

Scenario Worksheet

Practice and Scenario Description:	
Information Type	Data
Region	Mid Atlantic
State	New Jersey
Discipline Group	Water Management Engineering
Practice Code/Name	442 - Irrigation System, Sprinkler
Scenario ID	1
Scenario Name	Center Pivot System

Scenario Description	<p>Installation of a low to medium pressure center pivot system.</p> <p>Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications).</p> <p>Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)</p>
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Before Practice Situation	<p>A 57 acre field is irrigated with traveling guns. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.</p>
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After Practice Situation	<p>The existing traveling gun irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 885 feet in length with pressure regulators and low to medium pressure sprinklers on drops.</p> <p>The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated.</p> <p>This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on.</p>
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Scenario Feature Measure	Length of Center Pivot Lateral
Scenario Unit	Linear Foot
Scenario Typical Size	885

Cost Summary:		
Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$53,255.90	\$60.18
Equipment/Installation	\$0.00	\$0.00
Labor	\$0.00	\$0.00
Mobilization	\$730.12	\$0.82
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$53,986.02	\$61.00

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Practice and Scenario Description:

Information Type	Data
Region	Mid Atlantic
State	New Jersey
Discipline Group	Water Management Engineering
Practice Code/Name	442 - Irrigation System, Sprinkler
Scenario ID	2
Scenario Name	Linear Move System

Scenario Description	<p>Installation of a fixed linear or lateral move sprinkler system with sprinklers on drops with or without drag hoses to improve irrigation efficiency and reduce soil erosion.</p> <p>Resource concerns include: Soil Erosion(Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping)</p> <p>Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)</p>
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Before Practice Situation	A 76 acre field is irrigated with a traveling gun. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.
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After Practice Situation	<p>A typical unit is approximately 76 acres in size with the sprinkler system up to 1280 feet in length with drop tubes that have a minimum of 30" spacing.</p> <p>The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated.</p>
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Scenario Feature Measure	Length of Linear Move Lateral
Scenario Unit	Foot
Scenario Typical Size	1,280

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$83,539.96	\$65.27
Equipment/Installation	\$0.00	\$0.00
Labor	\$0.00	\$0.00
Mobilization	\$730.12	\$0.57
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$84,270.08	\$65.84

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Practice and Scenario Description:

Information Type	Data
Region	Mid Atlantic
State	New Jersey
Discipline Group	Water Management Engineering
Practice Code/Name	442 - Irrigation System, Sprinkler
Scenario ID	3

Scenario Name	Renovation of Existing Sprinkler System
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Scenario Description	<p>Center Pivot and Linear Move sprinkler systems are used in large crop fields with fairly regular field borders and flat topography. The scenario involves changing nozzles on center pivot or lateral move irrigation systems to low-pressure systems to improve efficiency of water use and reduce energy use. This scenario is intended for cropland areas where the objective is water conservation. A typical scenario assumes a 885 LF span, including end booms renozzled with low-pressure nozzles.</p> <p>Resource concerns include: Soil Erosion(Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping)</p> <p>Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)</p>
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Before Practice Situation	A center pivot or lateral move system has high pressure sprinklers. The nozzles are worn and water is applied non-uniformly. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water quality. The runoff from the field causes soil erosion. The high pressure requirement for the system requires excess energy use.
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After Practice Situation	A Center Pivot or Linear Move sprinkler system with a span of 885 linear feet is re-nozzled with low-pressure nozzles. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump.
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Scenario Feature Measure	Length of Lateral Retrofitted
Scenario Unit	Linear Feet
Scenario Typical Size	885

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$4,513.50	\$5.10
Equipment/Installation	\$265.26	\$0.30
Labor	\$270.48	\$0.31
Mobilization	\$285.90	\$0.32
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$5,335.14	\$6.03

