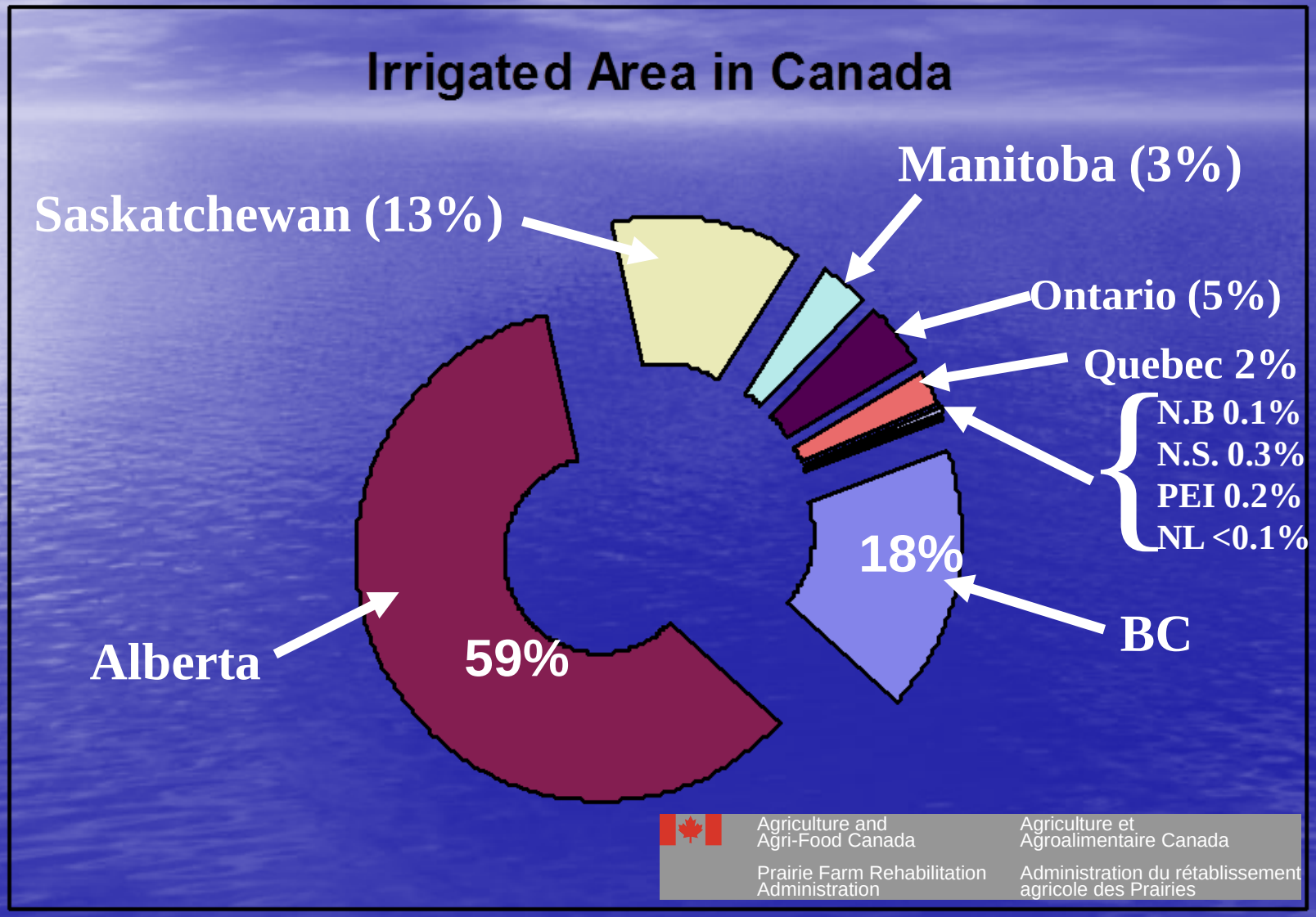
IRRIGATION INVESTMENT OPPORTUNITY
CANADIAN PRAIRIES
LAKE DIEFENBAKER, SASKATCHEWAN

- 500,000 irrigable acres to develop
- high quality water available
- irrigable land under $1,500/acre
- 2,200 CHU 9 years out of 10; 115 frost-free days
- potatoes, beans, corn, alfalfa & many more crops

CONTACT:
Saskatchewan Ministry of Agriculture
Irrigation Branch
(306) 867-5500
www.irrigationsaskatchewan.com

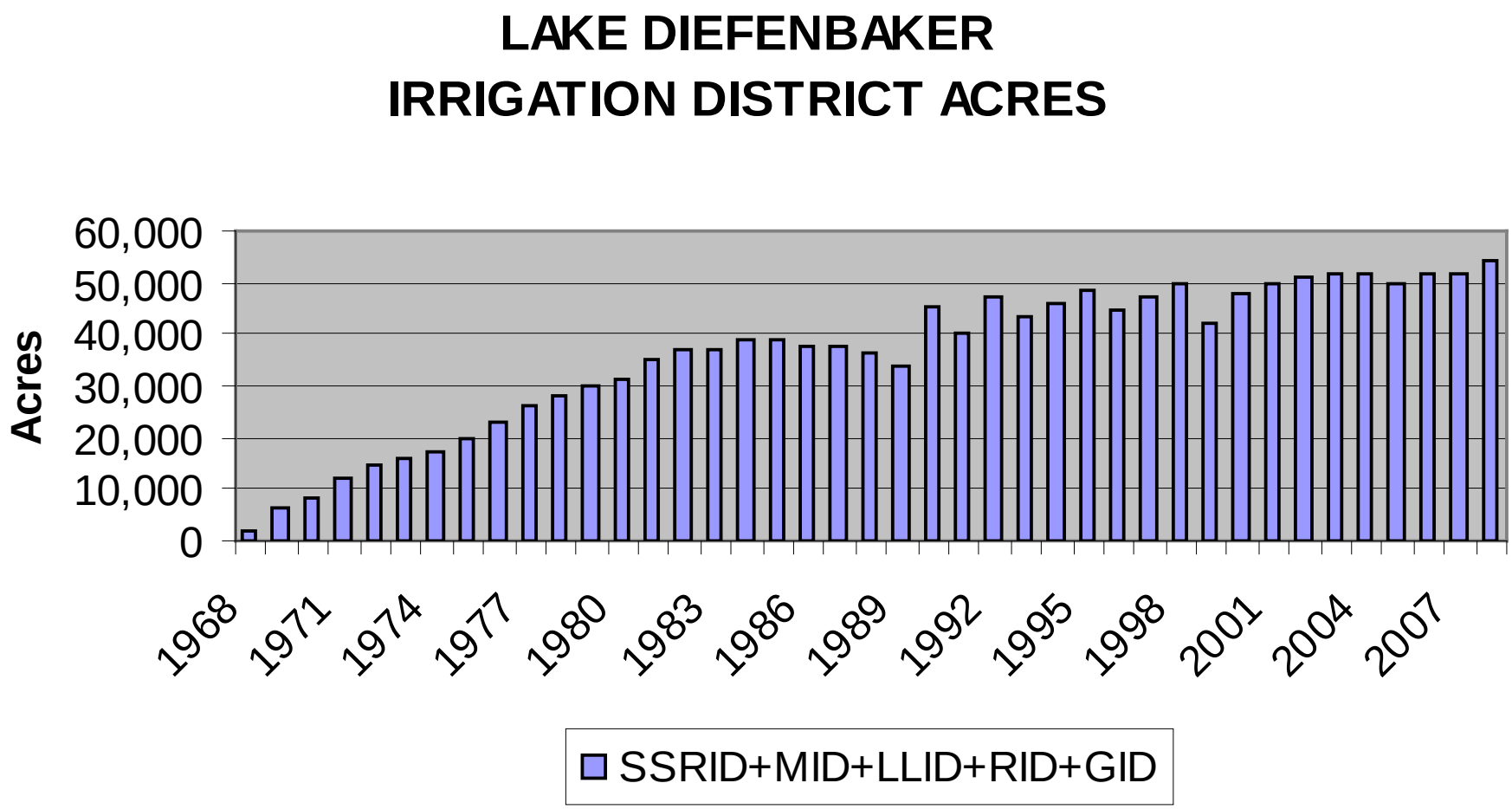

Irrigated Area in Canada
Manitoba (3%)
Saskatchewan (13%)
Ontario (5%)
Quebec 2%
N.B 0.1%
N.S. 0.3%
PEI 0.2%
NL <0.1%
18%
BC
Alberta
59%
Agriculture and Agri-Food Canada
Agriculture et Agroalimentaire Canada
Prairie Farm Rehabilitation Administration
Administration du rétablissement agricole des Prairies

Canada's Irrigation Potential

Province	Irrigated Area (Ha)	Potential Area	Potential % increase
BC	121,408	182,113	150%
Alberta	728,450	1,011,736	139%
Saskatchewan	80,939	404,694	500%
Manitoba	30,352	60,704	200%
Ontario	60,704	202,347	333%
Quebec	25,000	35,000	140%
New Brunswick	500	575	115%
Nova Scotia	3,642	7,285	200%
PEI	2,023	4,047	200%
Newfoundland	45	136	300%
CANADA	1,053,065	1,908,637	181%

