the potential for deep percolation.		
• Harmful Levels of Pathogens		Slight Improvement	Uniform water application reduces the potential for deep percolation.		
• Harmful Levels of Petroleum		Slight Improvement	Efficient and uniform irrigation reduces transport to ground water.		
In Surface Water:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Microirrigation 441</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
• Harmful Levels of Pesticides	Slight to Substantial Improvement	Efficient and uniform irrigation reduces runoff and erosion.			
• Excessive Nutrients and Organics	Slight to Substantial Improvement	Efficient and uniform irrigation reduces the potential for transport of dissolved nutrient to surface water.			
• Excessive Suspended Sediment and Turbidity	Not Applicable	Not applicable.			
• Excessive Salinity	Neutral	The action reduces the potential for runoff from the field but concentrates salts around the wetted perimeter.			
• Harmful Levels of Heavy Metals	Slight Improvement	Efficient and uniform irrigation reduces transport to surface water.			
• Harmful Temperatures	Neutral	Conservation irrigation systems minimize affects to surface water quality.			
• Harmful Levels of Pathogens	Slight to Substantial Improvement	Efficient and uniform irrigation reduces transport to surface water			
• Harmful Levels of Petroleum	Slight to Substantial Improvement	Efficient and uniform irrigation reduces transport to surface water			
<b>AIR – QUALITY</b>					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	Increased production from irrigation lowers the soil wind erodibility group by one class.			
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Increased production from irrigation lowers the soil wind erodibility group by one class.			
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	Not Applicable	Not applicable.			
<b>PLANTS – SUITABILITY</b>					
Plants not Adapted or Suited	Not Applicable	Not applicable.			
<b>PLANTS - CONDITION</b>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Microirrigation 441</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
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:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		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		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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral		Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.	
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		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.		Moderate to substantial increase.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation System, Microirrigation 441</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		Substantial.	Slight to moderate.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Negligible to slight.		
Labor - Labor		0	Slight to moderate increase.		
Labor – Change in Management Level		0	Not applicable.		
Risk - Yield		Not applicable.	Not applicable.		
Risk - Flexibility		Not applicable.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Decrease		
Risk – Cash Flow		Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase		
Profitability – Change in Profitability		Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Not applicable.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Not Applicable	No		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Storage Reservoir 436</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
SOIL - EROSION					
Sheet and Rill		Not Applicable	Not applicable.		
Wind		Not Applicable	Not applicable.		
Ephemeral Gully		Not Applicable	Not applicable.		
Classic Gully		Slight to Substantial Improvement	Due to stabilization gully from embankment construction.		
Streambank		Slight Improvement	Reduced peak flows downstream from reservoir.		
Shoreline		Slight to Moderate Worsening	Increase in shoreline.		
Irrigation Induced		Not Applicable	Not applicable.		
Mass Movement		Not Applicable	Not applicable.		
Road, Roadsides, and Construction Sites		Not Applicable	Not applicable.		
SOIL – CONDITION					
Organic Matter Depletion		Not Applicable	Not applicable.		
Rangeland Site Stability		Not Applicable	Not applicable.		
Compaction		Not Applicable	Not applicable.		
Subsidence		Not Applicable	Not applicable.		
Contaminants:					
• Salts and other Chemicals		Not Applicable	Not applicable.		
• 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.		
WATER – QUANTITY					
Rangeland Hydrologic Cycle		Not Applicable	Not applicable.		
Excessive Seepage		Slight Worsening	Possible seepage from Reservoir.		
Excessive Runoff, Flooding, or Ponding		Slight to Moderate Improvement	Peak flows are reduced.		
Excessive Subsurface Water		Slight Worsening	Seepage from reservoir.		
Drifted Snow		Not Applicable	Not applicable.		
Inadequate Outlets		Slight Improvement	Regulated downstream flows.		
Inefficient Water use on Irrigated Land		Slight to Substantial Improvement	Storage water for irrigation can be used in amore timely fashion increasing efficiency.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Storage Reservoir 436</b>		Baseline Setting: Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
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 reservoir.			
Reduced Storage of Water Bodies by Sediment Accumulation	Neutral	Limited sediment deposited in reservoir.			
Aquifer Overdraft	Slight Improvement	Seepage from the reservoir impacts recharge.			
Insufficient Flows in Water Courses	Slight Worsening	Water is used for irrigation reduces flows in water courses.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Worsening	Nutrients impounded could contaminate groundwater.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Sediment is trapped as water velocity is reduced.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Temperatures	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Neutral	May increase because of aquatic animal feed or decaying vegetation.			
• 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 <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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Storage Reservoir 436</b>		Baseline Setting: Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
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 Substantial Improvement	Increased water availability and access enhances plant growth, health and vigor.		
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		Slight to Moderate Improvement	Reservoirs provide food for some fish and wildlife.		
Inadequate Cover/Shelter		Slight Worsening	Any cover is eliminated in the area used for the reservoir.		
Inadequate Water		Slight to Moderate Improvement	Reservoirs provide water for wildlife; however entrapment, especially of fish and salamanders, as waters recede or are withdrawn.		
Inadequate Space		Slight Worsening	Reservoirs reduce existing space used by wildlife.		
Habitat Fragmentation		Neutral	Reservoirs are typically limited in extent.		
Imbalance Among and Within Populations		Slight Improvement	Reservoirs and adjacent areas provide variety and diversity for wildlife communities.		
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Storage Reservoir 436</b>		Baseline Setting: Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		Moderate to Substantial Improvement	Reservoirs can also provide stock water.		
Stress and Mortality		Moderate to Substantial Improvement	Available water reduces stress and mortality.		
HUMAN – ECONOMICS					
Land - Change in Land Use		Not applicable.	Not applicable.		
Land – Land in Production		Not applicable.	Moderate to substantial increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		Substantial.	Slight to moderate.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Negligible to slight.		
Labor - Labor		0	Slight to moderate increase.		
Labor – Change in Management Level		0	Not applicable.		
Risk - Yield		Not applicable.	Not applicable.		
Risk - Flexibility		Not applicable.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Decrease		
Risk – Cash Flow		Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase		
Profitability – Change in Profitability		Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01		
HUMAN - CULTURAL					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Not applicable.	No		
HUMAN – ENERGY					
Depletion of Fossil Fuel Resources		Not Applicable	No		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Dry Hydrant 432</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	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	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Neutral	Accessing the dry hydrant may result in limited compaction in the area of the water source.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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	Not Applicable	Not applicable.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Not Applicable	Not applicable.			
Inefficient Water use on Irrigated Land	Slight Worsening	Water used from storage for fire suppression will not be available for other uses.			
Inefficient Water use on Non-Irrigated Land	Slight Worsening	Water used from storage for fire suppression will not be available for other uses.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Dry Hydrant 432</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Not Applicable	Not applicable.			
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Suspended Sediment and Turbidity	Not Applicable	Not applicable.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Temperatures	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• 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	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	Slight Improvement	Reduces fire duration through fire suppression			
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>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Dry Hydrant 432</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Productivity, Health, and Vigor	Not Applicable	Not applicable.			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Not Applicable	Not applicable.			
<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	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Dry Hydrant 432</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Above-Ground, Multi-Outlet Pipeline 431</b>	Baseline Setting:				
	Appropriate Land Use(s): Crop, Hay, Pasture				
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<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	Slight to Substantial Improvement	Pipe will convey water to reduce erosion at the delivery point and on the field.			
Mass Movement	Not Applicable	Not applicable.			
Road, Roadsides, and Construction Sites	Not Applicable	Not applicable.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight to Significant Improvement	More efficient and uniform irrigation reduces salt accumulation.			
• Animal Waste and other Organics - N	Slight to Moderate Improvement	More efficient and uniform irrigation reduces nutrient leaching to ground water.			
• Animal Waste and other Organics - P	Not Applicable	Not applicable.			
• Animal Waste and other Organics - K	Not Applicable	Not applicable.			
• Commercial Fertilizer - N	Slight to Moderate Improvement	More efficient and uniform irrigation reduces nutrient leaching to ground water.			
• 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 Improvement	Reduced erosion leads to less sediment deposition.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Not applicable.	Not applicable.			
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	Pipe will convey water and improve the distribution and uniformity of water application thereby reducing runoff and ponding.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Above-Ground, Multi-Outlet Pipeline 431</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
Excessive Subsurface Water		Not Applicable		Not applicable.	
