



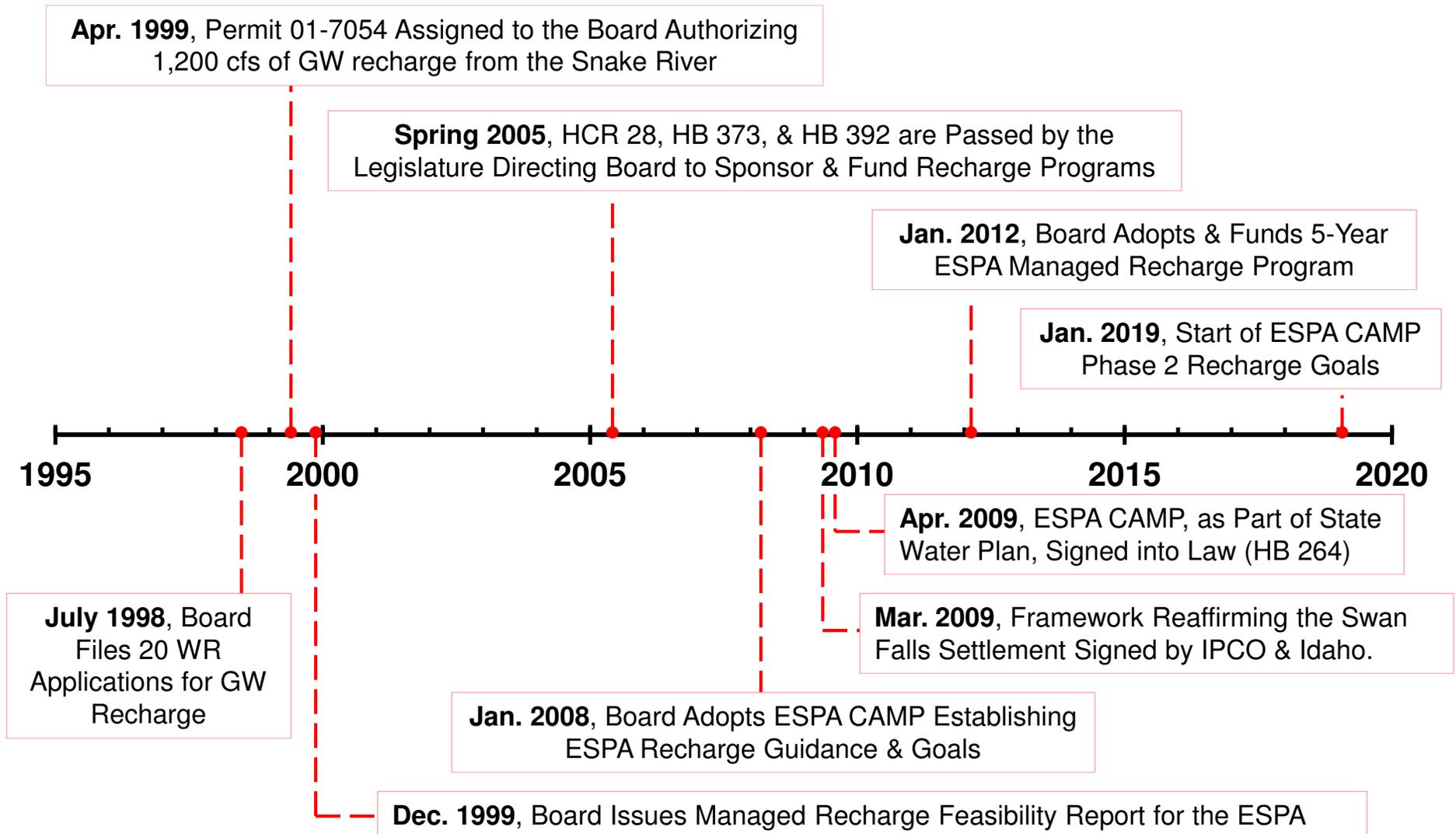
Considerations of Large Scale Recharge in the ESPA