Madramootoo CWRA 2004

Lake Diefenbaker Irrigation District Expansion

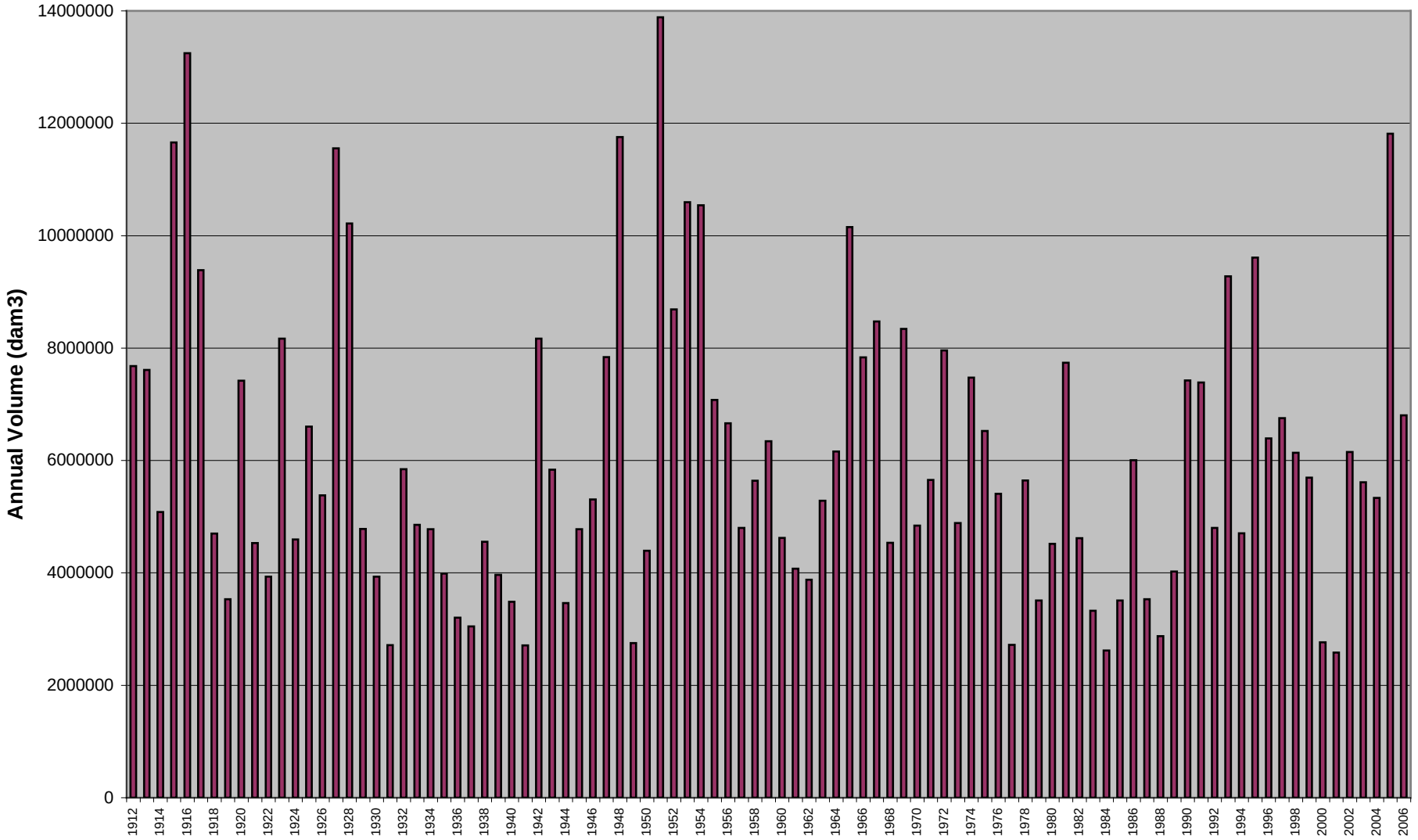


Lake Diefenbaker
Gardiner Dam

- 9.4 million dam^3 total storage
- 64m high dam x 5000m wide
- 225km long lake with 800km shoreline
- 45% of SK population's drinking water source

Lake Diefenbaker Net Annual Inflow 1912 - 2006

(Alberta at “Maximum” Level of Development)



Water Supply (CSWSEP)

Lake Diefenbaker Water Supply Study

Water supply analysis was completed for the Westside irrigation project study (SWA April 2006)

- Inflows corrected to theoretical maximum level of development in Alberta

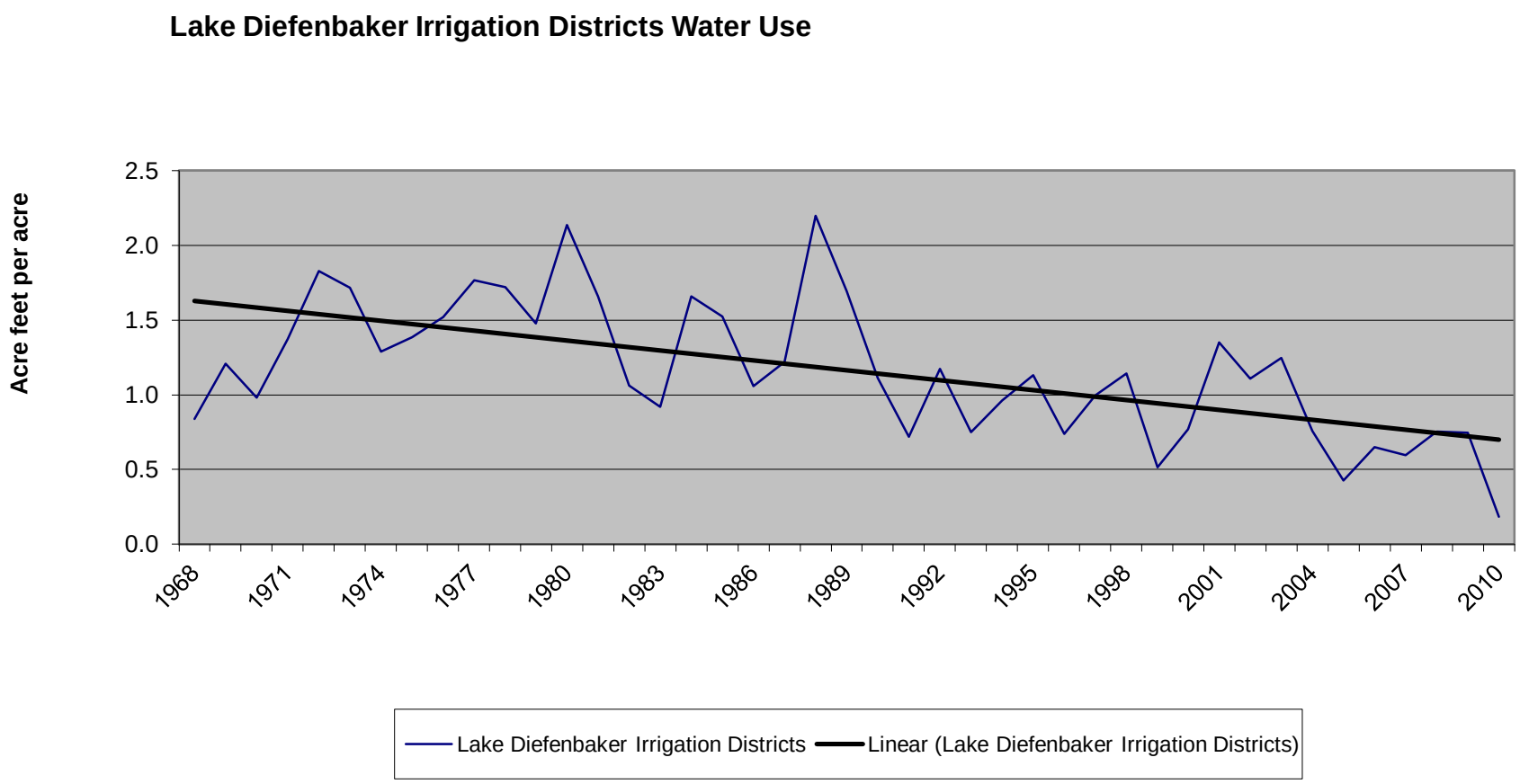
Lake Diefenbaker:

Surface area	43,000 ha (106,000 acres)
Useable storage	4,300,000 dam3 (3,500,000 ac. ft.)
Average inflow	5,800,000 dam3 (4,700,000 ac. ft.)
South Sask. River releases	50 m^3/sec (1,280,000 ac. ft.)
Qu'Appelle River releases	270,000 dam^3/year
Average evaporation losses	270,000 dam^3/year (219,000 ac. ft.)