Drifted Snow		Not Applicable		Not applicable.	
Inadequate Outlets		Not Applicable		Not applicable.	
Inefficient Water use on Irrigated Land		Slight to Substantial Improvement		Pipe will convey water and make it possible to use more efficiently.	
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		Slight to Moderate Improvement		Pipe will convey water and improve the distribution and uniformity of water application thereby reducing aquifer withdrawals.	
Insufficient Flows in Water Courses		Slight Improvement		Less water is diverted because conveyance losses are reduced, and water is more uniformly and efficiently applied.	
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides		Not Applicable		Not applicable.	
• Excessive Nutrients and Organics		Slight to Moderate Improvement		More efficient and uniform irrigation reduces nutrient leaching to ground water.	
• Excessive Salinity		Slight to Significant Improvement		More efficient and uniform irrigation reduces salt concentration.	
• Harmful Levels of Heavy Metals		Not Applicable		Not applicable.	
• Harmful Levels of Pathogens		Not Applicable		Not applicable.	
• Harmful Levels of Petroleum		Not Applicable		Not applicable.	
In Surface Water:					
• Harmful Levels of Pesticides		Not Applicable		Not applicable.	
• Excessive Nutrients and Organics		Slight Improvement		Improved distribution leads to less runoff and less nutrients returned to surface waters.	
• Excessive Suspended Sediment and Turbidity		Slight Improvement		Improved distribution leads to less runoff and less sediment returned to surface waters.	
• Excessive Salinity		Slight Improvement		Improved distribution leads to less runoff and less salts returned to surface waters.	
• Harmful Levels of Heavy Metals		Not Applicable		Not applicable.	
• Harmful Temperatures		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Above-Ground, Multi-Outlet Pipeline 431</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop, Hay, Pasture			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
• Harmful Levels of Pathogens		Not Applicable		Not applicable.	
• 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		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		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 Substantial Improvement		Increased water availability and access 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		Slight to Substantial Improvement		Increased water availability and access enhances plant growth, health and vigor.	
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.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Above-Ground, Multi-Outlet Pipeline 431</b>	Baseline Setting:				
	Appropriate Land Use(s): Crop, Hay, Pasture				
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>• Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>• Declining Species, Species of Concern</li> </ul>	Not Applicable	Not applicable.			
<b>ANIMALS – DOMESTIC</b>					
Inadequate Quantities and Quality of Feed and Forage	Slight to Substantial Improvement	Increased water availability and access enhances plant growth, health and vigor.			
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.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Reinforced Plastic Mortar 430GG</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
SOIL - EROSION					
Sheet and Rill		Not Applicable		Not applicable.	
Wind		Not Applicable		Not applicable.	
Ephemeral Gully		Not Applicable		Not applicable.	
Classic Gully		Slight to Moderate Improvement		Pipe can act as a collection and transport for water to prevent erosion.	
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.	
SOIL – CONDITION					
Organic Matter Depletion		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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.	
WATER – QUANTITY					
Rangeland Hydrologic Cycle		Not Applicable		Not applicable.	
Excessive Seepage		Slight Improvement		Pipeline can collect and convey excessive seepage to suitable outlet.	
Excessive Runoff, Flooding, or Ponding		Neutral		Pipeline will be used in conjunction with other practice to address resource concern.	
Excessive Subsurface Water		Slight Improvement		Pipeline can collect and convey excessive subsurface water to suitable outlet.	
Drifted Snow		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Reinforced Plastic Mortar 430GG</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Inadequate Outlets	Slight to Moderate Improvement	Pipeline can collect and convey excessive water to suitable outlet.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Pipe will convey water and make it possible to use more efficiently.			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Less water is diverted because conveyance losses are eliminated.			
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.			
• Harmful Levels of Heavy Metals	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.			
• Harmful Levels of Pathogens	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Improvement	Utilizing pipelines for water delivery reduces the delivery of sediment-attached nutrients to surface water.			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Impervious materials prevents erosion.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Reinforced Plastic Mortar 430GG</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<ul style="list-style-type: none"> <li>• Excessive Salinity</li> </ul>		Slight Improvement		The action eliminates the potential for irrigation water to pick up salts from an unlined ditch. The pipeline also eliminates evaporation, which can concentrate salts in irrigation water.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening		The action may transport water from heavy metal source enabling return flows to possibly deliver contaminates to surface water.	
<ul style="list-style-type: none"> <li>• Harmful Temperatures</li> </ul>		Neutral		Conservation irrigation systems minimize affects to surface water quality.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Pathogens</li> </ul>		Slight Worsening		May collect runoff and return flows may deliver possible contaminates to surface water	
<ul style="list-style-type: none"> <li>• Harmful Levels of Petroleum</li> </ul>		Neutral		May collect runoff and return flows may deliver possible contaminates to surface water	
<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		Not Applicable		Not applicable.	
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>• CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement		Increased water availability and access enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Reinforced Plastic Mortar 430GG</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight short-term decrease in cropland as pipeline is installed	Slight Increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Reinforced Plastic Mortar 430GG</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Labor – Change in Management Level		0	Slight to Moderate Decrease		
Risk - Yield		Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease		
Risk - Flexibility		Slight decrease due to more efficient distribution of water.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Increase		
Risk – Cash Flow		Moderate increase due to construction cost.	Situational		
Profitability – Change in Profitability		Slight to moderate decrease or increase.	0		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Construction impacts (mechanical).	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Pipeline conveyance often requires pumping pressure; however, water losses and energy for maintenance are lower than for surface conveyance systems.	No		
Underutilization of Non-Fossil Energy Resources		Not applicable.	No		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Steel 430FF</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Not Applicable	Not applicable.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Not Applicable	Not applicable.			
Classic Gully	Slight to Moderate Improvement	Pipe can act as a collection and transport for water to prevent erosion.			
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.			
SOIL – CONDITION					
Organic Matter Depletion	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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.			
WATER – QUANTITY					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight Improvement	Pipeline can collect and convey excessive seepage to suitable outlet.			
Excessive Runoff, Flooding, or Ponding	Neutral	Pipeline will be used in conjunction with other practice to address resource concern.			
Excessive Subsurface Water	Slight Improvement	Pipeline can collect and convey excessive subsurface water to suitable outlet.			
Drifted Snow	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Steel 430FF</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Inadequate Outlets	Slight to Moderate Improvement	Pipeline can collect and convey excessive water to suitable outlet.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Pipe will convey water and make it possible to use more efficiently.			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Less water is diverted because conveyance losses are eliminated.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.			
• Harmful Levels of Heavy Metals	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.			
• Harmful Levels of Pathogens	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Improvement	Utilizing pipelines for water delivery reduces the delivery of sediment-attached nutrients to surface water.			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Impervious materials prevents erosion.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Steel 430FF</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<ul style="list-style-type: none"> <li>Excessive Salinity</li> </ul>	Slight Improvement	The action eliminates the potential for irrigation water to pick up salts from an unlined ditch. The pipeline also eliminates evaporation, which can concentrate salts in irrigation water.			
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>	Slight Worsening	The action may transport water from heavy metal source enabling return flows to possibly deliver contaminants to surface water.			
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>	Neutral	Conservation irrigation systems minimize affects to surface water quality.			
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>	Slight Worsening	May collect runoff and return flows may deliver possible contaminants to surface water			
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>	Neutral	May collect runoff and return flows may deliver possible contaminants 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:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>		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		Not Applicable		Not applicable.	
PLANTS – SUITABILITY					
Plants not Adapted or Suited		Not Applicable		Not applicable.	
PLANTS - CONDITION					
Productivity, Health, and Vigor		Slight to Substantial Improvement		Increased water availability and access enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Steel 430FF</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
• 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	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.			
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	N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease			
Land – Land in Production	Slight short-term decrease in cropland as pipeline is installed	Slight Increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	0	Slight increase.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Moderate increase			
Labor - Labor	Moderate increase to maintain channels and monitor water flow.	Negligible			
Labor – Change in Management Level	0	Slight to Moderate Decrease			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Steel 430FF</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Risk - Yield	Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease			
Risk - Flexibility	Slight decrease due to more efficient distribution of water.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Increase			
Risk – Cash Flow	Moderate increase due to construction cost.	Situational			
Profitability – Change in Profitability	Slight to moderate decrease or increase.	0			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Construction impacts (mechanical).	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Pipeline conveyance often requires pumping pressure; however, water losses and energy for maintenance are lower than for surface conveyance systems.	No			
Underutilization of Non-Fossil Energy Resources	Not applicable.	No			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Low-pressure, Underground, Plastic 430EE</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
SOIL - EROSION					
Sheet and Rill		Not Applicable		Not applicable.	
