WELL SUSTAINABLE YIELD CALCULATION BY STEP DRAWDOWN TEST

YIGO/DEDEDO WELL F-17 (CT-4 PILOT)   11-Nov-94

Step, m	Pumping Rate Qm (gpm)	Step Drawdown &(ft)	Total Drawdown sm (ft)	Spec. Drawdown (s/Q)m (ft/gpm)
1	165	0.05	0.05	0.0003
2	185	0.00	0.05	0.0003
3	235	0.10	0.15	0.0006

Well Loss Coefficient, C =   2.12E-06 ft/gpm^2
Formation Loss Coefficient, B =   2.00E-05 ft/gpm

Pump Rate (gpm)	Drawdown, sw BQ + CQ^2 (ft)	Efficiency, E 100/(1+CQ/B) (%)
100	0.02	8.62
175	0.07	5.12
250	0.14	3.64
325	0.23	2.82
400	0.35	2.30

TRANSMISSIVITY CALCULATIONS

By Time-Recovery Method;

Transmissivity, Tr = 264Q/(s1-s2) =   886,286 gpd/ft
or,
Transmissivity, Tr = 35.3Q/(s1-s2) =   118,507 ft^2/d

Where,
Pumping Rate, Q =   235 gpm
Recovery over one log cycle, s1-s2 =   0.07 ft

By Time-Drawdown Method;

Transmissivity, Td = 264Q/(s1-s2) =   1,240,800 gpd/ft
or,
Transmissivity, Td = 35.3Q/(s1-s2) =   165,910 ft^2/d

Where,
Pumping Rate, Q =   235 gpm
Drawdown over one log cycle, s1-s2 =   0.05 ft

Time-Recovery Method appears more reasonable based on existing wells in the area, therefore, use T =   886,286 gpd/ft
=   118,507 ft^2/d

HYDRAULIC CONDUCTIVITY CALCULATIONS

Hydraulic Conductivity, K = T/(h+z) =   13,604 gpd/ft^2

Where,
Transmissivity, T =   886,286 gpd/ft
Aquifer head above mean sea level, h =   3.45 ft
Well depth below mean sea level, z =   61.70 ft

PERMIABILITY CALCULATIONS

Permiability, Kp = T/(h+z) =   1,819 ft/d

Where,
Transmissivity, T =   118,507 ft^2/d
Aquifer head above mean sea level, h =   3.45 ft
Well depth below mean sea level, z =   61.70 ft

PILOT/DEVELOPED WELL COMPARISON w/o SCREEN

Pilot well diameter, d =	10.00	in
Developed well diameter, dw =	20.00	in
Effective aquifer thickness, L = (h+z) =	65.15	ft
Pilot well effective area, A = (pi)(d/12)(L) =	170.56	sf
Developed well effective area, Aw = (pi)(dw/12)(L) =	341.12	sf
Expected yield, Q =	350.00	gpm
=	0.78	cfs
Pilot well loss coefficient, C =	2.12E-06	
Developed well loss coefficient, Cw = C(A/Aw)^2 =	5.30E-07	
Pilot well formation loss coefficient, B =	2.00E-05	ft/gpm
Transmissivity, T =	886,286	gpd/ft
Dev. well form. loss coef, Bw = B + (528/T)log(r/rw) =	-1.59E-04	ft
say	0.00	
Drawdown in pilot well, s = BQ + CQ^2 =	0.27	ft
Drawdown in developed well w/o screen, sw = BQ + CwQ^2	0.06	ft

PILOT/DEVELOPED WELL COMPARISON w/ SCREEN

Screen open area per foot, sc =	80.00	in^2/ft
Screen diameter, dc =	12.00	in
Screen length, Lc = L =	65.15	ft
Screen area, As = pi(dc)(Lc) =	204.67	sf
Screen open area, Ac = (sc/144)(Lc) =	36.19	sf
Approach velocity of screen, V = Q/As =	0.0038	fps
Velocity through screen, Vc = Q/Ac	0.0215	fps
Gravitational constant, g =	32.20	ft/sec^2
Head loss through screen, ds' = [(Vc-Vs)/2g]*(1/0.7) =	0.0004	ft
Distance to inside of filter, rf = (dc/2)/12 =	0.50	ft
Distance to aquifer/filter interface, ra = (dw/2)/12 =	0.83	ft
Average aquifer thickness (unconfined), D = Lc =	65.15	ft
Hydraulic conductivity through filter, K" =	6,626	gpd/ft
where filter media is;	large pebble gravel	
Filter loss coefficient, B" = [528/(K"D)]log(ra/rf) =	0.0003	ft/gpm
Filter loss, ds" = B"Q =	0.0950	ft
Drawdown in developed well w/ screen, s' = sw+ds'+ds"	0.16	ft