Discussion of the use of the Transfer Tool and Performing Mitigation Analysis Associated with Various Water Right Processes

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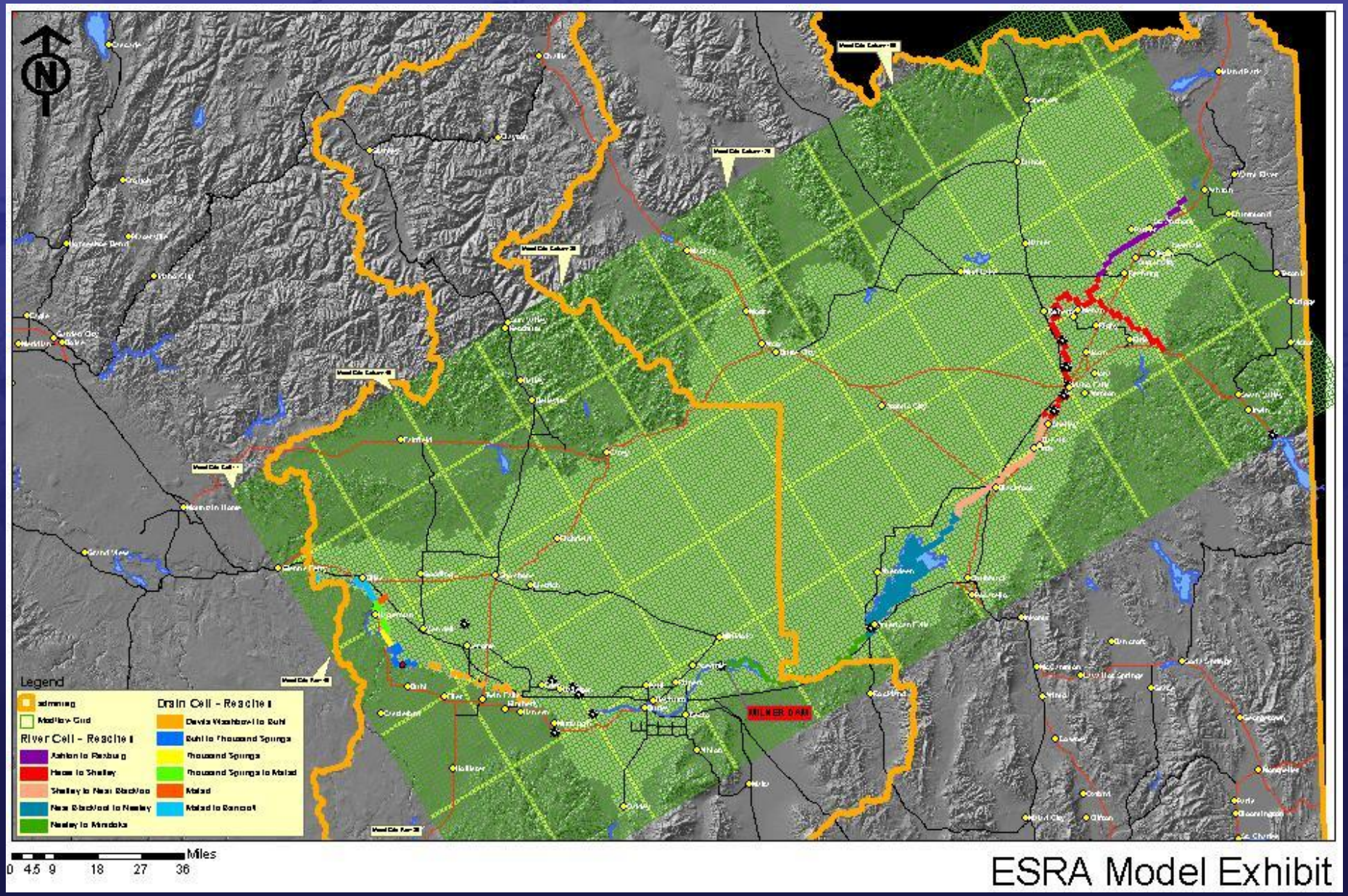
September 1, 2010

Mitigation Analysis



Mitigation Analysis

1. New Applications
   - Handful every year
2. Water Bank Applications
   - 5 to10 applications/year
   - Unique in time period scale
3. Transfers
   - Southern Office: 12% of 132 transfers = 16 trns/year
   - Eastern Office: 12% of 148 transfers = 18 trns/year

Mitigation Requirement References in Transfer Memo No. 24

- 3 (12) – Changes to Point of Diversion From Eastern Snake Plain Aquifer
  - Pages 12-13

- 5c (5) – Mitigation
  - Pages 24-25

Steady State: 3 Part Test to Determine Whether Mitigation is Required for a Specific Reach

Permanent mitigation is required for a specific reach if…

1. The depletionary hydrograph describing the total effects to the reach due to the transfer, is greater than 110% of the depletionary hydrograph that describes the total effects to the reach without the transfer (i.e. 10% increase).

2. The depletionary hydrograph describing the total effects to the reach due to the transfer, is at least 2 ac-ft/trimester greater than the depletionary hydrograph that describes the total effects to the reach without the transfer.

3. The modeled/predicted depletion in the specific reach is greater than 10% of the total modeled/predicted depletion to all reaches of the Snake River, as a result of the conditions proposed by the transfer (i.e. 10% of total).

If all three conditions above are met, for any single hydraulically-connected reach of the Snake River, the applicant must <u>fully</u> mitigate the effects of the proposed transfer on that reach, as predicted by the ESPA Transfer Tool.

Transient State: 2 Part Test to Determine Whether Mitigation is Required for a Specific Reach

Temporary mitigation is required for a specific reach if…

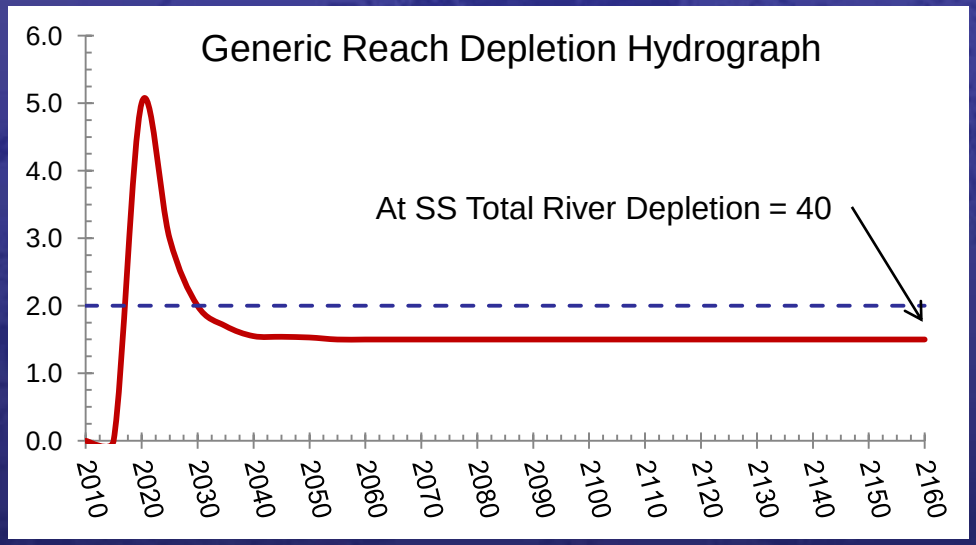
1. For any given time step after the initiation of the transfer, the depletionary hydrograph describing the total effects to the reach due to the transfer, is greater than 110% of the depletionary hydrograph that describes the total effects to the reach without the transfer (i.e. 10% increase).

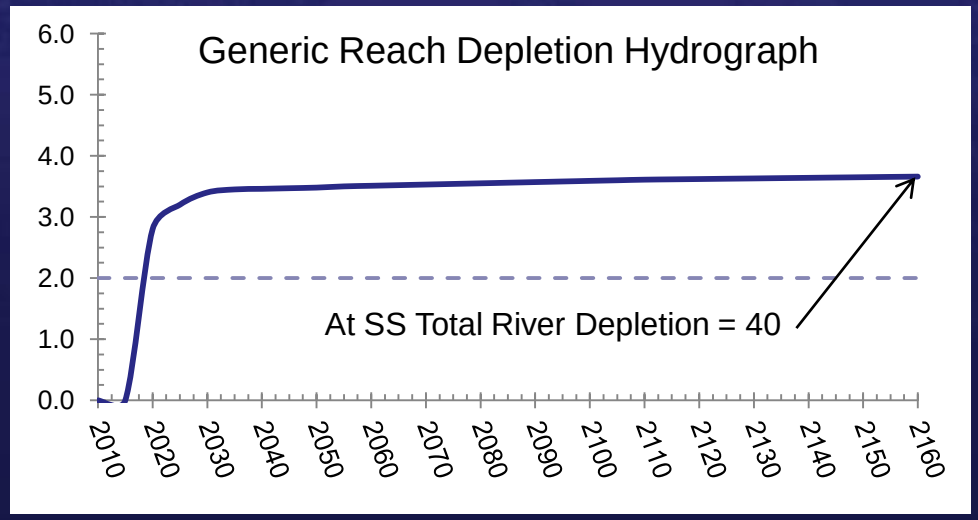
2. For any given time step after the initiation of the transfer, the depletionary hydrograph describing the total effects to the reach due to the transfer, is at least 2 ac-ft/trimester greater than the depletionary hydrograph that describes the total effects to the reach without the transfer.

If both conditions above are met, for any single hydraulically-connected reach of the Snake River, the applicant must <u>fully</u> mitigate the temporary effects of the proposed transfer on that reach, as predicted by the ESPA Transfer Tool.

Transient State: 2 Part Test Caveat

Mitigation during the transient state is not required, if mitigation is not required at steady state (last time step), and steady state depletions are greater than at any time during the transient state.





Step 1: >10% Increase Check.

Step 2: 2 ac-ft Check .

Step 3: 10% of Total Check.

One-Way Transfers vs. Offsetting Transfer Packages

Mitigation Evaluation Approach

1. Evaluate the impacts on reaches (increases and decreases or debits and credits) from each individual transfer separately (*one-way analysis of each proposed transfer*).
    - Reach impacts due to the transfer shall only be evaluated for the specific volume of water identified for modification by the transfer(s). Remaining or un-transferred volumes of water under the water right and/or un-transferred volumes of water from associated water rights not included in the transfer should *not* be included in mitigation analysis. This includes water lost due to changes in the consumptive volume component of a water right as a result of a transfer that proposes a change in the beneficial use.

2. Apply the appropriate mitigation requirement tests, as presented in *Transfer Processing Memo No. 24*, to each individual one-way transfer analysis. Mitigation is required for transfer approval when all of the following conditions are met in steady state and the first two conditions are met for transient state:
    - 10% increase
    - >2 ac-ft increase
    - 10% of total

Mitigation Evaluation Approach Continued

3. Sum the impacts to each reach from each individual one-way transfer analysis. Include in the summation reach gains and reach losses. For those reaches where the sum of all changes in depletion is positive, including depletions during the transient state, the combined depletion volume must be *fully mitigated*.

4. If offsetting transfers do not fully mitigate reach depletions, evaluate the impact on reaches from *secondary proposed mitigation efforts* such as non-use of irrigated ground or release of storage water.

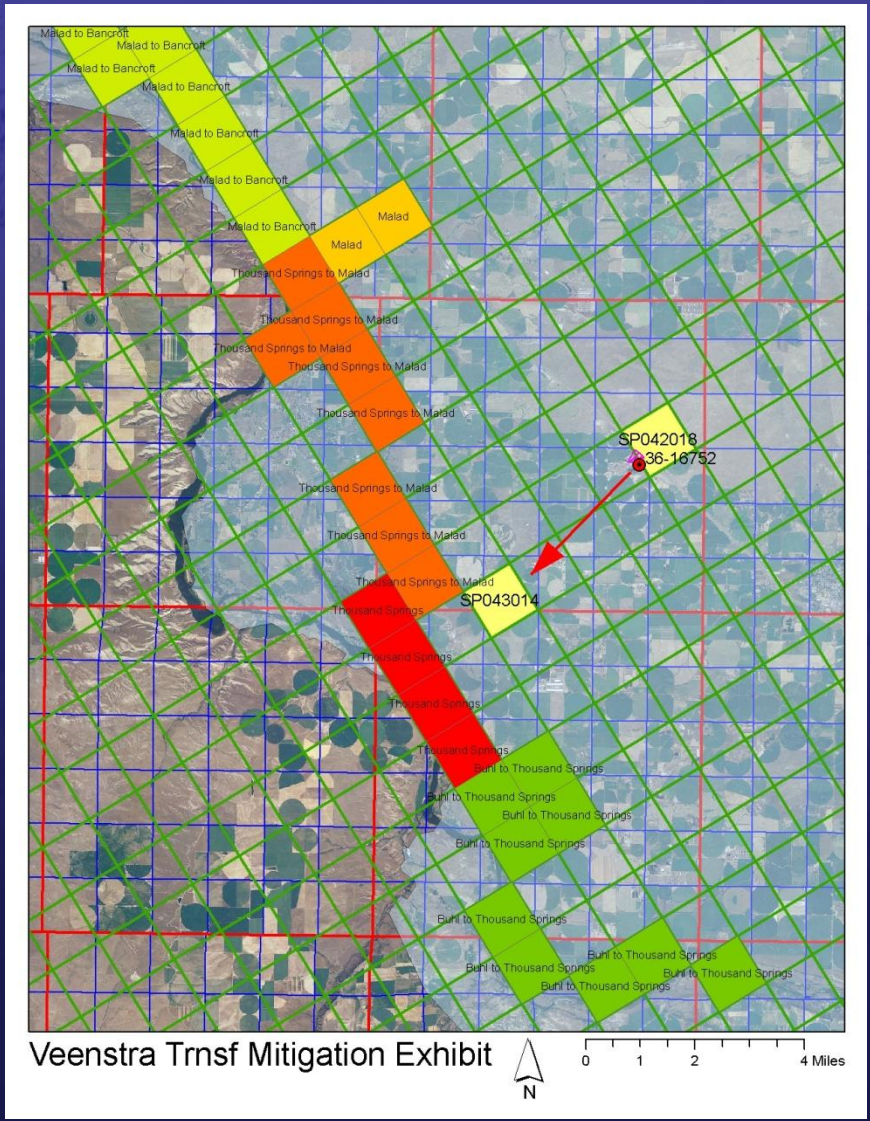
5. Combine the effects of depletion impacts from step 3 with net mitigation efforts from step 4. If changes in depletion amounts for each reach are zero or less, mitigation is deemed adequate and the transfer is approvable. *If changes in depletion to any reach are greater than zero, then additional mitigation is required before the transfer can be approved by the Department*.

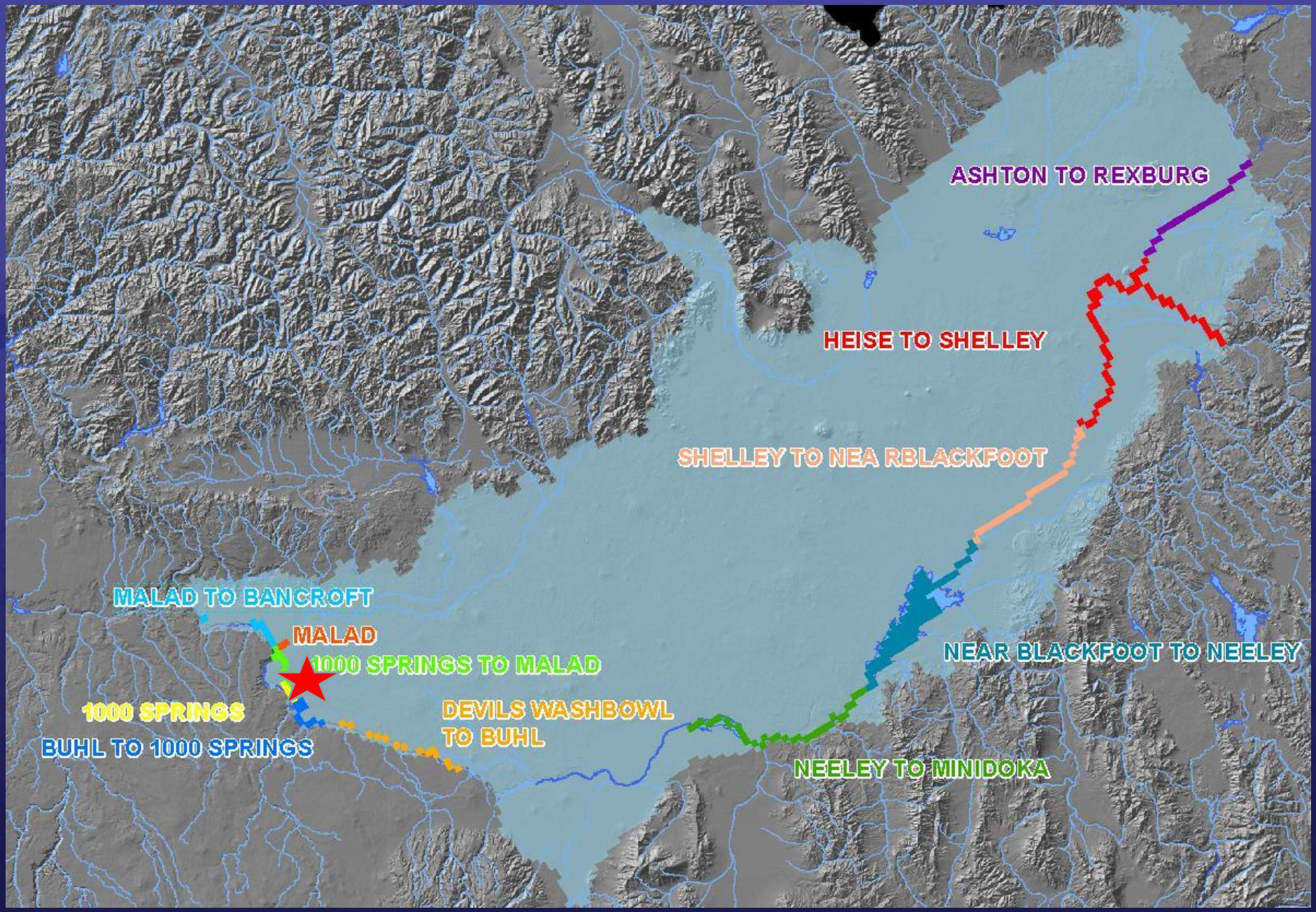
Example 1:
One-Way Transfer Analysis

Example 1:
One-Way Transfer Analysis

Starting in 2002 transfer water right from existing well (R42, C18) to new well (R43, C14).

