Ground Water Impacts From Canal Leakage
Ground Water Impacts From Canal Leakage

• Defining canal leakage
• Quantifying leakage
• Salinity impacts from canals
• Mitigating impacts of canal leakage
What Is Canal Leakage?
Is This a Problem?
At what point do you decide to do something about it?

1. Waste of water? Quantity issues
2. Acreage loss to weeds and wet ground?
3. Water quality problems with salinity?
Canals Leak

• How do we know?

• Are you sure its not just over irrigation?
How Do We Tell?

- Its obvious – visual
  - Yeah but what you assume isn't always the way it is.
- Monitoring Wells
- Flow measurements
Ground Water Impacts From Canal Leakage

• Defining canal leakage
• Quantifying leakage
• Salinity impacts from canals
• Mitigating impacts of canal leakage
Quantifying Leakage
Install Monitoring Wells
Ground Water Impacts From Canal Leakage

• Defining canal leakage
• Quantifying leakage
• Salinity impacts from canals
• Mitigating impacts of canal leakage
Seep Below Canal In Clay Till

Irrigation Season

- Seep
- Canal
- Ground water
- Well
- Clay Till
- Marine Shale
Seep Below Canal In Clay Till
Winter Season

Seep
Canal
Ground water
Well
Clay Till
Ground water
Marine Shale
Seep Below Canal In Alluvium
Irrigation Season
Seep Below Canal In Alluvium
Winter Season

- Seep
- Canal
- Alluvium
- Winter Season
- Ground water
- Well
- Marine Shale
Dryland Saline Seep With Canal In Portion Of Recharge Area
Fort Peck Irrigation Project
Ground Water Impacts From Canal Leakage

• Defining canal leakage
• Quantifying leakage
• Salinity impacts from canals
• Mitigating impacts of canal leakage
Now that we proved it leaks
What should we do?

• Line it with a fabric liner
• Put it in a pipe
• Put in a curtain
• Spray it with PAM (polyacrylamide).
Fabric Liner

- Major bucks!!
- In Conrad on the P-Canal the NRCS through PL-566 lined 4477 feet for $282,590.00
- $63.00 per foot
P-Canal SPMR-01

Cross Section 1

Well Number

110 130 150 170 190 210 230

Relative Elev (ft)

Ground Surface

T28N R2W Sec. 30

Colorado Shale Formation

Water Table July 2007

Well Casing

Grass

Canal

CRP
P - Canal Hydrograph
Below Canal - Unlined Portion
Well 121

Water Table - Depth Below Ground Surface

Measurement Date

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<th>2007</th>
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Cross Section 4

Well Number 110

Relative Elev (ft)

T28N R2W Sec. 30

CRP

Colorado Shale Formation

Well Casing

Water Table July 2007

Seep

P-Canal SPMR-01

107 106 102 101
Put it in a pipe

- The Fort Peck Irrigation Project is doing that.

- 3.5 miles of canal in a pipe for $500,000

- $27.00 a foot
Install a Curtain
Install a Curtain

• The Pondera Canal Company installed two areas with a curtain.
• 1,200 feet of liner (1000’ stretch and 200’ stretch).
• The total cost was $5,160.00 with labor, supplies and equipment
• $4.30 per foot
P - Canal Hydrograph
Below Canal - Cutoff Curtain
Well 140

Water Table - Depth Below Ground Surface

Measurement Date

Feet
Spray on liner
Spray on Liner
PAM

Costs: The Pondera Canal Company applied PAM on 14.6 acres at $410.00/ac

They applied it to 14.6 acres for $5,986.00

$0.20 per foot on an average canal
P - Canal Hydrograph
Well 125

Water Table - Depth Below Ground Surface

Measurement Date

Feet

2005
2006
2007
Questions?