Water Supply - Conclusions

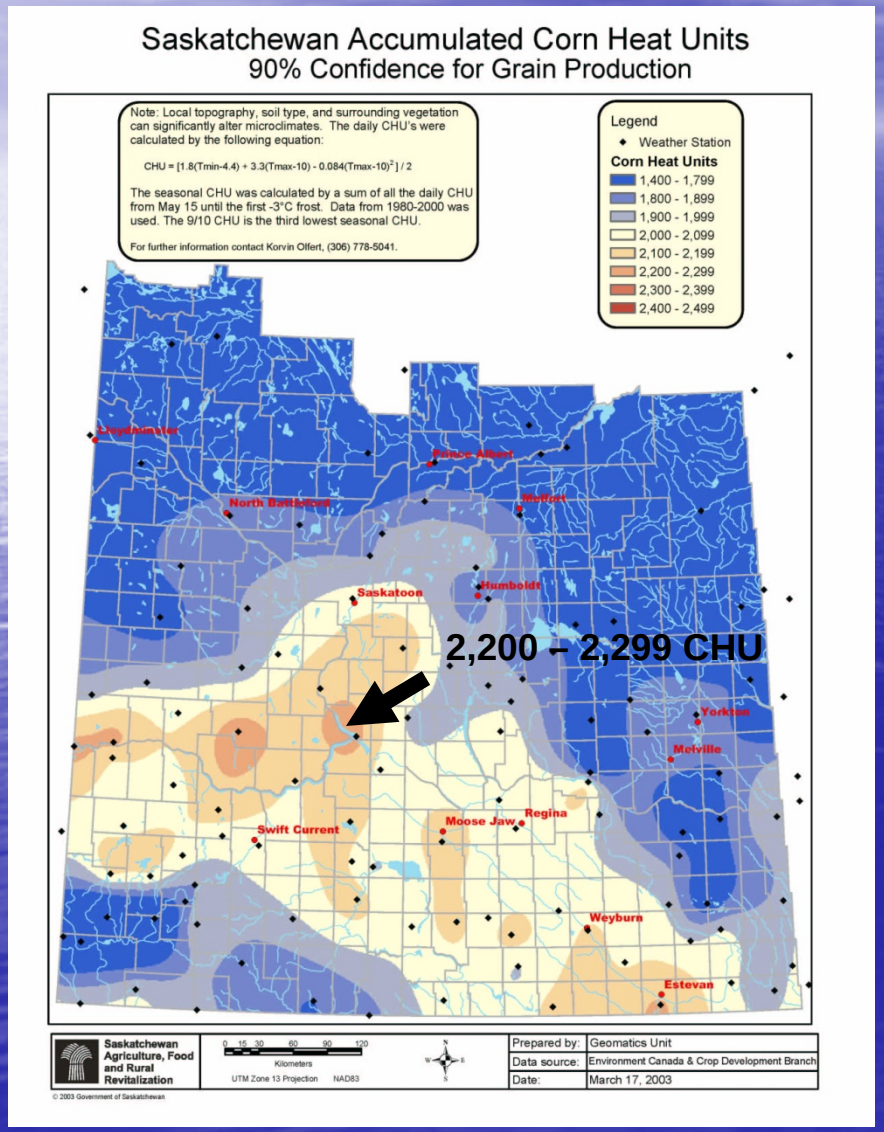
- Study concluded that 740,000 dam^3 (600,000 ac ft) is available if irrigation water shortages in at least 10% of the years is acceptable
- No allocation to irrigation without a provincial water management strategy