1. WR #1
   - Accomplished Transfer
   - Irrigation → Dairy Use
   - Priority date 1958
   - 18 ac-ft/trimester depletion





Evaluate Impacts on 11 “Hydraulically Connected” Reaches of the Snake River

ENHANCED GROUND-WATER RIGHTS TRANSFER SI

UNIVERSITY OF IDAHO - IDAHO WATER RESOURCES RESEARCH INSTITUTE IDAHO DEPARTMENT O

Cells this color are set up for user entries

UPDATE DATES

RUN MODEL

GET OUTPUT

CALCULATE EFFECTS

ENTER STARTING DATE FOR SIMULATION. THEN PUSH "UPDATE DATES" BUTTON

YEAR	1958
SEASON	SPRING

TRANSFER NO:	73740
TRANSFER NAME:	Veenstra

ENTER CELL LOCATIONS:

	'TO' CELL	'FROM1' CELL	'FROM2' CELL	'FROM3' CELL
ROW	43	42	0	0
COLUMN	14	18	0	0

TRIMESTER OF ACTIVITY	TO WELL Projected Use AF/TRIMESTER	FROM1 WELL With Transfer AF/TRIMESTER	FROM1 WELL Without Transfer AF/TRIMESTER	FROM2 WELL With Transfer AF/TRIMESTER	FROM2 WELL Without Transfer AF/TRIMESTER	FROM3 WELL With Transfer AF/TRIMESTER	FROM3 WELL Without Transfer AF/TRIMESTER
SPR 1958	0	18	18	0	0	0	0
SUM 1958	0	18	18	0	0	0	0
WIN 1958	0	18	18	0	0	0	0
SPR 1959	0	18	18	0	0	0	0
SUM 1959	0	18	18	0	0	0	0
WIN 1959	0	18	18	0	0	0	0
SPR 1960	0	18	18	0	0	0	0
SUM 1960	0	18	18	0	0	0	0
WIN 1960	0	18	18	0	0	0	0
SPR 1961	0	18	18	0	0	0	0

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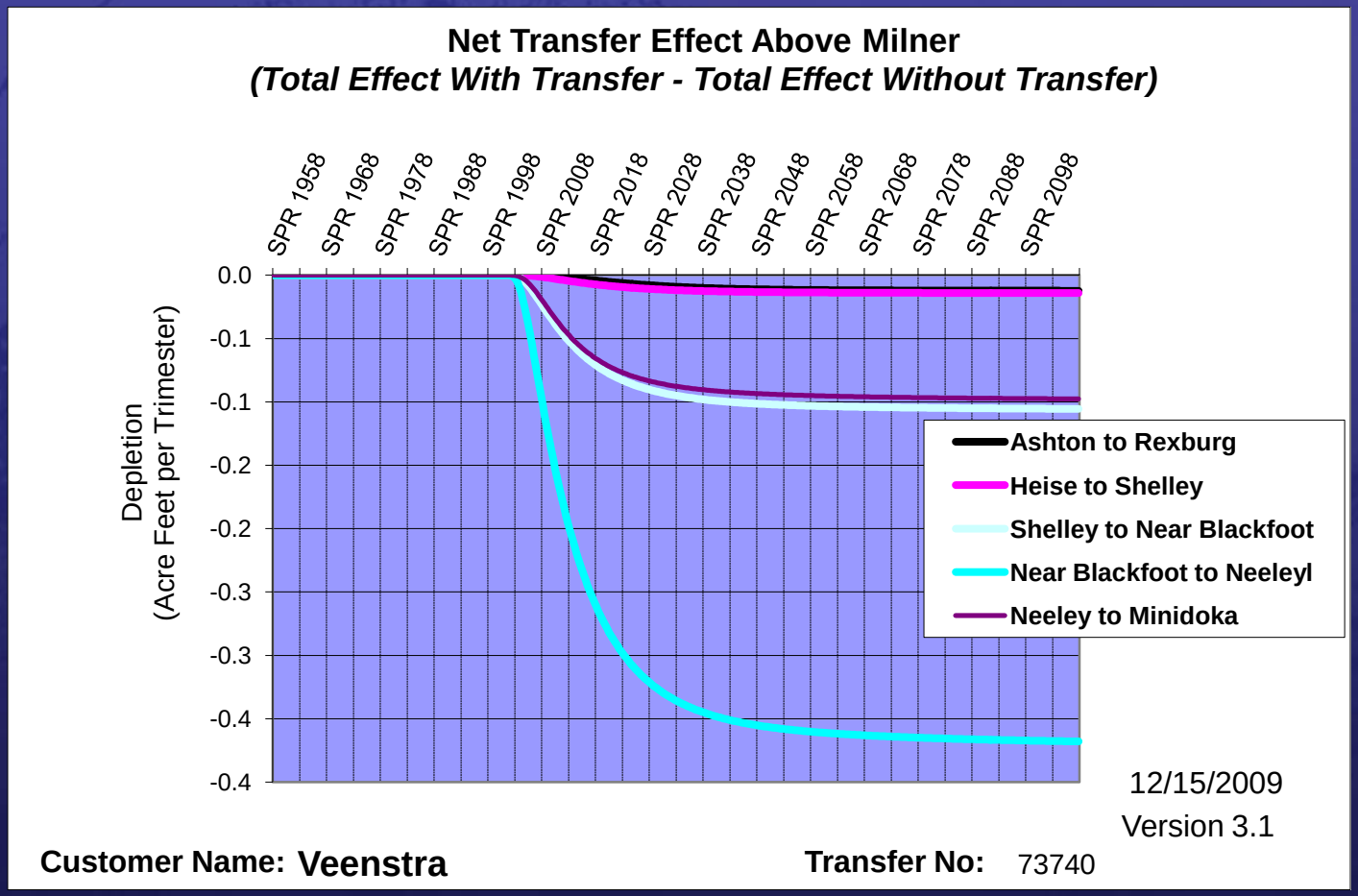
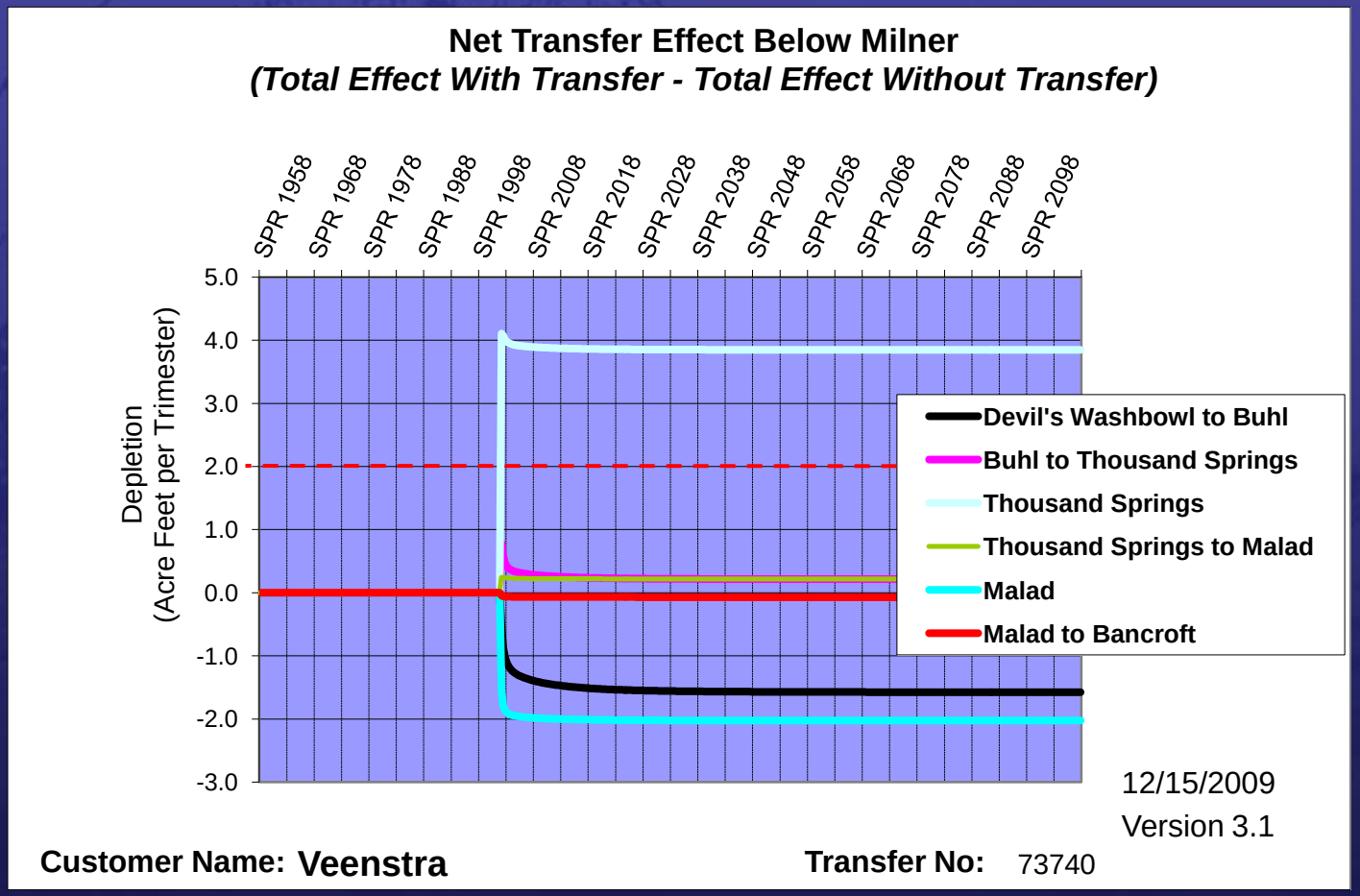
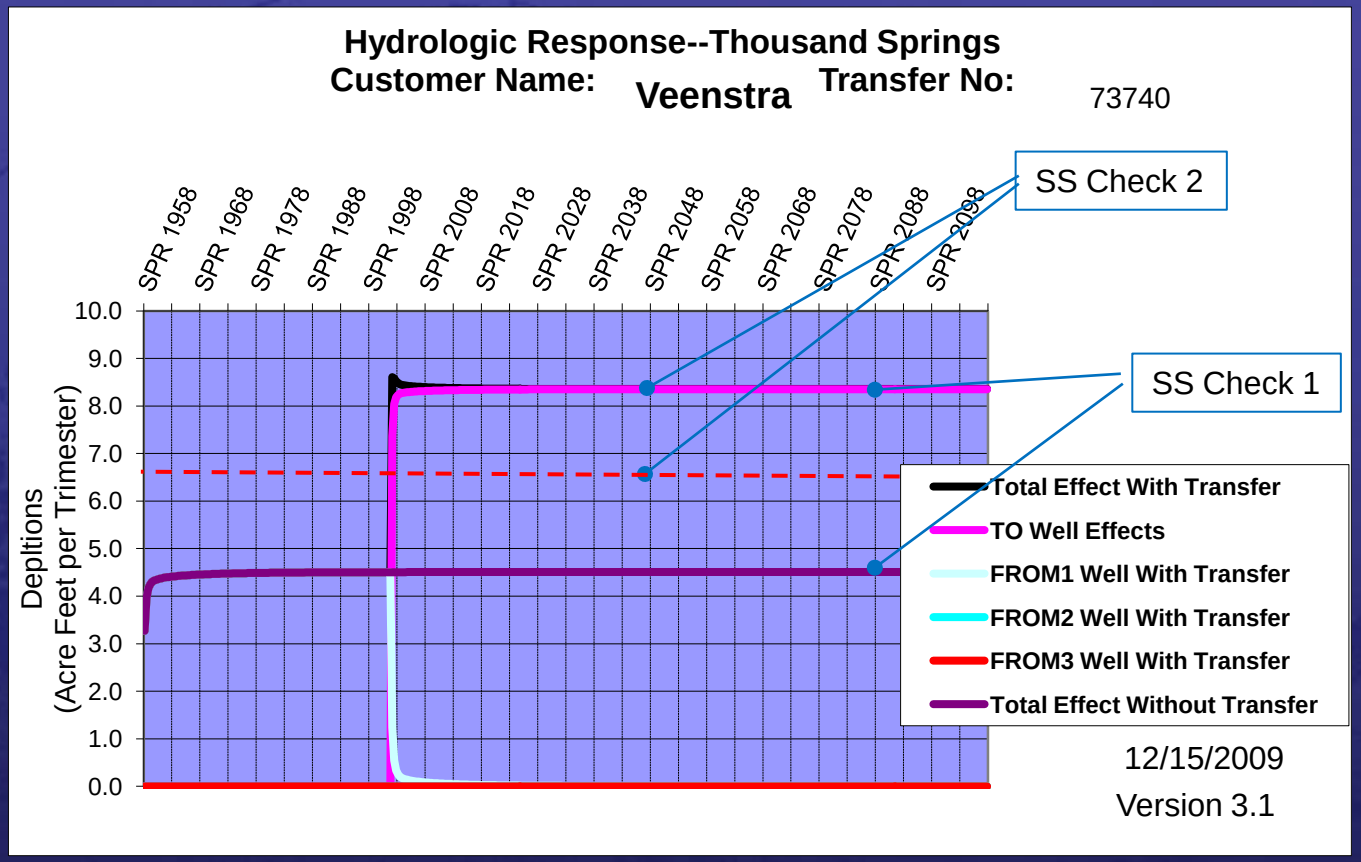


No positive changes to depletion – no mitigation requirements



Only 1000 Springs > 2 ac-ft/trimester – only have to evaluate 1000 Springs for Mitigation Requirements

Steady State Analysis



Step 1: >10% Increase Check:

100*(8.5/4.5 - 1) = 85%
85% > 10%,
∴ mitigate

Step 2: 2 ac-ft Check :

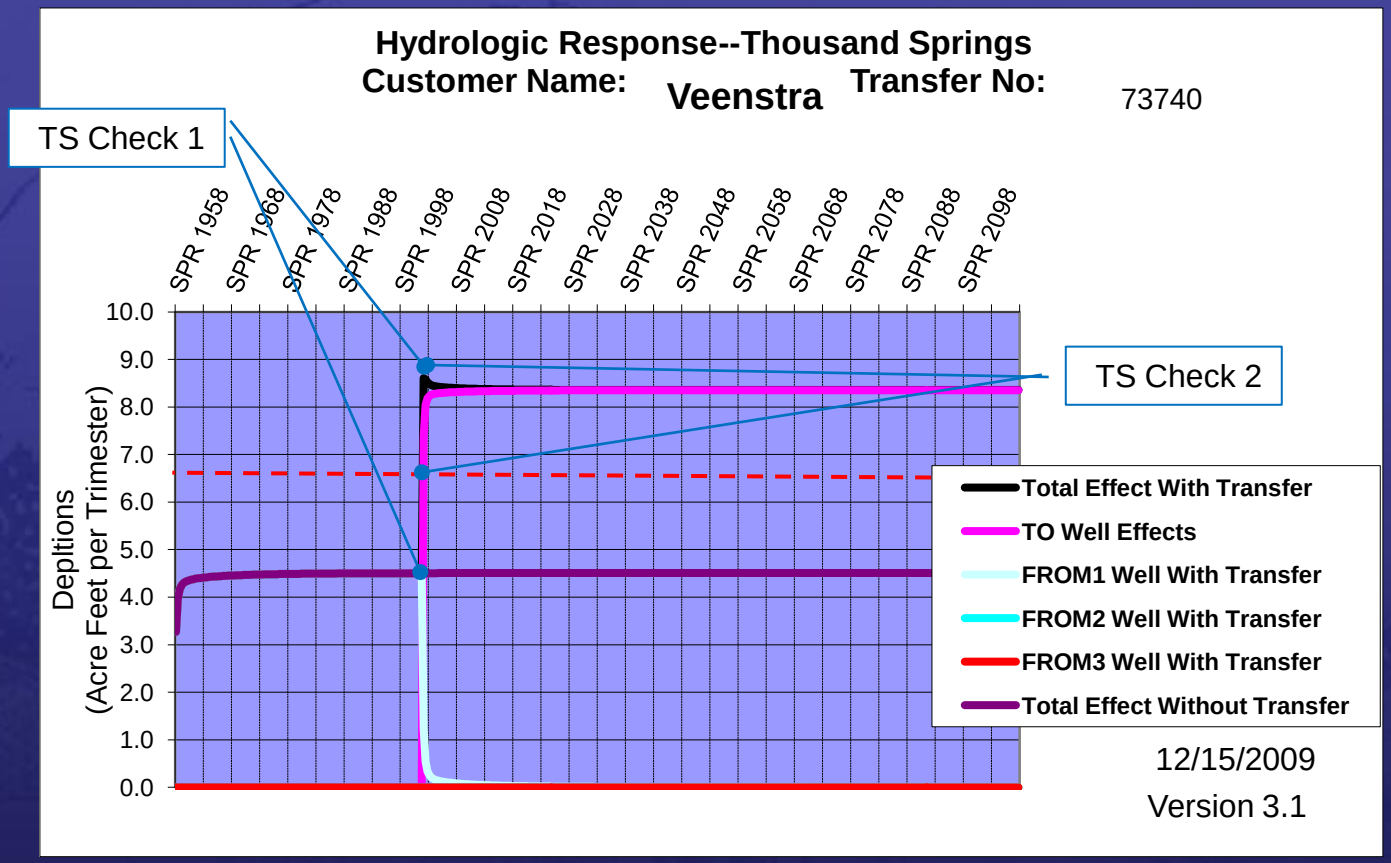
(8.4-4.5) = 3.8
3.8 > 2,
∴ mitigate

Step 3: 10% of Total Check:

100*(8.4/18.1) = 46%
46% > 10%,
∴ mitigate

Conclusion: all mitigation conditions have been met in steady state, therefore mitigation to the “1000 Springs” reach is required.

Transient State Analysis



Step 1: >10% Increase Check:

100*(8.6/4.5 - 1) = 91%
91% > 10%, ∴ mitigate

Step 2: 2 ac-ft Check :

(8.6 – 4.5) = 4.1
4.1 > 2, ∴ mitigate

Conclusion: both mitigation conditions have been met in transient state, therefore mitigation to the “1000 Springs” reach is required.

1 2107	0.0	0.0	0.1	0.3	0.1	2.4	4.8	8.4	0.8	1.1	0.0	0.0	0.0	0.1	0.3	0.1	2.4
2107	0.0	0.0	0.1	0.3	0.1	2.4	4.8	8.4	0.8	1.1	0.0	0.0	0.0	0.1	0.3	0.1	2.4
												0.876788	11.95914	12.73648	74.01241		

Enter First Time Step of Transfer: SPR 2002

Match: 133 Match: 456

	AtR	HtS	StNB	NBtN	NtM	DWtB	BtTS	TS	TStM	M	MtB	Total
Preexisting Effects @ SS (Last Time Step):	0.02	0.03	0.20	0.69	0.18	4.00	4.64	4.51	0.56	3.14	0.11	18.09
Steady State - Value of Dep. @ Last Time Step:	0.01	0.01	0.09	0.33	0.09	2.43	4.85	8.36	0.78	1.12	0.04	18.10
Preexisting Effects @ Transient State (Max Value Timestep):	0.02	0.03	0.20	0.69	0.18	4.00	4.64	4.51	0.56	3.14	0.11	18.09
Transient State - Max. Value of Dep. After Transfer:	0.02	0.02	0.19	0.66	0.17	3.43	5.41	8.61	0.80	1.59	07	20.98
Steady State Change:	-0.01	-0.01	-0.11	-0.37	-0.10	-1.58	0.21	3.85	0.22	-2.03	-0.07	
Transient State Change:	0.00	0.00	-0.01	-0.03	-0.01	-0.58	0.78	4.10	0.24	-1.55	-0.05	

Transfer Tool (Modified Etransfer_V3_1.xls)

One-Way Analysis of Independent Transfers

Transfer 1 (Stormcircle to Mainline):

