

## Water Use License Application Evaluation Template

This is a typical example of the groundwater balance assessment used during a Water Use License Application and focus strictly on the groundwater recharge potential of the property on which the water use is to be developed and used.

Software will calculate the components for the assessment		Only insert data in THESE coloured boxes	
<b>A21F</b>	Kaalfontein 44 IQ (sub- Quaternary Catchment)		Quaternary Catchment and Farm Name/Number/Portion
Size (ha) of Property (Deed)	3816	38.160 km <sup>2</sup> [Area in Km <sup>2</sup> ]	Area (ha) of Property as per Transport Deeds Registrar
General Authorisation on Quaternary (m <sup>3</sup> /ha/a)	60	228 960 m <sup>3</sup> /ha/a on Area	First General Authorisation (DWAF)
General Authorisation on Quaternary (m <sup>3</sup> /ha/a)	0	0	Total volume as per General Authorisation (#2) on Area
<b>License (Water Use required)</b>	1500 000	1500 000 m <sup>3</sup> /a	Water use requested by licensee for Area
Harvest Potential <sub>MAP</sub> - Min	10 000	m <sup>3</sup> /km <sup>2</sup> /a	Harvest Potential as per Vegter's Map (Including lateral Recharge) - <b>Minimum</b>
Harvest Potential <sub>MAP</sub> - Max	15 000	m <sup>3</sup> /km <sup>2</sup> /a	Harvest Potential as per Vegter's Map (Including lateral Recharge) - <b>Maximum</b>
Available Volume/a: Lower Harvest Potential value		381 600 m <sup>3</sup> /a	Volume of groundwater that can be authorised with Harvest Potential evaluation. (Maximum - Minimum)
Available Volume/a: Highest Harvest Potential Value		572 400 m <sup>3</sup> /a	
Average Harvest Potential volume		477 000 m <sup>3</sup> /a	
Average Harvest Potential ratio		2.9 : 1	Ratio: This allocation VS Harvest Potential.
Exploitation Potential (Haupt) for Quaternary Catchment	8 781	m <sup>3</sup> /km <sup>2</sup> /a	This is: Harvest Potential corrected for abstraction, recharge and hydraulic characteristics of aquifer(s) in Quaternary Catchment
Exploitation Potential (Haupt) for Area	335 070	m <sup>3</sup> /a	
Exploitation Potential ratio		4.5 : 1	Ratio: This allocation VS Exploitation Potential (by WSM-Haupt)
GRA II Information	<b>A21F</b>	<b>m<sup>3</sup> on Area</b>	
Volume water Stored in Aquifer	585.980	18 618 648	Total volume (m <sup>3</sup> ) of groundwater stored in aquifer systems within QC (i.e. WZ + FZ) [Repeat from Project 1].
Harvest Potential (as in GRA II)	15.336	487 266	Annual volume (m <sup>3</sup> ) of groundwater per km <sup>2</sup> available for exploitation according to Harvest Potential (Baron, Seward & Seymour, 1998)
Baseflow (MACBf)	8.159	259 231	Mean annual volume (m <sup>3</sup> ) of groundwater discharge (baseflow) to rivers in Quaternary Catchment [output Project 3].
Average Annual Potential Recharge (Dry)	34.695	1 102 376	Mean annual volume (m <sup>3</sup> ) of groundwater recharge from rainfall per Quaternary Catchment under 'drought' conditions, i.e. rainfall < MAP x %CV.
Groundwater Resource Pot (AGRP - Dry)	154.818	4 919 113	Mean annual Groundwater Resource Potential (AGRP in m <sup>3</sup> ) per Quaternary Catchment under 'drought' recharge conditions (Re Dry).
Average Groundwater Exploitation Potential (AGEP - Dry)	68.380	2 172 677	Mean annual Groundwater Exploitation Potential (AGRP in m <sup>3</sup> ) per Quaternary Catchment under 'drought' recharge conditions (AGEP <sub>Dry</sub> = AGRP <sub>Dry</sub> x Ef). <b>INCLUDING SOME STORAGE!</b>
Potential Groundwater Exploitation Potential (PGEP - Dry)	66.999	2 128 788	Mean annual Potable Groundwater Exploitation Potential (PGEP in m <sup>3</sup> ) per Quaternary Catchment under 'drought' recharge conditions (PGEP <sub>Dry</sub> = AGEPEP <sub>Dry</sub> x Pf).
Utilisable Groundwater Resource Potential (UGRP - Dry)	18.713	594 591	Mean annual Utilisable Groundwater Resource Potential (UGRP in m <sup>3</sup> ) per Quaternary Catchment under 'drought' recharge conditions (UGRP <sub>Dry</sub> = AGRP <sub>Dry</sub> using max. allowable drawdown [Project 4]).
Annual Recharge required .....	39.3	mm	<b>Recharge required to sustain THIS water use on Area</b>
Annual Recharge from av. Harvest Potential	12.5	mm	Recharge available On Area to sustain Harvest Potential
Annual Recharge from Exploitation Potential	8.8	mm	Recharge available On Area to sustain Max Utilisable Groundwater
Annual Recharge from GRA II Estimation.	28.9	mm	Recharge available On Area to sustain AGEPEP (GRA II)
Average Recharge Sub-QC (Mm <sup>3</sup> /a)	1.46	38.2 mm/a on s-QC	
Sub-Quaternary Catchment Area	38.16	<Km <sup>2</sup> / m <sup>2</sup> > 38 160 000	
Base flow	0.1031	Mm <sup>3</sup> /a	
Instream Flow Requirements	0.0000	Mm <sup>3</sup> /a	Source: From Reserve determination by Groundwater Consulting Services (March 2007).
Basic Human Needs	0.0037	Mm <sup>3</sup> /a	
Amount of Recharge available for allocation	38	mm/a	
Recharge in reserve on this Area	(1)	mm/a	Difference between Recharge in Reserve and Required for water use (deficit if printed in red!!!)
→ Land area required to sustain thus Use		8970 ha	Based on mean 17 mm/a recharge of:
<b>THIS ALLOCATION</b>	1.5000	Mm <sup>3</sup> /a	
Already allocated in Quaternary Catchment	1.051	Mm <sup>3</sup> /a	Updated from WARMS data base on:
<b>TOTAL ALLOCATION</b>	2.5547	Mm <sup>3</sup> /a	Total allocation for Quaternary Catchment, this water use included
Summary: Reserve volume in Quaternary Catchment	-1.1	Mm <sup>3</sup>	175% << ALREADY allocated in A21F - Quaternary Catchment