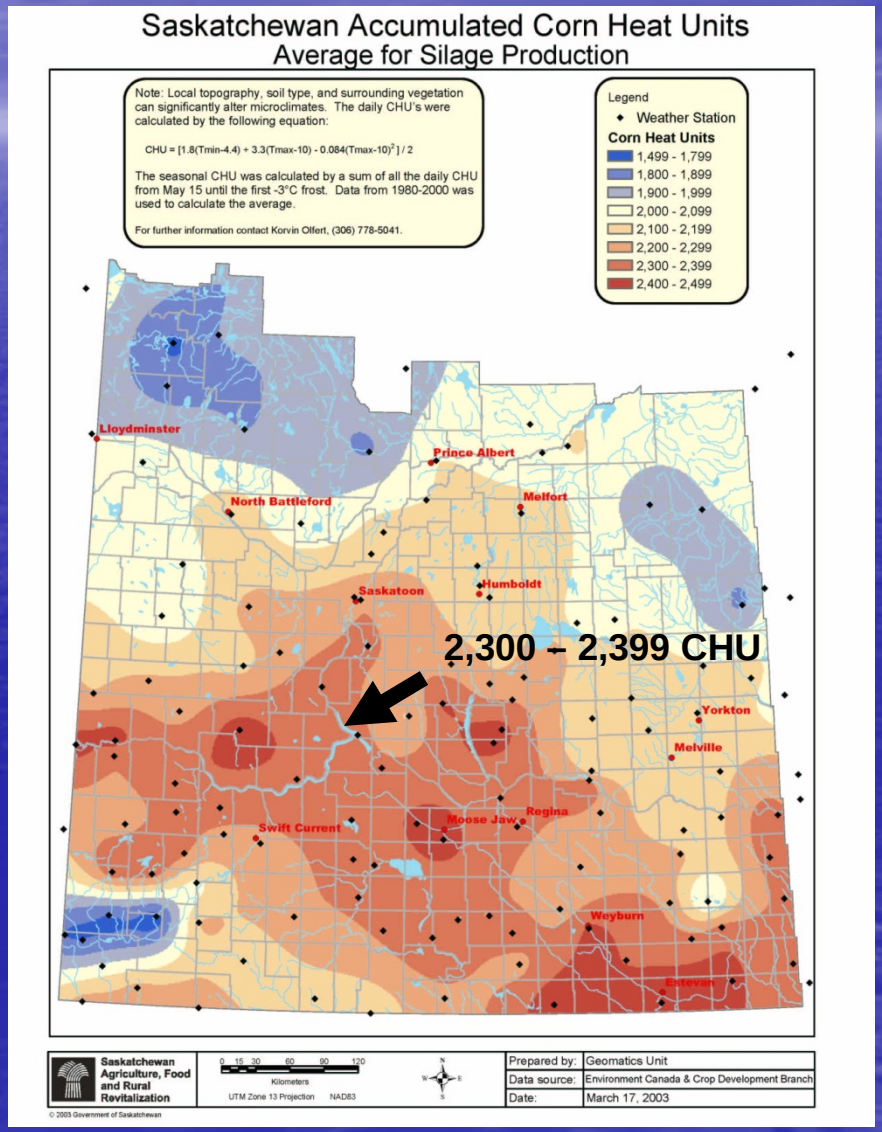
Irrigation Water Use



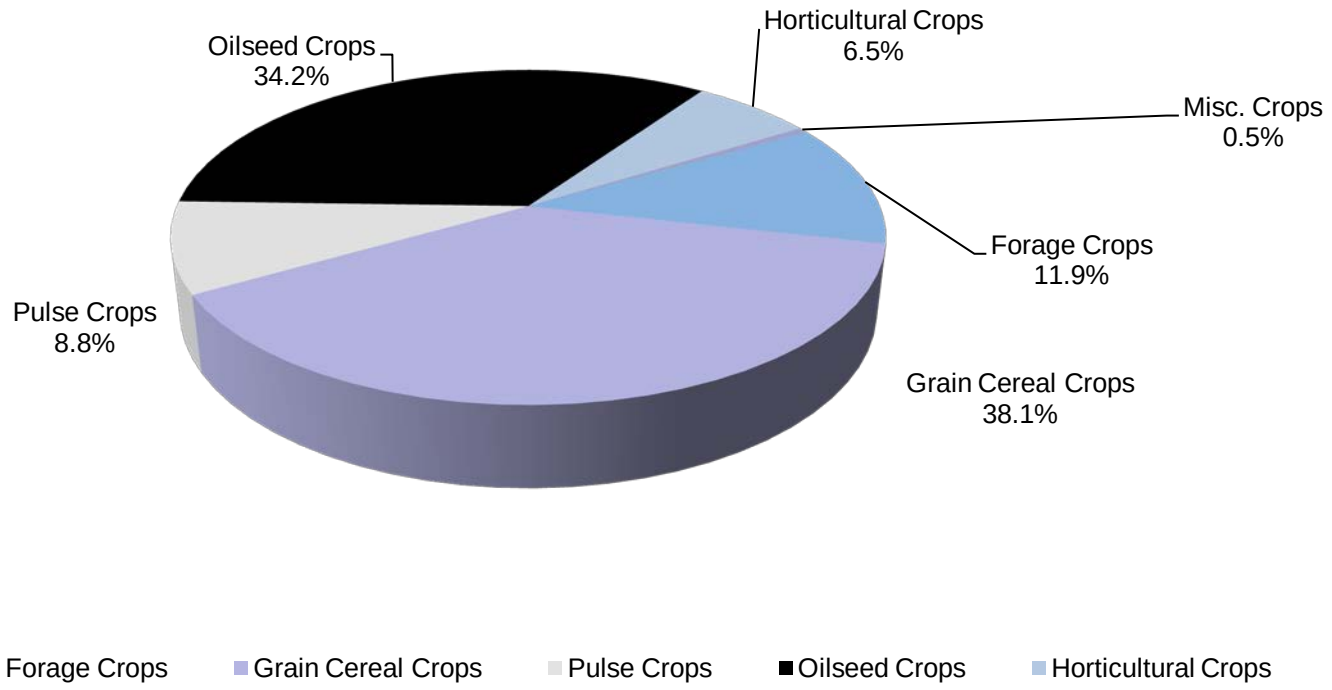
Low pressure centre pivots

Climate for Cropping





Lake Diefenbaker Crop Mix 2011



Crop Rotation: Forages 12%

Crop Rotation: Cereals 38%

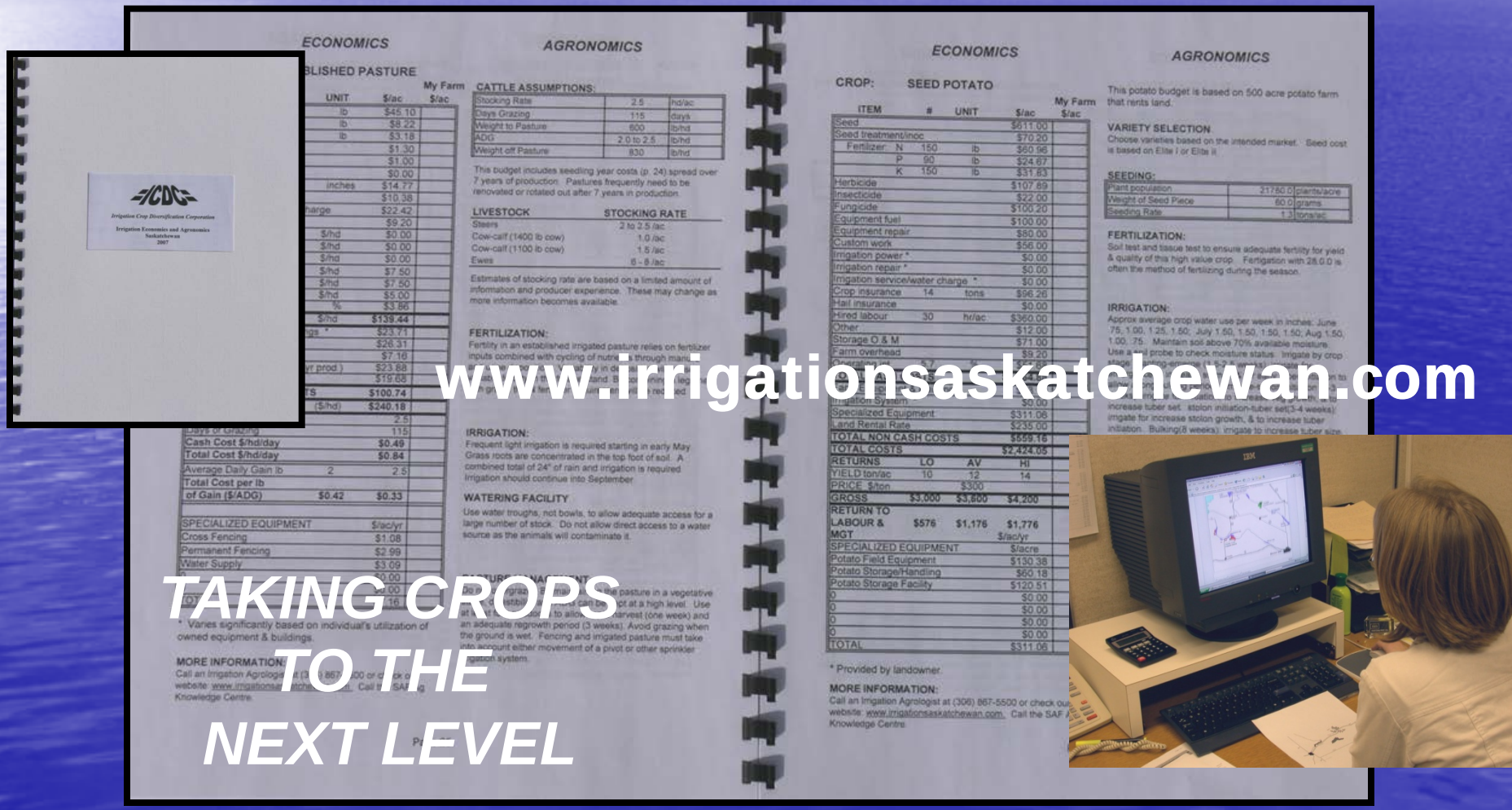
Crop Rotation Oilseeds 34%

Crop Rotation: Pulses 9%

Crop Rotation: Vegetables 6.5%

Crop Rotation: Misc. 0.5%

Irrigated Crop Budgets



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TAKING CROPS TO THE NEXT LEVEL

Irrigated Crop Budgets 2011

Crop	Gross $/ac*	Rotation %	Contribution $/ac	Contribution %
Horticulture (Potatoes)	**$4392**	**7%**	**$307**	**37%**
Pulse (Dry Beans)	**$691**	**9%**	**$62**	**7.5%**
Oilseeds (Canola)	**$660**	**34%**	**$224**	**27%**
Cereals (Hd Wheat)	**$488**	**38%**	**$185**	**22.5%**
Forages (Alfalfa)	**$360**	**12%**	**$43**	**6%**
*** 80% of target (Majority Crop)**		**Irrigation Output ($/ac)**	**$821**	

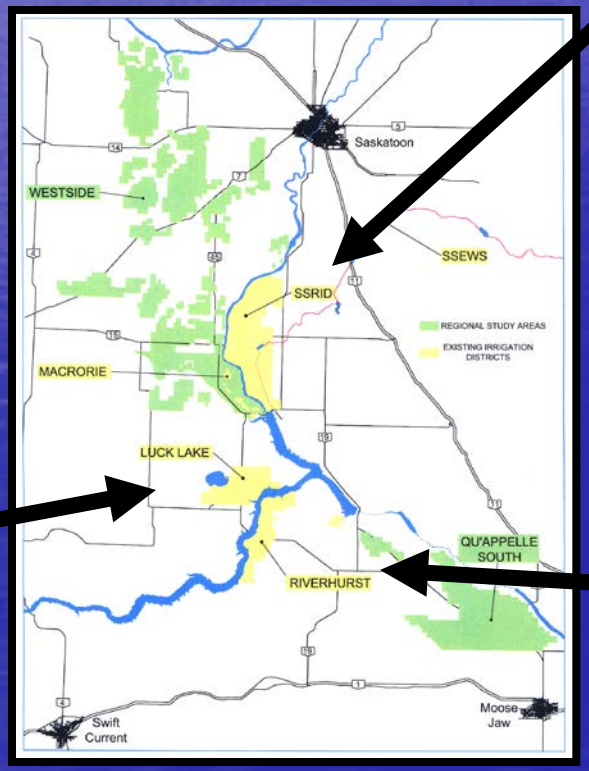
<u>Irrigation:</u> $821 x 100,000 acres = $82,100,000 / year around Lake Diefenbaker

Cost of Irrigation $/ac for 12” 2011

SSRID

$27.20

Plus on-farm pumping



Luck Lake ID

$62.96

Riverhurst ID

$57.42

On-Farm Irrigation Cost 2011

Quarter section pivot (133ac)

• Irrigation Certification	$1,300
• Centre pivot	$80,000
• Pivot pad	$1,600
• Mainline (10”)($5.32/ft)	$9,900
• Trenching ($2.25/ft)	$4,185
• Wiring	$2,325
• Fittings	$1,500
• *Intake well/screen	$1,500
• *Turbine pump/motor (30hp)	$10,000
• Powerline ($25,000/mile)	
TOTAL	**$112,310

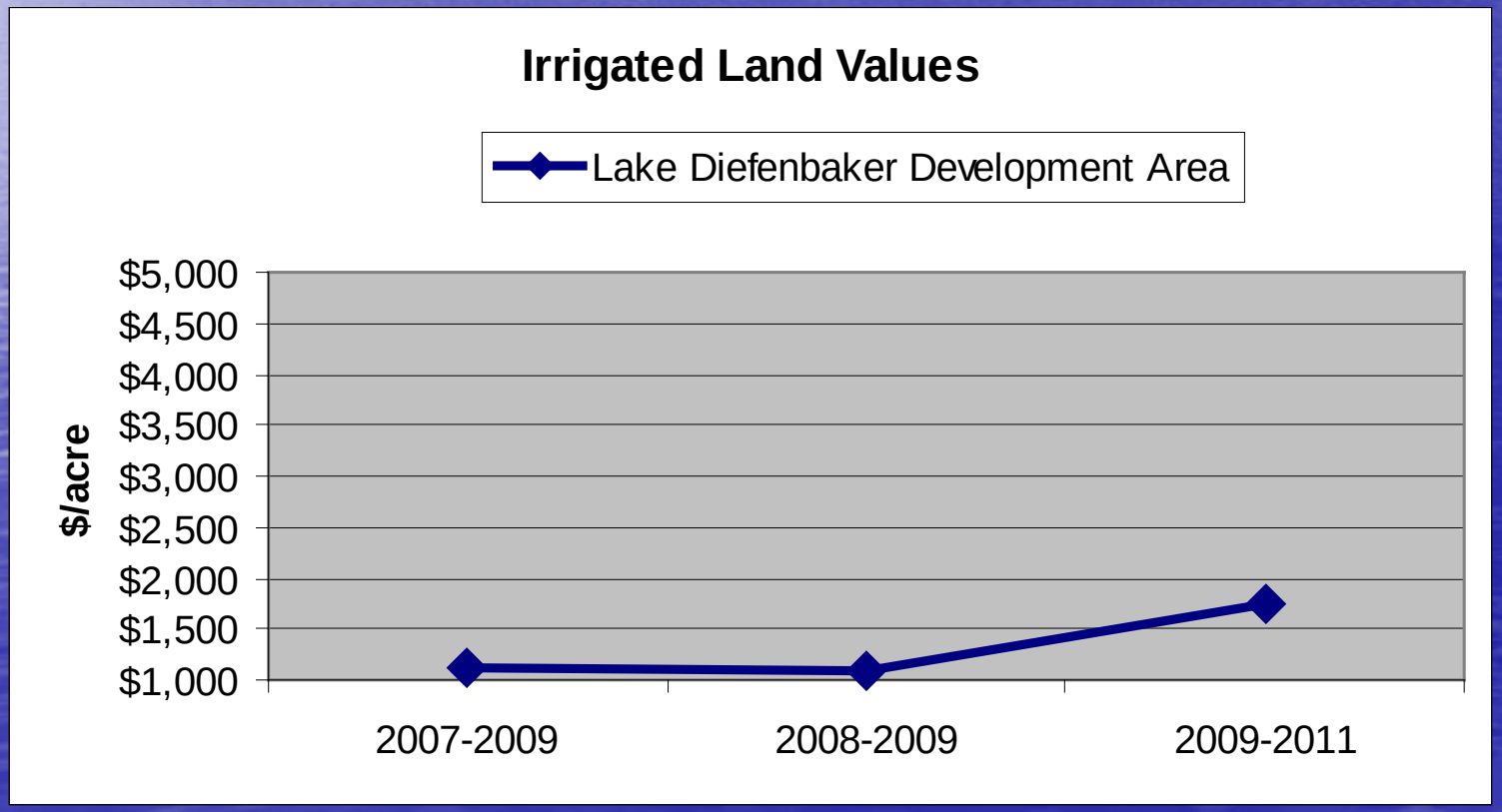
* Not required for pressurized mainline districts