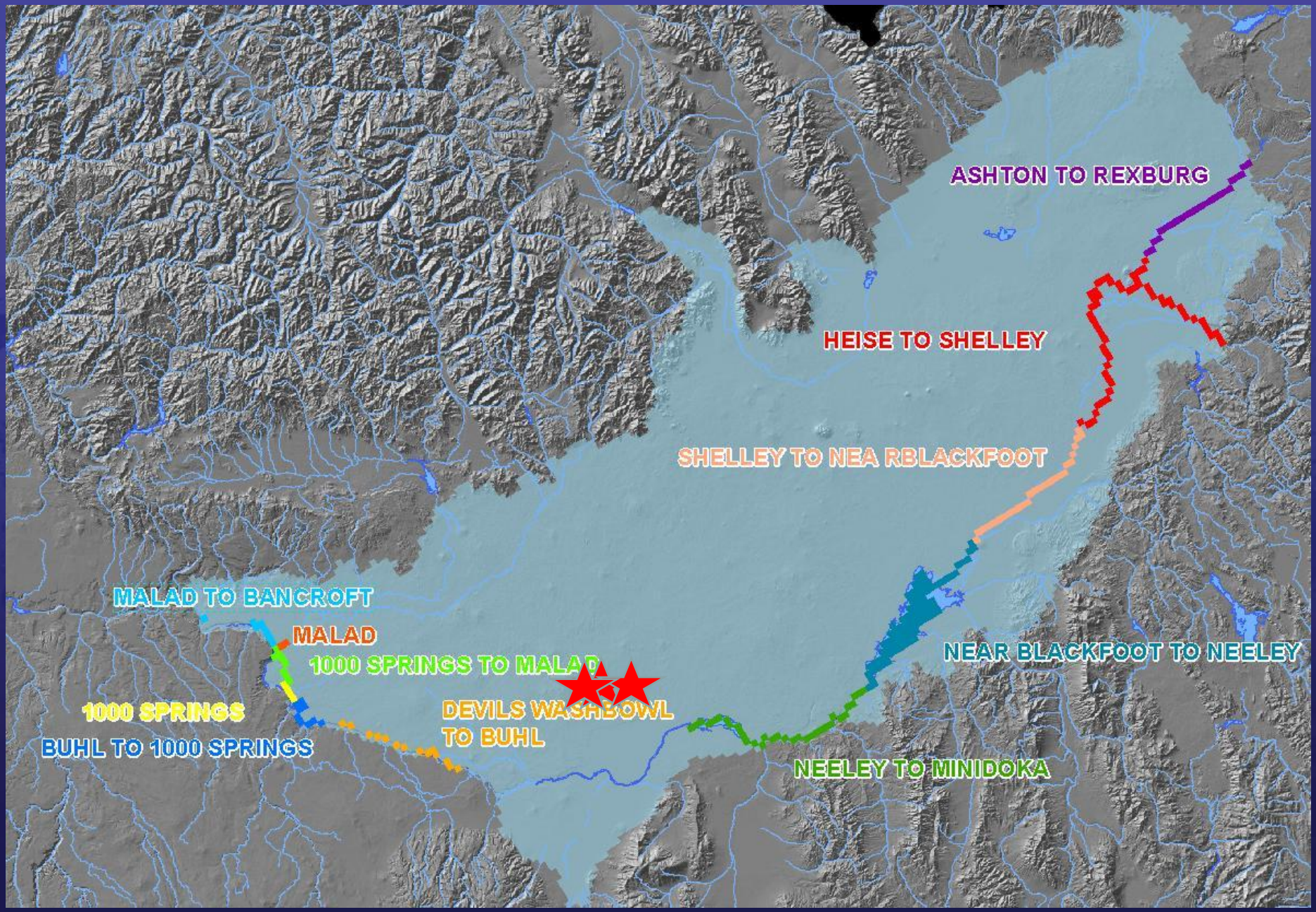
WR No.	Div. Rate (CFS)	Con. Vol. (AFA)	No. of Irr. Acres	Priority Date	POD Location	Dedicated Vol. AFA/	AFT	Model Node		Impact by Reach (AF/Trimester) Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	M ad	Malad to Bancroft
Transfer 1: Proposed Steady State Impacts following Transfer																				
36-16752	0.37	72.4	18.1	4/29/1958	SENE023T7SR14E	54.3	18.1	SP042018	Pre-SS:	0.02	0.03	0.20	0.69	0.18	4.00	4.64	4.51	0.56	3.14	0.11
36-16752	0.37	72.4	18.1	4/29/1958		54.3	18.1	SP043014	Post-SS:	0.01	0.01	0.09	0.33	0.09	2.43	4.85	8.36	0.7	1.12	0.04
Transfer: Worst Case Transient State Impacts following Transfer																				
36-16752	0.37	72.4	18.1	4/29/1958	SENE023T7SR14E	54.3	18.1	SP042018	Pre-TS:	0.02	0.03	0.20	0.69	0.18	4.00	4.64	4.51	0.56	3.14	0.11
36-16752	0.37	72.4	18.1	4/29/1958	0	54.3	18.1	SP043014	Post-TS:	0.02	0.02	0.19	0.66	0.17	3.43	5.41	8.61	0.80	1.59	0.07

		Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	M ad	Malad to Bancroft
Steady State Analysis	Mitigation Check 1 - >10% of Historical:	-52.9%	-53.0%	-53.0%	-53.1%	-52.9%	-39.4%	4.6%	85.3%	39.1%	-64.4%	-62.9%
	Mitigation Check 2: > 2 AF/T:	0.0	0.0	-0.1	-0.4	-0.1	-1.6	0.2	3.8	0.2	-2.0	-0.1
	Mitigation Check 3 - >10% of Total:	0.1%	0.1%	0.5%	1.8%	0.5%	13.4%	26.8%	46.2%	4.3%	6.2%	0.2%
	Mitigation Required?:	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
	Mitigation Vol. Req'd (ac-ft):	0.0	0.0	-0.1	-0.4	-0.1	-1.6	0.2	3.8	0.2	-2.0	-0.1
Transient State Analysis	Mitigation Check 1 - >10% of Historical:	-9.5%	-6.9%	-4.8%	-4.4%	-5.3%	-14.4%	16.8%	91.0%	43.3%	-49.4%	-40.8%
	Mitigation Check 2: > 2 AF/T:	0.0	0.0	0.0	0.0	0.0	-0.6	0.8	4.1	0.2	-1.6	0.0
	Mitigation Required?:	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
	Mitigation Vol. Req'd (ac-ft):	0.0	0.0	0.0	0.0	0.0	-0.6	0.8	4.1	0.2	-1.6	0.0

Read Me

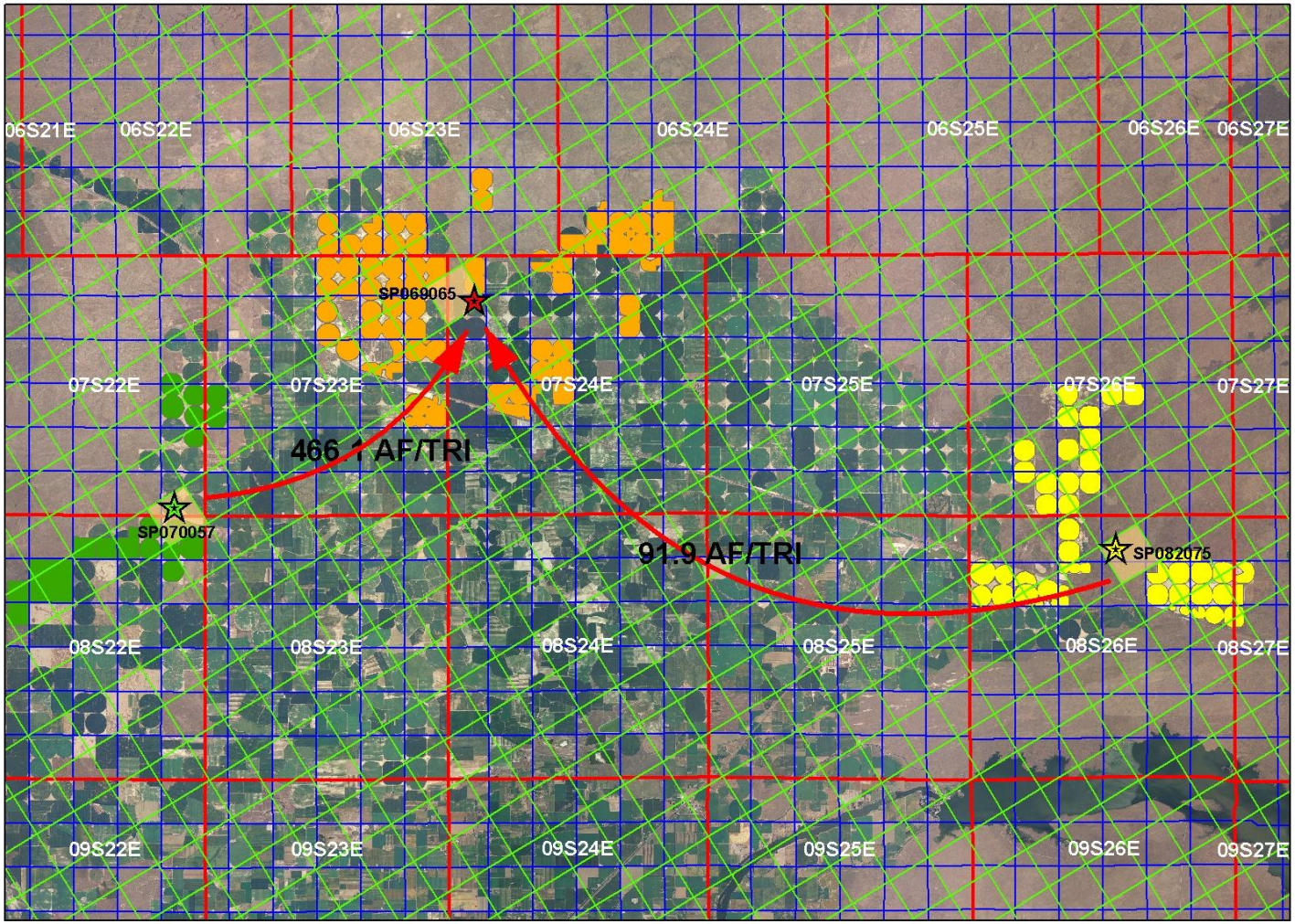
Mitigation Analysis Tool (Mitigation Analysis Tool 12-16-09.xls)

Example 2:
Simple Offsetting Transfer Analysis



Evaluate Impacts on 11 “Hydraulically Connected” Reaches of the Snake River

Example 2:
Simple Offsetting Transfer Analysis



Western Mortgage Off-Setting Transfer Proposal

Mitigation Analysis Period

Trimester

Transfer 1 (Stormcircle to Mainline):

WR No.	Div. Rate (CFS)	Con. Vol. (AFA)	No. of Irr. Acres	Priority Date	POD Location	Dedicated Vol. AFA/	AFT	Model Node		Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
										Impact by Reach (AF/Trimester)										
Transfer 1: Proposed Steady State Impacts following Transfer																				
???	???	275.6	68.9	1/1/1960	8S26E-3	275.6	91.9	SP082075	Pre-SS	5.75	6.60	49.28	172.09	51.03	95.76	36.22	22.91	2.51	21.49	0.82
???	???	275.6	68.9	1/1/1960	8S26E-3	275.6	91.9	SP068066	Post-SS	5.96	6.85	51.10	178.32	49.65	91.17	35.10	22.25	2.45	21.08	0.80
Transfer 1: Worst Case Transient State Impacts following Transfer																				
???	???	275.6	68.9	1/1/1960	8S26E-3	275.6	91.9	SP082075	Pre-TS	5.75	6.60	49.28	172.09	51.03	95.76	36.22	22.91	2.51	21.49	0.82
???	???	275.6	68.9	1/1/1960	8S26E-3	275.6	91.9	SP068066	Post-TS	5.96	6.85	51.10	178.32	49.65	91.17	35.10	22.25	2.45	21.08	0.80

		Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
Steady State Analysis	Mitigation Check 1 - >10% of Historical:	3.7%	3.7%	3.7%	3.6%	-2.7%	-4.8%	-3.1%	-2.8%	-2.5%	-1.9%	-1.8%
	Mitigation Check 2: > 2 AF/T:	0.2	0.2	1.8	6.2	-1.4	-4.6	-1.1	-0.7	-0.1	-0.4	0.0
	Mitigation Check 3 - >10% of Total:	1.3%	1.5%	11.0%	38.4%	10.7%	19.6%	7.6%	4.8%	0.5%	4.5%	0.2%
	Mitigation Required?:	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Mitigation Vol. Req'd (ac-ft):	0.2	0.2	1.8	6.2	-1.4	-4.6	-1.1	-0.7	-0.1	-0.4	0.0
Transient State Analysis	Mitigation Check 1 - >10% of Historical:	3.7%	3.7%	3.7%	3.6%	-2.7%	-4.8%	-3.1%	-2.8%	-2.5%	-1.9%	-1.8%
	Mitigation Check 2: > 2 AF/T:	0.2	0.2	1.8	6.2	-1.4	-4.6	-1.1	-0.7	-0.1	-0.4	0.0
	Mitigation Required?:	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Mitigation Vol. Req'd (ac-ft):	0.2	0.2	1.8	6.2	-1.4	-4.6	-1.1	-0.7	-0.1	-0.4	0.0

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Transfer 2 (StormCircle to Keco):

WR No.	Div. Rate (CFS)	Con. Vol. (AFA)	No. of Irr. Acres	Priority Date	POD Location	Dedicated Vol. AFA/	AFT	Model Node		Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
										Impact by Reach (AF/Trimester)										
Transfer: Proposed Steady State Impacts following Transfer																				
???	???	1398.4	349.6	1/1/1990	7S22E-36	1398.4	466.1	SP070057	Pre-SS	1.0	1.2	8.9	32.2	22.1	13.9	5.3	3.4	0.4	3.2	0.1
???	???	1398.4	349.6	1/1/1990	7S22E-36	1398.4	466.1	SP068066	Post-SS	1.2	1.3	10.1	35.1	9.8	18.0	6.9	4.4	0.5	4.2	0.2
Transfer 1: Worst Case Transient State Impacts following Transfer																				
???	???	1398.4	349.6	1/1/1990	7S22E-36	1398.4	466.1	SP070057	Pre-TS	1.0	1.2	8.9	32.2	22.1	13.9	5.3	3.4	0.4	3.2	0.1
???	???	1398.4	349.6	1/1/1990	7S22E-36	1398.4	466.1	SP068066	Post-TS	1.2	1.3	10.1	35.1	20.4	18.0	6.9	4.4	0.5	4.2	0.2

		Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
Steady State Analysis	Mitigation Check 1 - >10% of Historical:	14.5%	14.2%	13.2%	9.2%	-55.6%	29.4%	29.7%	29.8%	29.9%	30.0%	30.0%
	Mitigation Check 2: > 2 AF/T:	0.1	0.2	1.2	3.0	-12.3	4.1	1.6	1.0	0.1	1.0	0.0
	Mitigation Check 3 - >10% of Total:	1.3%	1.5%	11.0%	38.4%	10.7%	19.6%	7.6%	4.8%	0.5%	4.5%	0.2%
	Mitigation Required?:	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
	Mitigation Vol. Req'd (ac-ft):	0.1	0.2	1.2	3.0	-12.3	4.1	1.6	1.0	0.1	1.0	0.0
Transient State Analysis	Mitigation Check 1 - >10% of Historical:	14.5%	14.2%	13.2%	9.2%	-7.3%	29.4%	29.7%	29.8%	29.9%	30.0%	30.0%
	Mitigation Check 2: > 2 AF/T:	0.1	0.2	1.2	3.0	-1.6	4.1	1.6	1.0	0.1	1.0	0.0
	Mitigation Required?:	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
	Mitigation Vol. Req'd (ac-ft):	0.1	0.2	1.2	3.0	-1.6	4.1	1.6	1.0	0.1	1.0	0.0

Decrease in Depletion (credit)

Increase in Depletion (debit)

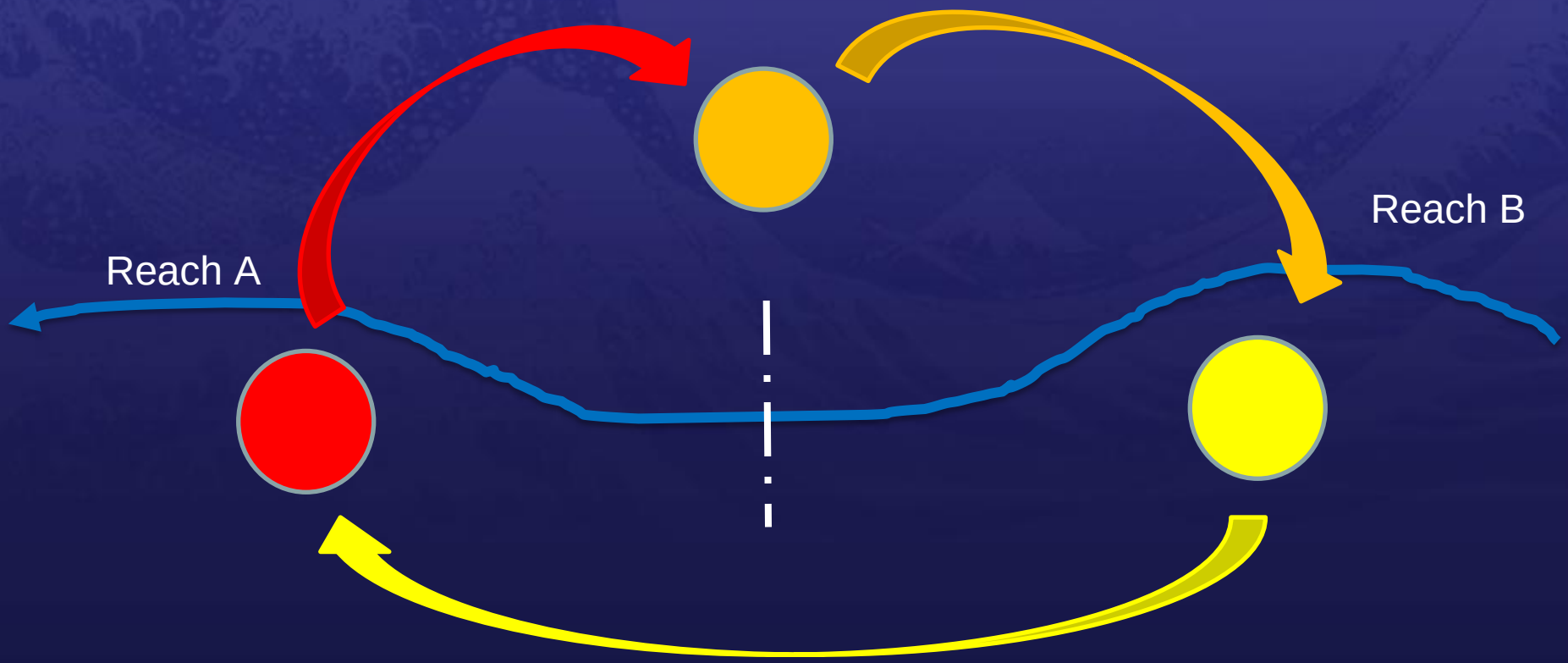
Steady State Summary of Modified Stream Depletions Following Transfer(s)
Impact by Reach (AF/Trimester)

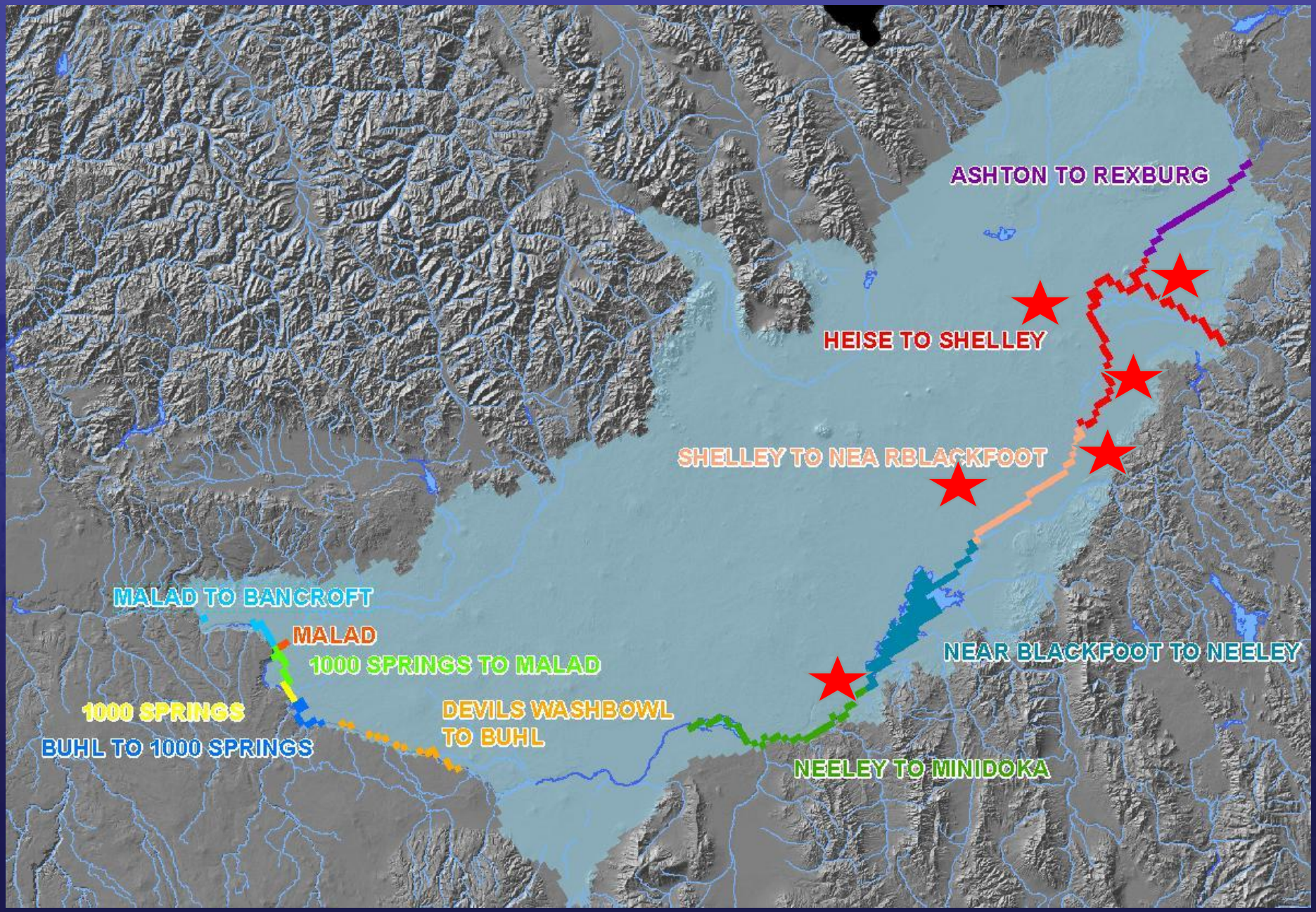
	Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
1	0.2	0.2	1.8	6.2	-1.4	-4.6	-1.1	-0.7	-0.1	-0.4	0.0
2	0.1	0.2	1.2	3.0	-12.3	4.1	1.6	1.0	0.1	1.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Summary:	0.0	0.0	0.0	0.0	-13.6	-0.5	-1.1	-0.7	-0.1	-0.4	0.0

