

## 14.2 Pumping Test Report for Lots 1 and 3

بسم الله الرحمن الرحيم

الأبرقي للتجارة و المقاولات و حفر الآبار الارتوازية Al-Abraki for Contracting & Drilling Wells

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# The final Report For Pumping Test

Rural Water Supply Component of Study for Water Resources  
Management and Rural Water Supply Improvement in  
Republic of Yemen.



Preparing Engineer: AbdulSalam Sallam.  
Execution : Mabkhout Al-Abraki Office.

September ٢٠٠٦

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## **Summary**

- 1. Information for Pumping Test Wells.**
- 2. Pictures of Pumping Test Sites.**
- 3. Pumping Test Report Sheets.**



Information for Pumping Test Wells

Governorate	District	Site Code	Site Name	Source Code	Target Water Source	Latitude N		Longitude E		Altitude (m)	Const. Year	Depth. (m)	SWL (G.L.-m)	Remarks
						°	'	°	'					
Al Mahweet	Al Khabt	A-01	Al Sha'afel Al Olyah & Al Sufia	A-01	New projected deep well	15	27	43	17	357	2005	192	20.12	
	Al Mahweet	A-02	Jabal Al Taraf	A-02	Existing projected deep well	15	26	43	30	1,111	1997	165	26.00	
	Al Rujum	A-03	Ozlat Al Jaradi	A-03	Existing projected deep well	15	27	43	37	1,986	1990	150	50.80	
	Bani Sa'ad	A-04	Al Khamis-Bani Ali	A-04	New projected deep well	15	10	43	29	458	2001	92	6.66	
Sana'a	Al Haymah	S-01	Bani Waleed	S-01/1	New projected deep well	15	00	43	53	1,664	2005	348	112.59	Recovery is very slow
	Al Kharjiyah	S-01/2	- Al Asboor	S-01/2	New projected deep well	15	00	43	52	1,654	2005	300	42.56	Recovery is very slow
Bani Matar	Bani Matar	S-03	Al Kharaba	S-03	Existing projected deep well	15	18	43	58	2,935	1982	150	44.93	
		S-04	Qarnian-Bait Al Najrani	S-04	Existing projected deep well	15	10	43	58	2,748	1975	145	10.01	
	Sanhan & Bany Bahlool	S-08	Dajah & Sarfah	S-08	New projected deep well	15	21	44	25	2,567	2006	672	468.33	Test carried by GARWSP
		S-13	Al Ga'ra	S-13	New projected deep well	15	19	44	27	2,603	2006	840	--	Test carried by GARWSP
Dahmar	Jabal Al Sharq	D-01	Elow Al Mikhlaf	D-01	New projected deep well	14	48	43	51	1,799	2000	273	184.13	
		D-02	Hamal Bait Al Jabar	D-02	Existing projected deep well	14	44	43	56	2,205	1985	310	185.80	
	Duran	D-03	Hegrat Al A'sham	D-03	New projected deep well	14	42	43	59	2,041	1999	320	163.05	
		D-04	Al Kuob	D-04	New projected deep well	14	45	44	10	2,237	1999	152	84.90	
	Ans	D-05	Mayfa'at Yaer	D-05	Existing projected deep well	14	33	44	14	2,176	1984	127	59.56	
		D-06	Wardasan	D-06	Existing projected deep well	14	24	44	20	2,118	1998	220	89.65	
	Mayfa'a	D-07	Al Asakera	D-07	New projected deep well	14	32	44	40	2,589	1999	304	193.58	
		D-08	Masneat Abdul Aziz	D-08	New projected deep well	14	26	44	31	2,508	2004	268	61.98	
Ibb	Al Qafir	I-01	Asfal Bani Saba	I-01	New projected deep well	14	13	44	14	1,812	2005	305	106.40	
		I-02	Al Sana	I-02	New projected deep well	14	13	44	14	1,741	2005	272	35.58	
	Ibb	I-03	Mamasa Al Marqab	I-03	New projected deep well	14	11	44	12	1,648	2005	78	47.78	
		I-04	Al Jahlah & Al Meshraq	I-04	New projected deep well	13	55	44	14	1,803	2005	305	14.85	

