

## Scenario Worksheet

### Practice and Scenario Description:

| Information Type   | Data                               |
|--------------------|------------------------------------|
| Region             | New England                        |
| State              | Connecticut                        |
| Discipline Group   | Water Management Engineering       |
| Practice Code/Name | 442 - Irrigation System, Sprinkler |
| Scenario ID        | 1                                  |
| Scenario Name      | Center Pivot System > 1000 LF      |

|                           |   |
|---------------------------|---|
| Scenario Description      | <p>Installation of a low pressure center pivot system with flow meter.</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>  |
| Before Practice Situation | A 160 acre field is irrigated with a high flow sprinkler system. 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.   |
| After Practice Situation  | <p>The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 1300 feet in length with pressure regulators and low 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 Feet                    |
| Scenario Typical Size    | 1,300                          |

### Cost Summary:

| Cost Category                      | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials                          | \$86,837.15   | \$66.80            |
| Equipment/Installation             | \$0.00        | \$0.00             |
| Labor                              | \$0.00        | \$0.00             |
| Mobilization                       | \$700.58      | \$0.54             |
| Acquisition of Technical Knowledge | \$0.00        | \$0.00             |
| Foregone Income                    | \$0.00        | \$0.00             |
| Total                              | \$87,537.73   | \$67.34            |

### Cost Details:

| Cost Category | Component ID | Component Name  | Component Description   | Unit | Price (\$/unit) | Quantity | Cost        | Component Justification | Quantity Justification                              |
|---------------|--------------|---|---|------|-----------------|----------|-------------|-------------------------|---|
| Materials     | 1452         | Flow Meter, with Electronic Index   | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.   | Each | \$1,387.50      | 1        | \$1,387.50  |                         |   |
| Materials     | 318          | Irrigation, Center pivot system with appurtenances, variable cost portion | Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Foot | \$61.74         | 1300     | \$80,262.00 |                         | 1300 LF of Center Pivot lateral for 160 acre field. |
| Materials     | 317          | Irrigation, Center pivot system with appurtenances, fixed cost portion    | Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.    | Each | \$5,187.65      | 1        | \$5,187.65  |                         | Center Pivot on 160 acre field.                     |

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|--------------------|------------------------------------|
| Region             | New England                        |
| State              | Connecticut                        |
| Discipline Group   | Water Management Engineering       |
| Practice Code/Name | 442 - Irrigation System, Sprinkler |
| Scenario ID        | 2                                  |
| Scenario Name      | Center Pivot System < or = 1000 LF |

|                      |  |
|----------------------|--|
| Scenario Description | <p>Installation of a low pressure center pivot system with flow meter.</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 | A 75 acre field is irrigated with a high flow sprinkler system flood. 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>The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 700 feet in length with pressure regulators and low 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 Feet                    |
| Scenario Typical Size    | 700                            |

### Cost Summary:

| Cost Category                      | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials                          | \$49,793.15   | \$71.13            |
| Equipment/Installation             | \$0.00        | \$0.00             |
| Labor                              | \$0.00        | \$0.00             |
| Mobilization                       | \$700.58      | \$1.00             |
| Acquisition of Technical Knowledge | \$0.00        | \$0.00             |
| Foregone Income                    | \$0.00        | \$0.00             |
| Total                              | \$50,493.73   | \$72.13            |

### Cost Details:

| Cost Category | Component ID | Component Name  | Component Description   | Unit | Price (\$/unit) | Quantity | Cost        | Component Justification | Quantity Justification                                     |
|---------------|--------------|---|---|------|-----------------|----------|-------------|-------------------------|--|
| Materials     | 1452         | Flow Meter, with Electronic Index   | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.   | Each | \$1,387.50      | 1        | \$1,387.50  |                         |  |
| Materials     | 318          | Irrigation, Center pivot system with appurtenances, variable cost portion | Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Foot | \$61.74         | 700      | \$43,218.00 |                         | 700 LF of Center Pivot lateral for about 35 ac acre field. |
| Materials     | 317          | Irrigation, Center pivot system with appurtenances, fixed cost portion    | Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.    | Each | \$5,187.65      | 1        | \$5,187.65  |                         | Center Pivot on 35 acre field.                             |

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### Practice and Scenario Description:

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|--------------------|------------------------------------|
| Region             | New England                        |
| State              | Connecticut                        |
| Discipline Group   | Water Management Engineering       |
| Practice Code/Name | 442 - Irrigation System, Sprinkler |
| Scenario ID        | 3                                  |
| Scenario Name      | Linear Move System > 1000 LF       |

|                      |   |
|----------------------|---|
| Scenario Description | <p>Installation of a linear or lateral move sprinkler system with flow meter and 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> <p>Payment rate is figured per foot of installed hardware length.</p> |
|----------------------|---|

|                           |  |
|---------------------------|--|
| Before Practice Situation | A 76 acre field is flood irrigated. 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 Center Pivot Lateral |
| Scenario Unit            | Linear Feet                    |
| Scenario Typical Size    | 1,280                          |

### Cost Summary:

| Cost Category                      | Scenario Cost | Scenario Cost/Unit |
|------------------------------------|---------------|--------------------|
| Materials                          | \$84,927.46   | \$66.35            |
| Equipment/Installation             | \$0.00        | \$0.00             |
| Labor                              | \$0.00        | \$0.00             |
| Mobilization                       | \$700.58      | \$0.55             |
| Acquisition of Technical Knowledge | \$0.00        | \$0.00             |
| Foregone Income                    | \$0.00        | \$0.00             |
| Total                              | \$85,628.04   | \$66.90            |

### Cost Details:

| Cost Category | Component ID | Component Name                        | Component Description  | Unit | Price (\$/unit) | Quantity | Cost        | Component Justification | Quantity Justification                            |
|---------------|--------------|---------------------------------------|--|------|-----------------|----------|-------------|-------------------------|---|
| Materials     | 1452         | Flow Meter, with Electronic Index     | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.  | Each | \$1,387.50      | 1        | \$1,387.50  |                         |   |
| Materials     | 322          | Linear Move System with appurtenances | Linear Move system including: central tower, lateral towers, pipes, sprinklers, controllers, installation.   | Acre | \$1,099.21      | 76       | \$83,539.96 |                         | 1280 LF Linear Move lateral to irrigate 76 acres. |
| Mobilization  | 1137         | Mobilization, very small equipment    | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$75.96         | 2        | \$151.92    |                         | Move in & out.                                    |

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|--------------------|------------------------------------|
| Region             | New England                        |
| State              | Connecticut                        |
| Discipline Group   | Water Management Engineering       |
| Practice Code/Name | 442 - Irrigation System, Sprinkler |
| Scenario ID        | 4                                  |
| Scenario Name      | Linear Move System < or = 1000 LF  |

**Scenario Description**

Installation of a linear or lateral move sprinkler system with flow meter and with sprinklers on drops with or without drag hoses to improve irrigation efficiency and reduce soil erosion.

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)

Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Payment rate is figured per foot of installed hardware length.

**Before Practice Situation**

A 30 acre field is flood irrigated. 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.

**After Practice Situation**

A typical unit is approximately 30 acres in size with the sprinkler system up to 500 feet in length with drop tubes that have a minimum of 30' spacing.

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.

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|--------------------------|--------------------------------|
| Scenario Feature Measure | Length of Center Pivot Lateral |
| Scenario Unit            | Linear Feet                    |
| Scenario Typical Size    | 500                            |

### Cost Summary:

| Cost Category                      | Scenario Cost      | Scenario Cost/Unit |
|------------------------------------|--------------------|--------------------|
| Materials                          | \$34,363.80        | \$68.73            |
| Equipment/Installation             | \$0.00             | \$0.00             |
| Labor                              | \$0.00             | \$0.00             |
| Mobilization                       | \$700.58           | \$1.40             |
| Acquisition of Technical Knowledge | \$0.00             | \$0.00             |
| Foregone Income                    | \$0.00             | \$0.00             |
| <b>Total</b>                       | <b>\$35,064.38</b> | <b>\$70.13</b>     |

### Cost Details:

| Cost Category | Component ID | Component Name                        | Component Description  | Unit | Price (\$/unit) | Quantity | Cost        | Component Justification | Quantity Justification                            |
|---------------|--------------|---------------------------------------|--|------|-----------------|----------|-------------|-------------------------|---|
| Materials     | 1452         | Flow Meter, with Electronic Index     | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.  | Each | \$1,387.50      | 1        | \$1,387.50  |                         |   |
| Materials     | 322          | Linear Move System with appurtenances | Linear Move system including: central tower, lateral towers, pipes, sprinklers, controllers, installation.   | Acre | \$1,099.21      | 30       | \$32,976.30 |                         | 1280 LF Linear Move lateral to irrigate 76 acres. |
| Mobilization  | 1137         | Mobilization, very small equipment    | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | \$75.96         | 2        | \$151.92    |                         | Move in & out.                                    |