Net Result:

No Additional Mitigation Required

Example 3:
Complex Offsetting Transfer Analysis





Evaluate Impacts on 11 “Hydraulically Connected” Reaches of the Snake River

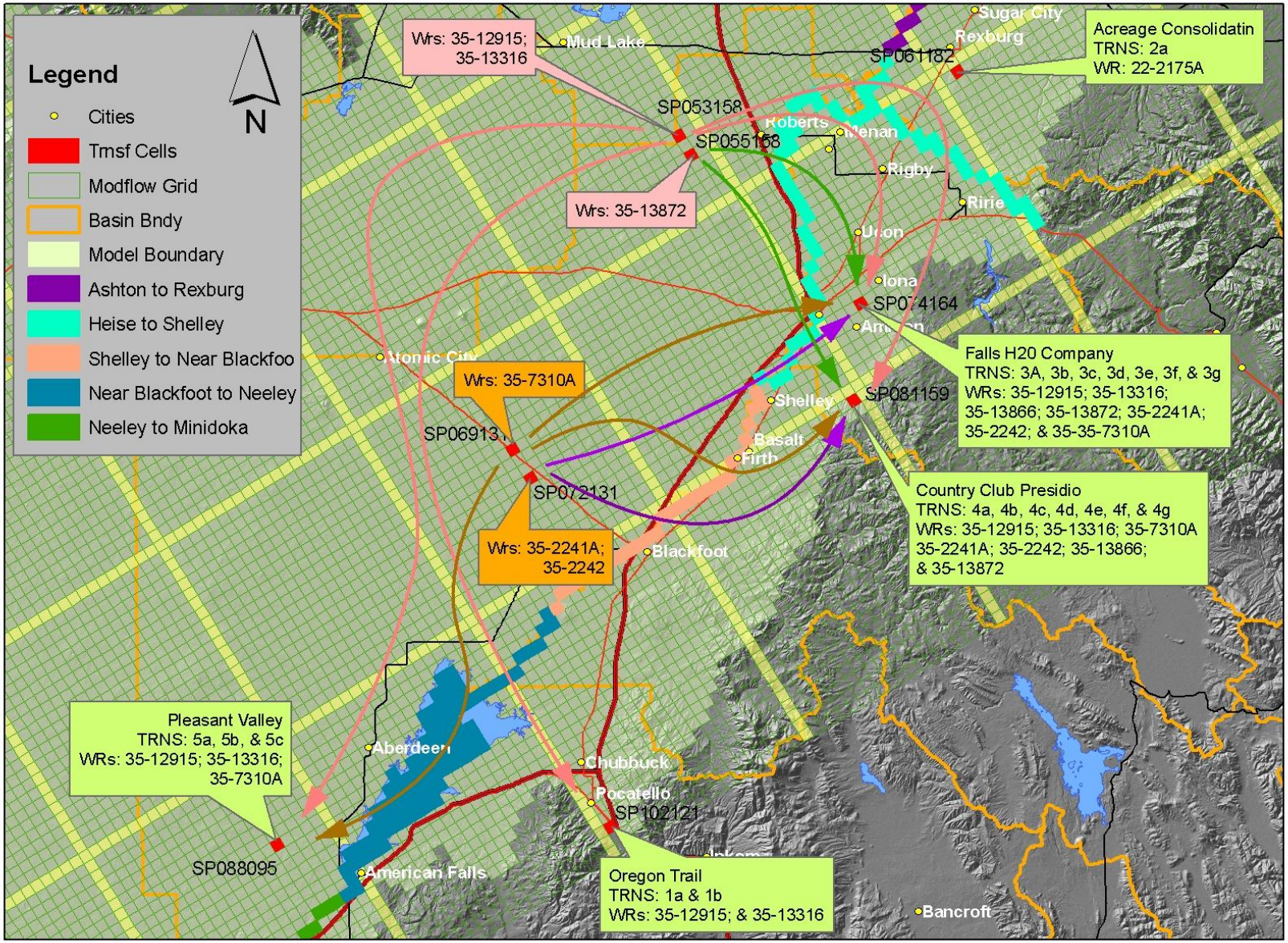


Fig. 1: Falls Water Company Offsetting Transfer Exhibit

Transfer 1a (OR Trail):

WR No.	Div. Rate (CFS)	Con. Vol. (AFA)	No. of Irr. Acres	Priority Date	POD Location	Dedicated Vol. AFA/	AFT	Model Node		Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
										Impact by Reach (AF/Annum)										
Transfer 1: Proposed Steady State Impacts following Transfer																				
35-12915	1.08	304.5	87.0	10/31/1986		304.5	101.5	SP053158	Pre-SS	2.1	2.4	6.4	9.5	0.2	0.2	0.1	0.1	0.0	0.1	0.0
35-12915	1.08	304.5	87	10/31/1986	0	304.5	101.5	SP102121	Post-SS	0.4	0.5	5.0	14.3	0.3	0.3	0.1	0.1	0.0	0.1	0.0
Transfer: Worst Case Transient State Impacts following Transfer																				
35-12915	1.08	304.5	87	10/31/1986	0	304.5	101.5	SP053158	Pre-TS	2.1	2.4	6.4	9.5	0.2	0.2	0.1	0.1	0.0	0.1	0.0
35-12915	1.08	304.5	87	10/31/1986	0	304.5	101.5	SP102121	Post-TS	1.9	2.2	6.0	15.2	0.3	0.3	0.1	0.1	0.0	0.1	0.0

Steady State Analysis	Mitigation Check 1 - >10% of Historical:	-79.1%	-78.2%	-21.8%	50.8%	25.2%	11.5%	11.5%	11.5%	11.5%	11.5%	11.5%
	Mitigation Check 2: > 6 AF/A:	-1.6	-1.9	-1.4	4.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Mitigation Check 3 - >10% of Total:	2.1%	2.5%	23.8%	67.9%	1.4%	1.3%	0.5%	0.3%	0.0%	0.3%	0.0%
	Mitigation Required?:	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Mitigation Vol. Req'd (ac-ft):	-1.6	-1.9	-1.4	4.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Transient State Analysis	Mitigation Check 1 - >10% of Historical:	-8.3%	-8.3%	-5.8%	59.5%	25.2%	11.5%	11.5%	11.5%	11.5%	11.5%	11.5%
	Mitigation Check 2: > 6 AF/A:	-0.2	-0.2	-0.4	5.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Mitigation Required?:	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Read Me	Mitigation Vol. Req'd (ac-ft):	-0.2	-0.2	-0.4	5.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0

x19

Steady State Summary of Modified Stream Depletions Following Transfer(s)
Impact by Reach (AF/Annum)

	Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
1	-1.6	-1.9	-1.4	4.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0
2	-4.8	12.3	14.2	-20.0	-0.5	-0.6	-0.2	-0.1	0.0	-0.1	0.0
3	-3.9	-1.1	14.4	-8.7	-0.2	-0.2	-0.1	-0.1	0.0	-0.1	0.0
4	-1.1	-1.2	-2.2	3.3	0.8	0.2	0.1	0.1	0.0	0.0	0.0
5	-4.6	-5.3	-3.9	13.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0
6	-13.3	34.2	39.6	-55.8	-1.5	-1.6	-0.6	-0.4	0.0	-0.4	0.0
7	-10.9	-3.1	40.2	-24.3	-0.6	-0.7	-0.3	-0.2	0.0	-0.2	0.0
8	-3.0	-3.5	-6.0	9.1	2.3	0.6	0.2	0.1	0.0	0.1	0.0
9	-6.0	25.4	25.9	-41.9	-1.1	-1.2	-0.4	-0.3	0.0	-0.3	0.0
10	-1.3	-0.4	5.8	-3.8	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
11	-5.7	24.1	24.5	-39.6	-1.0	-1.1	-0.4	-0.3	0.0	-0.3	0.0
12	-1.3	-0.4	5.5	-3.6	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
13	2.5	5.9	3.4	-11.1	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.0
14	2.5	5.9	3.4	-11.1	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.0
15	1.3	2.6	6.0	-9.3	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0
16	1.3	2.6	6.0	-9.3	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0
17	2.4	5.8	3.4	-10.9	-0.2	-0.2	-0.1	-0.1	0.0	-0.1	0.0
18	2.7	5.7	13.5	-20.6	-0.5	-0.4	-0.2	-0.1	0.0	-0.1	0.0
19	-7.9	-9.7	-58.4	41.7	23.7	5.5	2.1	1.3	0.1	1.3	0.0
Summary:	-65.5	69.4	100.4	-205.8	-6.7	-7.0	-2.7	-1.7	-0.2	-1.6	-0.1

Example 3: Complex Offsetting Transfer Analysis

Set Aside 1 (Non-Use/Desiccation):

WR No.	Div. Rate (CFS)	Con. Vol. (AFA)	No. of Irr. Acres	Priority Date	POD Location	Dedicated Vol. AFA/	Dedicated Vol. AFT	Model Node		Impact by Reach (AF/Annum) Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
Non-Use: Proposed Steady State Impacts following Change																				
35-12915	0.18	47.8	11.9	10/31/1986		47.8	15.9	SP053158	Pre-SS	4.7	5.5	14.5	21.5	0.5	0.5	0.2	0.1	0.0	0.1	0.0
35-12915	0.18	47.8	11.9	10/31/1986	0	47.8	15.9	SP053158	Post-SS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non-Use 1: Worst Case Transient State Impacts following Change																				
35-12915	0.18	47.8	11.9	10/31/1986	0	47.8	15.9	SP053158	Pre-TS	4.7	5.5	14.5	21.5	0.5	0.5	0.2	0.1	0.0	0.1	0.0
35-12915	0.18	47.8	11.9	10/31/1986	0	47.8	15.9	SP053158	Post-TS	4.4	5.3	14.3	21.0	0.5	0.4	0.2	0.1	0.0	0.1	0.0
									SS Reach Impacts:	-4.7	-5.5	-14.5	-21.5	-0.5	-0.5	-0.2	-0.1	0.0	-0.1	0.0
									TS Reach Impacts	-0.3	-0.1	-0.2	-0.5	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0

Set Aside 2 (Non-Use/Desiccation):

WR No.	Div. Rate (CFS)	Con. Vol. (AFA)	No. of Irr. Acres	Priority Date	POD Location	Dedicated Vol. AFA/	Dedicated Vol. AFT	Model Node		Impact by Reach (AF/Annum) Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
Non-Use: Proposed Steady State Impacts following Change																				
35-13316	0.67	133.0	33.3	1/27/1976		133	44.3	SP053158	Pre-SS	13.2	15.2	40.4	59.9	1.5	1.5	0.6	0.4	0.0	0.3	0.0
35-13316	0.67	133	33.3	1/27/1976	0	133	44.3	SP053158	Post-SS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non-Use 1: Worst Case Transient State Impacts following Change																				
35-13316	0.67	133	33.3	1/27/1976	0	133	44.3	SP053158	Pre-TS	13.2	15.2	40.4	59.9	1.5	1.5	0.6	0.4	0.0	0.3	0.0
35-13316	0.67	133	33.3	1/27/1976	0	133	44.3	SP053158	Post-TS	12.6	14.2	37.3	57.1	1.4	1.4	0.5	0.3	0.0	0.3	0.0
									SS Reach Impacts:	-13.1	-15.2	-40.4	-59.8	-1.5	-1.5	-0.6	-0.4	0.0	-0.3	0.0
									TS Reach Impacts	-0.5	-1.0	-3.1	-2.8	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0

x5

Steady State Summary of Modified Stream Depletions Following Transfer(s)
Impact by Reach (AF/Annum)

	Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
Total 1- Way Transfer Depletions:	-65.5	69.4	100.4	-205.8	-6.7	-7.0	-2.7	-1.7	-0.2	-1.6	-0.1
Total Mitigation Efforts:	-69.7	-69.4	-118.5	-174.8	-4.2	-4.4	-1.7	-1.1	-0.1	-1.0	0.0
	-135.1	0.1	-18.0	-380.6	-10.9	-11.3	-4.4	-2.8	-0.3	-2.6	-0.1

Example 3:
Complex Offsetting Transfer Analysis

Transient State Summary of Modified Stream Depletions Following Transfer(s)
Impact by Reach (AF/Annum)

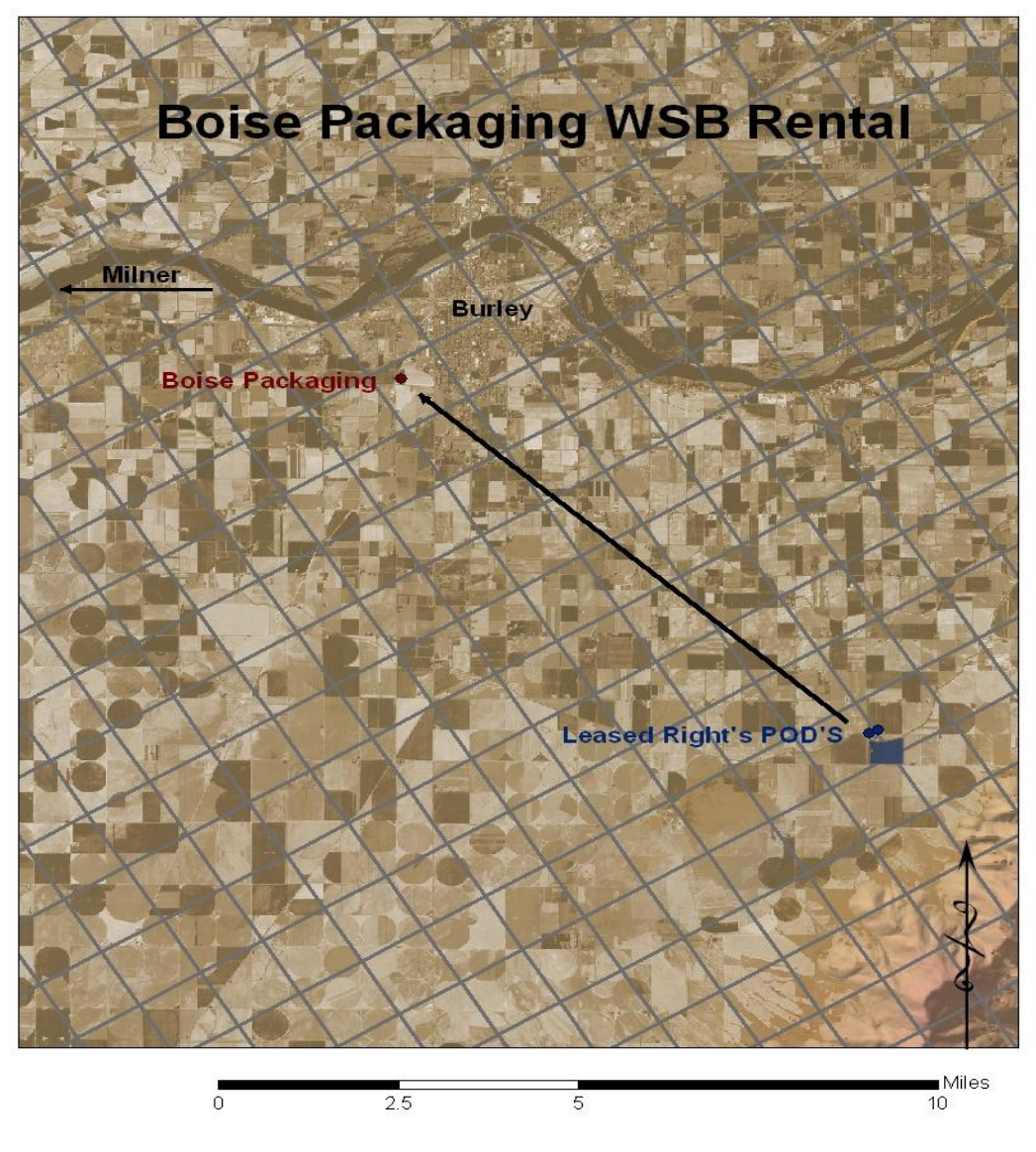
	Ashton to Rexburg	Heise to Shelley	Shelley to Nr Blckft	Nr Blckft To Neeley	Neeley to Minidoka	Dev. Wbl. To Buhl	Buhl to Kspr	Kspr	Kspr to Malad	Malad	Malad to Bancroft
1	-0.2	-0.2	-0.4	5.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.2	15.0	22.4	-3.0	-0.4	-0.5	-0.2	-0.1	0.0	-0.1	0.0
3	-0.8	0.5	17.8	-1.2	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0
4	-0.1	-0.1	-0.2	4.5	0.8	0.2	0.1	0.1	0.0	0.0	0.0
5	-0.2	-0.4	-0.9	16.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0
6	3.4	43.1	64.7	-3.3	-0.5	-0.8	-0.3	-0.2	0.0	-0.2	0.0
7	-0.9	2.0	50.5	-1.4	-0.2	-0.3	-0.1	-0.1	0.0	-0.1	0.0
8	-0.1	-0.3	-0.4	12.7	2.3	0.6	0.2	0.1	0.0	0.1	0.0
9	3.8	30.9	43.0	-2.9	-0.4	-0.6	-0.2	-0.1	0.0	-0.1	0.0
10	-0.1	0.3	7.3	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	4.1	29.5	41.1	-1.6	-0.2	-0.3	-0.1	-0.1	0.0	-0.1	0.0
12	0.0	0.3	6.9	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	2.5	5.9	3.4	-6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	2.5	5.9	3.4	-6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	1.3	2.6	6.0	-5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	1.3	2.6	6.0	-5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	2.4	5.8	3.4	-6.4	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
18	2.7	5.7	13.5	-11.5	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
19	-0.4	-0.5	-21.6	48.2	23.7	5.5	2.1	1.3	0.1	1.3	0.0

WSB Evaluation

1. Water Bank Applications
   - 5 to10 applications/year
   - Unique in time period scale
2. Transient Time Period
   - 2 part-test to determine mitigation

WSB Example

- 4.9 acres/19.6 af of irrigation needed for landscaping around a commercial plant in Burley
- Two rights identified as sufficient, 1966 and 1975 priorities. 1.58 cfs/315.2 af/78.8 acres leased to the bank. Completely stacked in acres
- Application moves water 8.5 miles NW towards river from historic diversion point



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ENHANCED GROUND-WATER RIGHTS TRANSFER SPREADSHEET

UNIVERSITY OF IDAHO - IDAHO WATER RESOURCES RESEARCH INSTITUTE IDAHO DEPARTMENT OF WATER RESOURCES

Cells this color are set up for user entries

UPDATE DATES | RUN MODEL | GET OUTPUT

CALCULATE EFFECTS

ENTER STARTING DATE FOR SIMULATION. THEN PUSH "UPDATE DATES" BUTTON

YEAR	1966
SEASON	SPRING

TRANSFER NO:	123
TRANSFER NAME:	Boise Packaging

ENTER CELL LOCATIONS:

	'TO' CELL	'FROM1' CELL	'FROM2' CELL	'FROM3' CELL
ROW	85	93		
COLUMN	49	51		

TRIMESTER OF ACTIVITY	TO WELL Projected Use AF/TRIMESTER	FROM1 WELL With Transfer AF/TRIMESTER	FROM1 WELL Without Transfer AF/TRIMESTER	FROM2 WELL With Transfer AF/TRIMESTER	FROM2 WELL Without Transfer AF/TRIMESTER	FROM3 WELL With Transfer AF/TRIMESTER	FROM3 WELL Without Transfer AF/TRIMESTER
SPR 1966	0	7	7	0	0	0	0
SUM 1966	0	13	13	0	0	0	0
WIN 1966	0	0	0	0	0	0	0
SPR 1967	0	7	7	0	0	0	0
SUM 1967	0	13	13	0	0	0	0
WIN 1967	0	0	0	0	0	0	0
SPR 1968	0	7	7	0	0	0	0
SUM 1968	0	13	13	0	0	0	0
WIN 1968	0	0	0	0	0	0	0
SPR 1969	0	7	7	0	0	0	0
SUM 1969	0	13	13	0	0	0	0
WIN 1969	0	0	0	0	0	0	0
SPR 1970	0	7	7	0	0	0	0
SUM 1970	0	13	13	0	0	0	0
WIN 1970	0	0	0	0	0	0	0
SPR 1971	0	7	7	0	0	0	0
SUM 1971	0	13	13	0	0	0	0
WIN 1971	0	0	0	0	0	0	0
SPR 1972	0	7	7	0	0	0	0
SUM 1972	0	13	13	0	0	0	0
WIN 1972	0	0	0	0	0	0	0
SPR 1973	0	7	7	0	0	0	0
SUM 1973	0	13	13	0	0	0	0

Entering Dates

Enter the starting year and season for your simulation. The starting date represents the begin of the analysis period. (Spring is Mar, Apr, May and Jun. Summer is Jul, Aug, Sep and Oct. Winter is Nov, Dec, Jan and Feb.)

