Stream depletion analysis - Hunt (1999) solution

Pumped aquifer

Transmissivity (T)	20	(m^2/d)
Storage coefficient (S)	0.1	-

Streambed

Hydraulic conductivity (K*)	1	(m/d)
Thickness (B*)	1	(m)
Width (W)	100	(m)
Stream bed conductance (λ)	**100**	(m/d)

Well

Pumping rate (Q)	8.1	(L/s)
Separation distance (L)	70	(m)

Application efficiency

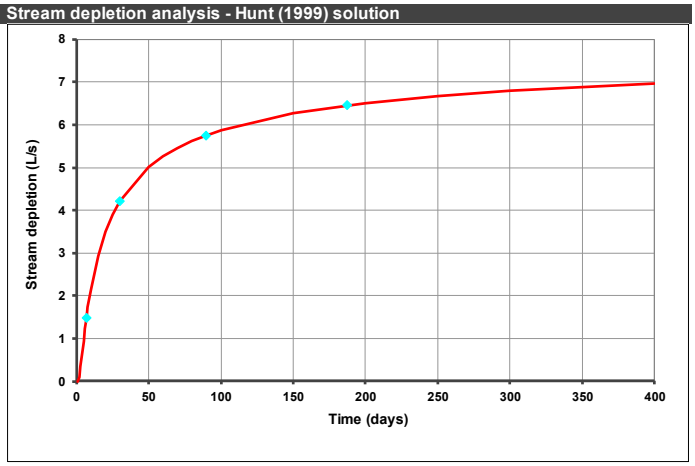
Irrigation efficiency	100%	
Separation distance (L2)	70	(m)

Stream depletion after

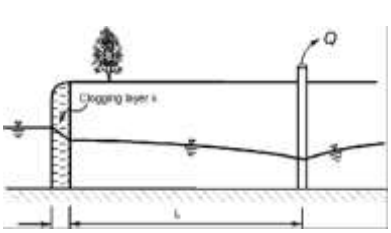
Time (days)	q (L/s)	%
7	1	**18%**
30	4	**52%**
90	6	**71%**
187	6	**80%**

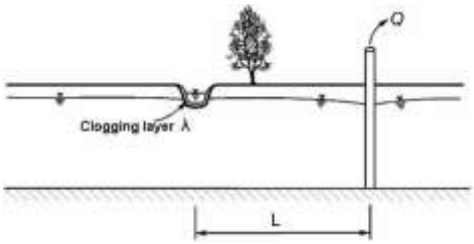
Only the values in shaded cells can be updated - all other cells are dependent on those input values.

Setting lambda to a very high value will give Theis solution



Time (days)	Depletion Rate @100% (L/s)	@100% (L/s)
1.0	0.0	0.0
2.0	0.1	0.1
3.0	0.3	0.3
4.0	0.6	0.6
5.0	0.9	0.9
6.0	1.2	1.2
7.0	1.5	1.5
8.0	1.7	1.7
9.0	1.9	1.9
10.0	2.1	2.1
15.0	2.9	2.9
20.0	3.5	3.5
25.0	3.9	3.9
30.0	4.2	4.2
50.0	5.0	5.0
60.0	5.3	5.3
70.0	5.5	5.5
80.0	5.6	5.6
90.0	5.8	5.8
100.0	5.9	5.9
150.0	6.3	6.3
200.0	6.5	6.5
250.0	6.7	6.7
300.0	6.8	6.8
400.0	7.0	7.0





Stream depletion analysis - Hunt (1999) solution

Pumped aquifer

Transmissivity (T)	20	(m^2/d)
Storage coefficient (S)	0.1	-

Streambed

Hydraulic conductivity (K*)	1	(m/d)
Thickness (B*)	1	(m)
Width (W)	100	(m)
Stream bed conductance (λ)	**100**	(m/d)

Well

Pumping rate (Q)	7.3	(L/s)
Separation distance (L)	70	(m)

Application efficiency

Irrigation efficiency	100%	
Separation distance (L2)	70	(m)