Mathew Weaver

July 11, 2012

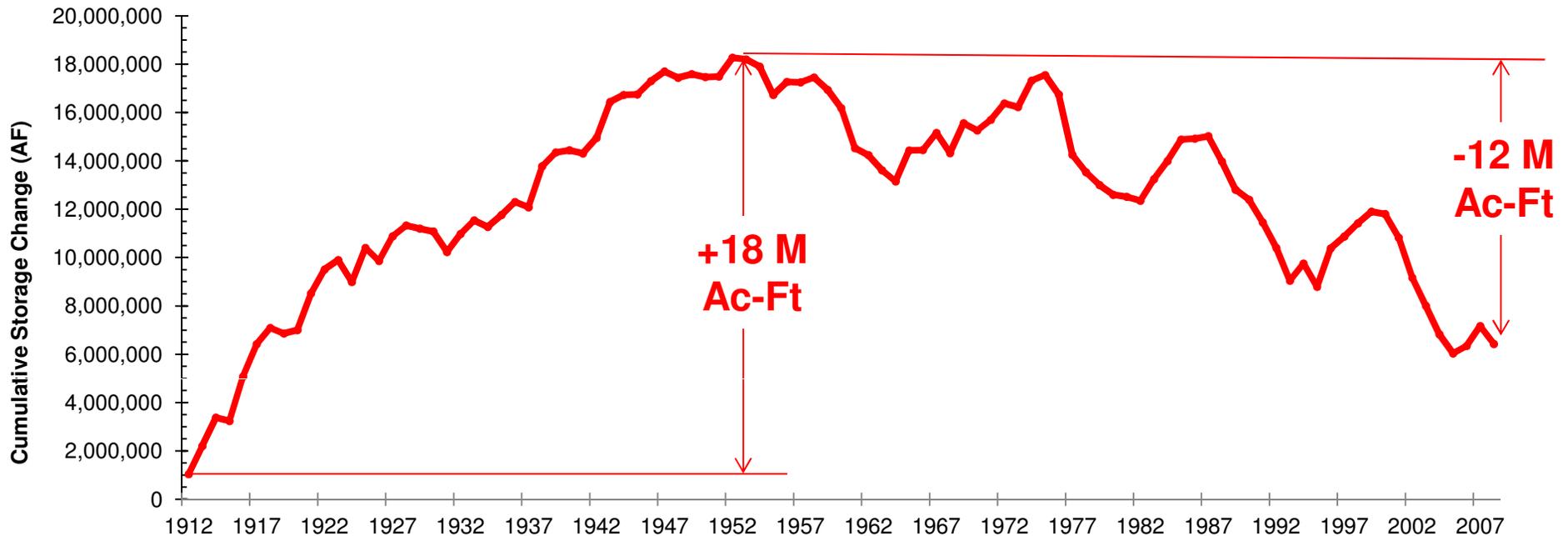


ESPA Aquifer Recharge Milestones





Managed Aquifer Recharge on the Eastern Snake Plain is a Policy of the State of Idaho



“The long-term objective of the Plan is to incrementally achieve a net ESPA water budget change of 600 thousand acre-feet (kaf) annually. It is projected that this hydrologic goal can be achieved by the year 2030 through a mix of management actions...”

-ESPA CAMP January 2009, pg. 4

The [ESPA CAMP] water budget adjustment mechanisms include:

- A. Ground water to surface water conversions.
- B. Managed aquifer recharge.**
- C. Demand reduction.
- D. Pilot weather modification program.
- E. Minimizing loss of incidental recharge.

-ESPA CAMP January 2009, pg. 4

The ESPA CAMP provides the following goals regarding managed aquifer recharge:

Aquifer Recharge – Approximately 150-250 kaf/year (using the Board's natural flow water permit and storage water when available).

Phase 1 Target (1-10 years): 100 kaf/year

Phase 2 Target (>10 years): 150-250 kaf/year

-ESPA CAMP January 2009, pg. 10-11

ESPA Managed Recharge is Addressed in the 2009 Swan Falls Reaffirmation Agreement Between the Idaho Power Company and the State of Idaho:

- **Reaffirmed the 1984 Settlement Agreement did not Preclude Recharge**
- Recognizes it is in IPCO's and State's Mutual Interest to Explore & Develop Recharge
- **Recognizes the Board's Intent to Implement Recharge in Phases Consistent with ESPA CAMP**
- Recognizes the Board has Discretion on How to Implement CAMP
- **Requires the Board to Seek Legislative Approval if it Seeks to Increase Camp Ph. 1 Recharge by more than 75,000 Acre-Feet on Average Annually**

-Framework Reaffirming the Swan Falls Settlement, March 25, 2009. Exhibit 2 Memorandum of Understanding.

