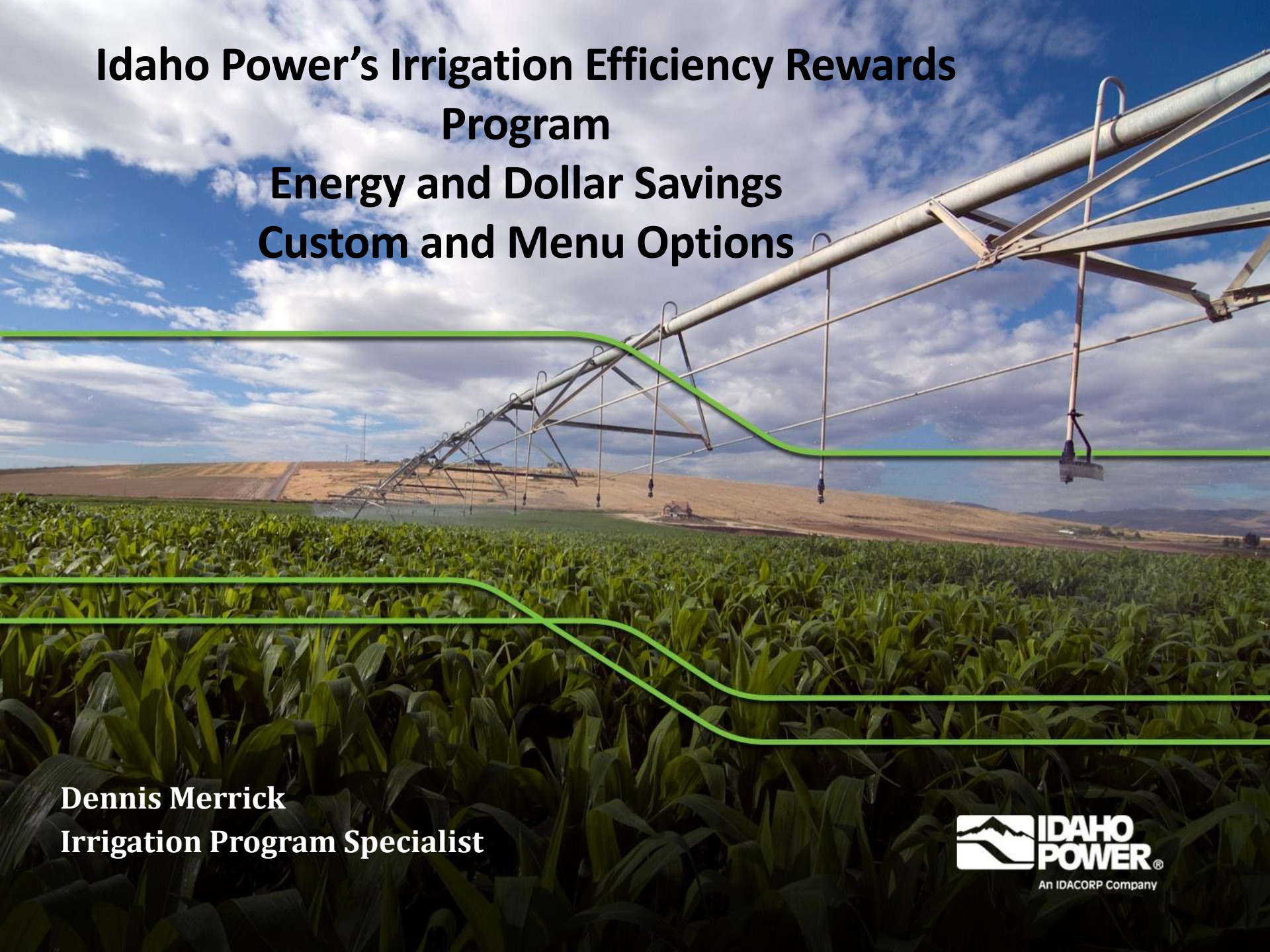
Idaho Power's Irrigation Efficiency Rewards Program
Energy and Dollar Savings
Custom and Menu Options



Dennis Merrick
Irrigation Program Specialist

IDAHO POWER®
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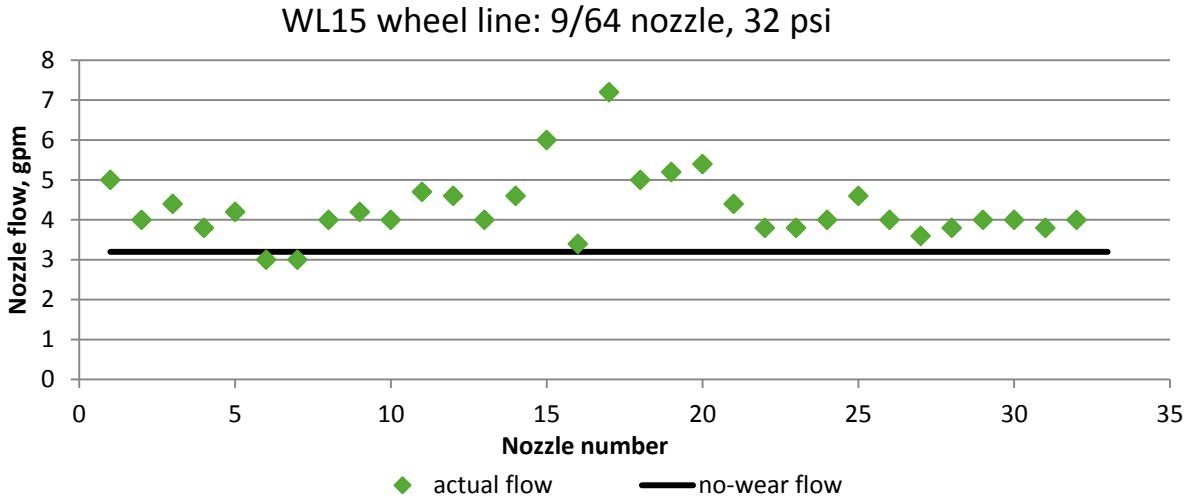
Irrigation Efficiency Rewards Menu Option