Wind		Not Applicable		Not applicable.	
Ephemeral Gully		Not Applicable		Not applicable.	
Classic Gully		Slight to Moderate Improvement		Pipe can act as a collection and transport for water to prevent erosion.	
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.	
SOIL – CONDITION					
Organic Matter Depletion		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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.	
WATER – QUANTITY					
Rangeland Hydrologic Cycle		Not Applicable		Not applicable.	
Excessive Seepage		Slight Improvement		Pipeline can collect and convey excessive seepage to suitable outlet.	
Excessive Runoff, Flooding, or Ponding		Neutral		Pipeline will be used in conjunction with other practice to address resource concern.	
Excessive Subsurface Water		Slight Improvement		Pipeline can collect and convey excessive subsurface water to suitable outlet.	
Drifted Snow		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Low-pressure, Underground, Plastic 430EE</b>		Baseline Setting: Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Inadequate Outlets	Slight to Moderate Improvement	Pipeline can collect and convey excessive water to suitable outlet.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Pipe will convey water and make it possible to use more efficiently.			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Less water is diverted because conveyance losses are eliminated.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.			
• Harmful Levels of Heavy Metals	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.			
• Harmful Levels of Pathogens	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Improvement	Utilizing pipelines for water delivery reduces the delivery of sediment-attached nutrients to surface water.			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Impervious materials prevents erosion.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Low-pressure, Underground, Plastic 430EE</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<ul style="list-style-type: none"> <li>• Excessive Salinity</li> </ul>		Slight Improvement		The action eliminates the potential for irrigation water to pick up salts from an unlined ditch. The pipeline also eliminates evaporation, which can concentrate salts in irrigation water.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening		The action may transport water from heavy metal source enabling return flows to possibly deliver contaminates to surface water.	
<ul style="list-style-type: none"> <li>• Harmful Temperatures</li> </ul>		Neutral		Conservation irrigation systems minimize affects to surface water quality.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Pathogens</li> </ul>		Slight Worsening		May collect runoff and return flows may deliver possible contaminates to surface water	
<ul style="list-style-type: none"> <li>• Harmful Levels of Petroleum</li> </ul>		Neutral		May collect runoff and return flows may deliver possible contaminates to surface water	
<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		Not Applicable		Not applicable.	
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>• CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement		Increased water availability and access enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Low-pressure, Underground, Plastic 430EE</b>		Baseline Setting: Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight short-term decrease in cropland as pipeline is installed	Slight Increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Low-pressure, Underground, Plastic 430EE</b>		Baseline Setting: Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Labor – Change in Management Level	0	Slight to Moderate Decrease			
Risk - Yield	Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease			
Risk - Flexibility	Slight decrease due to more efficient distribution of water.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Increase			
Risk – Cash Flow	Moderate increase due to construction cost.	Situational			
Profitability – Change in Profitability	Slight to moderate decrease or increase.	0			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Construction impacts (mechanical).	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Pipeline conveyance often requires pumping pressure; however, water losses and energy for maintenance are lower than for surface conveyance systems.	No			
Underutilization of Non-Fossil Energy Resources	Not applicable.	No			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, High-pressure, Underground, Plastic 430DD</b>		Baseline Setting: Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Not Applicable	Not applicable.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Not Applicable	Not applicable.			
Classic Gully	Slight to Moderate Improvement	Pipe can act as a collection and transport for water to prevent erosion.			
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.			
SOIL – CONDITION					
Organic Matter Depletion	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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.			
WATER – QUANTITY					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight Improvement	Pipeline can collect and convey excessive seepage to suitable outlet.			
Excessive Runoff, Flooding, or Ponding	Neutral	Pipeline will be used in conjunction with other practice to address resource concern.			
Excessive Subsurface Water	Slight Improvement	Pipeline can collect and convey excessive subsurface water to suitable outlet.			
Drifted Snow	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, High-pressure, Underground, Plastic 430DD</b>		Baseline Setting: Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Inadequate Outlets	Slight to Moderate Improvement	Pipeline can collect and convey excessive water to suitable outlet.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Pipe will convey water and make it possible to use more efficiently.			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Less water is diverted because conveyance losses are eliminated.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.			
• Harmful Levels of Heavy Metals	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.			
• Harmful Levels of Pathogens	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Improvement	Utilizing pipelines for water delivery reduces the delivery of sediment-attached nutrients to surface water.			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Impervious materials prevents erosion.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, High-pressure, Underground, Plastic 430DD</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<ul style="list-style-type: none"> <li>• Excessive Salinity</li> </ul>		Slight Improvement		The action eliminates the potential for irrigation water to pick up salts from an unlined ditch. The pipeline also eliminates evaporation, which can concentrate salts in irrigation water.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening		The action may transport water from heavy metal source enabling return flows to possibly deliver contaminants to surface water.	
<ul style="list-style-type: none"> <li>• Harmful Temperatures</li> </ul>		Neutral		Conservation irrigation systems minimize affects to surface water quality.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Pathogens</li> </ul>		Slight Worsening		May collect runoff and return flows may deliver possible contaminants to surface water	
<ul style="list-style-type: none"> <li>• Harmful Levels of Petroleum</li> </ul>		Neutral		May collect runoff and return flows may deliver possible contaminants to surface water	
<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		Not Applicable		Not applicable.	
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>• CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement		Increased water availability and access enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, High-pressure, Underground, Plastic 430DD</b>		Baseline Setting: Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight short-term decrease in cropland as pipeline is installed	Slight Increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, High-pressure, Underground, Plastic 430DD</b>		Baseline Setting: Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Labor – Change in Management Level	0	Slight to Moderate Decrease			
Risk - Yield	Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease			
Risk - Flexibility	Slight decrease due to more efficient distribution of water.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Increase			
Risk – Cash Flow	Moderate increase due to construction cost.	Situational			
Profitability – Change in Profitability	Slight to moderate decrease or increase.	0			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Construction impacts (mechanical).	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Pipeline conveyance often requires pumping pressure; however, water losses and energy for maintenance are lower than for surface conveyance systems.	No			
Underutilization of Non-Fossil Energy Resources	Not applicable.	No			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Nonreinforced Concrete 430CC</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		Not Applicable		Not applicable.	
Ephemeral Gully		Not Applicable		Not applicable.	
Classic Gully		Slight to Moderate Improvement		Pipe can act as a collection and transport for water to prevent erosion.	
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		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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		Slight Improvement		Pipeline can collect and convey excessive seepage to suitable outlet.	
Excessive Runoff, Flooding, or Ponding		Neutral		Pipeline will be used in conjunction with other practice to address resource concern.	
Excessive Subsurface Water		Slight Improvement		Pipeline can collect and convey excessive subsurface water to suitable outlet.	
Drifted Snow		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Nonreinforced Concrete 430CC</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Inadequate Outlets	Slight to Moderate Improvement	Pipeline can collect and convey excessive water to suitable outlet.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Pipe will convey water and make it possible to use more efficiently.			
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	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Less water is diverted because conveyance losses are eliminated.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.			
• Harmful Levels of Heavy Metals	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.			
• Harmful Levels of Pathogens	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Improvement	Utilizing pipelines for water delivery reduces the delivery of sediment-attached nutrients to surface water.			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Impervious materials prevents erosion.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Nonreinforced Concrete 430CC</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<ul style="list-style-type: none"> <li>• Excessive Salinity</li> </ul>		Slight Improvement		The action eliminates the potential for irrigation water to pick up salts from an unlined ditch. The pipeline also eliminates evaporation, which can concentrate salts in irrigation water.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening		The action may transport water from heavy metal source enabling return flows to possibly deliver contaminates to surface water.	
<ul style="list-style-type: none"> <li>• Harmful Temperatures</li> </ul>		Neutral		Conservation irrigation systems minimize affects to surface water quality.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Pathogens</li> </ul>		Slight Worsening		May collect runoff and return flows may deliver possible contaminates to surface water	
<ul style="list-style-type: none"> <li>• Harmful Levels of Petroleum</li> </ul>		Neutral		May collect runoff and return flows may deliver possible contaminates to surface water	
<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		Not Applicable		Not applicable.	