In January of 2012 the IWRB Adopted a Resolution Authorizing and Funding Managed Aquifer Recharge for Five Years, Identifying an Average Annual Target of 100,000 AF

*“NOW THEREFORE BE IT RESOLVED that the IWRB **approves the expenditure of a total of \$1.5 million** from the Secondary Aquifer Planning, Management, and Implementation Fund...to implement a 5-year managed aquifer recharge pilot program...”*

“BE IT FURTHER RESOLVED that the pilot managed recharge project will be limited to recharging natural flow to avoid placing additional pressure on storage supplies above Milner Dam.”

-A Resolution to Allocate Funds in the Matter of the Eastern Plain Aquifer Managed Recharge Pilot Program, January 27, 2012.

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2012-2019:

100,000 Ac-Ft, not to exceed 175,000 Ac-Ft Annually on Avg.

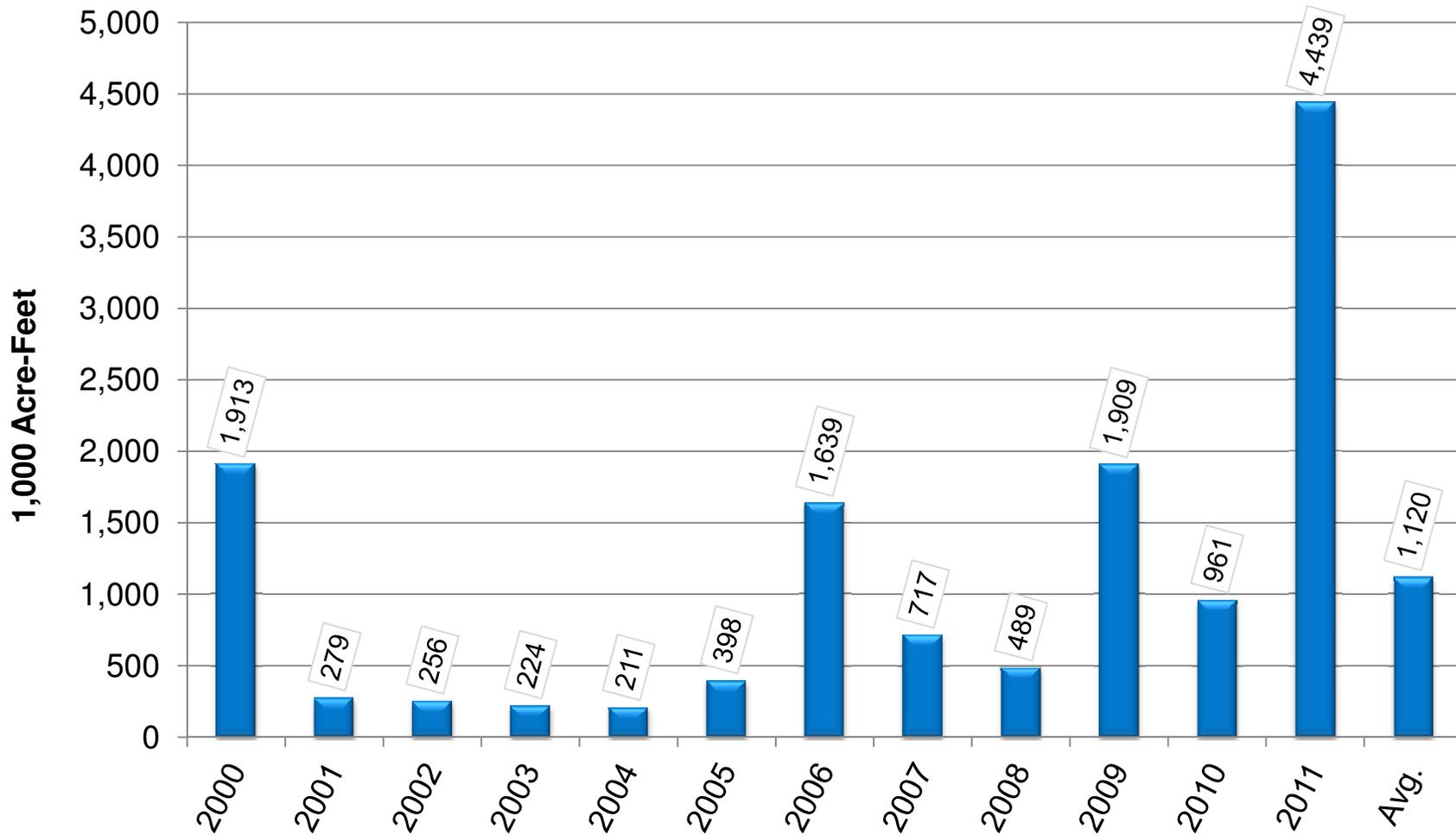
>2019:

150,000 to 250,000 Ac-Ft Annually on Avg.

