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# Bringing New Land Into Cultivation

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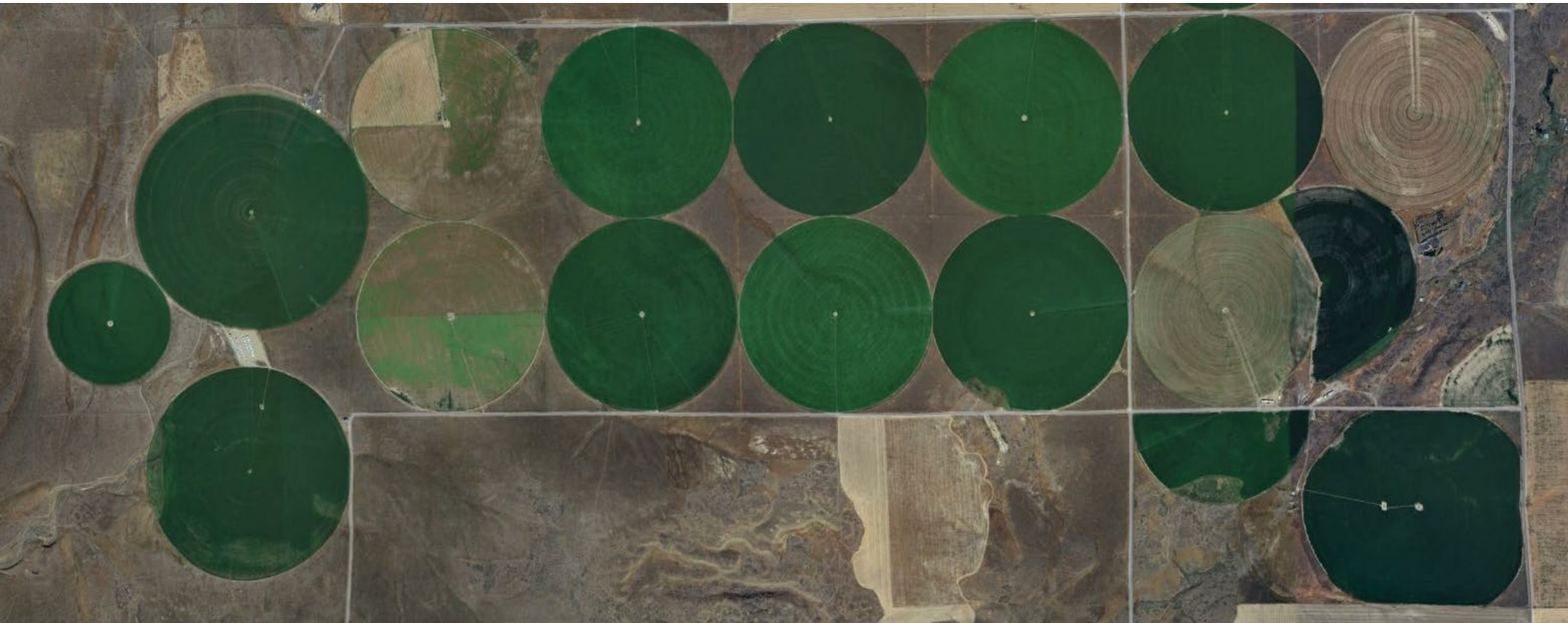
# Outline

- Changing an Existing Water Right
- What Can and Cannot be Changed
- Standard Changes
  - Two Examples
- Spreading to Additional Irrigated Acres
  - One Example



# Changing an Existing Water Right

- So, you want to change one or more attributes of your water right?
- You might be able to do that, but the devil is in the details.



# Claim or Certificate Water Right Changes



- Extent and validity of water right will be analyzed through the change application process. Meaning only water rights that have been perfected and maintained through beneficial use can be changed.
- What Attributes Can Be Changed on Claims or Certificates?
  - Points of Diversion/Withdrawal
  - Place of Use
  - Purpose of Use
  - Number of Irrigated Acres
  - Period of Use

# Permit Water Right Changes



- What Attributes Can Be Changed on Groundwater Permits?
  - Points of Diversion/Withdrawal
  - Place of Use
- What Attributes Can Be Changed on Surface Water Permits?
  - Points of Diversion under very specific and limited circumstances



# Water Right Changes

- What Attributes Cannot Be Changed?
  - Priority Date
  - Instantaneous Rate (cannot be increased)
  - Annual Volume (cannot be increased)
  - Source of Supply