** Plus GST & PST

Irrigated Land Values

Average selling price for Irrigated Land

$ / ac



Source: Farm Credit Canada; Ministry of Agriculture's Lands Branch

The Irrigation Act, 1996

Irrigation Certification

- Soil/Water compatibility
- Environmental sustainability

Irrigation Districts

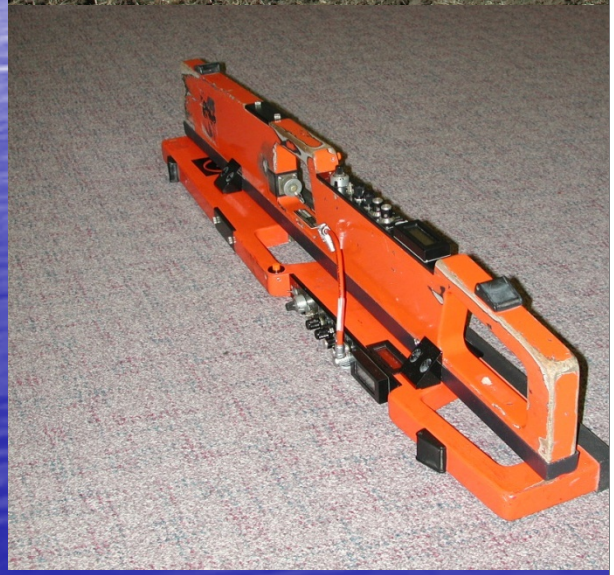
- Incorporated under the Act
- Pay 100% of operation, maintenance and administration costs plus Irrigation Replacement Fund contributions

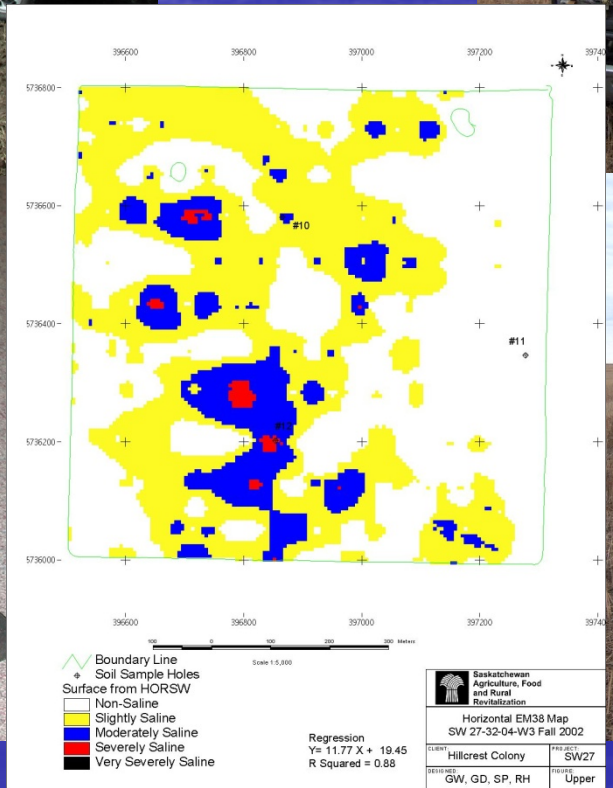
Irrigation Crop Diversification Corp.

- R&D
- Education

Irrigation Certification

Environmental Sustainability





Irrigation R&D Support

The Canada Saskatchewan Irrigation Diversification Centre (CSIDC)

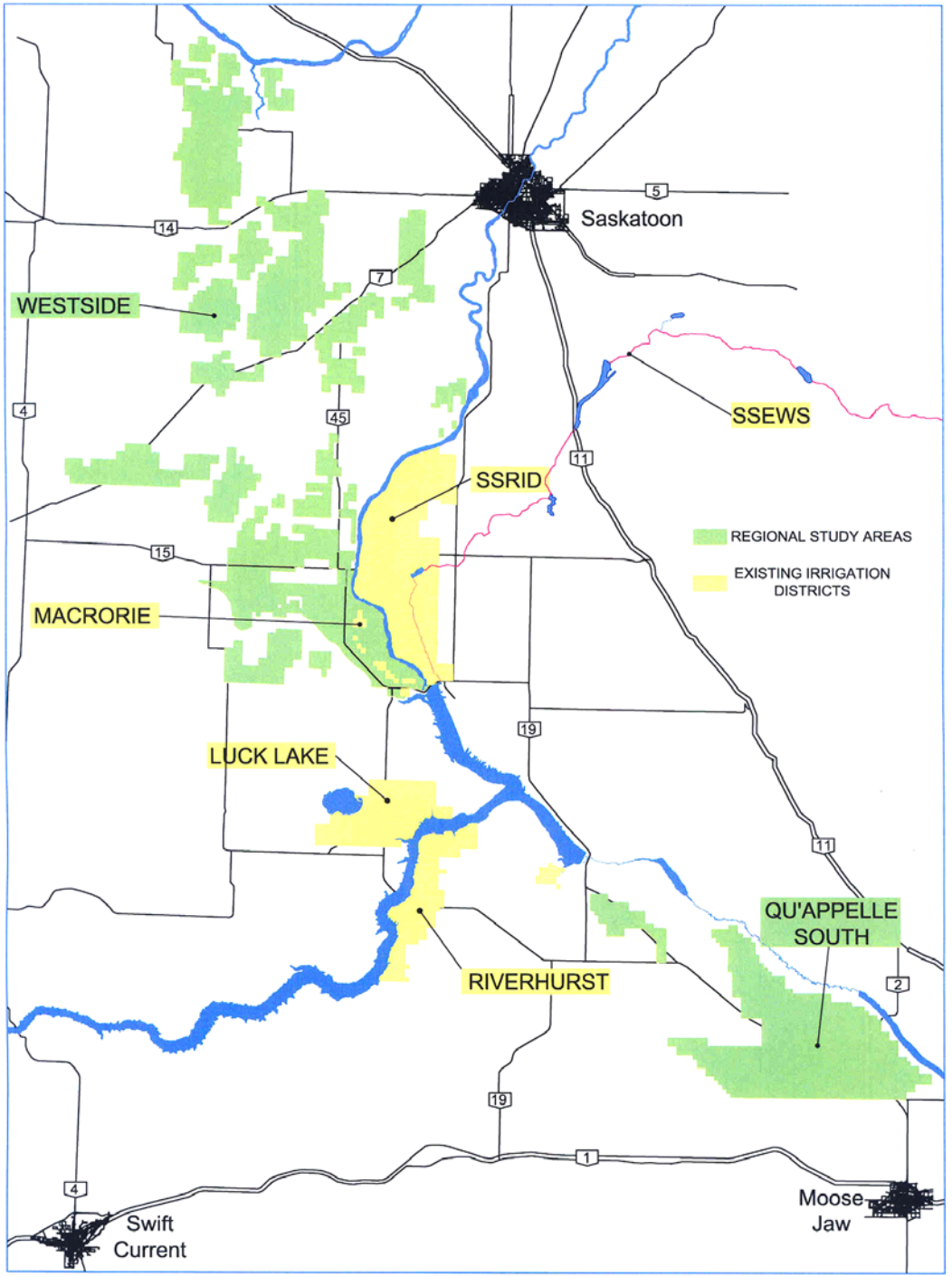
Agriculture and Agri-Food Canada
Saskatchewan Ministry of Agriculture
University of Saskatchewan
Irrigation Crop Diversification Corporation (ICDC)
Saskatchewan Irrigation Projects Association (SIPA)

The Canada Saskatchewan Water Supply Expansion Program (CSWSEP)

- Five irrigation studies were commissioned
- Three Irrigation Districts examined infill and expansion
- Two regional studies investigated the feasibility of constructing new multi-purpose projects
- Lake Diefenbaker would supply 94% of the irrigated acres
- SIPA's study: Time To Irrigate - The Economic, Social and Environmental Benefits of Expanding Irrigation

LAKE DIEFENBAKER irrigated area:

CURRENT:
100,000 acres
INFILL:
50,000 acres;
EXPANSION:
500,000 acres.