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>• CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement		Increased water availability and access enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Nonreinforced Concrete 430CC</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight short-term decrease in cropland as pipeline is installed	Slight Increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Nonreinforced Concrete 430CC</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Labor – Change in Management Level		0	Slight to Moderate Decrease		
Risk - Yield		Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease		
Risk - Flexibility		Slight decrease due to more efficient distribution of water.	Not applicable.		
Risk - Timing		Not applicable.	Moderate Increase		
Risk – Cash Flow		Moderate increase due to construction cost.	Situational		
Profitability – Change in Profitability		Slight to moderate decrease or increase.	0		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Construction impacts (mechanical).	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Pipeline conveyance often requires pumping pressure; however, water losses and energy for maintenance are lower than for surface conveyance systems.	No		
Underutilization of Non-Fossil Energy Resources		Not applicable.	No		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Irrigation Water Conveyance, Pipeline, Aluminum Tubing 430AA		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
<b>SOIL - EROSION</b>					
Sheet and Rill		Not Applicable		Not applicable.	
Wind		Not Applicable		Not applicable.	
Ephemeral Gully		Not Applicable		Not applicable.	
Classic Gully		Slight to Moderate Improvement		Pipe can act as a collection and transport for water to prevent erosion.	
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		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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		Slight Improvement		Pipeline can collect and convey excessive seepage to suitable outlet.	
Excessive Runoff, Flooding, or Ponding		Neutral		Pipeline will be used in conjunction with other practice to address resource concern.	
Excessive Subsurface Water		Slight Improvement		Pipeline can collect and convey excessive subsurface water to suitable outlet.	
Drifted Snow		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Aluminum Tubing 430AA</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
Inadequate Outlets		Slight to Moderate Improvement	Pipeline can collect and convey excessive water to suitable outlet.		
Inefficient Water use on Irrigated Land		Slight to Substantial Improvement	Pipe will convey water and make it possible to use more efficiently.		
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		Not Applicable	Not applicable.		
Insufficient Flows in Water Courses		Slight Improvement	Less water is diverted because conveyance losses are eliminated.		
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides		Not Applicable	Not applicable.		
• Excessive Nutrients and Organics		Not Applicable	Not applicable.		
• Excessive Salinity		Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.		
• Harmful Levels of Heavy Metals		Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.		
• Harmful Levels of Pathogens		Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.		
• Harmful Levels of Petroleum		Not Applicable	Not applicable.		
In Surface Water:					
• Harmful Levels of Pesticides		Not Applicable	Not applicable.		
• Excessive Nutrients and Organics		Slight Improvement	Utilizing pipelines for water delivery reduces the delivery of sediment-attached nutrients to surface water.		
• Excessive Suspended Sediment and Turbidity		Slight Improvement	Impervious materials prevents erosion.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Aluminum Tubing 430AA</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<ul style="list-style-type: none"> <li>• Excessive Salinity</li> </ul>		Slight Improvement		The action eliminates the potential for irrigation water to pick up salts from an unlined ditch. The pipeline also eliminates evaporation, which can concentrate salts in irrigation water.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening		The action may transport water from heavy metal source enabling return flows to possibly deliver contaminants to surface water.	
<ul style="list-style-type: none"> <li>• Harmful Temperatures</li> </ul>		Neutral		Conservation irrigation systems minimize affects to surface water quality.	
<ul style="list-style-type: none"> <li>• Harmful Levels of Pathogens</li> </ul>		Slight Worsening		May collect runoff and return flows may deliver possible contaminants to surface water	
<ul style="list-style-type: none"> <li>• Harmful Levels of Petroleum</li> </ul>		Neutral		May collect runoff and return flows may deliver possible contaminants to surface water	
<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		Not Applicable		Not applicable.	
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>• CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable		Not applicable.	
<ul style="list-style-type: none"> <li>• CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement		Increased water availability and access enhances plant growth, health and vigor.	
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Aluminum Tubing 430AA</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		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:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight decrease, lose cropland as ditch is installed.	Moderate increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Pipeline, Aluminum Tubing 430AA</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Labor – Change in Management Level		0	Slight to Moderate Decrease		
Risk - Yield		Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease		
Risk - Flexibility		Slight decrease due to more efficient distribution of water.	Not applicable.		
Risk - Timing		Not applicable.	Substantial Increase		
Risk – Cash Flow		Substantial increase due to construction cost.	Situational		
Profitability – Change in Profitability		Moderate decrease or increase.	0.03		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Consider if ditch is historic structure.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Gravity fed irrigation is energy efficient but water inefficient. Lining reduces water losses and associated pumping requirements.	No		
Underutilization of Non-Fossil Energy Resources		Not applicable.	No		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Galvanized Steel 428C</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
<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		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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 Improvement		Ditch may intercept runoff that might otherwise cause deposition.	
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle		Not Applicable		Not applicable.	
Excessive Seepage		Slight Improvement		Seepage from ditch or canal will be eliminated.	
Excessive Runoff, Flooding, or Ponding		Not Applicable		Not applicable.	
Excessive Subsurface Water		Slight Worsening		Seepage from ditch or canal will be eliminated.	
Drifted Snow		Not Applicable		Not applicable.	
Inadequate Outlets		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Galvanized Steel 428C</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
Inefficient Water use on Irrigated Land		Substantial Improvement	Lining eliminates water losses providing more water for irrigation.		
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		Slight Worsening	Seepage is eliminated that may provide water for recharge.		
Insufficient Flows in Water Courses		Slight to Moderate Improvement	Less water is diverted because of seepage losses in canal are eliminated.		
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides		Not Applicable	Not applicable.		
• Excessive Nutrients and Organics		Not Applicable	Not applicable.		
• Excessive Salinity		Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.		
• Harmful Levels of Heavy Metals		Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.		
• Harmful Levels of Pathogens		Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.		
• Harmful Levels of Petroleum		Not Applicable	Not applicable.		
In Surface Water:					
• Harmful Levels of Pesticides		Not Applicable	Not applicable.		
• Excessive Nutrients and Organics		Slight Improvement	Lined ditches reduce the delivery of sediment-attached nutrients to surface water.		
• Excessive Suspended Sediment and Turbidity		Slight Improvement	Impervious materials prevents erosion.		
• Excessive Salinity		Slight Improvement	The action eliminates the potential for irrigation water to pick up salts from the ditch.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Galvanized Steel 428C</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening	The action may collect runoff and return flows may deliver possible contaminants to surface water.		
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>		Neutral	Conservation irrigation systems minimize affects to surface water quality.		
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>		Slight Worsening	May collect runoff and return flows may deliver possible contaminants to surface water		
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>		Neutral	May collect runoff and return flows may deliver possible contaminants to surface water		
<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		Not Applicable	Not applicable.		
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement	Increased water availability and access enhances plant growth, health and vigor.		
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		Not Applicable	Not applicable.		
Noxious and Invasive Plants		Not Applicable	Not applicable.		
Forage Quality and Palatability		Not Applicable	Not applicable.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Galvanized Steel 428C</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
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 when operating.		
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"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight decrease, lose cropland as ditch is installed.	Moderate increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		
Labor – Change in Management Level		0	Slight to Moderate Decrease		
Risk - Yield		Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease		
Risk - Flexibility		Slight decrease due to more efficient distribution of water.	Not applicable.		
Risk - Timing		Not applicable.	Substantial Increase		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Galvanized Steel 428C</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Risk – Cash Flow		Substantial increase due to construction cost.	Situational		
Profitability – Change in Profitability		Moderate decrease or increase.	0.03		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Consider if ditch is historic structure.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Gravity fed irrigation is energy efficient but water inefficient. Lining reduces water losses and associated pumping requirements.	No		
Underutilization of Non-Fossil Energy Resources		Not applicable.	No		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Flexible Membrane 428B</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
<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		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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 Improvement		Ditch may intercept runoff that might otherwise cause deposition.	
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle		Not Applicable		Not applicable.	
Excessive Seepage		Slight Improvement		Seepage from ditch or canal will be eliminated.	
Excessive Runoff, Flooding, or Ponding		Not Applicable		Not applicable.	
Excessive Subsurface Water		Slight Worsening		Seepage from ditch or canal will be eliminated.	
Drifted Snow		Not Applicable		Not applicable.	
Inadequate Outlets		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Flexible Membrane 428B</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
Inefficient Water use on Irrigated Land		Substantial Improvement	Lining eliminates water losses providing more water for irrigation.		