# Water Right Changes



- Change Application Tests:
  - The right to be changed must be valid
  - New use must be beneficial
  - Can not impair existing water rights
  - Must be from the same source of supply
  - Water must be physically available
  - Must not be against the public interest (groundwater only)



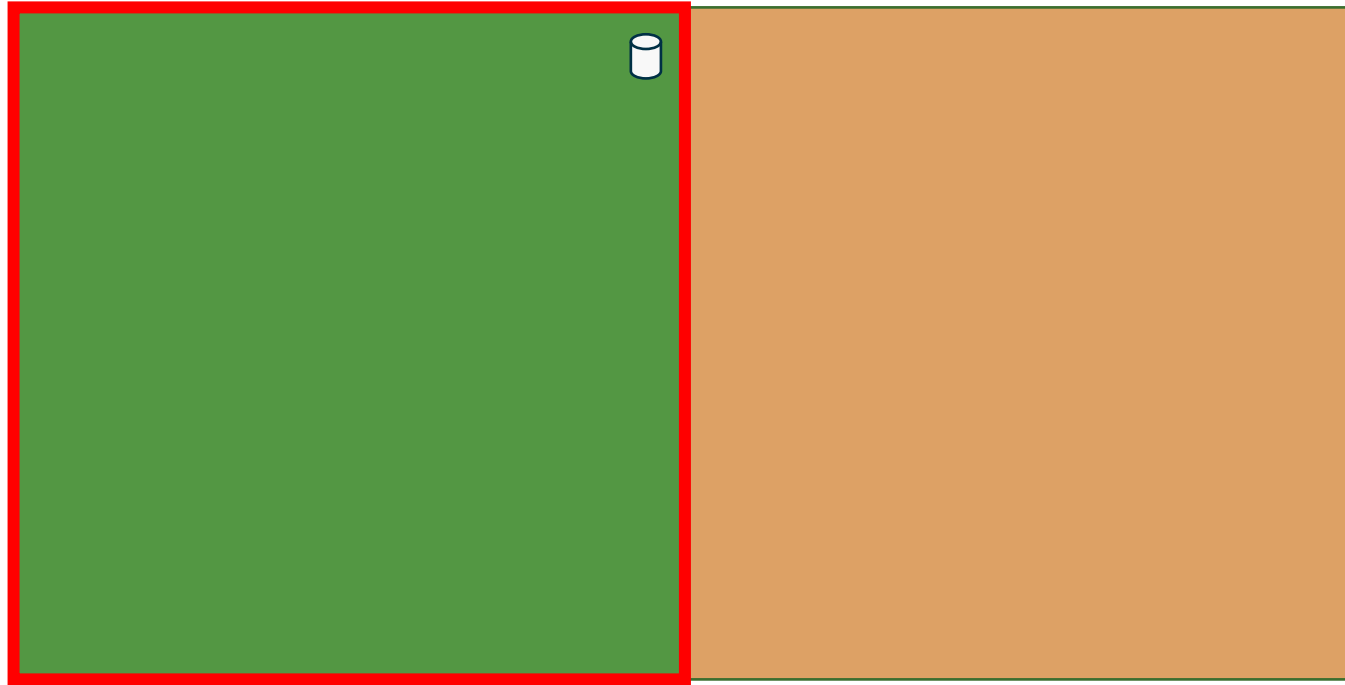
# Two Examples

- Standard Water Right Changes that Could Lead to Irrigation of New Ground
  - 1. Moving the Corners
  - 2. Acquiring an existing water right and moving it to your ground.