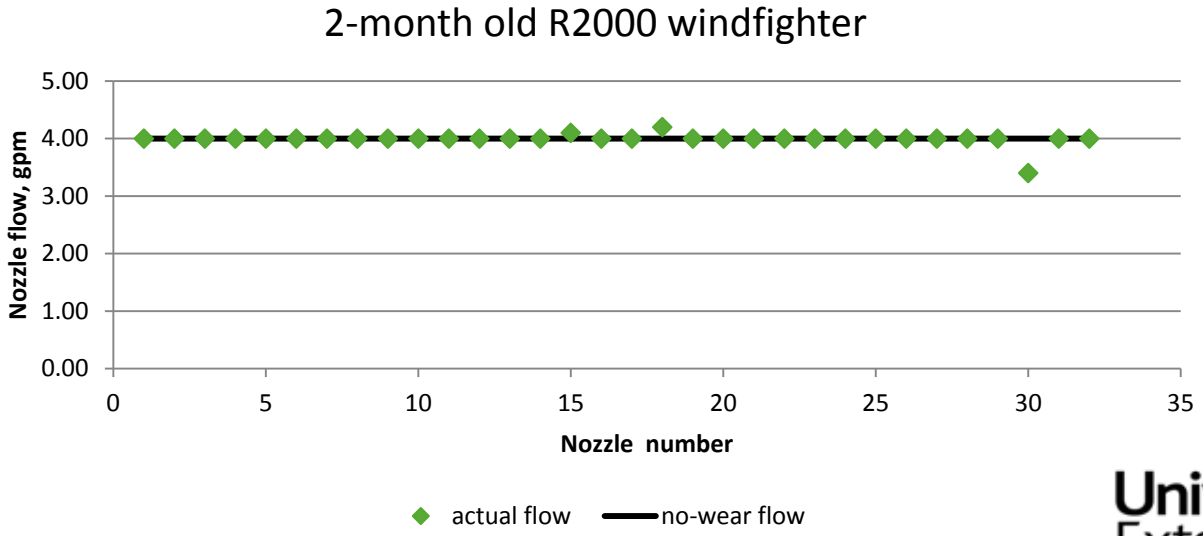
- Designed to reduce energy consumption by replacing worn or damaged irrigation system components
- Idaho Power provides incentives to customers
- Can submit invoices for incentives within one year from the date of purchase
- Components can be replaced for incentive only after three years of use
- Pivot packages are normally replaced after 10,000 hours of operation or 5 years of use.

Nozzle Wear and Flow

- If a drill bit does not tightly fit into the same size nozzle, wear has occurred.
- A loose fitting drill bit that has room for the width of one hair equals an increase in water flow of up to 20%