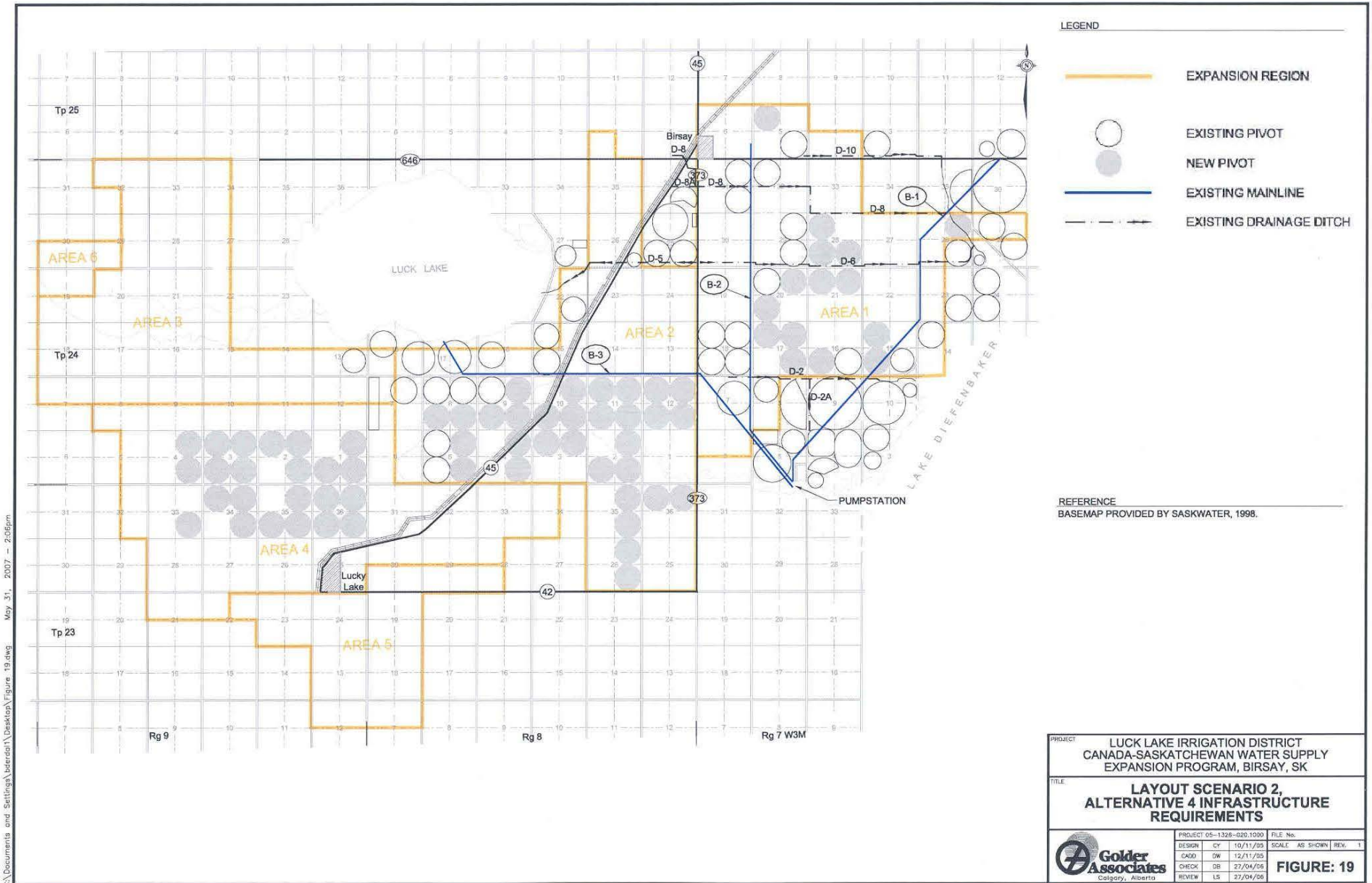
INFILL

- 2009-2011 $6.2 million - Community Adjustment Fund 90%:10% Ministry
- 2011-2013 $4.5 million - FRWIP Ministry 90%:10% districts with approved infill plans and replacement funds.

Luck Lake Irrigation Project

- Construction costs of $38 million
- Pressurized pipeline delivery system
- Project completed in 1989
- Water delivered to 10,000 acres
- Built by Sask Water now owned and operated by the Ministry of Agriculture
- Provides water to Ducks Unlimited's Luck Lake Heritage Marsh, regional pipelines, communities and livestock

Luck Lake Irrigation District



Luck Lake Irrigation District

INFILL

- Infill requires the phased addition of pipelines and pumps
- Infill potential of 11,000 acres
- Total infrastructure costs of $20M
- 2009-11 Community Adjustment Fund $2.1M
- 2011-13 $1.5M FRWIP

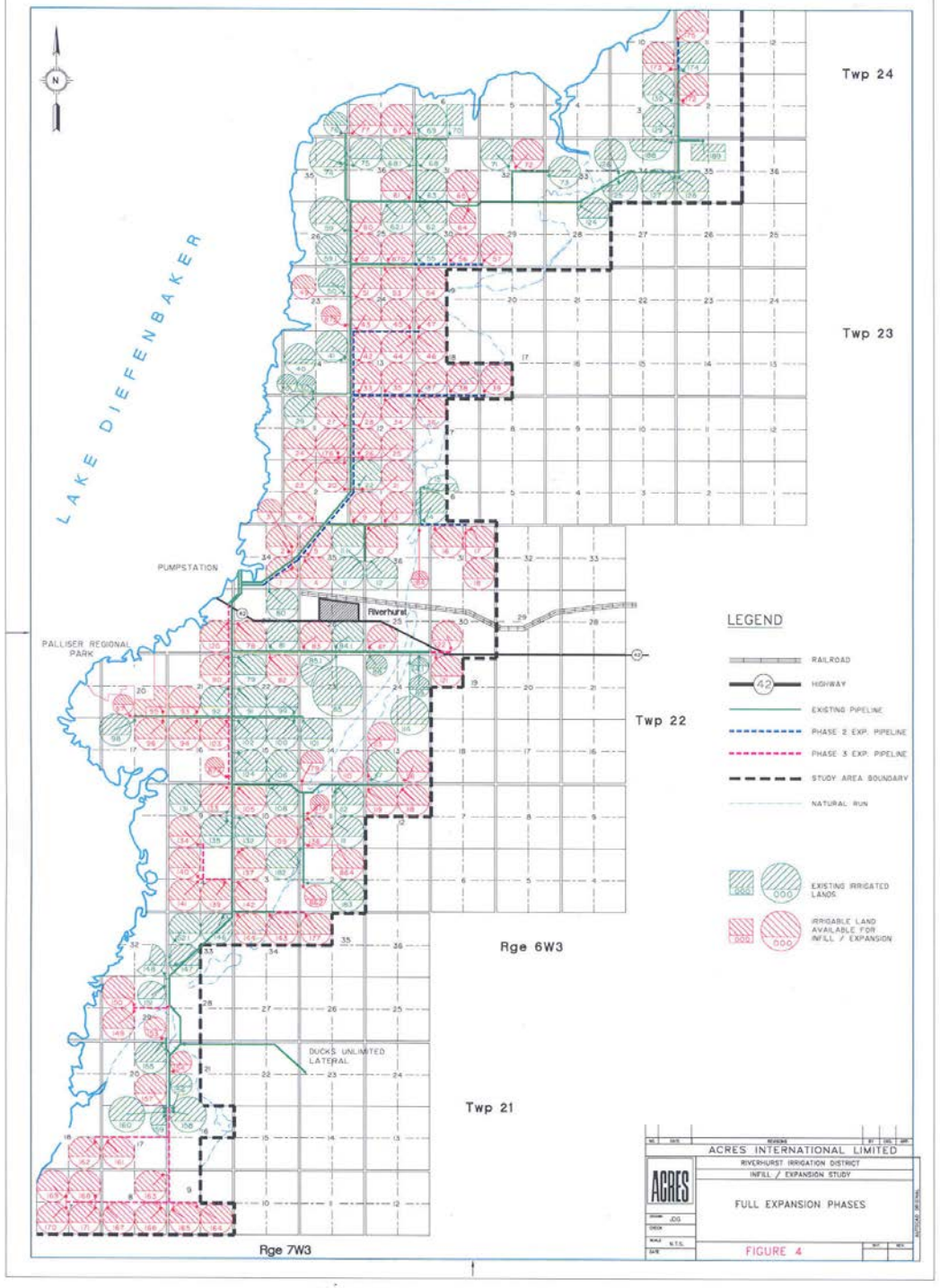
Riverhurst Irrigation Project

- Construction costs of $52 million
- Pressurized pipeline delivery system
- Project completed in 1991
- Water delivered to 10,000 acres
- Built by Sask Water now owned and operated by Saskatchewan Agriculture
- Provides water to Ducks Unlimited's Thunder Creek Heritage Marsh, Regional Park, marina, Village of Riverhurst, golf course