Once you have entered the starting date, push the "UPDATE DATE" Button.

The date only needs to be updated once, unless the desired timeframe of the simulation is ch

Modifying the date does not automatically adjust the location of the rates entered in the table.

Entering Well Locations

Enter the row and column location for the 'TO' well in spreadsheet cell B15 and B16, respectiv

Enter the row and column location for the 'FROM1' well in spreadsheet cell C15 amd C16, resp

Enter the row and column location for the 'FROM2' well in spreadsheet cell D15 and D16, resp

Enter the row and column location for the 'FROM3' well in spreadsheet cell E15 and E16, resp

If the 'FROM2' well is not to be modeled, the entered row and column should be 0 or blank.

If the 'FROM3' well is not to be modeled, the entered row and column should be 0 (zero).

The 'FROM3' well cannot be used if the 'FROM2' well is not being used.

Running the Model

Once the model cells have been specified for the 'FROM' and 'TO' wells, push the 'RUN MODEL' button to generate the response functions. The model only needs to be re-run if the locations of the 'FROM' and 'TO' wells are changed.

Getting the Model Output

Once the model has been run, push the 'GET OUTPUT' button to retrieve the model output. This prepares the model output for use for calculating effects.

Entering water use data

All water use should be entered in units of acre-feet per four month period. See the user's ma for instructions on multiple water rights with different priority dates and/or different wells.

Entering 'TO' Well Projected Water Use

Enter the projected water use for the 'TO' Well in Column B. 'TO' Well water use should start in the trimester (4-month period) in which the transfer will be effective.

Entering 'FROM' Well 'With Transfer' Use

Enter the 'With Transfer' water use for the first 'FROM' Well in Column C, for the second 'FROM' well in Column E, and for the third 'FROM' Well in Column G. 'With Transfer' water use should reflect historical and projected after transfer use for this well should cease or be reduced at the time of the water right transfer.

TITLE | EXPLANATION | DataEntry | TransferSummary | GRAPHS ABOVE MILNER | GRAPHS BELOW MILNER

Ready

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Home | Insert | Page Layout | Formulas | Data | Review | View | Developer

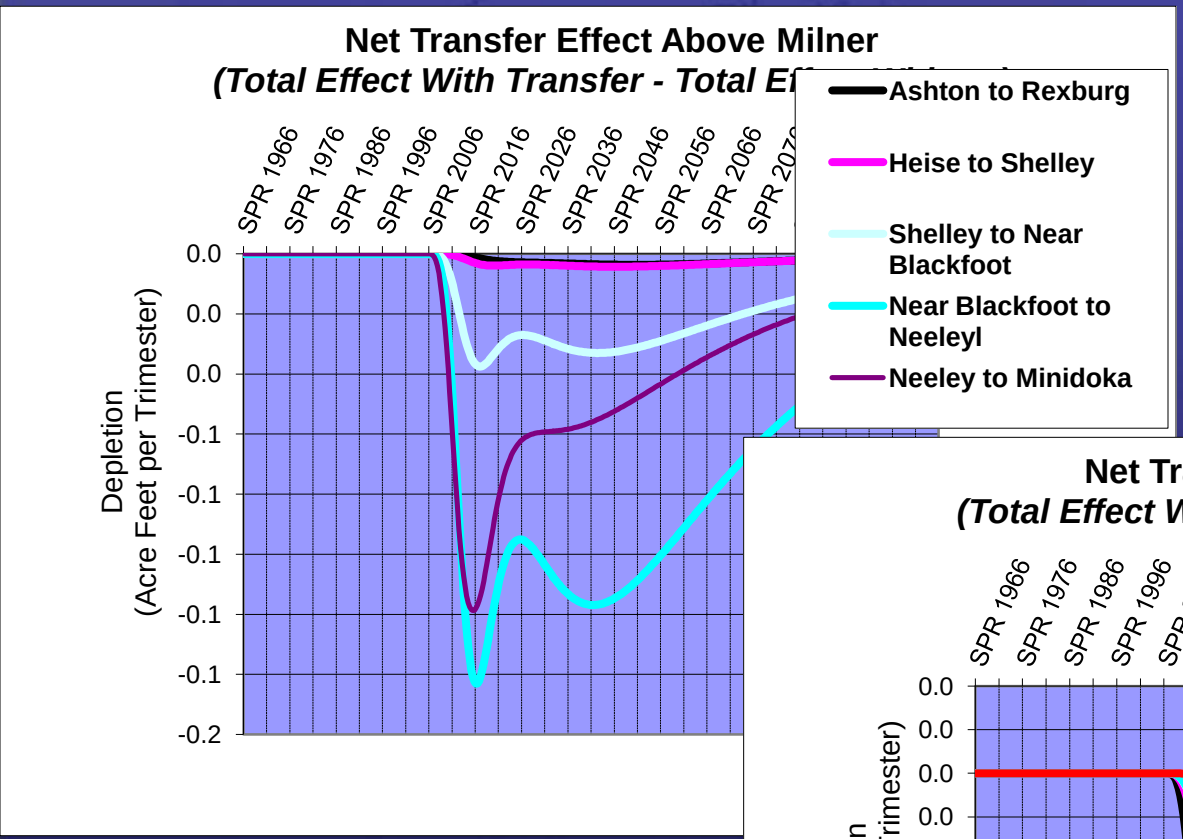
M6

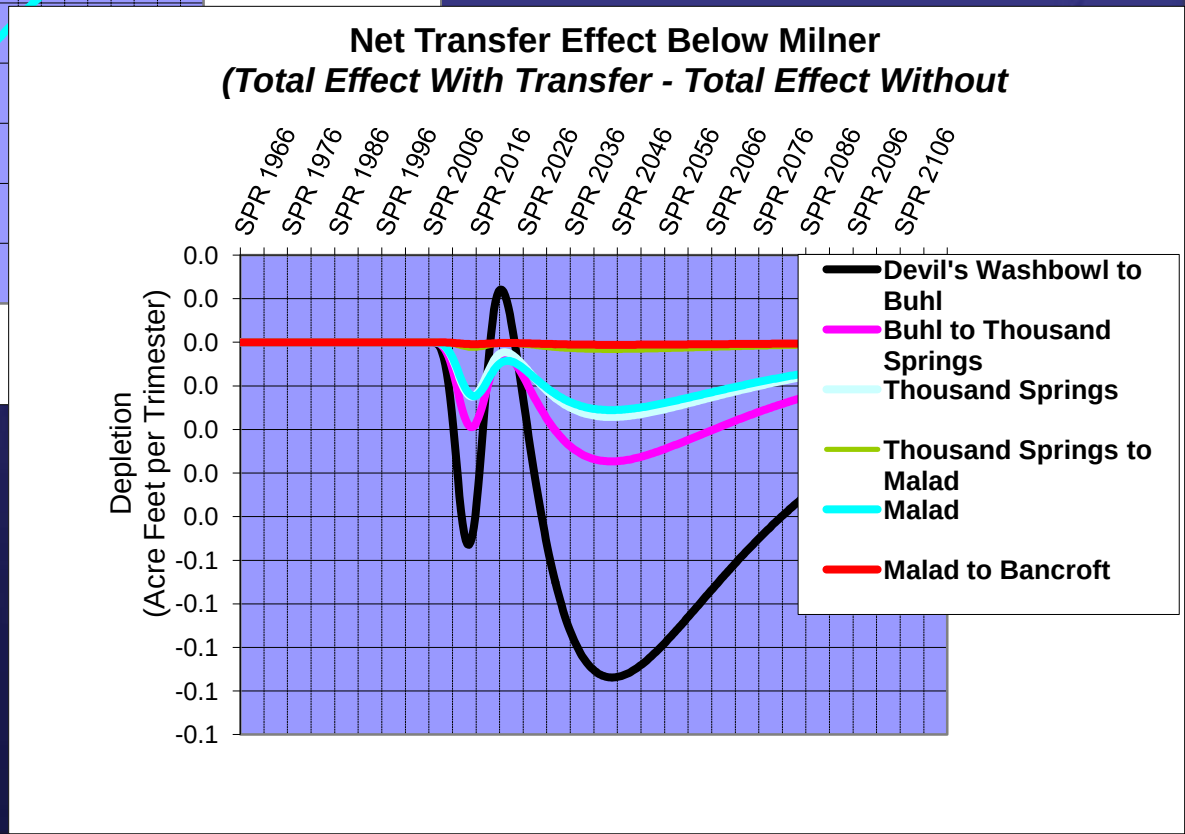
	A	B	C	D	E	F	G	H
128	WIN 2001	0	0	0	0	0	0	0
129	SPR 2002	0	7	7	0	0	0	0
130	SUM 2002	0	13	13	0	0	0	0
131	WIN 2002	0	0	0	0	0	0	0
132	SPR 2003	0	7	7	0	0	0	0
133	SUM 2003	0	13	13	0	0	0	0
134	WIN 2003	0	0	0	0	0	0	0
135	SPR 2004	0	7	7	0	0	0	0
136	SUM 2004	0	13	13	0	0	0	0
137	WIN 2004	0	0	0	0	0	0	0
138	SPR 2005	0	7	7	0	0	0	0
139	SUM 2005	0	13	13	0	0	0	0
140	WIN 2005	0	0	0	0	0	0	0
141	SPR 2006	0	0	7	0	0	0	0
142	SUM 2006	0	0	13	0	0	0	0
143	WIN 2006	0	0	0	0	0	0	0
144	SPR 2007	0	0	7	0	0	0	0
145	SUM 2007	0	0	13	0	0	0	0
146	WIN 2007	0	0	0	0	0	0	0
147	SPR 2008	0	0	7	0	0	0	0
148	SUM 2008	0	0	13	0	0	0	0
149	WIN 2008	0	0	0	0	0	0	0
150	SPR 2009	0	0	7	0	0	0	0
151	SUM 2009	0	0	13	0	0	0	0
152	WIN 2009	0	0	0	0	0	0	0
153	SPR 2010	7	0	7	0	0	0	0
154	SUM 2010	13	0	13	0	0	0	0
155	WIN 2010	0	0	0	0	0	0	0
156	SPR 2011	7	0	7	0	0	0	0
157	SUM 2011	13	0	13	0	0	0	0
158	WIN 2011	0	0	0	0	0	0	0
159	SPR 2012	7	0	7	0	0	0	0
160	SUM 2012	13	0	13	0	0	0	0
161	WIN 2012	0	0	0	0	0	0	0
162	SPR 2013	7	0	7	0	0	0	0
163	SUM 2013	13	0	13	0	0	0	0
164	WIN 2013	0	0	0	0	0	0	0
165	SPR 2014	7	0	7	0	0	0	0
166	SUM 2014	13	0	13	0	0	0	0
167	WIN 2014	0	0	0	0	0	0	0
168	SPR 2015	7	0	7	0	0	0	0
169	SUM 2015	13	0	13	0	0	0	0
170	WIN 2015	0	0	0	0	0	0	0
171	SPR 2016	0	7	7	0	0	0	0
172	SUM 2016	0	13	13	0	0	0	0
173	WIN 2016	0	0	0	0	0	0	0
174	SPR 2017	0	7	7	0	0	0	0
175	SUM 2017	0	13	13	0	0	0	0
176	WIN 2017	0	0	0	0	0	0	0
177	SPR 2018	0	7	7	0	0	0	0
178	SUM 2018	0	13	13	0	0	0	0
179	WIN 2018	0	0	0	0	0	0	0
180	SPR 2019	0	7	7	0	0	0	0

TITLE | EXPLANATION | DataEntry | TransferSummary | GRAPHS ABOVE MILNER | GRAPHS BELOW MILNER

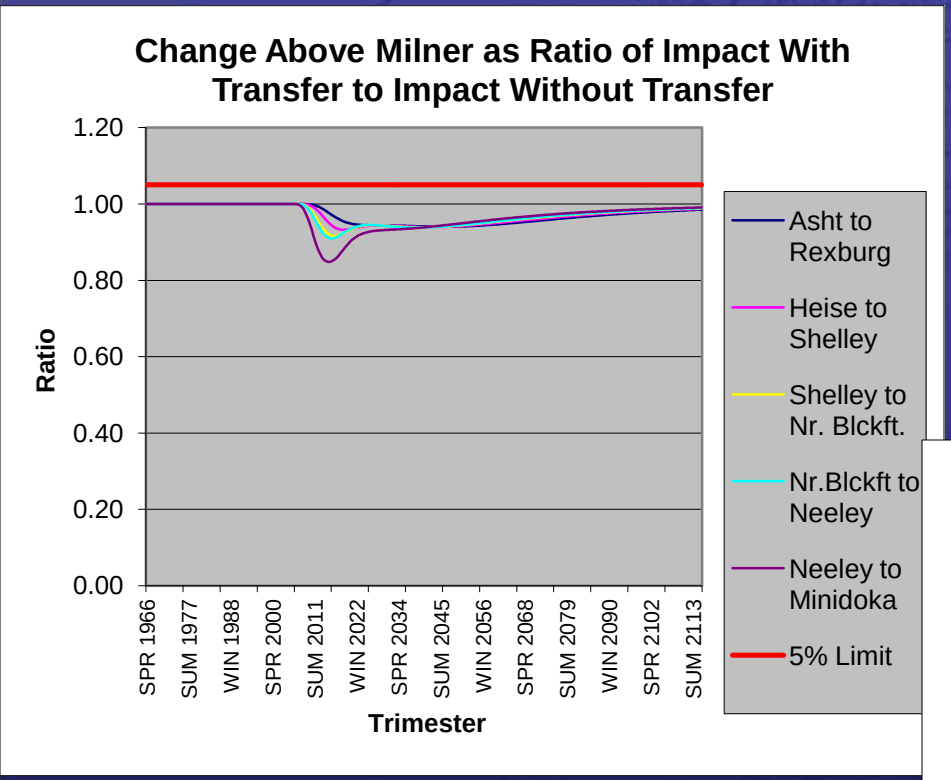
Ready 75%

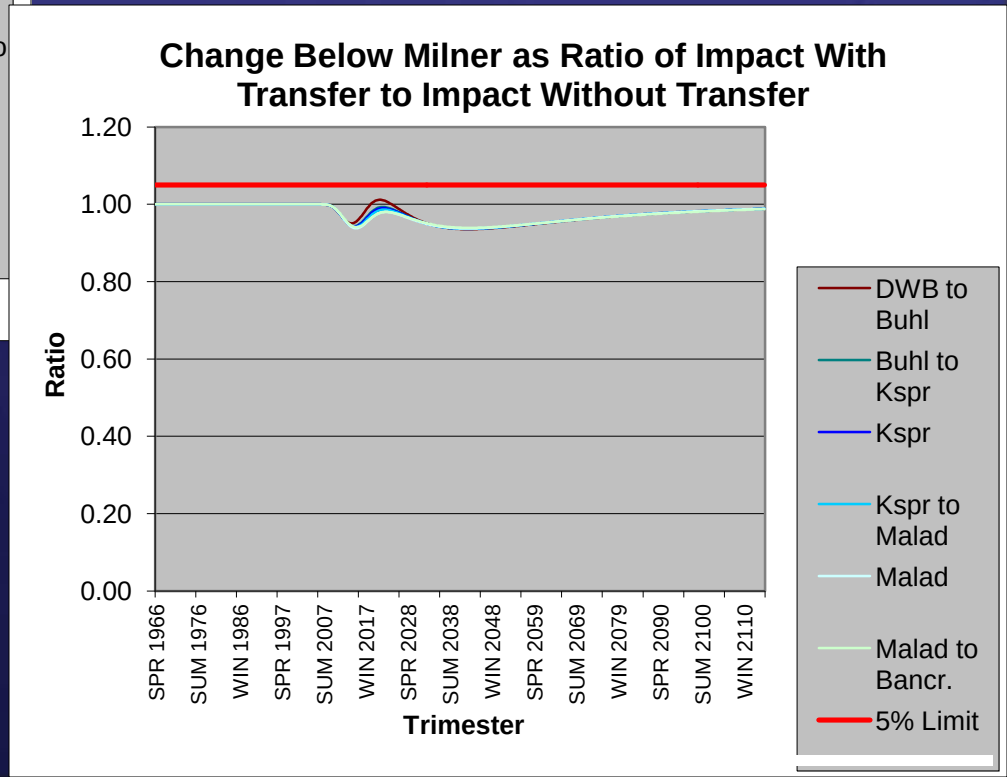
WSB Example


Net Transfer Effect Above Milner
(Total Effect With Transfer - Total Ef
SPR 1966
SPR 1976
SPR 1986
SPR 1996
SPR 2006
SPR 2016
SPR 2026
SPR 2036
SPR 2046
SPR 2056
SPR 2066
Depletion
(Acre Feet per Trimester)
0.0
0.0
0.0
-0.1
-0.1
-0.1
-0.1
-0.1
-0.2
Ashton to Rexburg
Heise to Shelley
Shelley to Near Blackfoot
Near Blackfoot to Neeleyl
Neeley to Minidoka


Net Transfer Effect Below Milner
(Total Effect With Transfer - Total Effect Without
SPR 1966
SPR 1976
SPR 1986
SPR 1996
SPR 2006
SPR 2016
SPR 2026
SPR 2036
SPR 2046
SPR 2056
SPR 2066
SPR 2076
SPR 2086
SPR 2096
SPR 2106
Depletion
(Acre Feet per Trimester)
0.0
0.0
0.0
0.0
0.0
0.0
0.0
-0.1
-0.1
-0.1
-0.1
-0.1
Devil's Washbowl to Buhl
Buhl to Thousand Springs
Thousand Springs
Thousand Springs to Malad
Malad
Malad to Bancroft

WSB Example





Summary: Model shows no reach has increased depletions greater than 2 af per trimester or greater than 10% over the simulated pre-rental depletions.

ESPA Tool & Permits

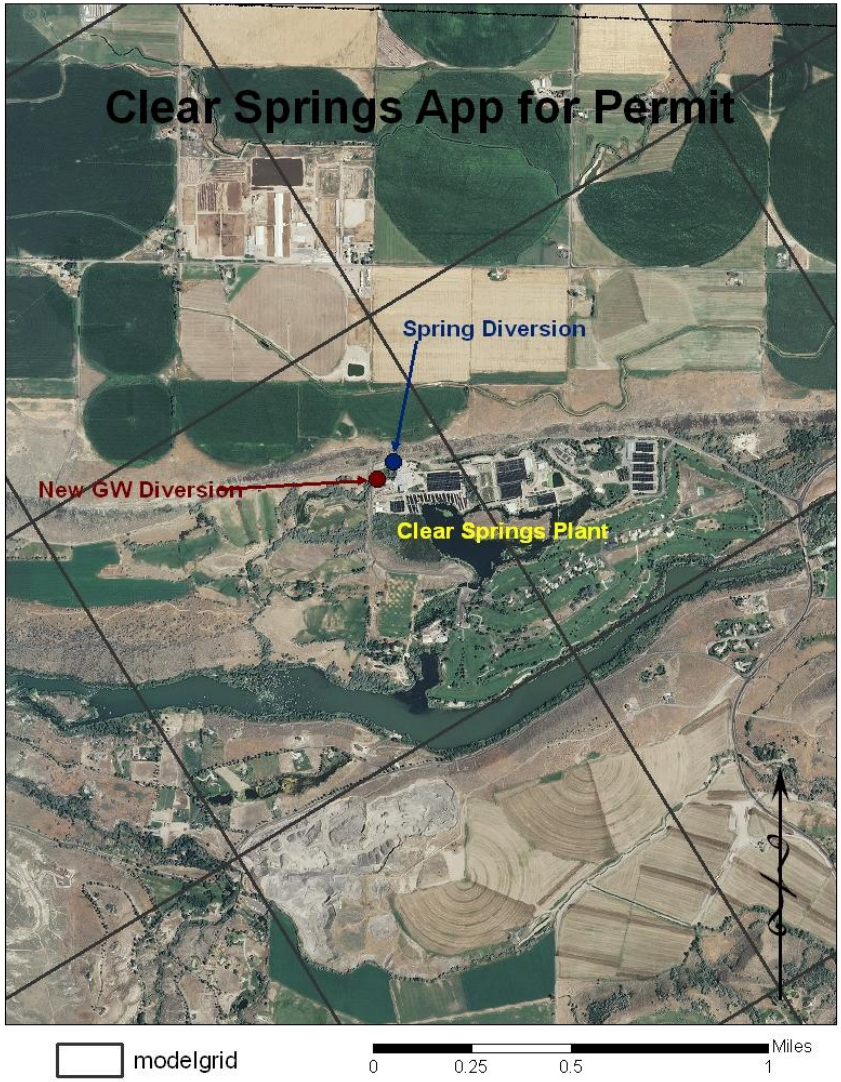
- Handful of applications per year
- Model can be used to determine amount and where mitigation is required
- Because permit is new appropriation, mitigation always required. A possible exception
  - Applicant can demonstrate water is available for appropriation within the non-trust areas of the model. IDWR considers this area to have no water available for appropriation, though no moratorium issued.