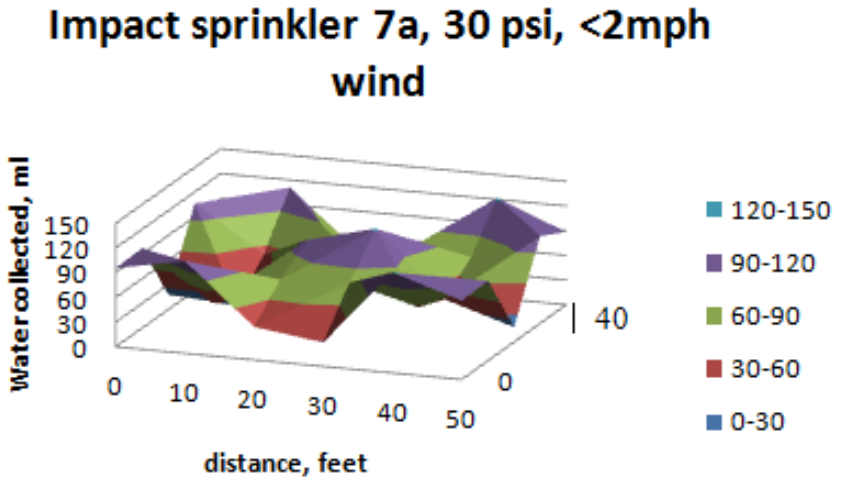
Worn Nozzles

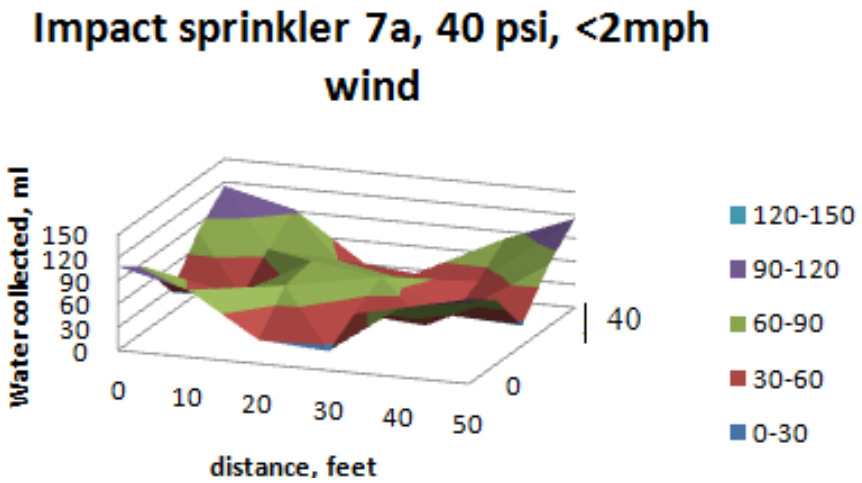


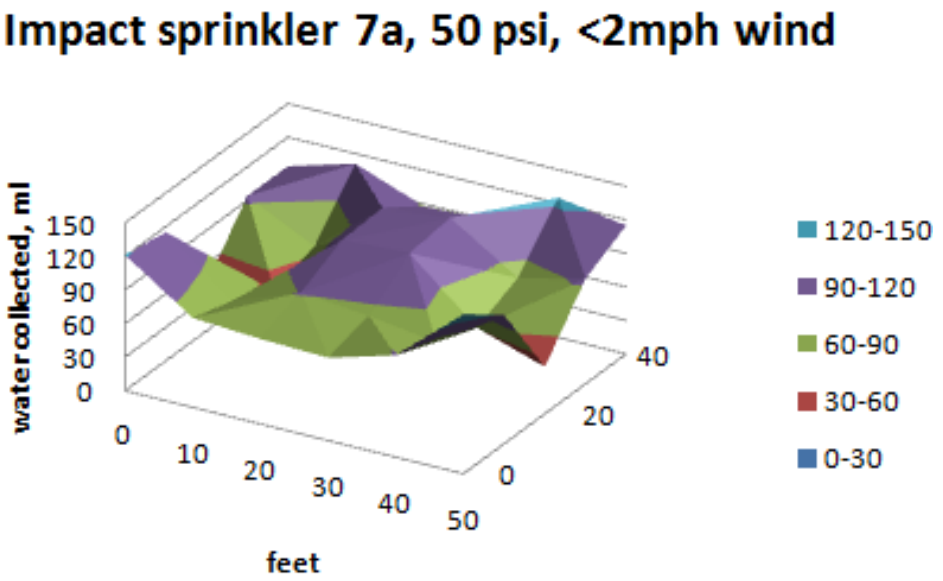


University of Idaho Extension

Sprinkler Application Uniformity







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¼ mile -- 32-Bird Line
20% Increase in Flow

29 GPM
1908 kWh/yr
$152.69

New or Rebuilt impact or rotating type sprinklers - $2.75

1.6 GPM
105 kWh/yr
$8.42

0.7 GPM
46 kWh/yr
$3.68

New or Rebuilt Levelers (leveler rebuild kits) $ 0.75

0.5 GPM
33 kWh/yr
$2.63

Complete pivot package (Regulator, Nozzle , Head) $8.00

5% wear
45 GPM
2937 kWh/yr
$234.96

Pivot Uniformity

Table 15. Estimated crop yield reduction in low quarter of the center pivot irrigated fields.

CU range	Percent of tested systems in CU range	Deficit in LQ area after applying 28 inches irrigation, inches	ET deficit, %[3]	Spring wheat yield reduction, %	Alfalfa yield reduction, T/ac	Sugar beet sugar yield reduction, %
70-79	25	9.2	33	38	1.8	25
80-85	36	7.0	25	29	1.4	16
85-89	18	5.8	21	24	1.2	12
90-94	21	3.0	11	13	0.6	5

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Goosenecks and Drop Tubes $1.00

0.9 GPM
44 kWh/yr
$3.54

Wheel Line Gaskets $1.00

0.5 GPM
33 kWh/yr
$2.63

Drains (pivot and wheel-line)
$3.00

1.7 GPM
112 kWh/yr
$8.95

0.4 GPM
26 kWh/yr
$2.10

Riser caps and valve opener gaskets $1.00

3.9 GPM
257 kWh/yr
$20.53

Hand-line and portable main-line Gaskets $1.00

10 GPM
658 kWh
$52.65

6.4 GPM
421 kWh/yr
$33.70

Thunderbird® brand wheel-line Hubs $12.00

5.