# Moving the Corners

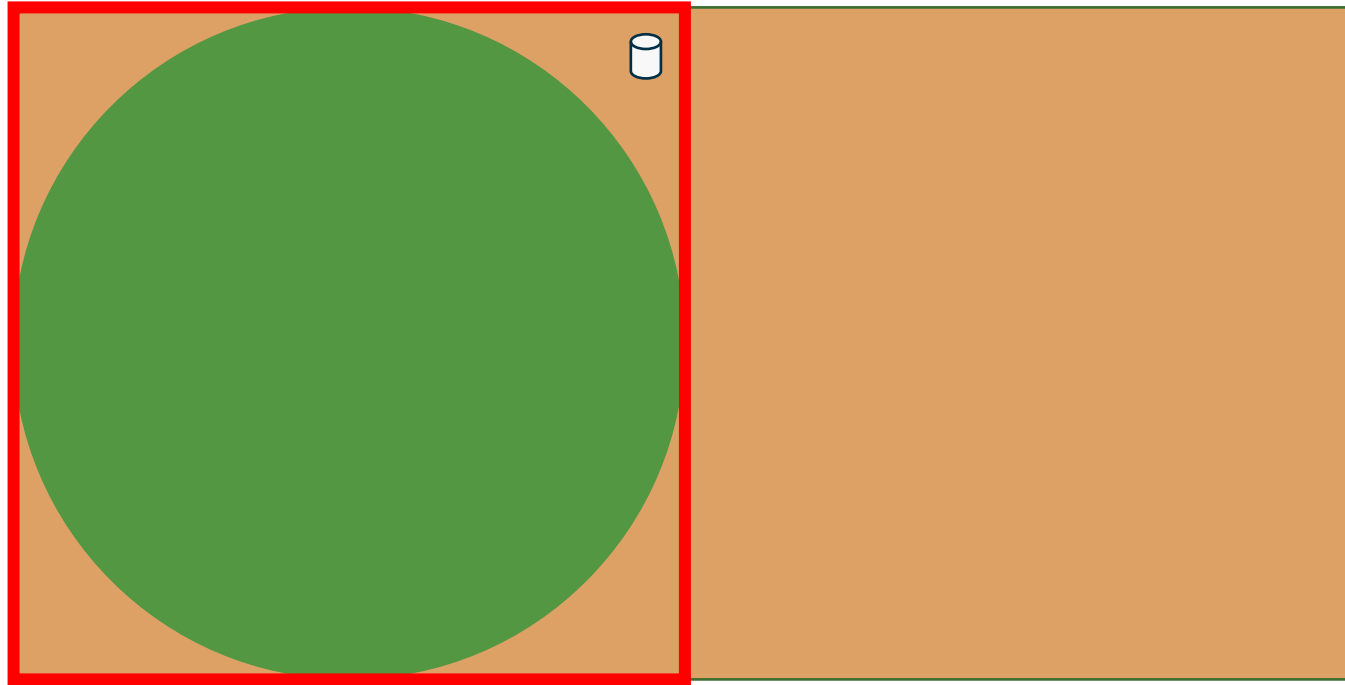


## **Original or Recent Use**

160 acres within the Place of Use irrigated  
using handlines or wheellines



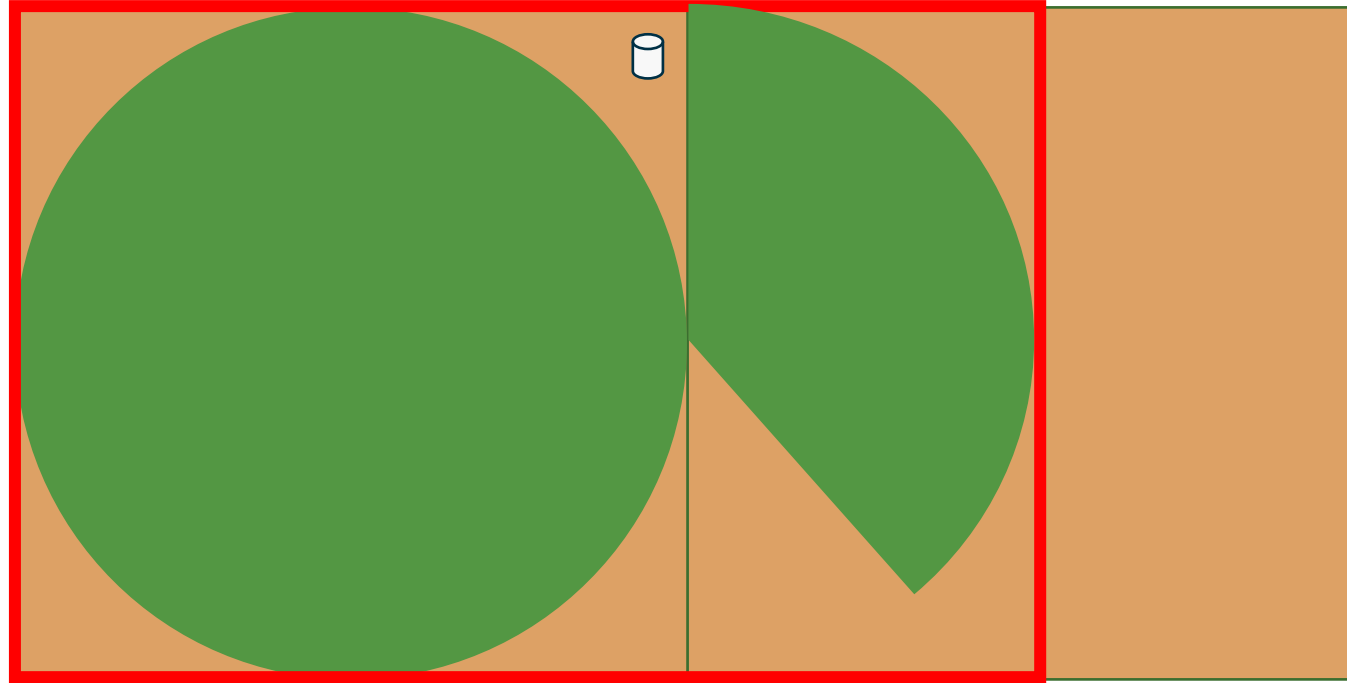
# Moving the Corners



**Proposed or Current Use**  
120 acres irrigated within Place of Use  
with center pivot



# Moving the Corners

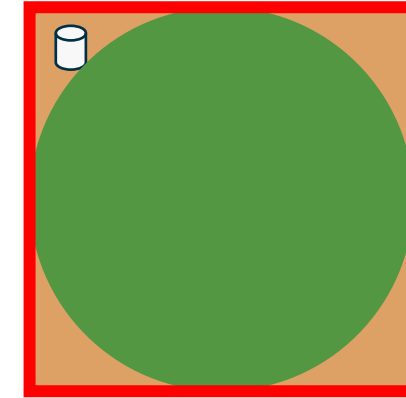


## **Use After Water Right Change**

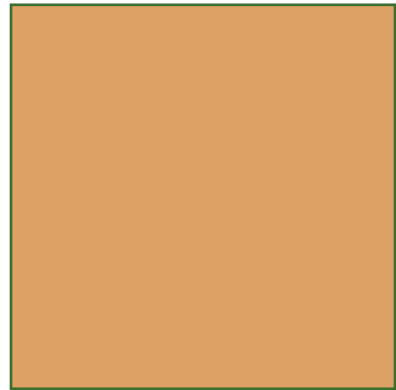
160 acres irrigated within expanded Place  
of Use with center pivots



# Acquiring and Moving an Existing Water Right



Their Ground

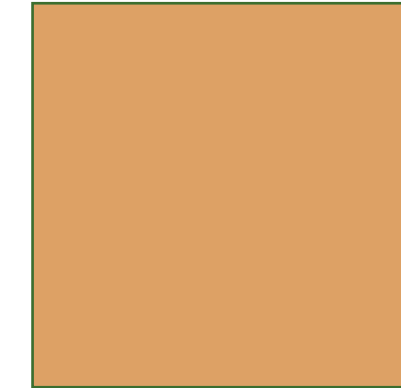


Your Ground

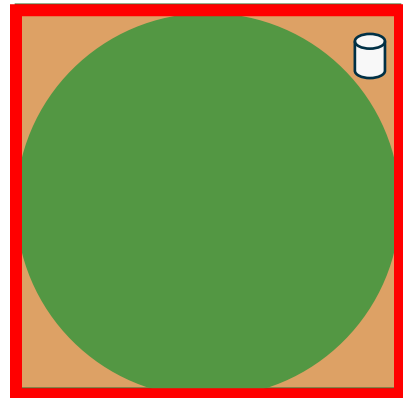
## Current Use

120 acres irrigated on their ground with their well

# Acquiring and Moving an Existing Water Right



Their Ground



Your Ground

## Proposed Use

120 acres irrigated on your ground with your well

# Spreading Water Right Change



- Increasing the number of authorized irrigated acres on a water right.
- Must pass the Annual Consumptive Quantity (ACQ) test.
- Two Step Process:
  - Standard Water Right Change Extent and Validity Analysis
  - Average consumptive use of the highest 2 years over the most recent 5 years of continuous use.



# Spreading to Additional Irrigated Acres



- Currently 100 acres of alfalfa irrigated with wheellines near Walla Walla.
- Total Irrigation Requirement (TIR) = Crop Irrigation Requirement (CIR)/Application Efficiency (Ea)
- Washington Irrigation Guide - Walla Walla Station - Crop Irrigation Requirements:

ALFALFA	BEG 5/ 4		END 10/22										SEASON
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
MONTHLY NET IRRIG REQUIRE(IN)	.00	.00	.00	.00	3.72	6.46	9.74	7.53	4.71	.69	.00	.00	32.85
AV. PAN FACTOR	.76	.76	.76	.76	.76	.76	.76	.76	.76	.76	.76	.76	

# Spreading to Additional Irrigated Acres



- Application Efficiency:

Table 1. Summary of Application Efficiency Ranges, Consumptive Use, and Return Flows<sup>6</sup>

Method		Application Efficiency, $E_a$ (%) <sup>7</sup>		% Total Evaporated	% Total Use Consumed	Return Flow
		Range	Average, $E_{a\text{ avg}}$	% Evap	% CU, Average <sup>8</sup>	% RF, Average <sup>9</sup>
Surface:	Graded Furrow	50 – 80	65	5	70	30
	w/ tailwater reuse	60 – 90	75	5	80	20
	Level Furrow	65 – 95	80	5	85	15
	Graded Border	50 – 80	65	5	70	30
	Level Basins	80 – 95	85	5	90	10
	Flood	35 – 60	50	5	55	45
Sprinkler:	Periodic Move (Handline)	60 – 85	75	10	85	15
	Side Roll (Wheelline)	60 – 85	75	10	85	15
	Moving Big Gun	55 – 75	65	10	75	25
	Solid-Set—Overtree	55 – 80	70	15	85	15
	Solid Set--Undertree	60 – 85	75	10	85	15
	Pop-Up Impact	60 – 85	75	10	85	15
Center-Pivot	Impact heads w/end gun	75 – 90	80	15	95	5
	Spray heads w/o end gun	75 – 95	90	10	100	0
	LEPA w/o end gun <sup>10</sup>	80 – 98	92	5	97	3
Lateral-Move	Spray heads w/hose feed	75 – 95	90	10	100	0
	Spray heads w/canal feed	70 – 95	85	10	95	5
Microirrigation:	Trickle/Drip	70 – 95	88	5	93	7
	Subsurface Drip	75 – 95	90	0	90	10
	Microspray	70 – 95	85	10	95	5

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# Spreading to Additional Irrigated Acres



- Alfalfa Crop Irrigation Requirement = 32.85 inches
- Wheeline Application Efficiency = 75% average
- Wheeline Percent Total Use Consumed = 85% average
  
- Total Irrigation Requirement =  $32.85 / 75\% = 43.80$  inches = 3.65 feet
- Water Use = Total Irrigation Requirement \* Irrigated Acres
- Water Use = 3.65 feet \* 100 acres = 365.0 acre-feet per year
  
- Consumptive Water Use = 365.0 acre-feet per year \* 85% = 310.25 acre-feet per year

# Spreading to Additional Irrigated Acres



DRY ONION

BEG 4/4

END 10/22

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEASON
MONTHLY NET IRRIG REQUIRE(IN)	.00	.00	.00	.68	4.89	7.23	10.75	7.13	.25	.00	.00	.00	30.92
AV. PAN FACTOR	.00	.00	.00	.42	.77	.84	.84	.72	.65	.00	.00	.00	

Method		Application Efficiency, Ea (%) <sup>7</sup>		% Total Evaporated	% Total Use Consumed	Return Flow
		Range	Average, Ea <sub>avg</sub>	%Evap	%CU, Average <sup>8</sup>	%RF, Average <sup>9</sup>
Surface:	Graded Furrow	50 – 80	65	5	70	30
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	Microspray	70 – 95	85	10	95	5

# Spreading to Additional Irrigated Acres



- Dry Onion Crop Irrigation Requirement = 30.92 inches
- Subsurface Drip Application Efficiency = 90% average
- Subsurface Drip Percent Total Use Consumed = 90% average
  
- Total Irrigation Requirement =  $30.92 / 90\% = 34.36$  inches = 2.86 feet
- Total Irrigation Requirement consumed =  $2.86 \text{ feet} * 90\% = 2.57$  feet
- Irrigated Acres = Existing Consumptive Water Use / Proposed Total Irrigation Requirement consumed
  
- Irrigated Acres =  $310.25 \text{ acre-feet} / 2.57 \text{ feet} = 120.7$  acres

# Spreading to Additional Irrigated Acres



Attribute	Before	After
Crop	Alfalfa	Dry Onion
CIR (inches)	32.85	30.92
Irrigation Method	Wheelline with impact heads	Subsurface Drip
Ea average (%)	75	90
Ea consumptive use (%)	85	90
TIR (inches)	43.80	34.36
TIR (feet)	3.65	2.86
<b>Irrigated Acres</b>	<b>100</b>	<b>120.7</b>
Total Use (acre-feet)	365.00	345.20
<b>Consumptive Use (acre-feet)</b>	<b>310.25</b>	<b>310.20</b>
Non-Consumptive Use (acre-feet)	54.75	35

# Questions?

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