Stream depletion after

Time (days)	q (L/s)	%
7	1	**18%**
30	4	**52%**
90	5	**71%**
187	6	**80%**

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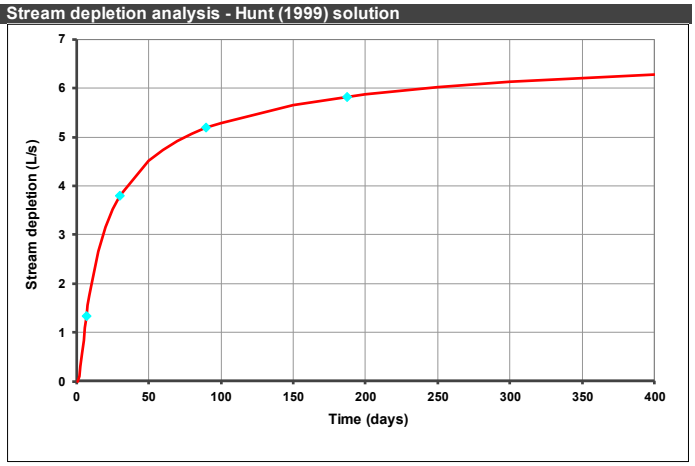
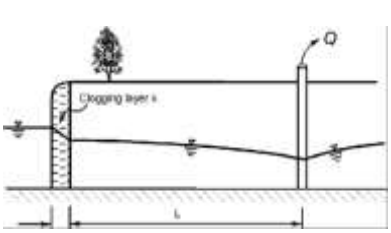
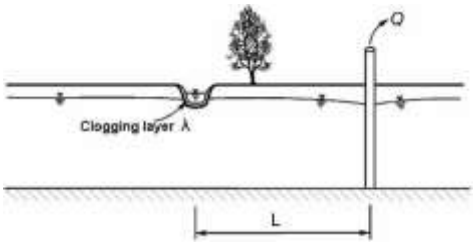
Setting lambda to a very high value will give Theis solution



Time (days)	Depletion Rate @100% (L/s)	@100% (L/s)
1.0	0.0	0.0
2.0	0.1	0.1
3.0	0.3	0.3
4.0	0.6	0.6
5.0	0.8	0.8
6.0	1.1	1.1
7.0	1.3	1.3
8.0	1.6	1.6
9.0	1.8	1.8
10.0	1.9	1.9
15.0	2.7	2.7
20.0	3.1	3.1
25.0	3.5	3.5
30.0	3.8	3.8
50.0	4.5	4.5
60.0	4.7	4.7
70.0	4.9	4.9
80.0	5.1	5.1
90.0	5.2	5.2
100.0	5.3	5.3
150.0	5.6	5.6
200.0	5.9	5.9
250.0	6.0	6.0
300.0	6.1	6.1
400.0	6.3	6.3





Stream depletion analysis - Hunt (1999) solution

Pumped aquifer

Transmissivity (T)	20	(m^2/d)
Storage coefficient (S)	0.1	-

Streambed

Hydraulic conductivity (K*)	1	(m/d)
Thickness (B*)	1	(m)
Width (W)	100	(m)
Stream bed conductance (λ)	**100**	(m/d)

Well

Pumping rate (Q)	3.3	(L/s)
Separation distance (L)	70	(m)

Application efficiency

Irrigation efficiency	100%	
Separation distance (L2)	70	(m)

Stream depletion after

Time (days)	q (L/s)	%
7	1	**18%**
30	2	**52%**
90	2	**71%**
365	3	**85%**

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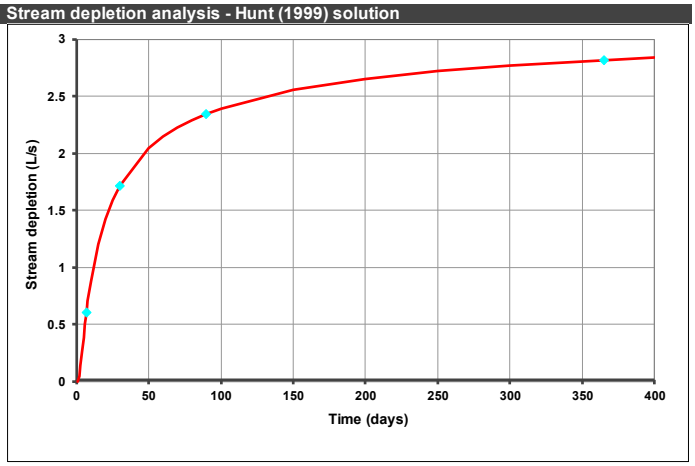
Setting lambda to a very high value will give Theis solution



Time (days)	Depletion Rate @100% (L/s)	@100% (L/s)
1.0	0.0	0.0
2.0	0.0	0.0
3.0	0.1	0.1
4.0	0.3	0.3
5.0	0.4	0.4
6.0	0.5	0.5
7.0	0.6	0.6
8.0	0.7	0.7
9.0	0.8	0.8
10.0	0.9	0.9
15.0	1.2	1.2
20.0	1.4	1.4
25.0	1.6	1.6
30.0	1.7	1.7
50.0	2.0	2.0
60.0	2.1	2.1
70.0	2.2	2.2
80.0	2.3	2.3
90.0	2.3	2.3
100.0	2.4	2.4
150.0	2.6	2.6
200.0	2.7	2.7
250.0	2.7	2.7
300.0	2.8	2.8
400.0	2.8	2.8