5.2 GPM
342 kWh/yr
$27.38

Cut, Press, Weld repair of hand-line, wheel-Line, portable mainline $8.00

21 GPM
1382 kWh/yr
$110.57

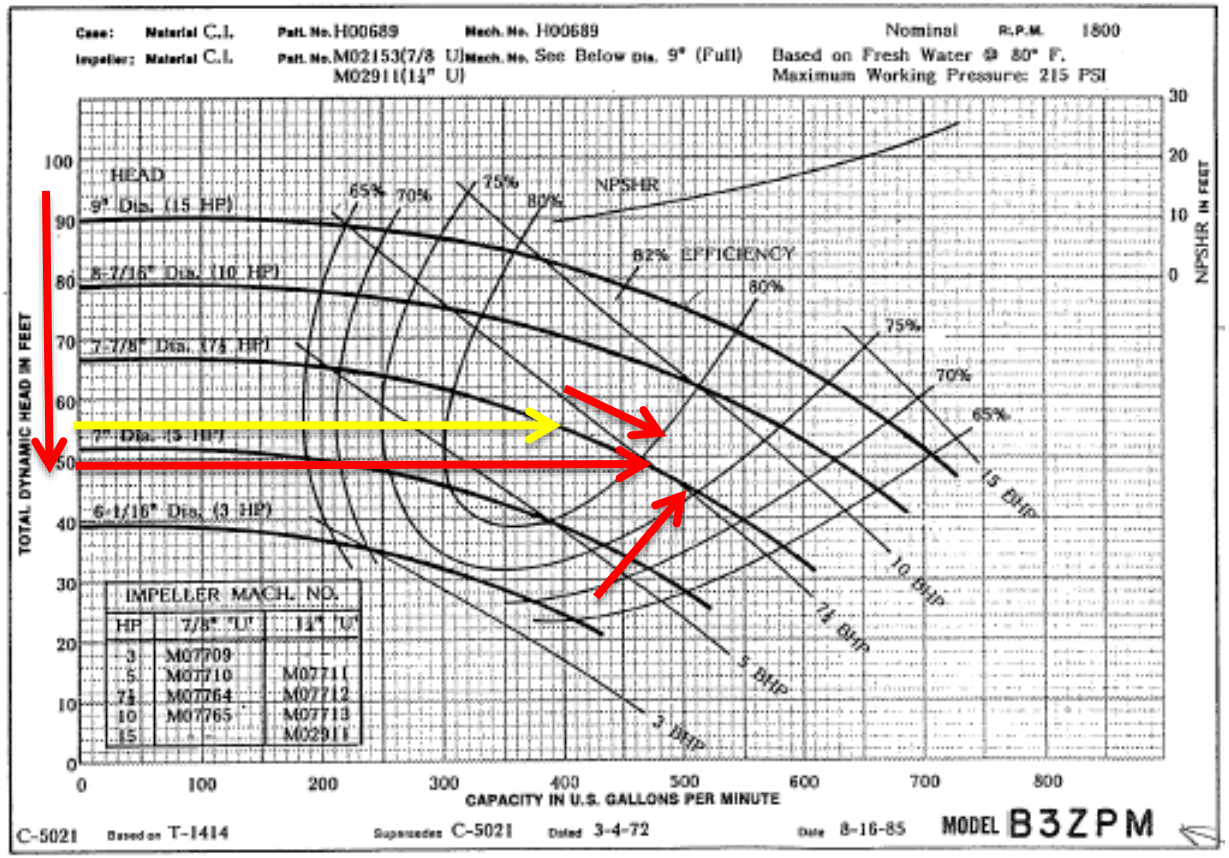
Center Pivot Base Boot Gasket $125.00

0.5 GPM
33 kWh/yr
$2.63

How does worn equipment effect my pump?

As the pump increases flow due to leaks:

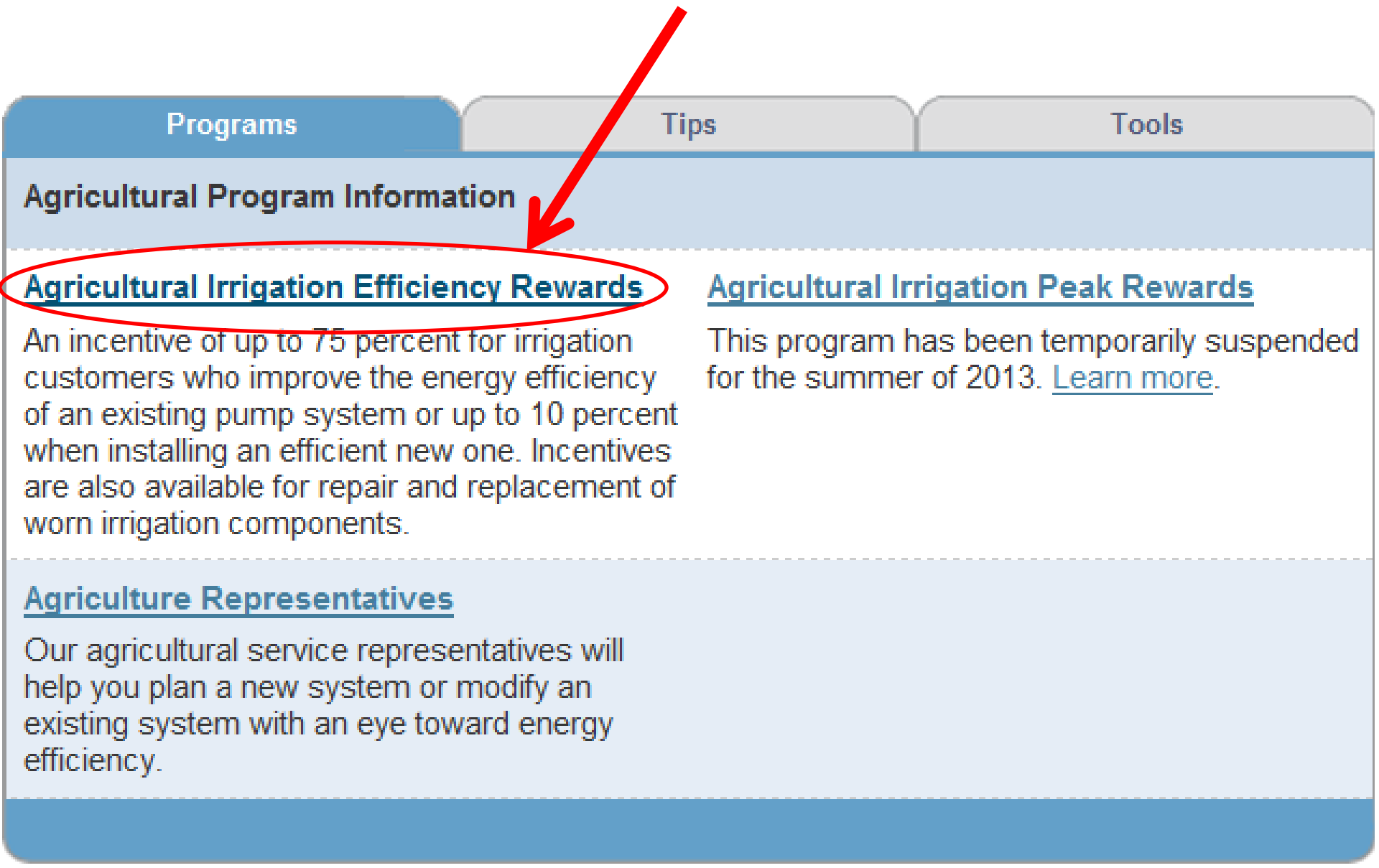
- Pump moves out on its curve
- Decreases pump efficiency
- Reduces operating pressure (TDH)
- Increases HP requirement and $$$
- Can move into the service factor (1.15)
- Decreases application uniformity resulting in yield loss
- Macro/micro nutrient loading-Chemigation



*overly wetted areas are more susceptible to disease and runoff.

Energy Efficiency → Irrigation

Under programs find:



Printable PDF's in Related Information

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Irrigation Efficiency Rewards Program

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Idaho Power's Irrigation Efficiency Rewards encourages energy-efficient equipment and design in irrigation systems.

Irrigators can receive financial incentive and reduce electric bills.