**Water for Managed Recharge is
Not Available Every Year!**

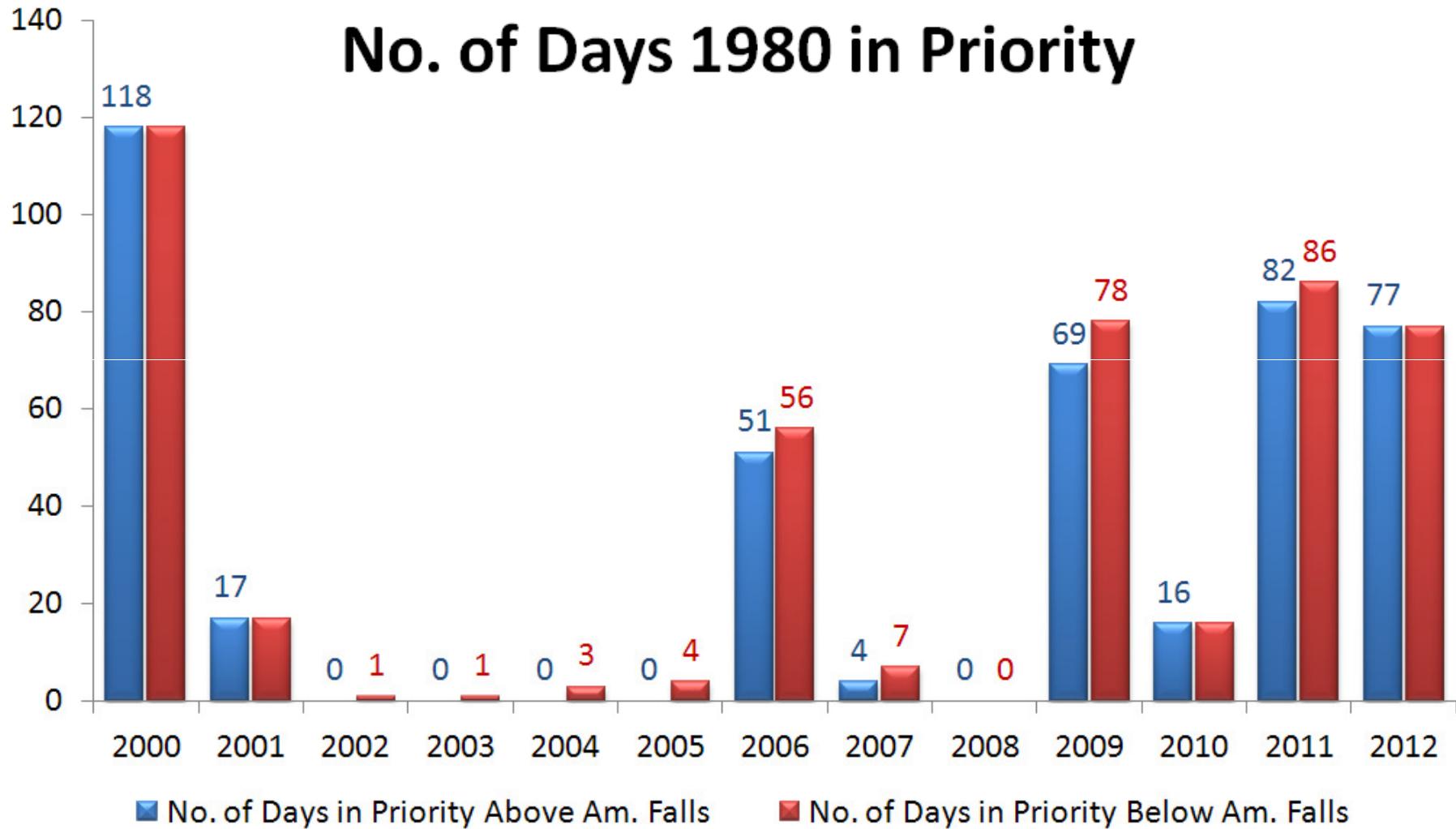


Annual Spill Past Milner





No. of Days 1980 in Priority



Additional considerations further constrain recharge :

- Water Delivery
- Weather
- Operation and Maintenance of Canals
- Storage Reservoir Operations
- Environmental considerations