ESPA Tool & Permits

- 2-prong test. For any reach:
  - new appropriation exceeds 2 acre-feet per trimester
  - new depletion, at steady state conditions, is greater than 10% of the total depletion to all reaches resulting from the proposed permit.
- If new appropriation meets <u>both</u> criteria, applicant must <u>fully</u> mitigate for the new consumptive use.
- If both criteria are not met, applicant must mitigate according to modeled depletions

Permit Example

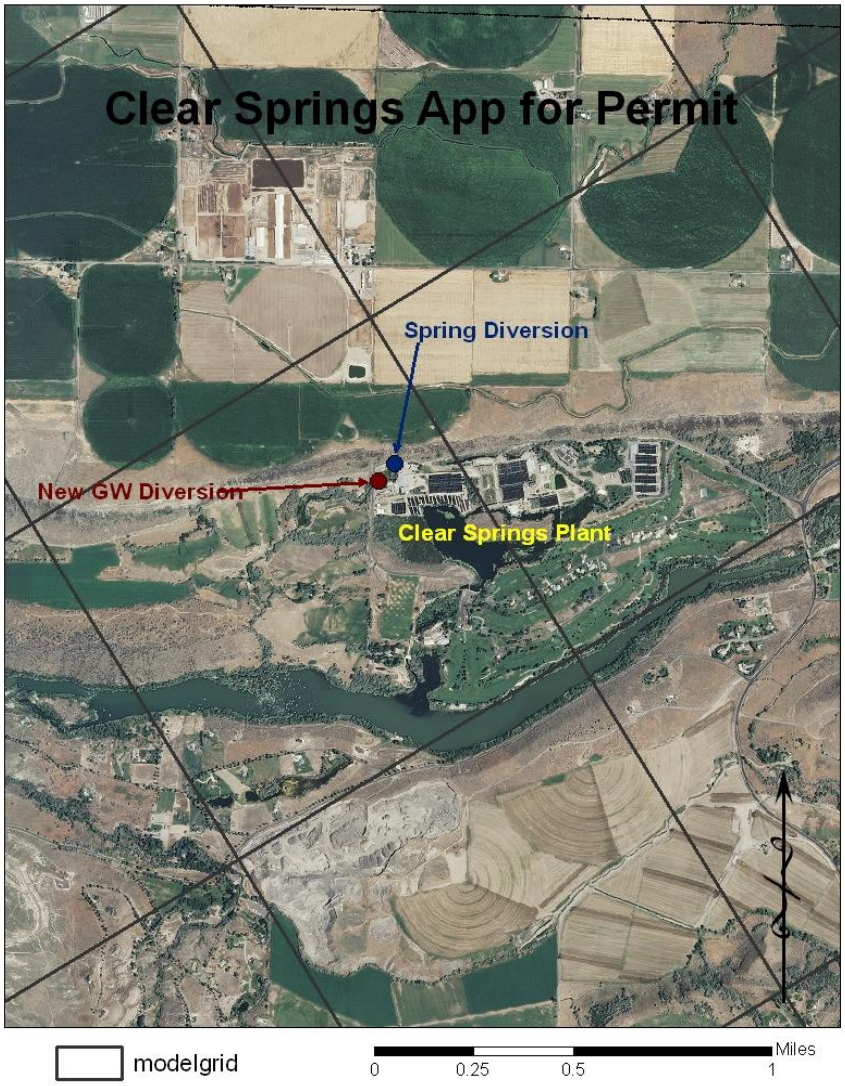
- Application for use of groundwater to meet safe drinking water requirements, for alternative use to a senior spring right for domestic and industrial purposes at plant
- Estimated diversion of 61 acre-feet per trimester
- Senior spring right tributary to the Buhl to 1000 Springs reach



Permit Example

- The Buhl to 1000 Springs reach exempted from mitigation b/c a condition of approval limited both the new GW permit and senior spring right to spring right's authorized diversion rate. Modeled depletions to all reaches <u>except</u> for Buhl to 1000 Springs

- Because return flows likely to accrue via surface flow to only the Buhl to 1000 Springs reach, model analysis considered entire diversion volume as depletionary



61run.xls [Compatibility Mode] - Microsoft Excel

ENHANCED GROUND-WATER RIGHTS TRANSFER SPREADSHEET

UNIVERSITY OF IDAHO - IDAHO WATER RESOURCES RESEARCH INSTITUTE IDAHO DEPARTMENT OF WATER RESOURCES

Cells this color are set up for user entries

UPDATE DATES | RUN MODEL | GET OUTPUT | CALCULATE EFFECTS

ENTER STARTING DATE FOR SIMULATION. THEN PUSH "UPDATE DATES" BUTTON

YEAR	2009
SEASON	SUMMER

TRANSFER NO: 36-16156

TRANSFER NAME: Clear Springs Foods

ENTER CELL LOCATIONS:

	'TO' CELL	'FROM1' CELL	'FROM2' CELL	'FROM3' CELL
ROW	50	80		
COLUMN	12	110		

TRIMESTER OF ACTIVITY	TO WELL Projected Use AF/TRIMESTER	FROM1 WELL With Transfer AF/TRIMESTER	FROM1 WELL Without Transfer AF/TRIMESTER	FROM2 WELL With Transfer AF/TRIMESTER	FROM2 WELL Without Transfer	FROM3 WELL With Transfer	FROM3 WELL Without Transfer
SUM 2009	61	0	0	0			
WIN 2009	61	0	0	0			
SPR 2010	61	0	0	0			
SUM 2010	61	0	0	0			
WIN 2010	61	0	0	0	0	0	0
SPR 2011	61	0	0	0	0	0	0
SUM 2011	61	0	0	0	0	0	0
WIN 2011	61	0	0	0	0	0	0
SPR 2012	61	0	0	0	0	0	0
SUM 2012	61	0	0	0	0	0	0
WIN 2012	61	0	0	0	0	0	0
SPR 2013	61	0	0	0	0	0	0
SUM 2013	61	0	0	0	0	0	0
WIN 2013	61	0	0	0	0	0	0
SPR 2014	61	0	0	0	0	0	0
SUM 2014	61	0	0	0	0	0	0
WIN 2014	61	0	0	0	0	0	0
SPR 2015	61	0	0	0	0	0	0
SUM 2015	61	0	0	0	0	0	0
WIN 2015	61	0	0	0	0	0	0
SPR 2016	61	0	0	0	0	0	0
SUM 2016	61	0	0	0	0	0	0
WIN 2016	61	0	0	0	0	0	0

- The "TO" cell is the location of the new well, one "FROM" well value must be entered, can be any cell location of the model – has no bearing on output as no water use data is entered here

Entering Dates

Enter the starting year and season for your simulation. The starting date represents the begin of the analysis period. (Spring is Mar, Apr, May and Jun. Summer is Jul, Aug, Sep and Oct. Winter is Nov, Dec, Jan and Feb.)

Once you have entered the starting date, push the "UPDATE DATE" Button.

The date only needs to be updated once, unless the desired timeframe of the simulation is ch

e location of the rates entered in the table.

in spreadsheet cell B15 and B16, respectiv
well in spreadsheet cell C15 amd C16, resp
well in spreadsheet cell D15 and D16, resp
well in spreadsheet cell E15 and E16, resp
d row and column should be 0 or blank.
d row and column should be 0 (zero).
ell is not being used.

FROM' and 'TO' wells, push
functions. The model only
d 'TO' wells are changed.

Getting the Model Output

Once the model has been run, push the 'GET OUTPUT' button to retrieve the model output. This prepares the model output for use for calculating effects.

Entering water use data

All water use should be entered in units of acre-feet per four month period. See the user's ma for instructions on multiple water rights with different priority dates and/or different wells.

Entering 'TO' Well Projected Water Use

Enter the projected water use for the 'TO' Well in Column B. 'TO' Well water use should start in the trimester (4-month period) in which the transfer will be effective.

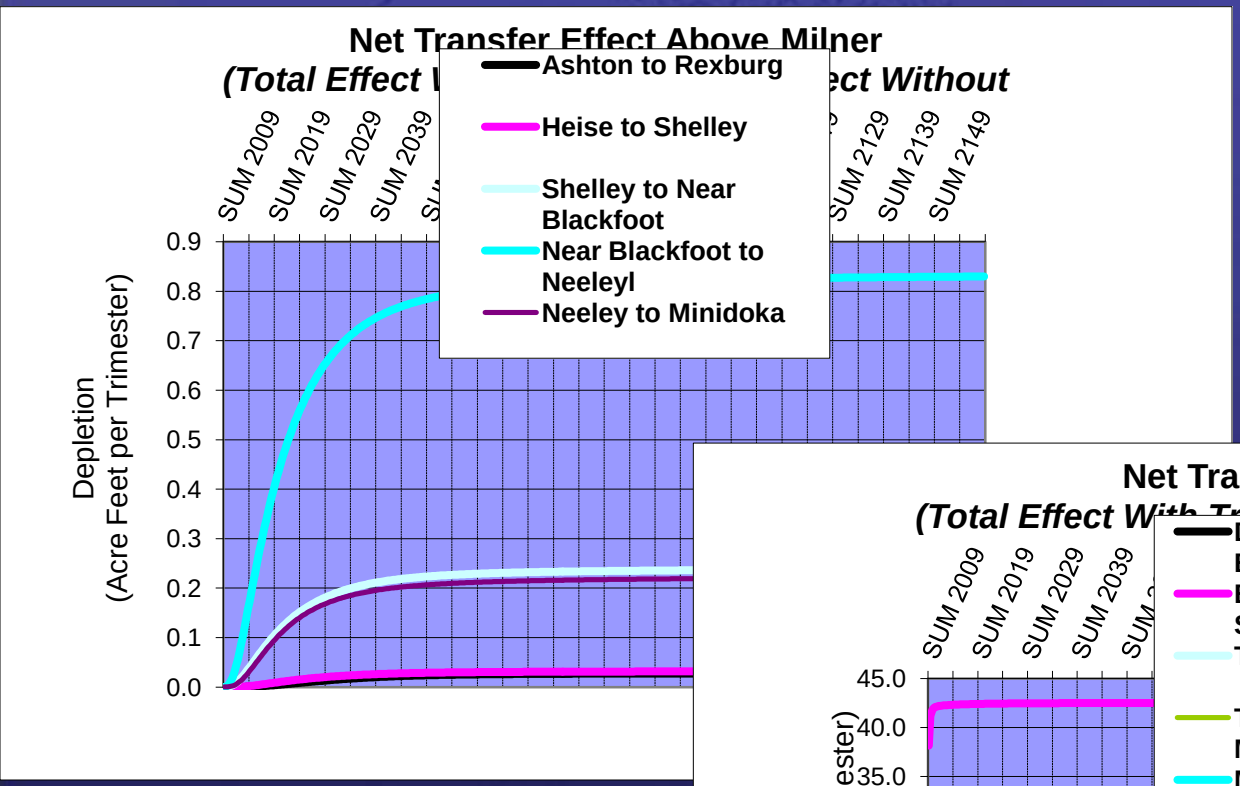
Entering 'FROM' Well 'With Transfer' Use

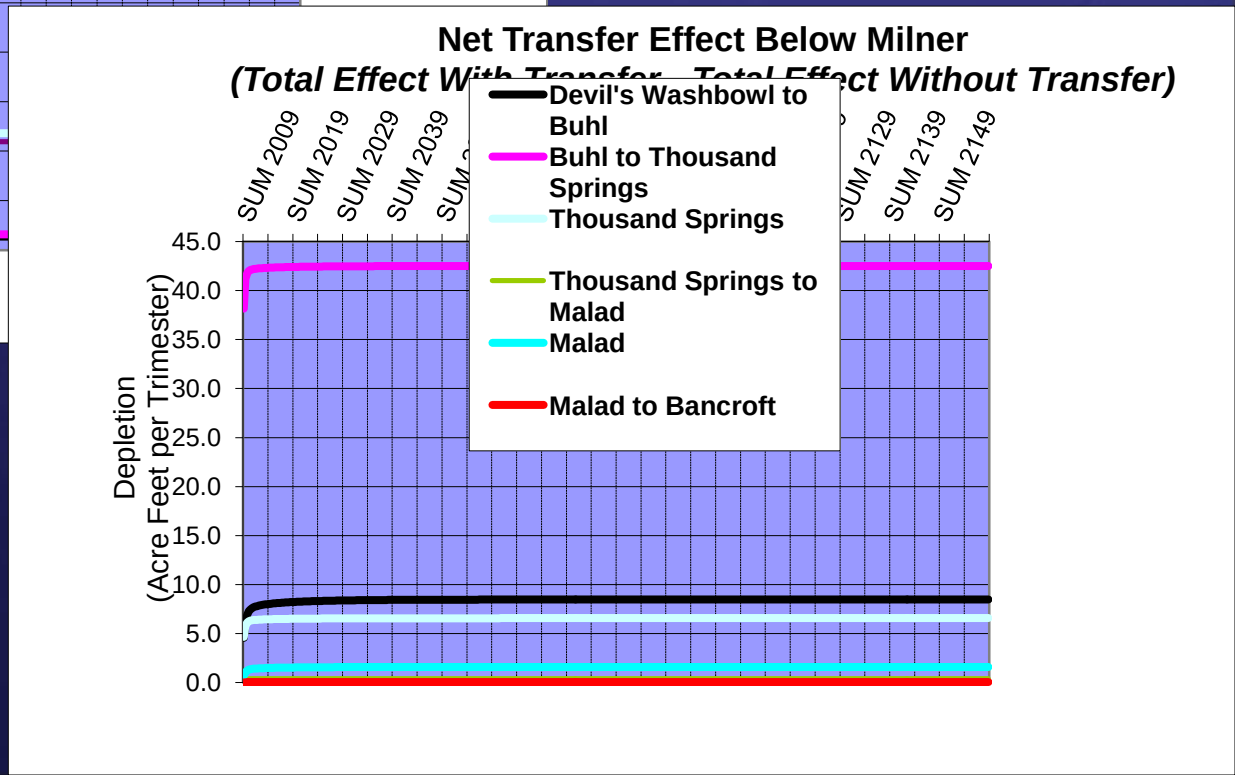
Enter the 'With Transfer' water use for the first 'FROM' Well in Column C, for the second 'FROM' well in Column E, and for the third 'FROM' Well in Column G. 'With Transfer' water use should reflect historical and projected after transfer use for this well should cease or be reduced at the time of the water right transfer.

TITLE | EXPLANATION | DataEntry | TransferSummary | GRAPHS ABOVE MILNER | GRAPHS BELOW MILNER

Ready 75%

Permit Example





Permit Example

- The year of maximum model predicted increase in depletion and the depletion at future steady state condition are both the last time step from the net transfer effect in the calculated tab of the model spreadsheet

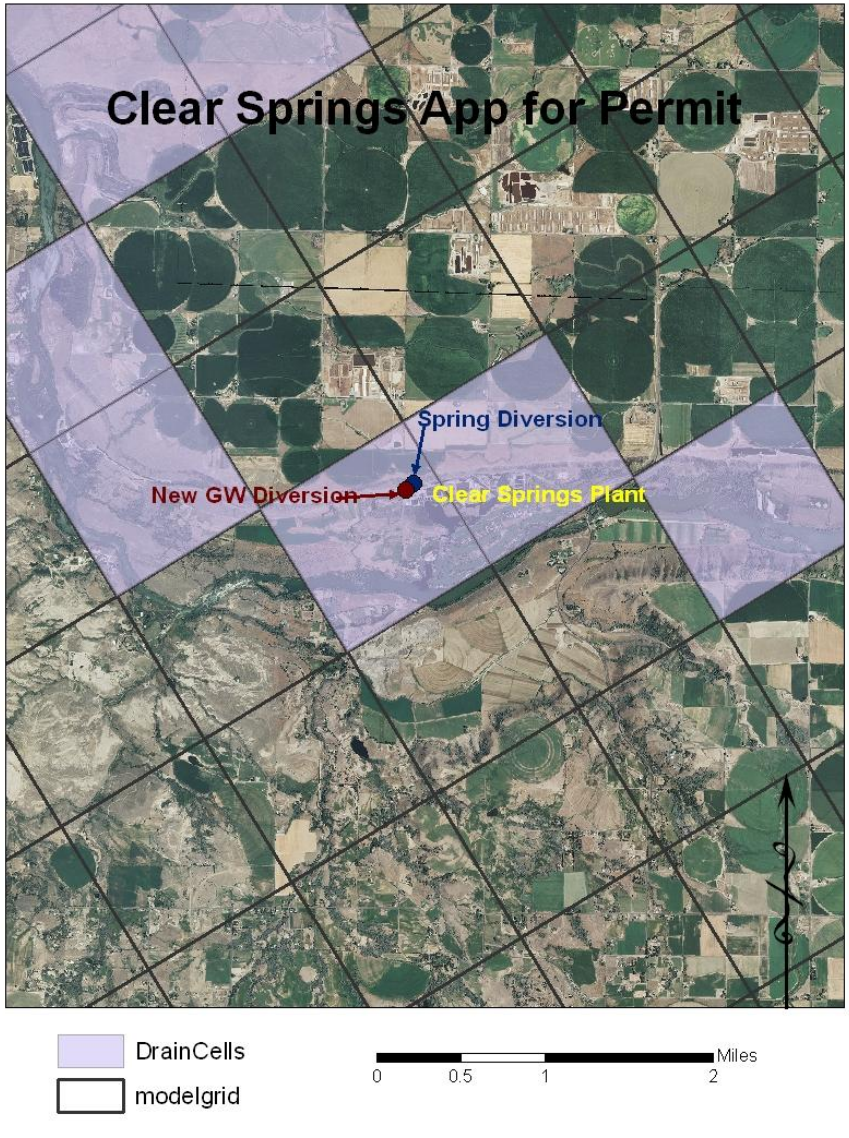
Ashton to Rexburg	Heise to Shelley	Shelley to Near Blackfoot	Near Blackfoot to Neeley	Neeley to Minidoka	Devil's Washbowl to Buhl	Buhl to 1000 Springs	1000 Springs	1000 Springs to Malad	Malad	Malad to Bancroft
0.0	0.0	0.2	0.8	0.2	8.5	42.5	6.6	0.4	1.6	0.1

- Two reaches meet the criteria for requiring mitigation – Devil's Washbowl to Buhl and 1000 Springs (Buhl to 1000 Springs exempted). Both exceed 2 af/trimester and reach depletion > 10% depletion to all reaches

Permit Example

- Further consideration of the permit showed the proposed diversion lie within a drain cell of the model, which would indicate no impact on the ESPA