We'll help you pay for energy-efficiency features in your irrigation system and help you use electricity in an economical manner.

Earn incentives from Idaho Power by:

- Installing a new, more efficient system.
- Making energy-efficient improvements to an existing irrigation system.

Participate in one or two ways:

- The Custom Incentive addresses extensive retrofits of existing systems or new irrigation systems.
- The Menu Incentive covers a significant portion of the costs of repairing and replacing specific components that help the irrigation system use less energy.

Customers now only have one year from the date of purchase to be eligible for the Menu incentives.

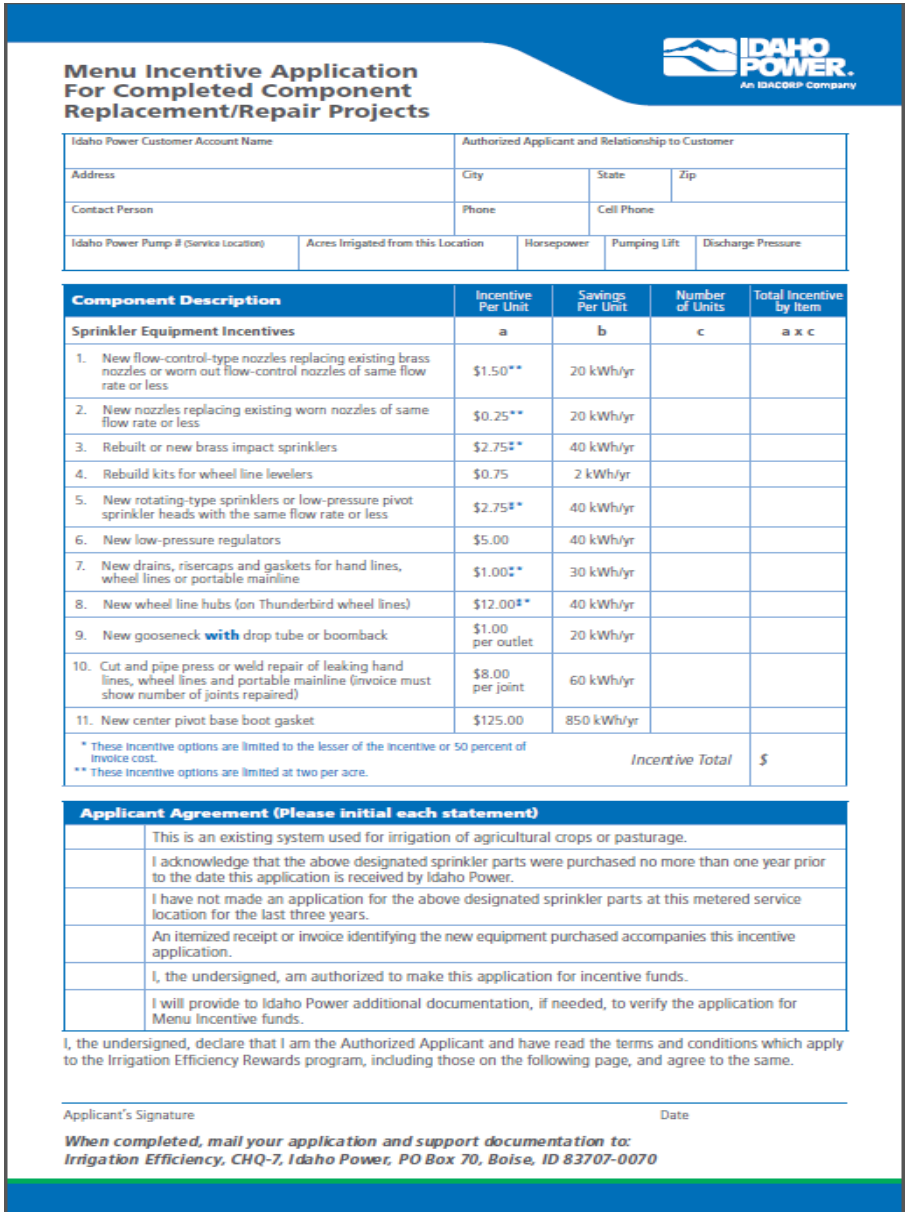
Related Information

- Program Details (PDF)
- Custom Incentive Application (PDF)
- Menu Incentive Application (PDF)
- Agreement (PDF)
- Area Agriculture Representatives
- Irrigation Energy Saving Ideas (PDF)
- Success Stories

Menu Incentive Application

Printable PDF as found on www.idahopower.com/irrigation

Can also be found at your area irrigation dealers and from your local area Idaho Power Ag-Rep.



Menu Incentive Application For Completed Component Replacement/Repair Projects

IDAHO POWER. An IDACORP Company

Idaho Power Customer Account Name		Authorized Applicant and Relationship to Customer		
Address		City	State	Zip
Contact Person		Phone	Cell Phone	
Idaho Power Pump # (Service Location)	Acres Irrigated from this Location	Horsepower	Pumping Lift	Discharge Pressure

Component Description	Incentive Per Unit	Savings Per Unit	Number of Units	Total Incentive by Item
Sprinkler Equipment Incentives	a	b	c	a x c
1. New flow-control-type nozzles replacing existing brass nozzles or worn out flow-control nozzles of same flow rate or less	$1.50**	20 kWh/yr		
2. New nozzles replacing existing worn nozzles of same flow rate or less	$0.25**	20 kWh/yr		
3. Rebuilt or new brass impact sprinklers	$2.75***	40 kWh/yr		
4. Rebuild kits for wheel line levelers	$0.75	2 kWh/yr		
5. New rotating-type sprinklers or low-pressure pivot sprinkler heads with the same flow rate or less	$2.75***	40 kWh/yr		
6. New low-pressure regulators	$5.00	40 kWh/yr		
7. New drains, risercaps and gaskets for hand lines, wheel lines or portable mainline	$1.00***	30 kWh/yr		
8. New wheel line hubs (on Thunderbird wheel lines)	$12.00***	40 kWh/yr		
9. New gooseneck **with** drop tube or boomback	$1.00 per outlet	20 kWh/yr		
10. Cut and pipe press or weld repair of leaking hand lines, wheel lines and portable mainline (invoice must show number of joints repaired)	$8.00 per joint	60 kWh/yr		
11. New center pivot base boot gasket	$125.00	850 kWh/yr		
* These incentive options are limited to the lesser of the incentive or 50 percent of invoice cost. ** These incentive options are limited at two per acre.			*Incentive Total*	$