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		Slight Worsening	Seepage is eliminated that may provide water for recharge.		
Insufficient Flows in Water Courses		Slight to Moderate Improvement	Less water is diverted because of seepage losses in canal are eliminated.		
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides		Not Applicable	Not applicable.		
• Excessive Nutrients and Organics		Not Applicable	Not applicable.		
• Excessive Salinity		Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.		
• Harmful Levels of Heavy Metals		Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.		
• Harmful Levels of Pathogens		Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.		
• Harmful Levels of Petroleum		Not Applicable	Not applicable.		
In Surface Water:					
• Harmful Levels of Pesticides		Not Applicable	Not applicable.		
• Excessive Nutrients and Organics		Slight Improvement	Lined ditches reduce the delivery of sediment-attached nutrients to surface water.		
• Excessive Suspended Sediment and Turbidity		Slight Improvement	Impervious materials prevents erosion.		
• Excessive Salinity		Slight Improvement	The action eliminates the potential for irrigation water to pick up salts from the ditch.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Flexible Membrane 428B</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening	The action may collect runoff and return flows may deliver possible contaminants to surface water.		
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>		Neutral	Conservation irrigation systems minimize affects to surface water quality.		
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>		Slight Worsening	May collect runoff and return flows may deliver possible contaminants to surface water		
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>		Neutral	May collect runoff and return flows may deliver possible contaminants to surface water		
<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		Not Applicable	Not applicable.		
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement	Increased water availability and access enhances plant growth, health and vigor.		
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		Not Applicable	Not applicable.		
Noxious and Invasive Plants		Not Applicable	Not applicable.		
Forage Quality and Palatability		Not Applicable	Not applicable.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Flexible Membrane 428B</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
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 when operating.		
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"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight decrease, lose cropland as ditch is installed.	Moderate increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		
Labor – Change in Management Level		0	Slight to Moderate Decrease		
Risk - Yield		Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease		
Risk - Flexibility		Slight decrease due to more efficient distribution of water.	Not applicable.		
Risk - Timing		Not applicable.	Substantial Increase		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Flexible Membrane 428B</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Risk – Cash Flow		Substantial increase due to construction cost.	Situational		
Profitability – Change in Profitability		Moderate decrease or increase.	0.03		
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Consider if ditch is historic structure.	No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Gravity fed irrigation is energy efficient but water inefficient. Lining reduces water losses and associated pumping requirements.	No		
Underutilization of Non-Fossil Energy Resources		Not applicable.	No		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Plain Concrete 428A</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
<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		Not Applicable		Not applicable.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Not Applicable		Not applicable.	
• 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 Improvement		Ditch may intercept runoff that might otherwise cause deposition.	
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle		Not Applicable		Not applicable.	
Excessive Seepage		Slight Improvement		Seepage from ditch or canal will be eliminated.	
Excessive Runoff, Flooding, or Ponding		Not Applicable		Not applicable.	
Excessive Subsurface Water		Slight Worsening		Seepage from ditch or canal will be eliminated.	
Drifted Snow		Not Applicable		Not applicable.	
Inadequate Outlets		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Plain Concrete 428A</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Inefficient Water use on Irrigated Land	Substantial Improvement	Lining eliminates water losses providing more water for irrigation.			
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	Slight Worsening	Seepage is eliminated that may provide water for recharge.			
Insufficient Flows in Water Courses	Slight to Moderate Improvement	Less water is diverted because of seepage losses in canal are eliminated.			
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Slight to Moderate Improvement	The action eliminates seepage from earth canals which can move soluble salts to the ground water.			
• Harmful Levels of Heavy Metals	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of heavy metals to groundwater.			
• Harmful Levels of Pathogens	Slight Improvement	The action eliminates seepage losses from canals, which reduces the potential for movement of pathogens to groundwater.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Improvement	Lined ditches reduce the delivery of sediment-attached nutrients to surface water.			
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Impervious materials prevents erosion.			
• Excessive Salinity	Slight Improvement	The action eliminates the potential for irrigation water to pick up salts from the ditch.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Plain Concrete 428A</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>		Slight Worsening	The action may collect runoff and return flows may deliver possible contaminants to surface water.		
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>		Neutral	Conservation irrigation systems minimize affects to surface water quality.		
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>		Slight Worsening	May collect runoff and return flows may deliver possible contaminants to surface water		
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>		Neutral	May collect runoff and return flows may deliver possible contaminants to surface water		
<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		Not Applicable	Not applicable.		
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>		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		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 Substantial Improvement	Increased water availability and access enhances plant growth, health and vigor.		
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Not Applicable	Not applicable.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		Not Applicable	Not applicable.		
Noxious and Invasive Plants		Not Applicable	Not applicable.		
Forage Quality and Palatability		Not Applicable	Not applicable.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Plain Concrete 428A</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS	RATIONALE		
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 when operating.		
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"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>		Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.		
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>		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		N/A if no change in crops irrigated, substantial if water use changes.	Slight decrease		
Land – Land in Production		Slight decrease, lose cropland as ditch is installed.	Moderate increase.		
Capital – Change in Equipment		0	Substantial.		
Capital - Total Investment Cost		0	Slight increase.		
Capital – Annual Cost		0	Situational.		
Capital – Credit and Farm Program Eligibility		0	Moderate increase		
Labor - Labor		Moderate increase to maintain channels and monitor water flow.	Negligible		
Labor – Change in Management Level		0	Slight to Moderate Decrease		
Risk - Yield		Slight to moderate decrease due to increased irrigation efficiency.	Slight Decrease		
Risk - Flexibility		Slight decrease due to more efficient distribution of water.	Not applicable.		
Risk - Timing		Not applicable.	Substantial Increase		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Irrigation Water Conveyance, Ditch and Canal Lining, Plain Concrete 428A</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
Risk – Cash Flow		Substantial increase due to construction cost.		Situational	
Profitability – Change in Profitability		Moderate decrease or increase.		0.03	
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT		Consider if ditch is historic structure.		No	
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources		Gravity fed irrigation is energy efficient but water inefficient. Lining reduces water losses and associated pumping requirements.		No	
Underutilization of Non-Fossil Energy Resources		Not applicable.		No	

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
PRACTICE: Hillside Ditch 423		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<b>SOIL - EROSION</b>					
Sheet and Rill	Slight to Substantial Improvement	A channel constructed across the slope diverts damaging runoff and shortens slope length			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Slight to Substantial Improvement	A channel constructed across the slope diverts damaging runoff to a protected outlet.			
Classic Gully	Slight to Substantial Improvement	Diverts damaging runoff and shorten slope length.			
Streambank	Slight Improvement	Diverts overland flow that may reach streambanks.			
Shoreline	Not Applicable	Not applicable.			
Irrigation Induced	Not Applicable	Not applicable.			
Mass Movement	Not Applicable	Not applicable.			
Road, Roadsides, and Construction Sites	Slight Improvement	diverts runoff that may otherwise cause erosion on road site			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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 Improvement	Ditch intercepts runoff that might otherwise cause deposition.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Neutral	Hillside ditch may provide outlet for seepage			
Excessive Runoff, Flooding, or Ponding	Moderate to Substantial Improvement	Collects and conveys runoff to safe outlet.			
Excessive Subsurface Water	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hillside Ditch 423</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Slight Worsening	May add additional runoff to already inadequate outlets.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Slight Improvement	Helps collect excess water and convey to other locations where the water maybe used.			
Reduced Capacity of Conveyances by Sediment Deposition	Slight Worsening	May convey additional sediment laden water to restricted conveyance ways.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Worsening	May convey additional sediment laden water to restricted water bodies.			
Aquifer Overdraft	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Slight Improvement	Adds additional flows to water courses.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Worsening	The action increases infiltration which may provide transport for nutrients.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Slight Improvement	The action diverts water from the pesticide application site.			
• Excessive Nutrients and Organics	Slight Worsening	The action collects runoff and delivers possible organics and dissolved nutrients to surface water.			
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Collects and slows run-off to a non-erosive velocity.			
• Excessive Salinity	Neutral	The action collects runoff but does not affect the total salt load from the field.			
• Harmful Levels of Heavy Metals	Slight Worsening	The action collects runoff and may deliver heavy metals to surface water.			