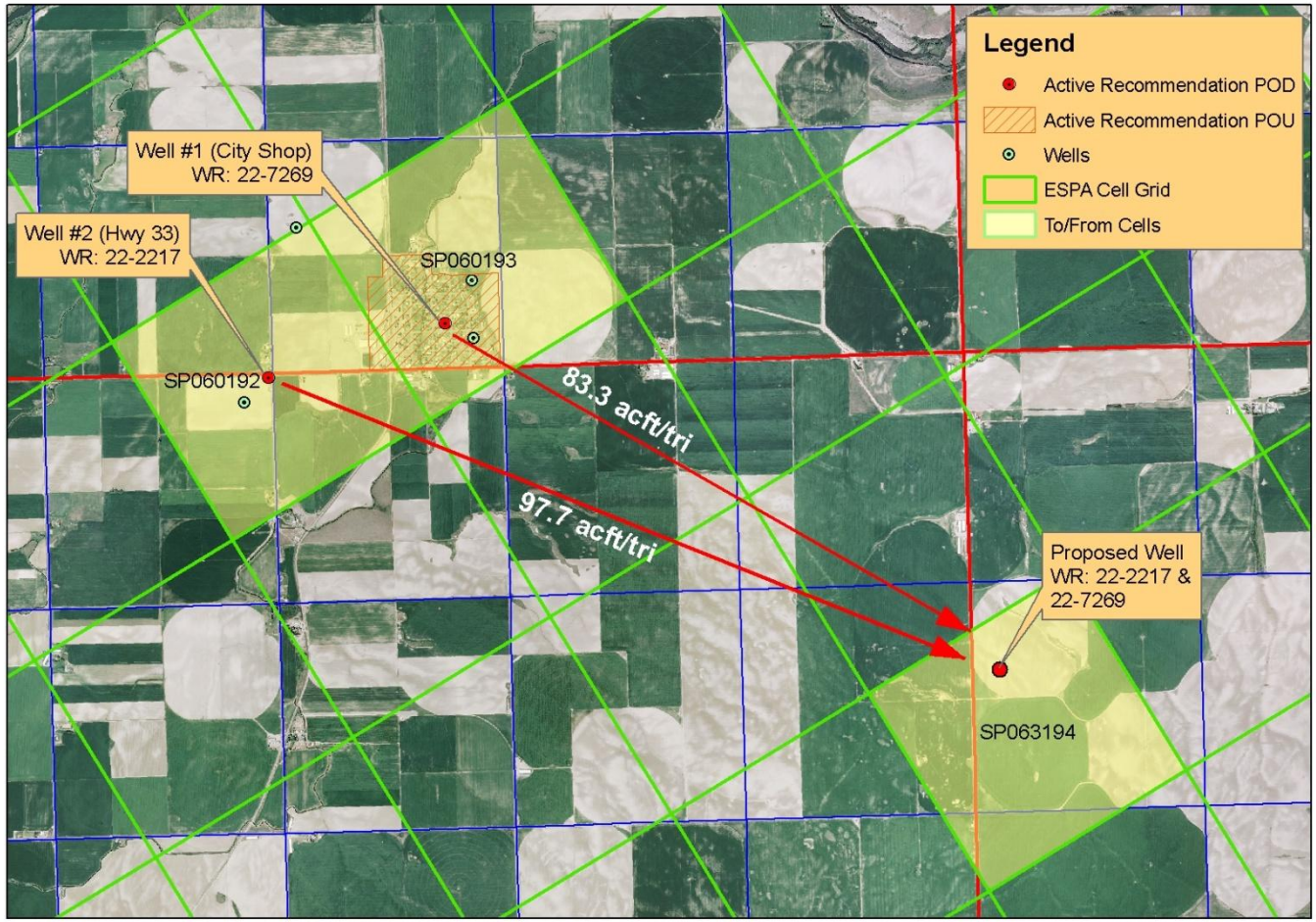
- Concluded impact of diversion would be on river flows versus wells or springs, no mitigation required



Additional Considerations

ONLY MODEL AND ANALYZE THE VOLUME OF WATER BEING TRANSFERRED!

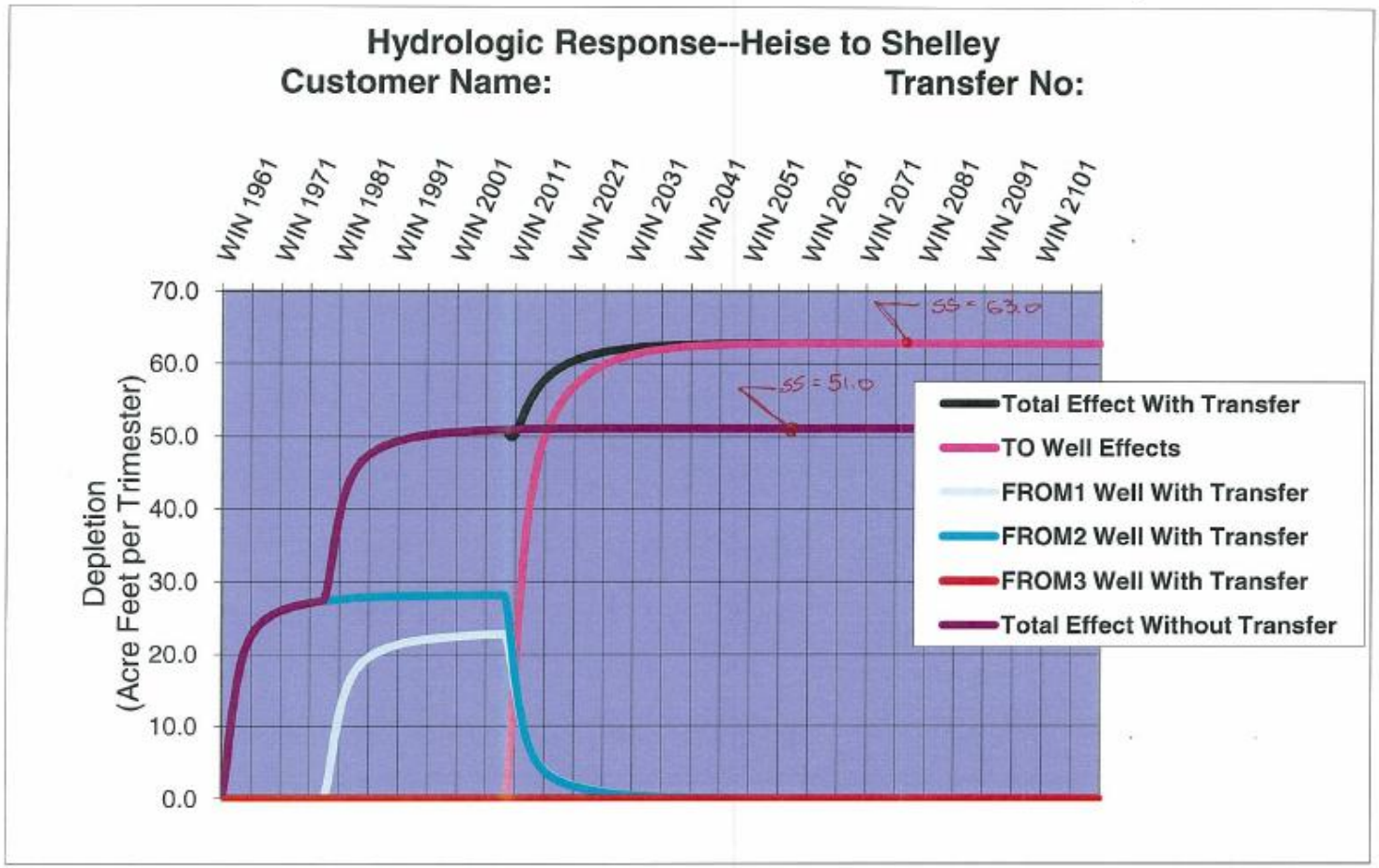
Transfer Vol. vs. Total WR Vol.



City of Newdale Trnsf # 76126

Transfer Vol. vs. Total WR Vol.

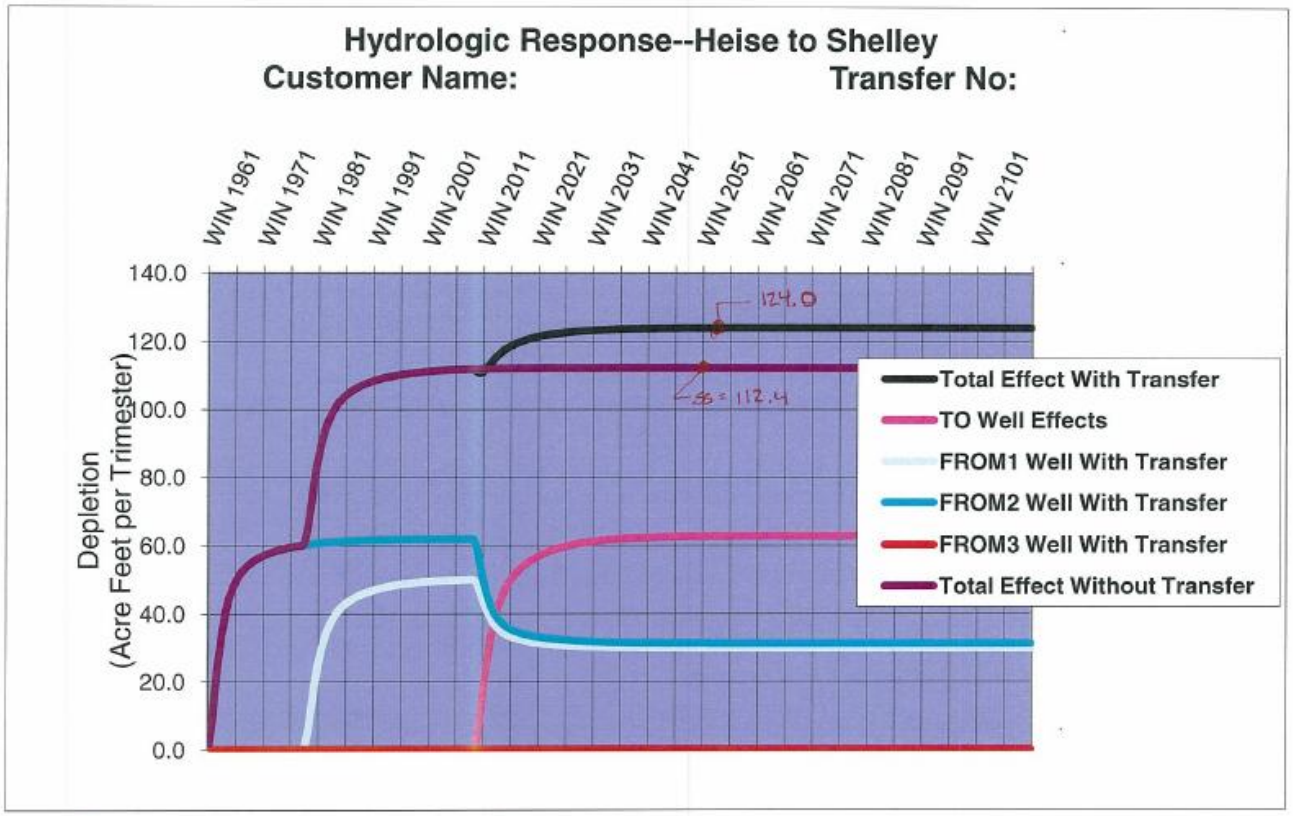
DEPT. APPROACH



1) >10% OF HISTORICAL CHECK: $\left(\frac{63}{51}\right) - 1 \approx 24\%$ ∴ MITIGATION REQ'D

Transfer Vol. vs. Total WR Vol.

RME APPROACH



1) > 10% OF HISTORICAL CHECK $\left(\frac{\text{PROPOSED}}{\text{EAST}}\right) - 1 \leq 0.10$ OR MITIGATION IS REQ'D

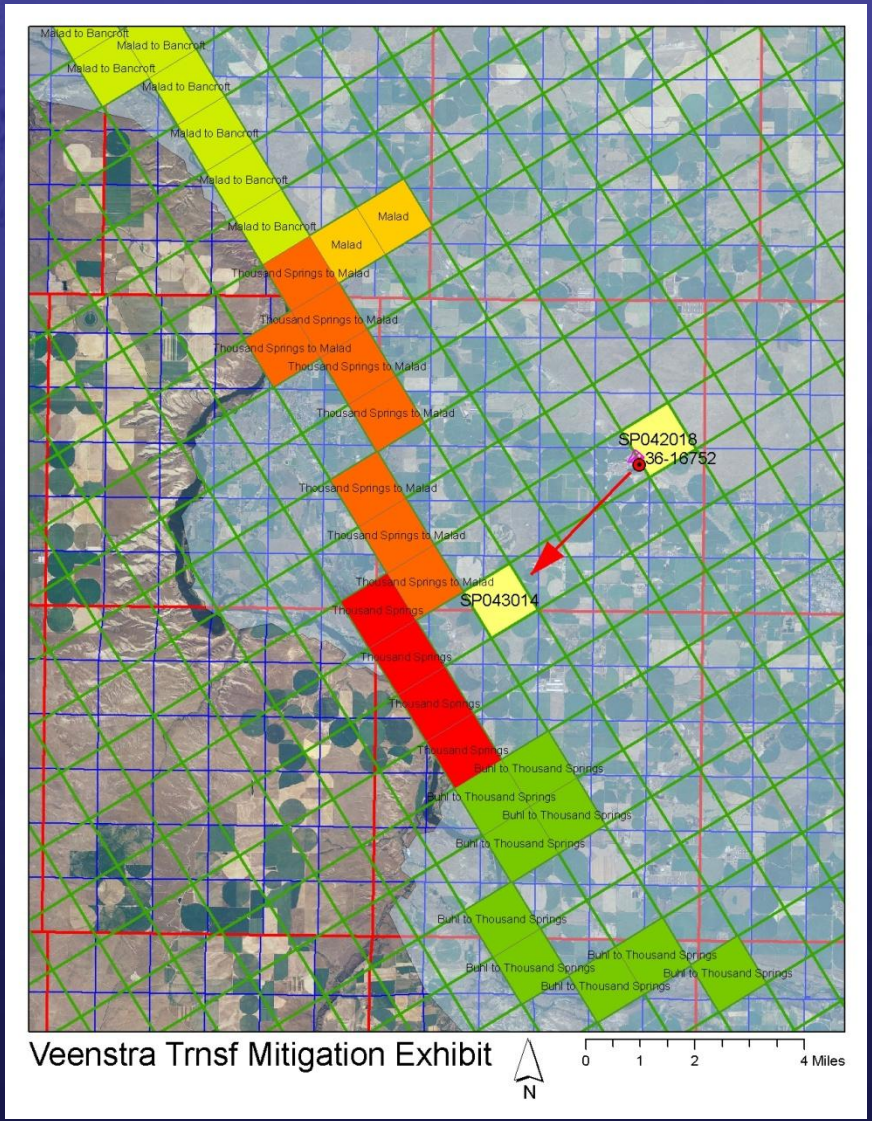
$\left(\frac{124.0}{112.4}\right) - 1 \approx 10\%$ ∴ NO MITIGATION

The Fat Line Syndrome: Average Distributions vs. Real Distributions

Example 1:
One-Way Transfer Analysis

Starting in 2011 transfer water right from existing well (R42, C18) to new well (R43, C14).

1. Assume
   - Transferring 40 acres of irrigation
   - 160 AF/Year
   - Assume evenly distributed amongst the trimesters
   - Realistically distributed amongst the trimesters



ENHANCED GROUND-WATER RIGHTS TRANS

UNIVERSITY OF IDAHO - IDAHO WATER RESOURCES RESEARCH INSTITUTE IDAHO DEPA

Cells this color are set up for user entries

UPDATE DATES

RUN MODEL

GET OUTPUT

CALCULATE EFFECTS

ENTER STARTING DATE FOR SIMULATION. THEN PUSH "UPDATE DATES" BUTTON

TRANSFER NO:

TRANSFER NAME:

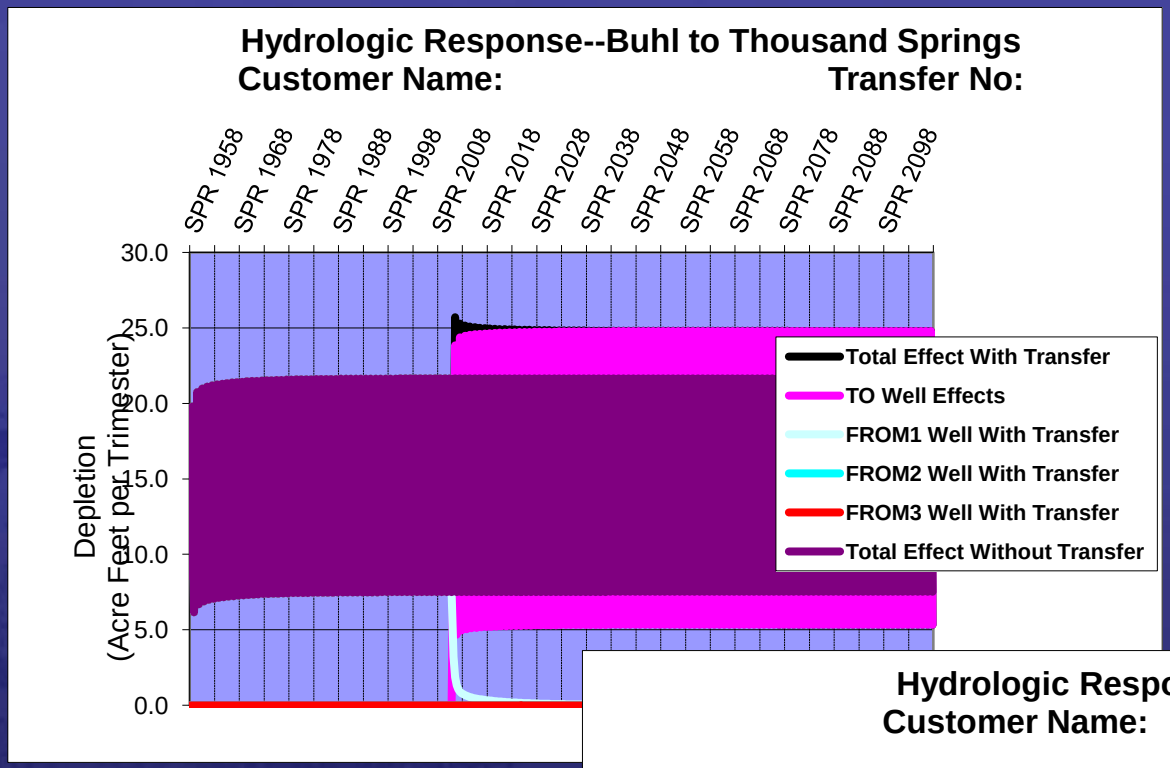
YEAR 1958

SEASON SPRING

ENTER CELL LOCATIONS:

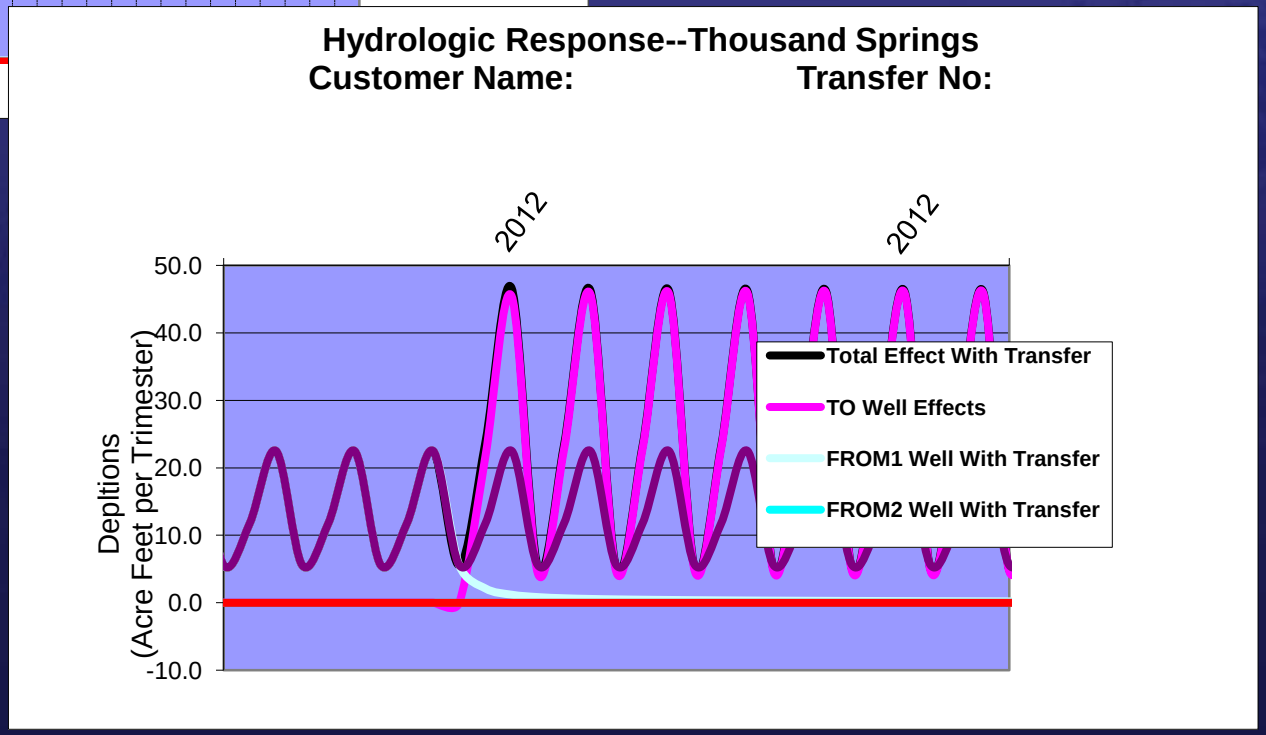
	'TO' CELL	'FROM1' CELL	'FROM2' CELL	'FROM3' CELL
ROW	43	42	0	0
COLUMN	14	18	0	0