Applicant Agreement (Please initial each statement)	
	This is an existing system used for irrigation of agricultural crops or pasturage.
	I acknowledge that the above designated sprinkler parts were purchased no more than one year prior to the date this application is received by Idaho Power.
	I have not made an application for the above designated sprinkler parts at this metered service location for the last three years.
	An itemized receipt or invoice identifying the new equipment purchased accompanies this incentive application.
	I, the undersigned, am authorized to make this application for incentive funds.
	I will provide to Idaho Power additional documentation, if needed, to verify the application for Menu Incentive funds.

I, the undersigned, declare that I am the Authorized Applicant and have read the terms and conditions which apply to the Irrigation Efficiency Rewards program, including those on the following page, and agree to the same.

Applicant's Signature Date

When completed, mail your application and support documentation to:
Irrigation Efficiency, CHQ-7, Idaho Power, PO Box 70, Boise, ID 83707-0070

Irrigation Efficiency Rewards
"Custom" Program Details

– 2 Options

- For significant changes to an Existing system or for installing a New system
  - **Existing system**
    - Farm ground that is currently pressure irrigated
    - $0.25 per annual kWh saved, or $450.00 per kW saved --**multiplied by the amount of savings calculated to happen in one season**
    - Not to exceed 75% of project cost
  - **New System**
    - Currently gravity irrigated or water source change
    - $0.25 per annual kWh saved
    - Not to exceed 10% of project cost

– Must apply before project begins

Irrigation Efficiency Rewards Custom Option

Existing & New Systems

Considerations:

- Can your system operate at a lower pressure?
- Can you create different pressure zones from elevation differences or type of system (low pressure pivot with high pressure hand-line corners)?
- Do you have pressure loss from undersized mainline?
- Can you install a higher efficiency pump?
- Can you reduce flow?
- Should you install multiple pumps or a Variable Frequency Drive (VFD) because your system operates a substantial number of hours at different flows or pressures?
- Are you changing from a high pressure (i.e. hand-line) to a low pressure (pivot) system?
- Do you have a water source change (deep well to canal)?
- Do you want to change from furrow irrigation to a pressurized system?
- Can you utilize some gravity pressure of offset Horsepower (HP) requirements.

Must apply and get approval before project begins

Existing System Upgrades and Modifications

Reducing Pressure

- Can you operate your system at a lower pressure?
  - Change from a high pressure hand-line/wheel-line/or pivots system (50 psi) to a low pressure center pivot (25 psi)
  - Trim Impeller
  - Use an End Gun Booster pump
  - To small of mainline causes increased friction (pressure) losses
    - Higher flow pivots with small diameter spans can also create significant pressure losses due to friction in the first few spans

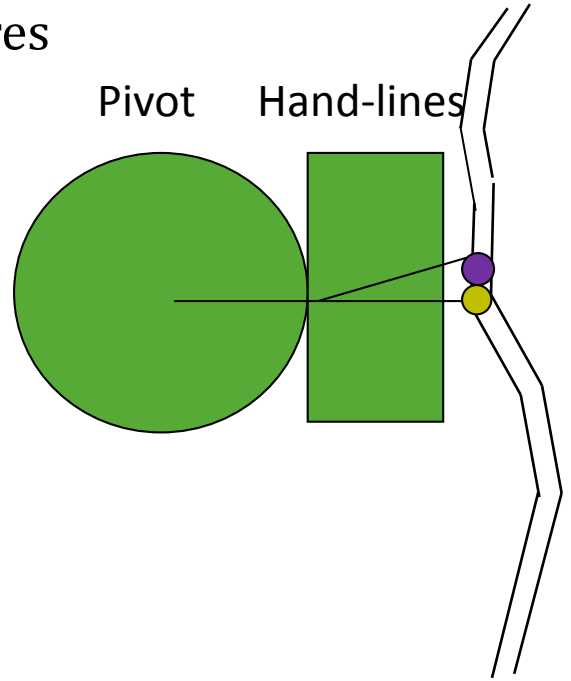
Reducing Pressure (continued)

- Create pressure zones with multiple pumps or variable frequency drive (VFD)
  - Significant elevation changes require different pressure at the pump
  - Single pump operating hand-line or wheel-lines and a low pressure pivot requires two different pressures

- Single Pump – one pressure zone
- 65 Hp for both- 1500 gpm @ 60 psi
- probably put in a 75 Hp

Versus

- Two pumps – two pressure zones
- 25 Hp for Pivot - 900 gpm @ 40 Psi
- 20 Hp for Wheel lines- 600 gpm @ 60 psi
- Annual savings $ 2600



Pump Efficiency

- Can you install a higher efficiency pump?
  - Replace old worn pump with one appropriately designed
    - Idaho Power Agricultural Representatives offer free irrigation system audits to determine the efficiency of your irrigation system. Our certified reps can provide ideas and recommendations to make your system more efficient and increase your bottom line.