Riverhurst Irrigation District

EXISTING IRRIGATED LANDS

IRRIGABLE LAND AVAILABLE FOR INFILL / EXPANSION



Riverhurst Irrigation District

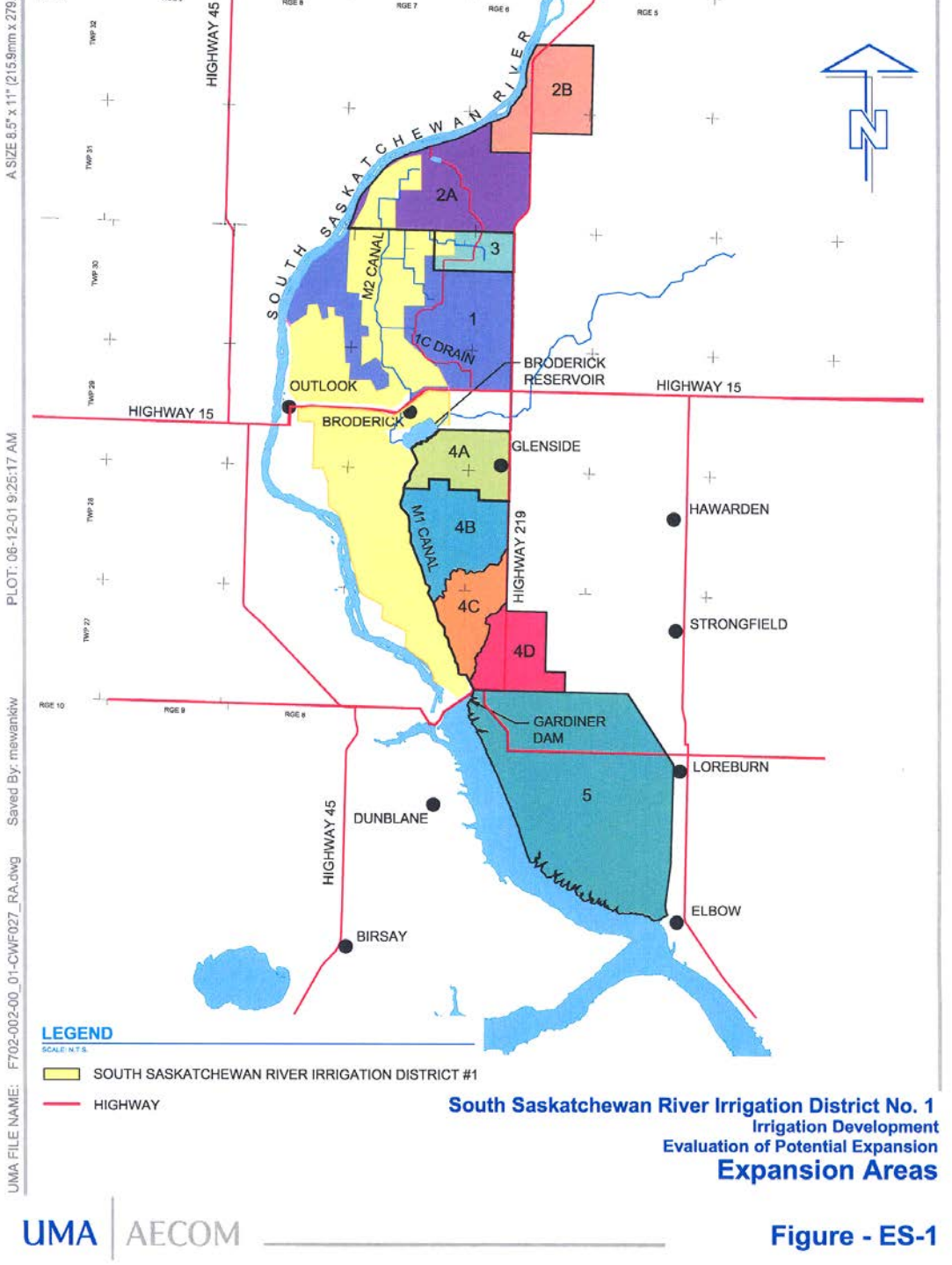
INFILL

- Existing Development of 10,000 acres
- Pressurized pipeline delivery systems
- Expansion requires phased addition of pipelines and pumps
- Infill potential of 11,000 acres
- Total infrastructure costs of $22M
- 2009-11 Community Adjustment Fund $1.9M
- 2011-13 FRWIP $1.5M

South Sask. River Irrigation District

- Part of the South Saskatchewan River Project (Gardiner and Qu'Appelle dams and Lake Diefenbaker)
- Irrigation began in 1968 with flood irrigation methods which have been superseded by centre pivots
- Each quarter was designed with gravity canal delivery and drainage
- Existing Development of 34,000 acres with 2,000 acres of flood remaining
- Infill and rehabilitation requires the phased conversion of canals to pipelines

South Saskatchewan River Irrigation District



South Sask. River Irrigation District

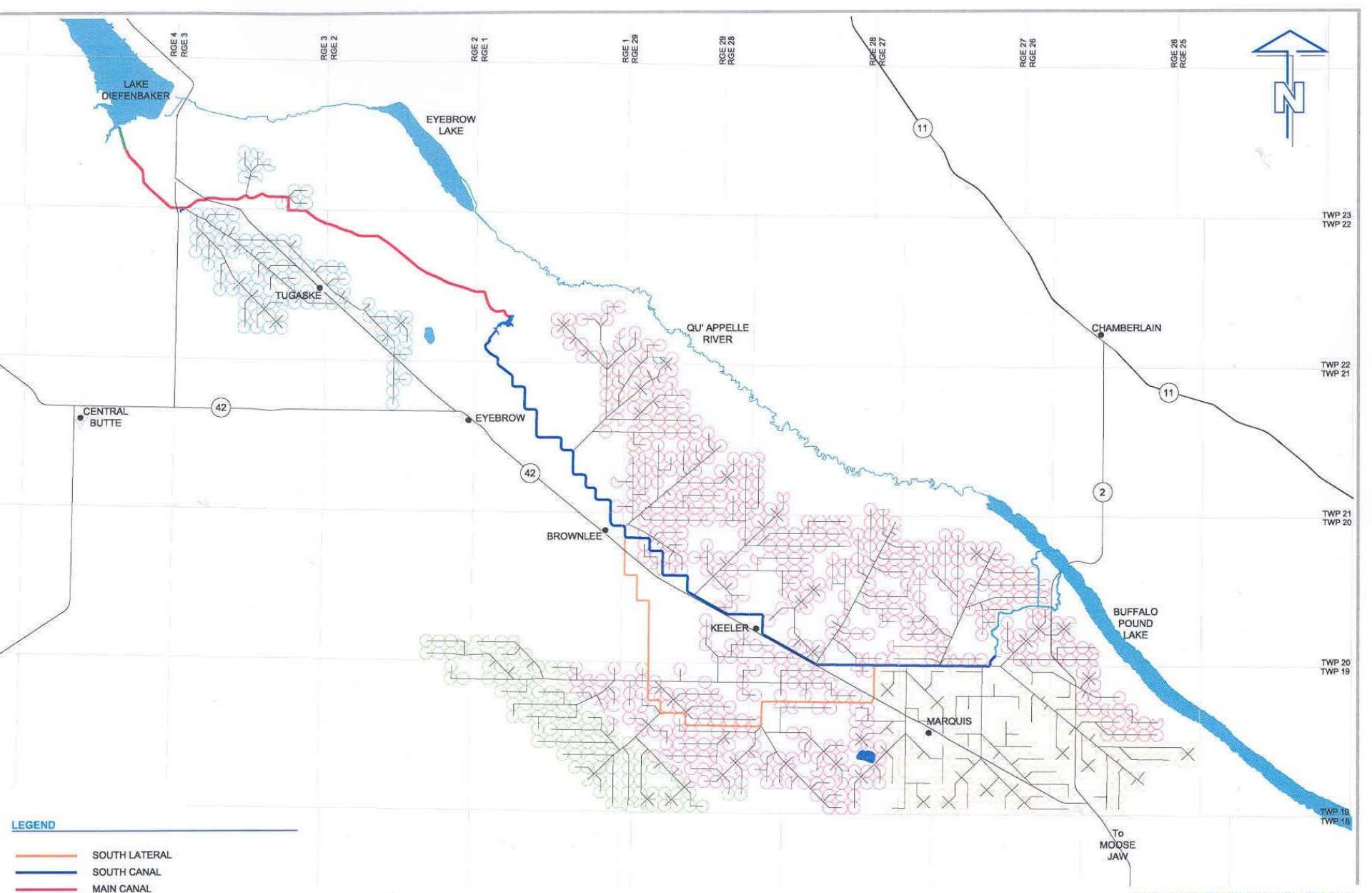
- INFILL
- Infill potential of 28,000 acres
- Total infrastructure costs of $58M
- 2009-11 Community Adjustment Fund $1.9M
- 2010-12 $178,000 Overall Infrastructure Plan Ministry Grant
- 2011-13 $1.5M FRWIP

EXPANSION

- Lake Diefenbaker was originally intended to irrigate some 500,000 acres to create the "critical mass" for value-added processing
- CSWSEP studies:
  - Qu'Appelle South Irrigation Project
  - Westside Irrigation Project
  - Time To Irrigate Vol I & II – SIPA
- SIPA's Irrigation Development Corporation proposal

Qu'Appelle South Irrigation Project

- Total Development of 110,000 acres
- Combination of open canal and reservoirs supplying modules of pressurized pipeline delivery systems
- Potential to supply Buffalo Pound Lake with high quality water for Regina & Moose Jaw plus recreational lakes downstream
- Total infrastructure costs of $558M
- Total on-farm investment of $100M
- Preliminary studies underway by South Central Enterprise Region