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Catch	Volume water in Aquifer System	Volume in 5m D-down	Storativity	Specific Yield	Harvest Potent	Exploitability Factor	Potability Factor	Drought Index	Mean Annual Base Flow	Annual Abstract	Annual Potential Recharge	Groundwater Resource Potential	Groundwater Exploitation Potential	Potable Groundwater Exploitation Potential	Utilisable Groundwater Resource Potential	Utilisable Groundwater Exploitation Potential	Utilisable Potable Groundwater Exploitation Potential							
Catch #	Sv	Svr (5m)	FZ	WZ	HP	Ef	Pf	Di	Bf	At	Re	Re (dry)	AGRP	AGRP (dry)	GEP	GEP (dry)	PGEP	PGEP (dry)	UGRP	UGRP (dry)	UGEP	UGEP (dry)	UPGEP	UPGEP (dry)
	m <sup>3</sup> x1000	m <sup>3</sup> x1000	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup> x1000	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>
<b>A21F</b>	585 980	128 391	0.000856	0.025608	15 335 600	0.370600	0.979800	1.00	8 158 710	7 899 850	47 168 500	34 694 800	167 417	154 818	73 073 900	68 380 100	71 597 8	66 998 8	31 142 100	18 713 400	11 560 100	6 939 21	11 295 700	6 777 880

The above source data is partially used to populate the Water Use Licensing Assessment Tool