Reducing Flow

- Can you reduce your overall flow?
  - Improve application efficiency and water distribution uniformity
    - Proper spacing sprinkler heads
    - Proper drop length on pivots
    - Correct nozzle size

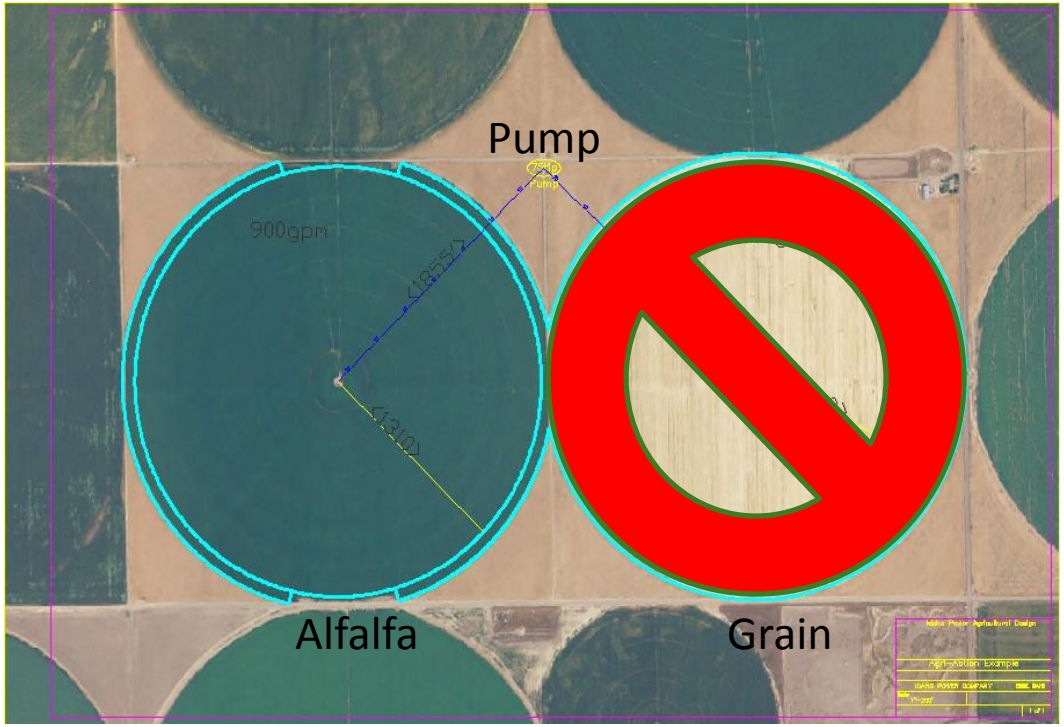
Reducing Flow (continued)

- Install a VFD
  - Short season and long season crops can require different flow outputs from a single system pump
  - Complex systems requiring multiple flow conditions

Example - two crops
2 pivots- 900 gpm each
65 HP @ 1800gpm (alfalfa & grain)