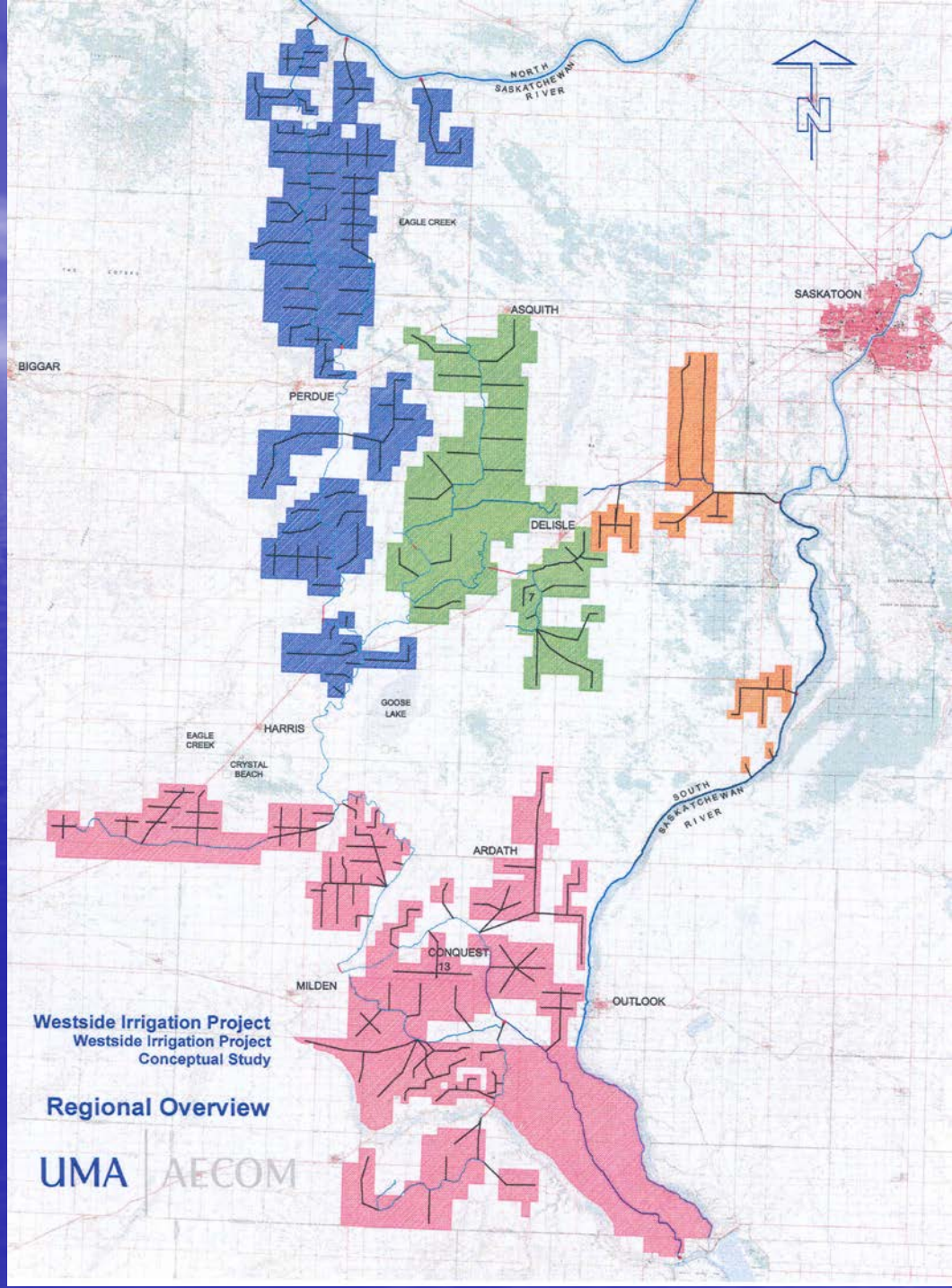
UMA | AECOM

Qu'Appelle South Irrigation Project
Irrigation Development
Conceptual Study
Option 2A
110,500 Acres
Figure 6.6

Westside Irrigation Project

- Total Development of 375,000 acres
  - Lake Diefenbaker = 332,000 acres
  - South Sask River = 26,000 acres
  - North Sask River = 17,000 acres
- Combination of open canal and reservoirs supplying modules of pressurized pipeline delivery systems in 5,000 to 10,000 ac. blocks
- Total infrastructure costs of $2B
- Total on-farm investment of $420M

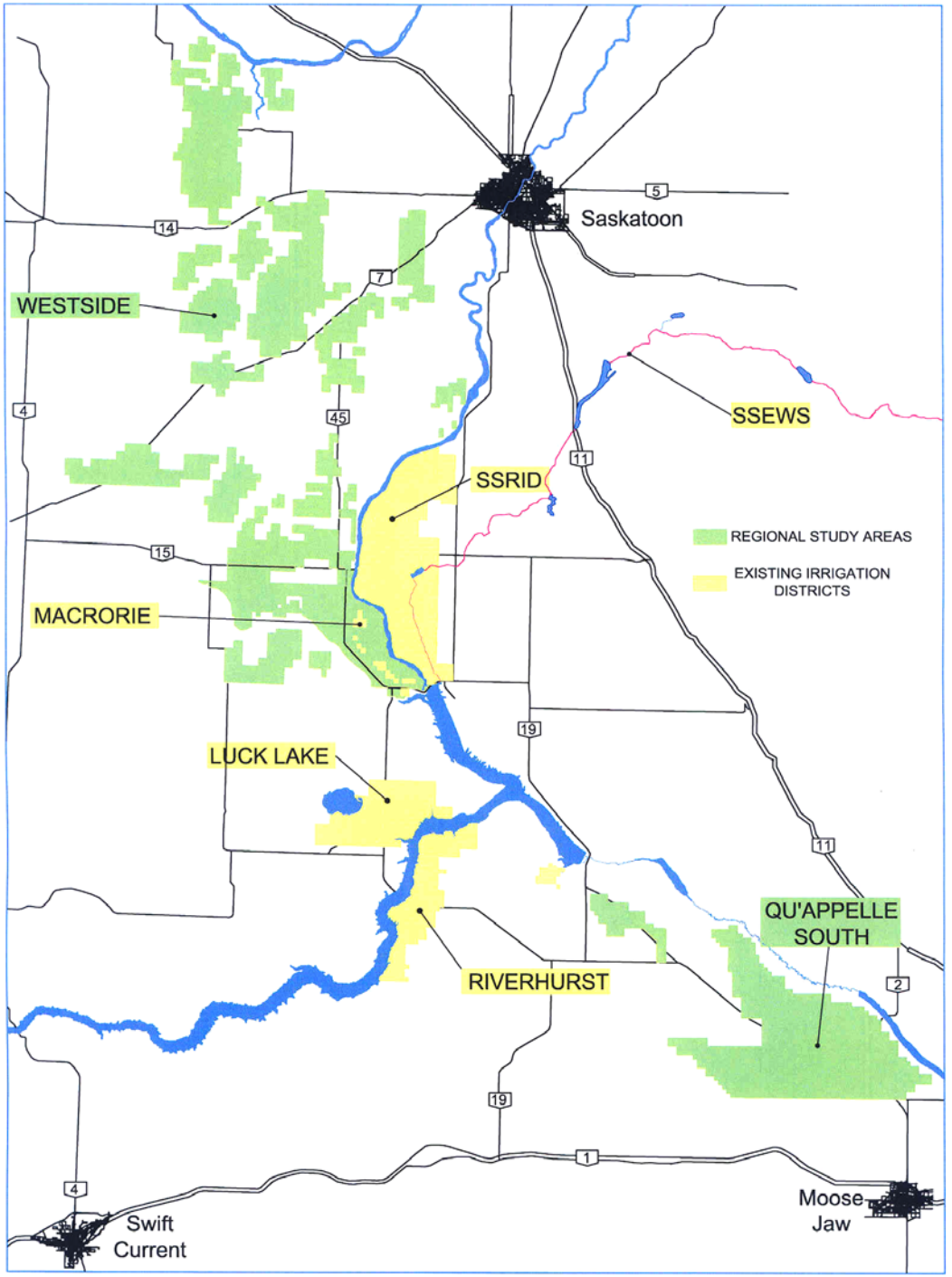
Westside Irrigation Project



Potential INFILL is 50,000ac. within existing irrigation districts.

Potential irrigation EXPANSION is 500,000ac.

Water use would be 20% of the average inflow into Lake Diefenbaker.



Development Summary

Irrigation INFILL and EXPANSION

District / Region INFILL/EXPANSION	EXISTING ('000ac)	INFILL ('000ac)	EXPANSION ('000ac)	TOTAL ('000ac)
Luck Lake ID	10	11	-	21
Riverhurst ID	10	11	-	21
S. Sask River ID	34	28	-	62
Qu'Appelle South	-	-	110	110
Westside	-	-	375	375
Total	54,000ac	50,000ac	485,000ac	589,000ac

Cost Summary

Irrigation District INFILL

District INFILL	INFILL ACRES ('000 acres)	INFILL COST ($Million)	INFILL AVERAGE COST (Off-farm $/ac)
Luck Lake ID	11	20	1,800
Riverhurst ID	11	22	2,000
S. Sask River ID	28	58	2,000
TOTAL	50,000ac	$100M	$2,000/ac

Cost Summary

Irrigation EXPANSION

Regional EXPANSION	EXPANSION ACRES ('000 acres)	EXPANSION COST ($Million)	EXPANSION AVERAGE COST (Off-farm $/ac)
Qu'Appelle South	110	558	5,100
Westside	375	2,000	5,300
Total	485,000 ac	$2,558M	$5,300/ac

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