Water Delivery Constraints:

Comparison of Milner-Gooding Canal Irrigation Deliveries to 1980 Priority Date Delivery

Year	Start of Irrigation Delivery	1980 Priority Date On	No. Of Days
2000	4/10/2000	2/7/2000	63
2001	4/5/2001	3/31/2001	5
2002	4/25/2002	Never On	0
2003	4/15/2003	Never On	0
2004	4/13/2004	Never On	0
2005	4/25/2005	Never On	0
2006	4/13/2006	4/20/2006	0
2007	4/10/2007	4/9/2007	1
2008	4/18/2008	Never On	0
2009	4/23/2009	4/4/2009	19
2010	4/16/2010	6/10/2010	0
2011	4/19/2011	5/12/2011	0
2012	4/9/2012	3/11/2012	29



*Milner-Gooding Canal at full capacity.
Department, 2009.*

Weather Constraints:



Mid-winter ice in an irrigation canal in the North Side system. Photo courtesy of Alan Hansten of North Side Canal Company.

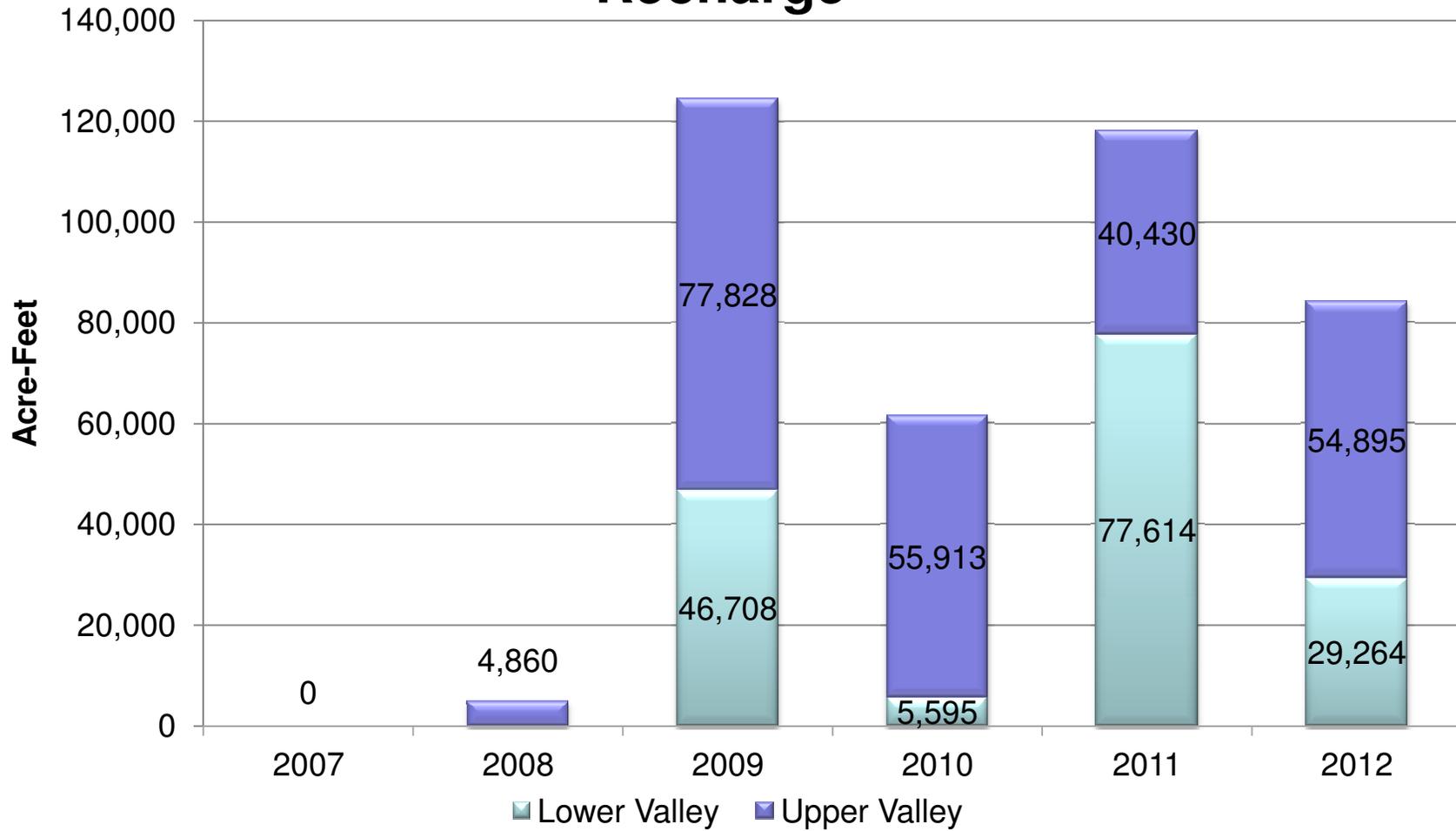
Canal O&M Constraints:



Above. Excavator on the Milner-Gooding Canal preparing for rip-rap. Right. Construction of new headgate delivery point from the Milner-Gooding Canal at Dietrich. Photos courtesy of Lynn Harmon, AFRD2 Canal Manager.

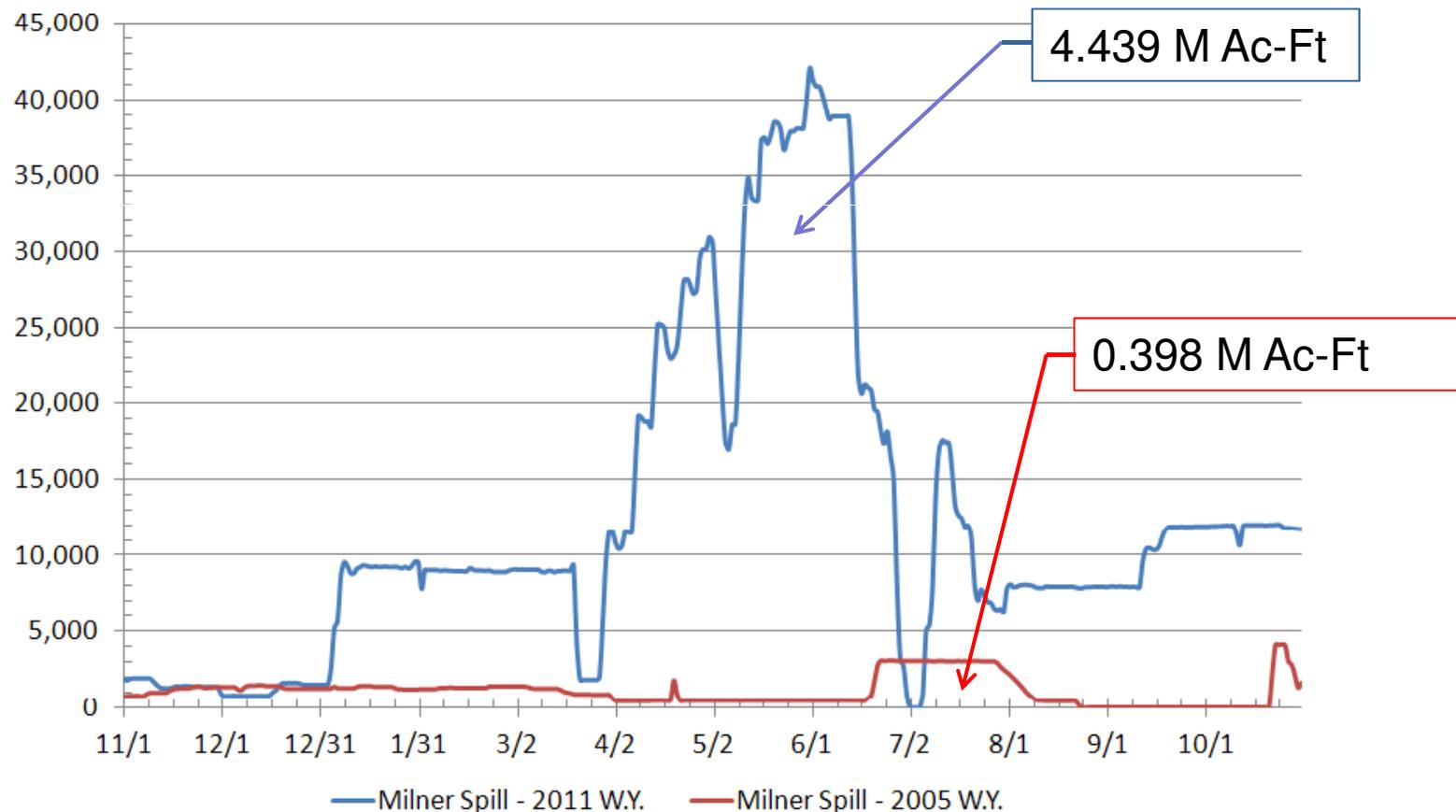


Recent IWRB Accomplished Managed Recharge



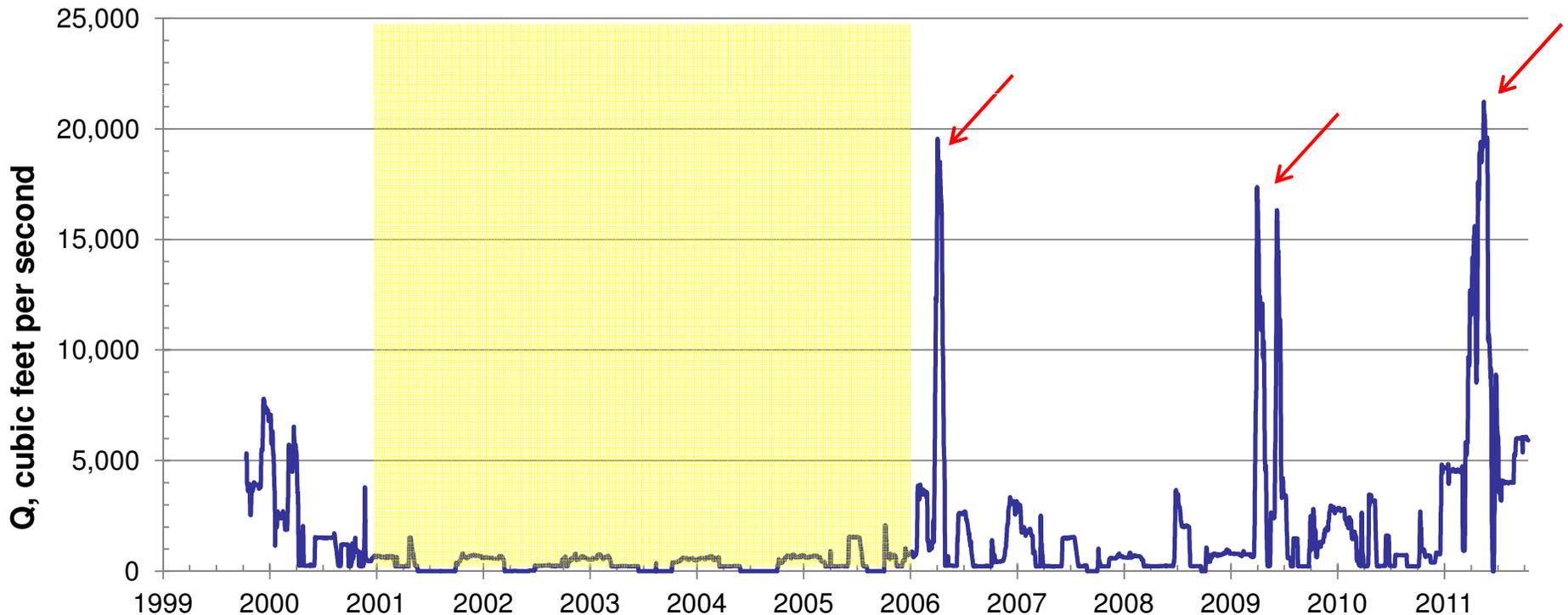
Recharge volumes for 2012 represent best estimates of achieved recharge to date.

In Order to Attain Averages, We Need to be Able to Overshoot the Target in Good Water Years



We want to recharge in a manner that minimizes conflict

Flow Past Milner: Nov. 1999 to Nov. 2011



Summary of No. of Days Required to Reach Various Annual Recharge Volumes

Q _{RECHARGE'} CFS	No. of Days to Recharge Target Volume (Ac-Feet)									