TRIMESTER OF ACTIVITY	TO WELL	FROM1 WELL		FROM2 WELL		FROM3 WELL	
	Projected Use	With Transfer	Without Transfer	With Transfer	Without Transfer	With Transfer	Without Transfer
	AF/TRIMESTER	AF/TRIMESTER	AF/TRIMESTER	AF/TRIMESTER	AF/TRIMESTER	AF/TRIMESTER	AF/TRIMESTER
SPR 1958	0	53	53	0	0	0	0
SUM 1958	0	107	107	0	0	0	0
WIN 1958	0	0	0	0	0	0	0
SPR 1959	0	53	53	0	0	0	0
SUM 1959	0	107	107	0	0	0	0
WIN 1959	0	0	0	0	0	0	0
SPR 1960	0	53	53	0	0	0	0
SUM 1960	0	107	107	0	0	0	0
WIN 1960	0	0	0	0	0	0	0
SPR 1961	0	53	53	0	0	0	0
SUM 1961	0	107	107	0	0	0	0
WIN 1961	0	0	0	0	0	0	0
SPR 1962	0	53	53	0	0	0	0
SUM 1962	0	107	107	0	0	0	0
WIN 1962	0	0	0	0	0	0	0
SPR 1963	0	53	53	0	0	0	0
SUM 1963	0	107	107	0	0	0	0



DISTRIBUTION

Spring	53.3 (1/3)
Summer	106.7 (2/3)
Winter	0.0



ENHANCED GROUND-WATER RIGHTS TRANS

UNIVERSITY OF IDAHO - IDAHO WATER RESOURCES RESEARCH INSTITUTE IDAHO DEPA

Cells this color are set up for user entries

UPDATE DATES | RUN MODEL | GET OUTPUT

CALCULATE EFFECTS

ENTER STARTING DATE FOR SIMULATION. THEN PUSH "UPDATE DATES" BUTTON

YEAR 1958

SEASON SPRING

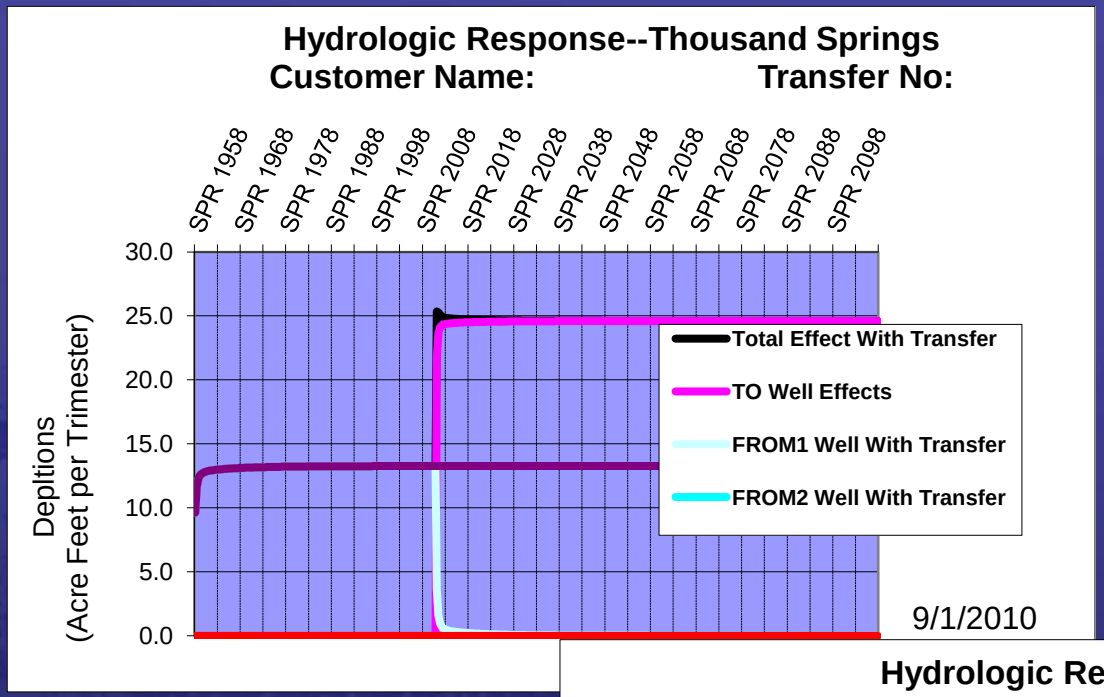
TRANSFER NO:

TRANSFER NAME:

ENTER CELL LOCATIONS:

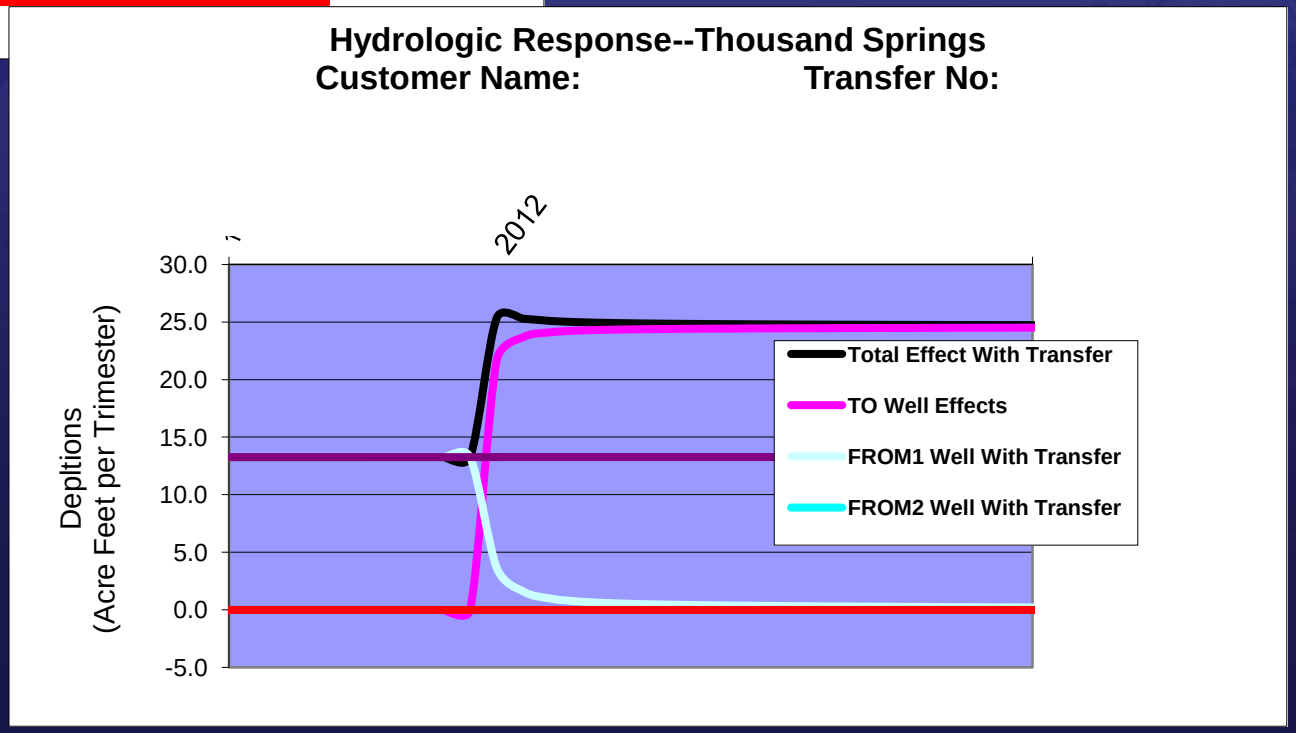
	'TO' CELL	'FROM1' CELL	'FROM2' CELL	'FROM3' CELL
ROW	43	42	0	0
COLUMN	14	18	0	0

TRIMESTER OF ACTIVITY	TO WELL Projected Use AF/TRIMESTER	FROM1 WELL With Transfer AF/TRIMESTER	FROM1 WELL Without Transfer AF/TRIMESTER	FROM2 WELL With Transfer AF/TRIMESTER	FROM2 WELL Without Transfer AF/TRIMESTER	FROM3 WELL With Transfer AF/TRIMESTER	FROM3 WELL Without Transfer AF/TRIMESTER
SPR 1958	0	53	53	0	0	0	0
SUM 1958	0	53	53	0	0	0	0
WIN 1958	0	53	53	0	0	0	0
SPR 1959	0	53	53	0	0	0	0
SUM 1959	0	53	53	0	0	0	0
WIN 1959	0	53	53	0	0	0	0
SPR 1960	0	53	53	0	0	0	0
SUM 1960	0	53	53	0	0	0	0
WIN 1960	0	53	53	0	0	0	0
SPR 1961	0	53	53	0	0	0	0
SUM 1961	0	53	53	0	0	0	0
WIN 1961	0	53	53	0	0	0	0
SPR 1962	0	53	53	0	0	0	0
SUM 1962	0	53	53	0	0	0	0
WIN 1962	0	53	53	0	0	0	0
SPR 1963	0	53	53	0	0	0	0
SUM 1963	0	53	53	0	0	0	0
WIN 1963	0	53	53	0	0	0	0
SPR 1964	0	53	53	0	0	0	0
SUM 1964	0	53	53	0	0	0	0
WIN 1964	0	53	53	0	0	0	0
SPR 1965	0	53	53	0	0	0	0
SUM 1965	0	53	53	0	0	0	0
WIN 1965	0	53	53	0	0	0	0
SPR 1966	0	53	53	0	0	0	0
SUM 1966	0	53	53	0	0	0	0



DISTRIBUTION

Spring	53.3 (1/3)
Summer	53.3 (1/3)
Winter	53.3 (1/3)

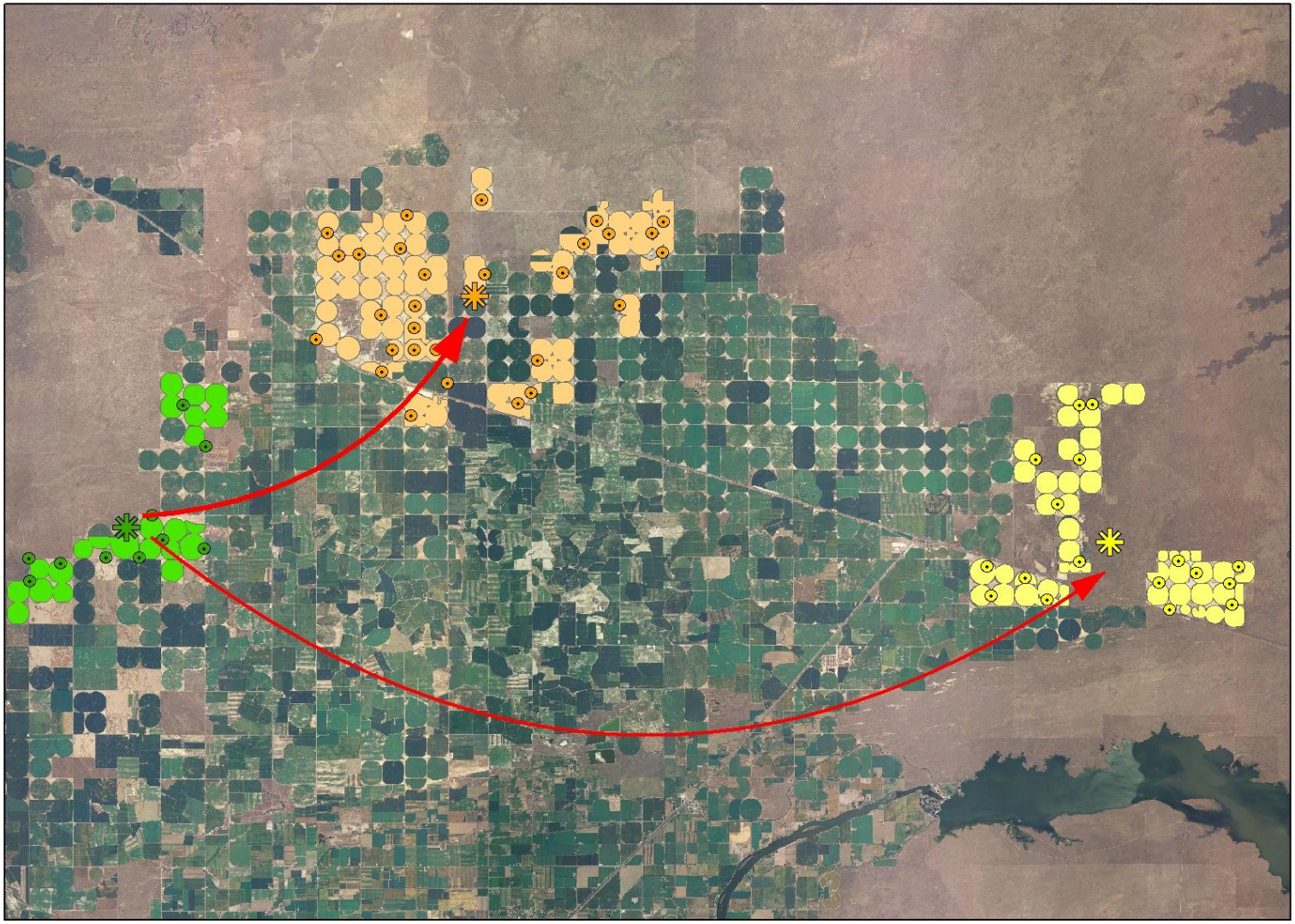


How to Handle A Large No. of PODs

A centroid or Weighted Mean Center of a group of POD’s can be used to model the transfer of water rights from one system to another where there are multiple points of diversion (many wells).

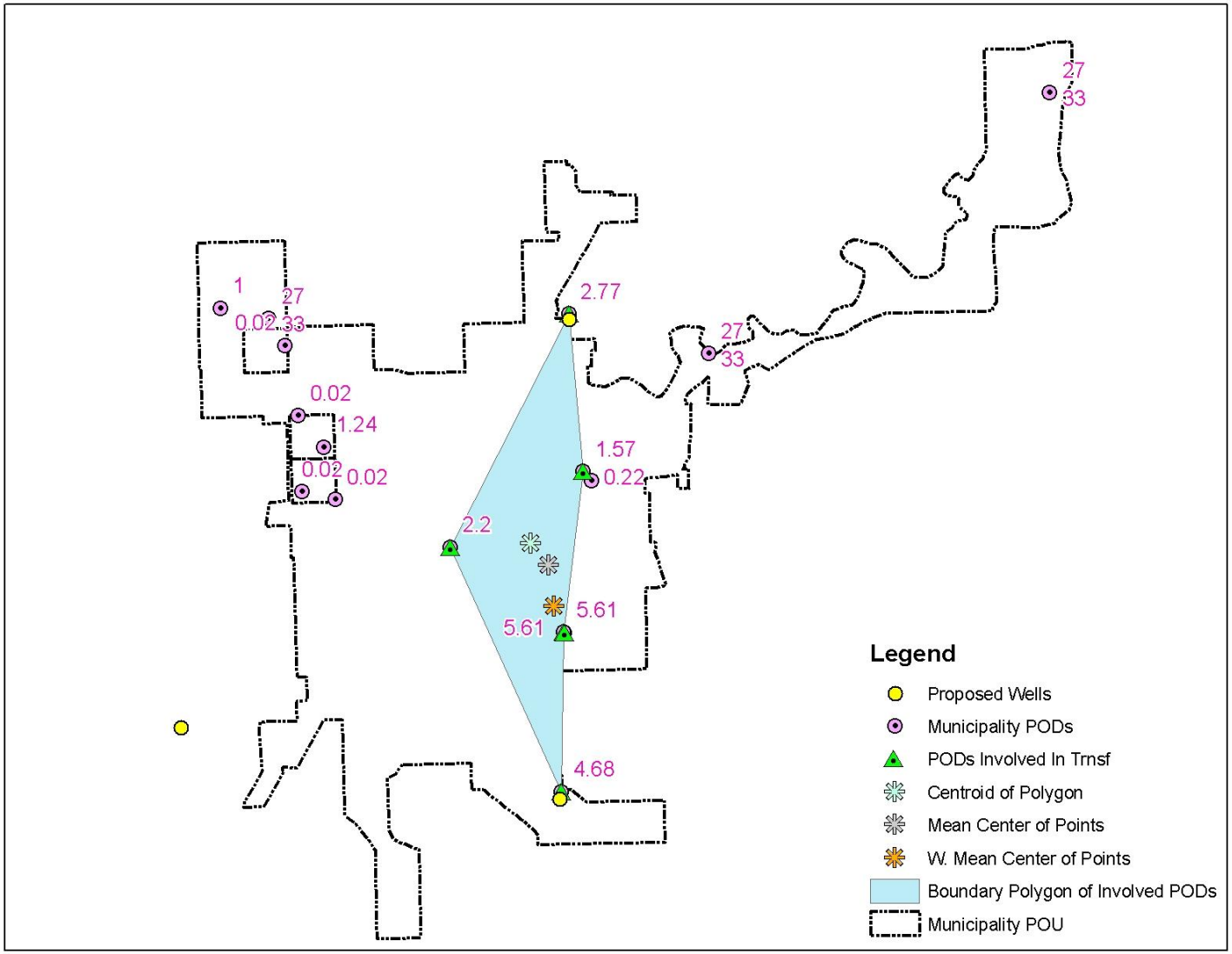
Create Weighted Mean Center utilizing ArcMap - ArcView “Mean Center” function, weighting points to Diversion Rate.

Weighted Mean Center (WMC) Example



Example: Use of Centroid Well Concept in a Transfer

Centroid of Polygon vs. MC of Points vs. WMC of Points



Outline of Steps Used in Calculating a Weighted Mean Center

- Open ArcMap
- Create Shape File Containing all the Points representing the wells/POD's
- Open "ArcToolbox"
- Open "Spatial Statistics Tools"
- Open "Measuring Geographic Distances"
- Open/Execute "Mean Center"
- Input Feature Class = Point Shape File
- Output Feature Class = Weighted Mean Center
- Weight Field = OverallMaxDiversionRate

How to Accommodate Non-Use in the WR History

		To Well	From Well	
	Year	Projected Use	With Transfer	Without Transfer
Priority Date	1960	0	20	20
		0	20	20
		0	20	20
WR into CRP	1989	0	0	20
		0	0	20
		0	0	20
Transfer Date	2011	20	0	20
		20	0	20
	Future	20	0	20

Transferring water rights with a history of non-use. i.e. how to handle SRBA and CRP.

This period is recognized by the Department as having no depletions, thereby acting as a form of mitigation, especially helpful to overcoming transient state impacts

NOTES: It is appropriate and consistent with previous practices to allow an applicant to show the diversion amount going to zero at the time the water rights went into CRP in the “With Transfer” column and to allow the historic diversions to continue in the “Without Transfer” column even during the time of non-use due to CRP. Refer to above example. The “Without Column” can be considered to represent the full allowable diversion under the water right – not what was actually achieved but what is legally possible. The “With Column” can be considered to represent what diversions have actually occurred or what has been historically achieved.

Trouble Shooting the Transfer Tool w/ Excel 2007

Common Set-Up Issues

1. The transfer tool must be run in a folder that is recognized as a “trusted location” in Excel’s trust center. Excel Options\Trust Center\Trust Center Settings\Trusted Locations.

2. Macro Settings must be set to the “Enable all macros (not recommended; potentially dangerous code can run” option. Excel Options\Trust Center\Trust Center Settings\Macro Settings

3. The Com Add-In “DMintegration_NET.Connect” (Hummingbird Add-In) must be removed. Excel Options\Add-Ins\Com Add-Ins\Go

The End