• Harmful Temperatures	Neutral	Ditches collect but do not retain overland flow.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hillside Ditch 423</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>	Slight to Moderate Worsening	Collects runoff and delivers possible pesticides to surface water			
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>	Slight to Moderate Worsening	Collects runoff and delivers possible petroleum to surface water			
<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	Not Applicable	Not applicable.			
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>	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	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 Improvement	Diverting runoff and reducing erosion will enhance the health and vigor of desired species.			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Slight Improvement	Water will be temporarily available in the ditch.			
Inadequate Space	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hillside Ditch 423</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
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"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

<b>STATE</b>	<b>WASHINGTON</b>	<b>FIELD OFFICE</b>	<b>ALL</b>	<b>DATE</b>	<b>9/2008</b>
<b>PRACTICE: Hillside Ditch 423</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>		
Underutilization of Non-Fossil Energy Resources		Practice facilitates methane collection for renewable fuel use.	Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hedgerow Planting 422</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 Improvement		Dense vegetation traps saltating particles.		
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 to Moderate Improvement		Permanent vegetation increases soil organic matter in the footprint of the practice.		
Rangeland Site Stability	Not Applicable		Not applicable.		
Compaction	Slight Improvement		Root development in the footprint of the practice will improve soil structure and porosity.		
Subsidence	Not Applicable		Not applicable.		
Contaminants:					
• Salts and other Chemicals	Not Applicable		Not applicable.		
• 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	Neutral		The action is used as a pest management mechanism in some locations.		
Damage from Sediment Deposition	Slight Worsening		Airborne soil may be deposited in or downwind of hedgerow.		
<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	Not Applicable		Not applicable.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hedgerow Planting 422</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>		
Drifted Snow	Slight to Moderate Improvement		Tall vegetation will trap snow upwind of structures and animal concentration areas.		
Inadequate Outlets	Not Applicable		Not applicable.		
Inefficient Water use on Irrigated Land	Not Applicable		Not applicable.		
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	Not Applicable		Not applicable.		
Insufficient Flows in Water Courses	Not Applicable		Not applicable.		
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable		Not applicable.		
• Excessive Nutrients and Organics	Not Applicable		Not applicable.		
• Excessive Salinity	Not Applicable		Not applicable.		
• Harmful Levels of Heavy Metals	Not Applicable		Not applicable.		
• Harmful Levels of Pathogens	Not Applicable		Not applicable.		
• Harmful Levels of Petroleum	Not Applicable		Not applicable.		
In Surface Water:					
• Harmful Levels of Pesticides	Slight Improvement		The action reduces pesticide drift and may reduce runoff and erosion. Also, the borders may attract beneficial insects or trap insect pests which reduce the need for pesticide applications.		
• Excessive Nutrients and Organics	Slight to Moderate Improvement		Nutrients from runoff are removed when the strips of vegetation are established where they can intercept overland flow or wind-borne soil.		
• Excessive Suspended Sediment and Turbidity	Not Applicable		Not applicable.		
• Excessive Salinity	Not Applicable		Not applicable.		
• Harmful Levels of Heavy Metals	Not Applicable		Not applicable.		
• Harmful Temperatures	Slight Improvement		Use of this practice along small streams increases shade and moderates stream temperatures.		
• Harmful Levels of Pathogens	Not Applicable		Not applicable.		
• Harmful Levels of Petroleum	Not Applicable		Not applicable.		
<b>AIR – QUALITY</b>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hedgerow Planting 422</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	Permanent rows of trees or shrubs can reduce wind erosion and intercept and trap airborne particles.			
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Permanent rows of trees or shrubs can reduce wind erosion and intercept and trap airborne particles.			
Excessive Ozone	Neutral	There is a minimal reduction of ozone precursors through reduced surface temperatures offered by shade and minimal biofiltering of ozone concentrations due to interception by tree and shrub foliage.			
Excessive Greenhouse Gas:					
• CO <sub>2</sub> (Carbon Dioxide)	Slight Improvement	Vegetation removes CO <sub>2</sub> from the air and stores it in the form of carbon in the plants and soil.			
• 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> )	Slight to Moderate Improvement	Interception of NH <sub>3</sub> by plants			
Chemical Drift	Slight to Moderate Improvement	Hedgerows will intercept chemical drift			
Objectionable Odors	Slight to Moderate Improvement	Will reduce wind velocities and will intercept VOCs and particulates.			
Reduced Visibility	Slight to Moderate Improvement	May remove dust or airborne particles			
Undesirable Air Movement	Substantial Improvement	Tall vegetation creates turbulence and slows undesired, leeward winds.			
Adverse Air Temperature	Moderate to Substantial Improvement	Tall vegetation provides shade and moderates temperatures.			
<b>PLANTS – SUITABILITY</b>					
Plants not Adapted or Suited	Substantial Improvement	Plants selected are adapted and suited.			
<b>PLANTS - CONDITION</b>					
Productivity, Health, and Vigor	Slight to Substantial Improvement	Plants selected will be maintained at optimal growing conditions for the intended purpose.			
Threatened or Endangered Plant Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hedgerow Planting 422</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Not Applicable	Not applicable.			
Noxious and Invasive Plants	Moderate to Substantial Improvement	Vegetation is installed and managed to control undesired species.			
Forage Quality and Palatability	Not Applicable	Not applicable.			
Wildfire Hazard	Not Applicable	Not applicable.			
<b>ANIMALS - FISH AND WILDLIFE</b>					
Inadequate Food	Moderate to Substantial Improvement	Selected plants improve food supply and availability.			
Inadequate Cover/Shelter	Moderate to Substantial Improvement	Selected desirable plants improve cover for wildlife.			
Inadequate Water	Not Applicable	Not applicable.			
Inadequate Space	Moderate to Substantial Improvement	Provides additional vertical habitat/space.			
Habitat Fragmentation	Slight to Moderate Improvement	Vegetation can help support wildlife habitat structure, diversity, extent and connectivity.			
Imbalance Among and Within Populations	Slight Improvement	Habitat management is implemented to remove limiting factors.			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Slight Improvement	Hedgerows can provide some shade and protection from wind.			
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.	Moderate to substantial increase.			
Capital - Change in Equipment	0	Substantial.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Hedgerow Planting 422</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grassed Waterway 412</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Not Applicable	Not applicable.			
Wind	Neutral	The unsheltered distance may be reduced by trapping saltating soil particles.			
Ephemeral Gully	Substantial Improvement	Shaping or grading of the channel conveys runoff water without causing erosion.			
Classic Gully	Moderate to Substantial Improvement	Runoff is controlled and managed to prevent erosion.			
Streambank	Slight Improvement	Inflows into the stream are controlled to prevent erosion.			
Shoreline	Slight Improvement	Inflows into the stream are controlled to prevent erosion.			
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 to Moderate Improvement	Erosion on construction sites and road side drainage ways controlled.			
SOIL – CONDITION					
Organic Matter Depletion	Moderate Improvement	Permanent vegetation in the area of the waterway increases soil organic matter.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight Worsening	Vegetation traps contaminated sediment.			
• Animal Waste and other Organics - N	Slight Worsening	Vegetation traps N and N-contaminated sediment, vegetation will take up N.			
• Animal Waste and other Organics - P	Slight Worsening	Vegetation traps P and P-contaminated sediment, vegetation will take up P.			
• Animal Waste and other Organics - K	Slight Worsening	Vegetation traps K and K-contaminated sediment, vegetation will take up K.			
• Commercial Fertilizer - N	Slight Worsening	Vegetation traps N and N-contaminated sediment, vegetation will take up N.			
• Commercial Fertilizer – P	Slight Worsening	Vegetation traps P and P-contaminated sediment, vegetation will take up P.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grassed Waterway 412</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
• Commercial Fertilizer – K	Slight Worsening	Vegetation traps K and K-contaminated sediment, vegetation will take up K.			
• Residual Pesticides	Slight Worsening	Vegetation traps contaminated sediment.			
Damage from Sediment Deposition	Moderate Worsening	Vegetation traps soil particles.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Neutral	Provide outlet for seeps.			
Excessive Runoff, Flooding, or Ponding	Moderate Improvement	Waterways provide outlets for diversions and other water control practices.			
Excessive Subsurface Water	Slight to Moderate Improvement	Subsurface drainage installed as part of this practice removes excess water.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Moderate to Substantial Improvement	Waterways provide adequate outlets.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.			
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Moderate Improvement	Reduces erosion that results in sediment deposition in conveyances.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Moderate Improvement	Reduces erosion that results in sediment deposition in conveyances.			
