

WAT: CROSS BOUNDARY ALLOCATION

OVERVIEW

To more accurately represent the impact of GW consents on water allocation, the Water Allocation Tool is to be extended to apply “Cross Boundary allocations”. Cross Boundary allocation works to allocate the GW Consent volume across multiple aquifers when:

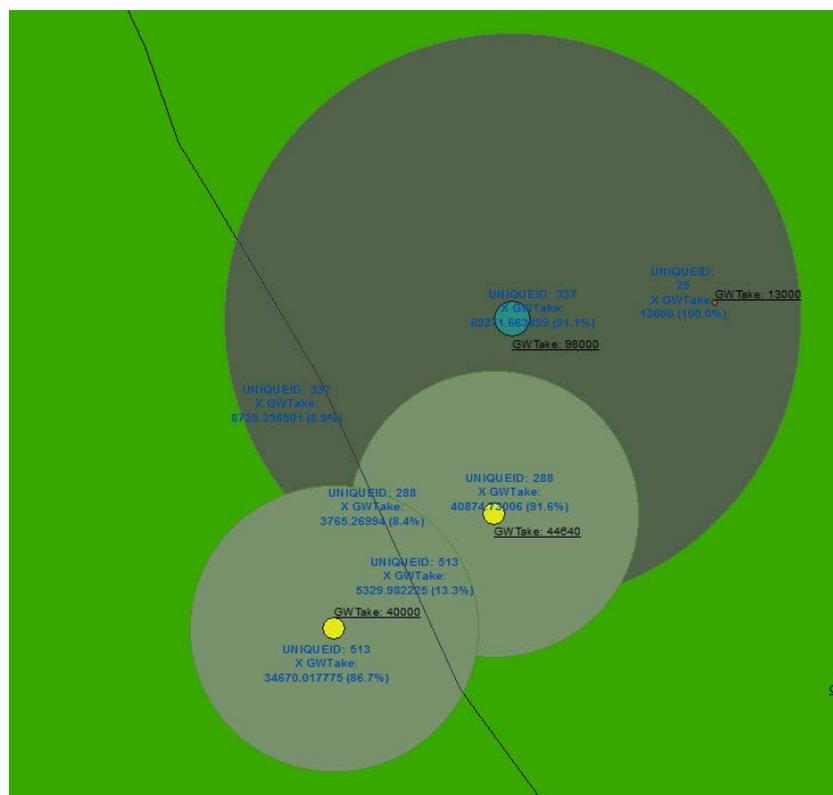
- The volume of the consent is larger
- The consent is close to the boundary between two subzones for the aquifer

File Location: W:\GIS Projects\CorporateServices\IT\GIS\2019 WAT Tidy up\WaterAllocation\

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CROSS BOUNDARY ALLOCATION

A “Radius of Influence” is created, the size of which is based on the Volume of the GW consent. The ratio at which the “Radius of Influence” covers multiple aquifers is then used to reallocate the GW Consent Net Take across the affected aquifers.



Also note that:

- Cross Boundary Allocation is applied to the “Latest Run” outputs from the WAT
- Cross Boundary Allocation is only applied to aquifers classified as “Specific – Aupouri”

Six “GW Volume” bands have been defined:

GW Volume (m3y)	Radius of Influence to apply (m)	GW Net Take (m3y)	
		Use X-Boundary Net Take (apply XBoundary adjustment)	Use current Net Take (don't apply adjustment)
< 20k	0	For none	For all
20 – 40k	500	<= 500m from boundary	> 500m from boundary
40 – 60k	1000	<= 1000m	> 1000m
60 – 80k	1500	<= 1500m	> 1500m
80 – 120k	2000	<= 2000m	> 2000m
120k +	2500	<= 2500m	> 2500m

METHODOLOGY

STEP A: Get Participating GW Consents

- 1) Filter to obtain GW Consents from Latest WAT run
- 2) Filter to obtain GW Units from Latest WAT run that participate in Cross Boundary allocation (e.g. Management = “Specific – Aupori”)
- 3) Spatial join of 1 and 2 to obtain all GW Consents in the participating GW Units
- 4) Split Participating GW Consents into bands based on volume

STEP B: Get Per_CrossBoundary for Participating GW Consents

For each band do the following

- 5) Apply distance buffer (based on band that it's in)
- 6) Intersect buffer with Participating GW Units (adds Aquifer name to Buffer)
- 7) Dissolve by IRIS ID and Aquifer name (IRIS ID may be duplicate for different points!)
- 8) Create Summary statistics of Buffer to get total Area of buffer and number of GW Units the buffer overlaps (frequency)
- 9) Calc Perc_CrossBoundary as Buffer.ShapeArea / TotalBuffer.ShapeArea

STEP C: Calc AdjustedGWTake

- 10) Calc Consent.AdjustedGWTake as Buffer.Per_CrossBoundary * GWTake_m3y
- 11) Calc GWUnit.AjustedGWTake as sum of Consent.AdjustedGWTake

APPENDIX 1: CROSS CHECKING RESULTS

The Sum of GW Takes for the “AOI” must sum to the same value regardless of whether the “Cross Boundary Allocation” or the original method is used.

	Latest Run	X Boundary Allocation (adjusted)
Number of GW Consents	84	84
Sum GW Takes (m3y)	7496332.80	7496332.80
Total Takes PA Con (m3y)	7717522.80	7717522.80
Diary: Total Annual Water Use	517459.04	517459.04
Total GW Takes (m3Y)	8234981.84	8234981.84