Harvest Grain crop – VFD adjusted for reduced flow requirement

35 HP @ 900 gpm (alfalfa)
Estimated 17,800 kWh's ($1424) saved for the rest of the irrigation season

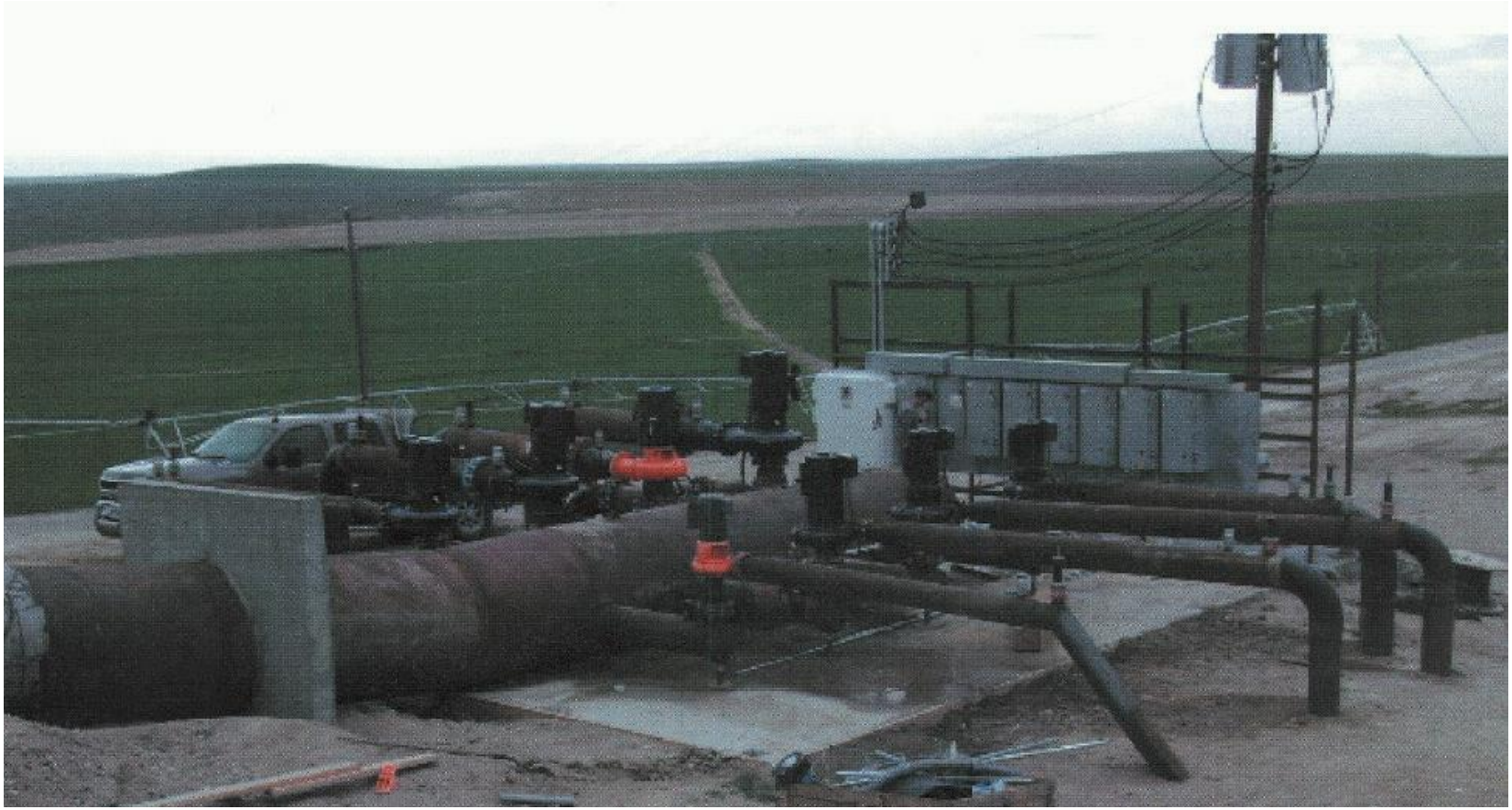


New Irrigation System

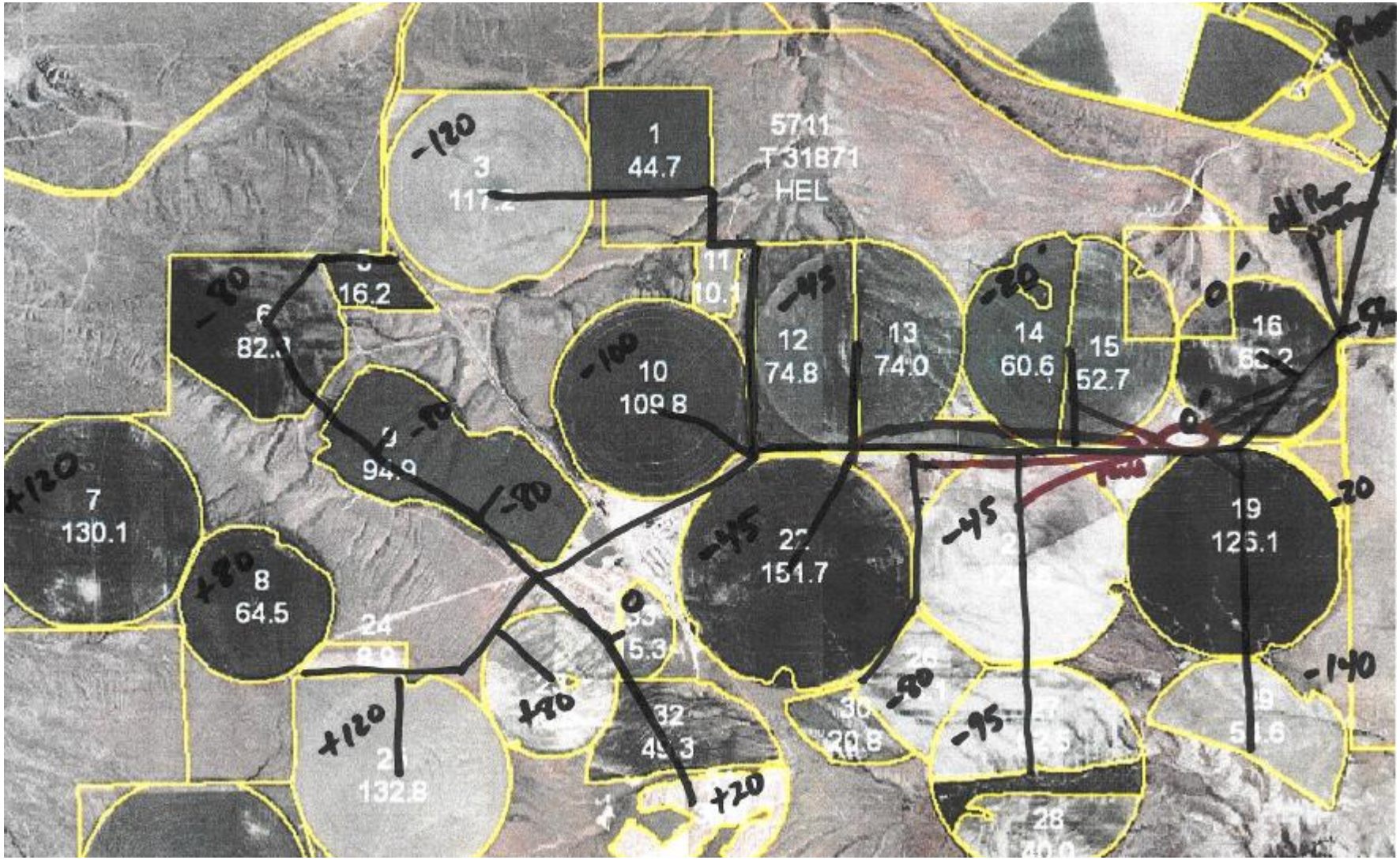
- Are you changing from a furrow irrigation system to a pressurized system?
- Are you changing your source of water?
  - Deep well to canal or surface water
  - Utilizing gravity pressure to offset pumping horsepower requirement

When designing a new irrigation system, ensure that the pump is designed at the appropriate pressure, flow, and efficiency. Just because a pump will do the job, doesn't mean it will do it efficiently

Eight pumps all different Pressures



Pond with Separate Pressure Zones



Ag-Reps

- Perform wire-to-water pump tests
- Perform system audits
- Help with irrigation system designs
- Demonstrate potential energy savings and reduced power costs
- Help with billing issues
- Rectify access issues
- Act as a liaison to other company personnel
- Act as a representative for you to Idaho Power

Ag Reps

Dennis Elison, 236-7744 – Blackfoot

Dan Erskine, 642-6546 – Payette

Troy Winward, 736-3430 – Twin Falls

Daniel Moore, 736-3215 –Mini-Cassia

Mike Liechty, 465-8626 – Nampa

Tim Fenwick, 388-6366 – Mtn. Home

Daniel Axness, 388-2586 – Support

Dennis Merrick, 388-2379 – Support

Questions?

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