Aquifer Overdraft	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Not Applicable	Not applicable.			
<b>WATER – QUALITY</b>					
In Groundwater:					
• Harmful Levels of Pesticides	Neutral	The action increases infiltration which is offset by increased soil organic matter and biological activity .			
• Excessive Nutrients and Organics	Neutral	The action may slightly increases infiltration within the waterway. However, the vegetation will uptake nutrients.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grassed Waterway 412</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action increases infiltration and traps adsorbed pesticides.			
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The vegetation in the channel will filter out some sediments, and the vegetation will utilize some nutrients.			
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Erosion is controlled, vegetation traps sediment, and runoff is delivered at a safe velocity.			
• Excessive Salinity	Neutral	The action results in slight increase of infiltration that could decrease soluble salts in runoff.			
• Harmful Levels of Heavy Metals	Slight Improvement	Waterway acts as filter and reduces heavy metals in the runoff. Vegetation may take up heavy metals.			
• Harmful Temperatures	Neutral	Water is not retained in the waterway			
• Harmful Levels of Pathogens	Slight Improvement	Waterway acts as filter and reduces pathogens in the runoff			
• Harmful Levels of Petroleum	Slight Improvement	Waterway acts as filter and reduces petroleum in the 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		Neutral		There is a minimal reduction of ozone precursors through reduced surface temperatures offered by shade or ground cover, and minimal biofiltering of ozone concentrations due to interception by vegetation.	
Excessive Greenhouse Gas:					
• CO <sub>2</sub> (Carbon Dioxide)		Slight Improvement		Vegetation removes CO <sub>2</sub> from the air and stores it in the form of carbon in the plants and soil.	
• 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		Not Applicable		Not applicable.	

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grassed Waterway 412</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<b>PLANTS – SUITABILITY</b>					
Plants not Adapted or Suited	Moderate to Substantial Improvement	Plants selected for retention are more adapted and suited.			
<b>PLANTS - CONDITION</b>					
Productivity, Health, and Vigor	Substantial Improvement	Vegetation is maintained at optimal conditions for the function of the waterway			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Not Applicable	Not applicable.			
Noxious and Invasive Plants	Moderate to Substantial Improvement	Vegetation is installed and managed to control undesired species.			
Forage Quality and Palatability	Not Applicable	Not applicable.			
Wildfire Hazard	Not Applicable	Not applicable.			
<b>ANIMALS - FISH AND WILDLIFE</b>					
Inadequate Food	Slight Improvement	Planting of wildlife adapted plants outside the hydraulic functioning area of the waterway will provide food.			
Inadequate Cover/Shelter	Slight Improvement	Planting of wildlife adapted plants outside the hydraulic functioning area of the waterway will provide cover/shelter.			
Inadequate Water	Slight Improvement	The action improves surface water quality and provides seasonal habitat for aquatic species, especially if connected to a stream or river.			
Inadequate Space	Slight Improvement	Waterways constructed in cropland will increase space and provide wildlife corridor			
Habitat Fragmentation	Slight Improvement	Waterways increase connectivity.			
Imbalance Among and Within Populations	Not Applicable	Not applicable.			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grassed Waterway 412</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Slight Improvement	There may be some use of the planting for feed and forage by livestock.			
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.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grade Stabilization Structure 410</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	Not Applicable	Not applicable.			
Ephemeral Gully	Not Applicable	Not applicable.			
Classic Gully	Slight to Substantial Improvement	The action stabilizes channel to prevent further erosion.			
Streambank	Slight to Substantial Improvement	The action stabilizes channel to prevent further erosion			
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	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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	Neutral	Stabilizing the channel can help sediment transport or deposition but has limited effect on soil condition.			
<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	Not Applicable	Not applicable.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Not Applicable	Not applicable.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grade Stabilization Structure 410</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Reduced Capacity of Conveyances by Sediment Deposition	Slight Improvement	Stabilizing the channel can help reduce sediment transport or deposition.			
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Improvement	Stabilizing the channel can help reduce sediment transport or deposition.			
Aquifer Overdraft	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Not Applicable	Not applicable.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Channel is stabilized and protected from excessive erosion.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Temperatures	Neutral	Stabilizing grade diminishes hyporheic (subsurface) flow.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• 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 <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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grade Stabilization Structure 410</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
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	Not Applicable	Not applicable.			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.			
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	Slight to Moderate Improvement	Soil/plant moisture relationships are improved near and on channel banks for species diversity and plant growth. Structures will not inhibit fish passage.			
Inadequate Cover/Shelter	Slight to Moderate Improvement	Soil/plant moisture relationships are improved for species diversity and plant growth. Structures will not inhibit fish passage.			
Inadequate Water	Slight Improvement	Gullies are stabilized with retention of some water in or near structures.			
Inadequate Space	Not Applicable	Not applicable.			
Habitat Fragmentation	Neutral	Structure should be designed to allow fish passage.			
Imbalance Among and Within Populations	Not Applicable	Not applicable.			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Grade Stabilization Structure 410</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Prescribed Forestry 409</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<b>SOIL - EROSION</b>					
Sheet and Rill	Not Applicable	Not applicable.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Not Applicable	Not applicable.			
Classic Gully	Slight to Substantial Improvement	Stabilization of the gully due to the embankment.			
Streambank	Slight Improvement	Reduced peak flows downstream from embankment.			
Shoreline	Slight to Moderate Worsening	Increase in shoreline.			
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	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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 Moderate Improvement	Sediment trapped in pond area behind dam.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight to Moderate Worsening	Possible seepage from ponding of water.			
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	Runoff and peak flows reduced.			
Excessive Subsurface Water	Slight Worsening	Seepage from ponded water.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Not Applicable	Not applicable.			
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Provides permanent water storage for irrigation.			
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Prescribed Forestry 409</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Substantial Improvement	Sediment is trapped behind embankment.			
Reduced Storage of Water Bodies by Sediment Accumulation	Neutral	Limited sediment deposition.			
Aquifer Overdraft	Slight Improvement	Seepage from the impoundment impacts recharge and water storage reduces demands on aquifer.			
Insufficient Flows in Water Courses	Slight Worsening	Controlled release of stored water provides flow downstream of structure.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Slight Worsening	Nutrients impounded could contaminate groundwater.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Levels of Pathogens	Not Applicable	Not applicable.			
• Harmful Levels of Petroleum	Not Applicable	Not applicable.			
In Surface Water:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Suspended Sediment and Turbidity	Slight to Substantial Improvement	Suspended sediments are trapped.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.			
• Harmful Temperatures	Neutral	Water released from impoundments may be warmer or cooler than receiving waters, depending on site conditions.			
• Harmful Levels of Pathogens	Slight to Moderate Worsening	Because of aquatic animal feed or decaying vegetation, or from excessive nutrients in runoff			
• 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 <sub>2</sub> (Carbon Dioxide)	Not Applicable	Not applicable.			
• N <sub>2</sub> O (Nitrous Oxide)	Not Applicable	Not applicable.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Prescribed Forestry 409</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>		
• 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	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	Not Applicable		Not applicable.		
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	Slight to Moderate Improvement		Impounded water improves food availability for some fish and wildlife, but decreases food sources for other species, especially stream dwellers.		
Inadequate Cover/Shelter	Slight to Substantial Improvement		Impounded water improves cover and shelter for some fish and wildlife, but decreases it for stream species.		
Inadequate Water	Slight Improvement		Although water is impounded for lotic species, passage to upstream and downstream habitats is not possible for fish and other aquatic wildlife.		
Inadequate Space	Slight to Moderate Improvement		Ponds and adjacent areas provide additional space for wildlife and pond-dwelling species, but eliminates space for stream species.		
Habitat Fragmentation	Moderate to Substantial Worsening		Aquatic and riparian habitats are fragmented.		

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Prescribed Forestry 409</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Imbalance Among and Within Populations	Slight to Moderate Improvement	Structures may fragment habitats and isolate subpopulations, but fish and wildlife habitat enhancement are a focus of this practice.			
Threatened and Endangered Fish and Wildlife Species:					
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Moderate to Substantial Improvement	Dams can also provide stock water.			
Stress and Mortality	Moderate to Substantial Improvement	Available water reduces stress and mortality.			
<b>HUMAN – ECONOMICS</b>					
Land - Change in Land Use	Not applicable.	Not applicable.			