	100,000	150,000	200,000	250,000	300,000	350,000	400,000	450,000	500,000	750,000
200	--	--	--	--	--	--	--	--	--	--
400	>118	--	--	--	--	--	--	--	--	--
600	84	>118	--	--	--	--	--	--	--	--
800	63	95	>118	--	--	--	--	--	--	--
1,000	50	76	101	>118	--	--	--	--	--	--
1,200	42	63	84	105	>118	--	--	--	--	--
1,400	36	54	72	90	108	>118	--	--	--	--
1,600	32	47	63	79	95	110	>118	--	--	--
1,800	28	42	56	70	84	98	112	>118	--	--
2,000	25	38	50	63	76	88	101	113	>118	--
2,500	20	30	40	50	61	71	81	91	101	--
3,000	17	25	34	42	50	59	67	76	84	>118
4,000	13	19	25	32	38	44	50	57	63	95
5,000	10	15	20	25	30	35	40	45	50	76
6,000	8	13	17	21	25	29	34	38	42	63
7,000	7	11	14	18	22	25	29	32	36	54
8,000	6	9	13	16	19	22	25	28	32	47
9,000	6	8	11	14	17	20	22	25	28	42
10,000	5	8	10	13	15	18	20	23	25	38
12,000	4	6	8	11	13	15	17	19	21	32
14,000	4	5	7	9	11	13	14	16	18	27

1980 in Priority >42 Days, 5 out of last 13 years (38%)

1980 in Priority >17 Days, 7 out of last 12 years (53%)

Ideally we need to be able to
accomplish annual recharge in
a 20-30 day window

Ideally we need to be able to
recharge at least three times the
annual goal

So what does it all mean?

- We need to target 750,000 Ac-Ft of recharge
 - 3x Maximum Annual Phase 2 Goal of 250,000 Ac-Ft on average
 - 4.25x Maximum Annual Phase 1 Goal of 175,000 Ac-Ft on average
- We need $Q = \sim 19,000$ CFS to recharge 750,000 Ac-Ft in 20 Days
- We need $Q = \sim 13,000$ CFS to recharge 750,000 Ac-Ft in 30 Days
- We need flexibility to recharge at many locations

Board's WR Applications:

- 19 Total Applications
- Combined Diversion Rate, 14,072 CFS
- Recharge Locations All Over ESPA
- Year Round Period of Use
- 1998 Priority Dates

NOTICE OF APPLICATIONS FOR WATER RIGHT

On March 20, 1998, the Idaho Water Resource Board, 1301 N. Orchard St, Boise, ID 83706, filed the following applications with the Department of Water Resources to appropriate water from the Snake River, Henry's Fork of the Snake River and Fall River. The applicant seeks to intermittently divert water for recharge purposes throughout the year when water is available, through the headworks of the following canals up to the maximum rate described below:

01-07131 - Progressive Irrigation Dist.	-	230 cfs
01-07132 - Enterprise Canal Co. Ltd	-	283
01-07133 - Snake River Valley Irr. Dist.	-	682
01-07134 - Peoples Canal & Irrigation Co.	-	475
01-07135 - New Sweden Irrigation District	-	949
01-07136 - Farmer's Friend Irrigation Co.	-	537
01-07137 - Harrison Canal & Irrigation Co.	-	698
01-07138 - Aberdeen-Springfield	-	1387
01-07139 - Rudy Irrigation Canal Co. Ltd	-	110
01-07140 - Rigby Canal & Irrigation Co.	-	253
01-07141 - Burgess Canal & Irrigation Co.	-	1,095
02-07473 - Northside Canal Co. Ltd	-	2,831
02-07474 - Twin Falls Canal Co.	-	3,738
21-07574 - Twin Groves Irr & Mfg Co.	-	160
21-07575 - Salem Union Canal Co. Ltd	-	339
21-07576 - Fall River Irrigation Co.	-	294
21-07577 - Egin Canal Co.	-	399
21-07578 - St. Anthony Union Canal Co.	-	568
21-07579 - Independent Canal Co.	-	337
21-07580 - Last Chance Canal Co.	-	94

Diversion for the planned recharge generally will occur during the non-irrigation season due to water availability and canal capacity.

The canal headings are further described as being within Bingham, Bonneville, Fremont, Jefferson, Jerome and Twin Falls Counties, Idaho. The place of use (recharge) is within the delivery systems and recharge areas of the respective companies and districts as designated in the specific Aquifer Recharge Plan for each application.

For more specific information about the applications, you may contact the department or call (208) 327-7900.

If approved, the applications will be subject to all prior water rights and will authorize recharge of water to the Eastern Snake Plain Aquifer in Idaho during times when there is water in excess of existing water rights and established minimum flows. Protests must be filed with the Director, Department of Water Resources, 1301 N. Orchard St., Boise, Idaho 83706, together with a \$25 filing fee on or before August 31, 1998. Protests must identify the application or applications objected to. A single \$25 protest fee will be accepted for a protest covering one or more applications.

KARL J. DREHER, Director

(3827)

Pub.: 8/13, 20



Questions & Discussions