Land – Land in Production	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
<b>HUMAN - CULTURAL</b>					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Prescribed Forestry 409</b>		Baseline Setting:			
		Appropriate Land Use(s): Forest, Grazed Forest, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.		No		
<b>HUMAN – ENERGY</b>					
Depletion of Fossil Fuel Resources	Not Applicable		No		
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.		Yes		

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Tree/Shrub Site Preparation 490</b>		Baseline Setting: Appropriate Land Use(s): Forest, Grazed Forest, Mined, Natural Area, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Slight Worsening	An area with disturbed soil or reduction in vegetative cover and surface litter has potential for increases in erosive water energy.			
Wind	Slight Worsening	An area with bare soil or reduction in vegetative cover and surface litter has potential for increased exposure of the soil surface to erosive wind energy.			
Ephemeral Gully	Slight to Moderate Worsening	An area with disturbed soil or reduction in vegetative cover and surface litter has potential for increases in erosive water energy.			
Classic Gully	Slight to Moderate Worsening	An area with disturbed soil or reduction in vegetative cover and surface litter has potential for increases in erosive water energy.			
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.			
SOIL – CONDITION					
Organic Matter Depletion	Slight to Moderate Worsening	Removal of vegetation and litter from a site removes organic material that could have become soil organic matter.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight Worsening	Use of heavy equipment compacts soil.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• 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.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Tree/Shrub Site Preparation 490</b>		Baseline Setting: Appropriate Land Use(s): Forest, Grazed Forest, Mined, Natural Area, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
• 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	Neutral	Temporary removal of surface litter and alteration of vegetative structure alters entrapment capabilities.			
WATER – QUANTITY					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Not Applicable	Not applicable.			
Excessive Runoff, Flooding, or Ponding	Neutral	Temporary site condition.			
Excessive Subsurface Water	Neutral	Temporary site condition.			
Drifted Snow	Not Applicable	Not applicable.			
Inadequate Outlets	Neutral	Temporary site condition.			
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.			
Inefficient Water use on Non-Irrigated Land	Moderate to Substantial Improvement	Mechanical disturbance of soil surface increases infiltration rate and soil moisture retention.			
Reduced Capacity of Conveyances by Sediment Deposition	Neutral	Potential for erosion from site is increased for a short period of time.			
Reduced Storage of Water Bodies by Sediment Accumulation	Neutral	Potential for erosion from site is increased for a short period of time.			
Aquifer Overdraft	Not Applicable	Not applicable.			
Insufficient Flows in Water Courses	Neutral	Temporary site condition.			
WATER – QUALITY					
In Groundwater:					
• Harmful Levels of Pesticides	Not Applicable	Not applicable.			
• Excessive Nutrients and Organics	Not Applicable	Not applicable.			
• Excessive Salinity	Not Applicable	Not applicable.			
• Harmful Levels of Heavy Metals	Neutral	Increased woody vegetation on site may result in minor uptake of contaminants.			
• Harmful Levels of Pathogens	Neutral	Increased woody vegetation on site may encourage microbial activity in the soil, reducing pathogen numbers.			

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Tree/Shrub Site Preparation 490</b>		Baseline Setting: Appropriate Land Use(s): Forest, Grazed Forest, Mined, Natural Area, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>	Neutral	Some herbicides require a petroleum-based carrier. Use of heavy equipment may lead to fuel or lubricant spills.			
In Surface Water:					
<ul style="list-style-type: none"> <li>Harmful Levels of Pesticides</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Excessive Nutrients and Organics</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Excessive Suspended Sediment and Turbidity</li> </ul>	Slight Worsening	Soil disturbance increases erosion from the site.			
<ul style="list-style-type: none"> <li>Excessive Salinity</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Harmful Levels of Heavy Metals</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>Harmful Temperatures</li> </ul>	Neutral	Eventual canopy cover of stand will shade streams.			
<ul style="list-style-type: none"> <li>Harmful Levels of Pathogens</li> </ul>	Neutral	Temporary site condition.			
<ul style="list-style-type: none"> <li>Harmful Levels of Petroleum</li> </ul>	Neutral	Temporary site condition.			
AIR – QUALITY					
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Worsening	Exhaust from equipment operation and dust from soil-disturbing activities add particulate matter to the air.			
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight Worsening	Exhaust from equipment operation and dust from soil-disturbing activities add particulate matter to the air.			
Excessive Ozone	Neutral	There is a short-term increase in vehicle emissions and ozone precursors from site preparation equipment.			
Excessive Greenhouse Gas:					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> (Carbon Dioxide)</li> </ul>	Slight Improvement	Vegetation removes CO <sub>2</sub> from the air and stores it in the form of carbon in the plants and soil.			
<ul style="list-style-type: none"> <li>N<sub>2</sub>O (Nitrous Oxide)</li> </ul>	Not Applicable	Not applicable.			
<ul style="list-style-type: none"> <li>CH<sub>4</sub> (Methane)</li> </ul>	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	Slight Improvement	Tall vegetation slows surface air movement and intercepts and captures air borne materials.			
Undesirable Air Movement	Not Applicable	Not applicable.			
Adverse Air Temperature	Not Applicable	Not applicable.			
PLANTS – SUITABILITY					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Tree/Shrub Site Preparation 490</b>		Baseline Setting: Appropriate Land Use(s): Forest, Grazed Forest, Mined, Natural Area, Recreation, Urban, Watershed Protection, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
Plants not Adapted or Suited	Moderate to Substantial Improvement	Site is altered to allow more suited and desired species to grow.			
<b>PLANTS - CONDITION</b>					
Productivity, Health, and Vigor	Substantial Improvement	Site is altered to allow more suitable species to grow resulting in increased productivity, improved health and vigor.			
Threatened or Endangered Plant Species:					
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.			
Noxious and Invasive Plants	Moderate to Substantial Improvement	Site conditions are managed to minimize undesired vegetation.			
Forage Quality and Palatability	Not Applicable	Not applicable.			
Wildfire Hazard	Moderate to Substantial Improvement	Activities reduce fuel load buildup.			
<b>ANIMALS - FISH AND WILDLIFE</b>					
Inadequate Food	Neutral	Temporary site conditions may decrease food species used by wildlife.			
Inadequate Cover/Shelter	Neutral	Temporary site conditions may decrease cover/shelter for wildlife.			
Inadequate Water	Not Applicable	Not applicable.			
Inadequate Space	Neutral	Conditions created are temporary. The action is designed to recreate woody habitat/space.			
Habitat Fragmentation	Neutral	Conditions created are temporary. The action is designed to recreate/reconnect woody habitat.			
Imbalance Among and Within Populations	Neutral	Temporary site condition. The action is designed to benefit woody species establishment.			
Threatened and Endangered Fish and Wildlife Species:					

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	WASHINGTON	FIELD OFFICE	ALL	DATE	9/2008
<b>PRACTICE: Tree/Shrub Site Preparation 490</b>		Baseline Setting: Appropriate Land Use(s): Forest, Grazed Forest, Mined, Natural Area, Recreation, Urban, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.			
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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	Slight Worsening	Activities can remove protective brush and trees.			
Inadequate Stock Water	Not Applicable	Not applicable.			
Stress and Mortality	Not Applicable	Not applicable.			
HUMAN – ECONOMICS					
Land - Change in Land Use	Not applicable.	Not applicable.			
Land – Land in Production	Not applicable.	Moderate to substantial increase.			
Capital – Change in Equipment	0	Substantial.			
Capital - Total Investment Cost	Substantial.	Slight to moderate.			
Capital – Annual Cost	0	Situational.			
Capital – Credit and Farm Program Eligibility	0	Negligible to slight.			
Labor - Labor	0	Slight to moderate increase.			
Labor – Change in Management Level	0	Not applicable.			
Risk - Yield	Not applicable.	Not applicable.			
Risk - Flexibility	Not applicable.	Not applicable.			
Risk - Timing	Not applicable.	Moderate Decrease			
Risk – Cash Flow	Situational. Negligible to moderate decrease in risk due to management of biogas.	Moderate Increase			
Profitability – Change in Profitability	Situational. Negligible to moderate increase in profitability where biogas is put to profitable use.	0.01			
HUMAN - CULTURAL					
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	No			
HUMAN – ENERGY					
Depletion of Fossil Fuel Resources	Not Applicable	No			
Underutilization of Non-Fossil Energy Resources	Practice facilitates methane collection for renewable fuel use.	Yes			

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<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.