Wells to be tested	22
Cancelled wells	2
Total wells tested	20

Pumping Tests Informations										Step Drawdown					Constant discharge & Recovery Test					Remarks	
Governorate	District	Site Code	Site Name	Source Code	Target Water Source	Depth. (m)	SWL (G.L.-m)	Pump depth (G.L.-m)	Step Drawdown discharge rate (l/sec)					I.W.L (m)	P.W.L (m)	Draw down (m)	Expect discharge rate (l/sec)	Constant discharge rate (l/sec)	Remarks		
									1st	2nd	3rd	4th	5th								
Al Mahweet	Al Khabt	A-01	Al Sha'afel Al Olyah & Al Sufia	A-01	New projected deep well	192	20.12	138	2.0	4.0	6.0	8.0	10.0	21.07	67.16	46.09	5.5	4.4			
	Al Mahweet	A-02	Jabal Al Taraf	A-02	Existing projected deep well	165	26.00	117	1.6	3.2	4.8	6.4	8.0	26.60	34.36	7.76	5.5	4.4			
	Al Rujum	A-03	Ozlat Al Jaradi	A-03	Existing projected deep well	150	50.80	107	2.6	5.2	7.8	10.4	13.0	51.50	56.56	5.06	10.4	10.4			
	Bani Sa'ad	A-04	Al Khamis-Bani Ali	A-04	New projected deep well	92	6.66	66	1.3	2.6	3.9	5.2	6.5	7.38	43.22	35.84	5.5	4.4			
San'a'a	Al Haymah	S-01	Bani Waleed	S-01/1	New projected deep well	348	112.59	247	0.6	1.2	1.8	2.4	3.0	116.70	143.84	27.14	2.0	1.6	Recovery is very slow		
	Al Kharijyah	S-01/2	- Al Asboor	S-01/2	New projected deep well	300	42.56	213	1.6	3.2	4.8	6.4	8.0	53.50	106.90	53.40	4.2	3.4	Recovery is very slow		
	Bani Matar	S-03	Al Kharaba	S-03	Existing projected deep well	150	44.93	111	1.3	2.6	4.2	5.2	6.5	45.75	81.64	35.89	3.9	3.5			
	Sanhan & Bany Bahlool	S-04	Qamlian-Bait Al Najrani	S-04	Existing projected deep well	145	10.01	105	1.4	2.8	4.3	5.6	7.0	11.20	12.11	0.91	5.6	5.6			
Dahmar	Alteyal	S-08	Dajah & Sarfah	S-08	New projected deep well	672	468.33	580	---	---	---	---	---	---	---	---	---	6.8	6.0	Test carried by GARWSP	
		S-13	Al Ga'ra	S-13	New projected deep well	840	---	668	---	---	---	---	---	---	---	---	---	---	6.1	5.4	Test carried by GARWSP
		D-01	Elow Al Mikhlaif	D-01	New projected deep well	273	184.13	207	1.5	3.0	4.5	6.0	7.5	184.68	186.38	1.70	3.0	2.4			
		D-02	Hamal Bait Al Jabar	D-02	Existing projected deep well	310	185.80	220	0.9	1.8	2.7	3.6	4.5	186.60	210.10	23.50	4.3	3.5			
		D-03	Hegrat Al A'sham	D-03	New projected deep well	320	163.05	249	1.3	2.6	3.9	5.2	6.5	163.60	184.50	20.90	5.2	5.0			
		D-04	Al Kuob	D-04	New projected deep well	152	84.90	123	0.1	0.2	0.3	0.4	0.5	85.50	92.02	6.52	0.35	0.3			
		D-05	Mayfa'at Yaer	D-05	Existing projected deep well	127	59.56	96	1.6	3.2	4.8	6.4	8.0	60.34	63.56	3.22	5.0	2.6			
		D-06	Wardasan	D-06	Existing projected deep well	220	89.65	165	0.5	0.7	0.9	1.1	---	90.45	132.70	42.25	0.5	0.5			
		D-07	Al Asakera	D-07	New projected deep well	304	193.58	250	1.4	2.8	4.2	5.6	7.0	194.15	195.70	1.55	5.6	4.5			
		D-08	Masneat Abdul Aziz	D-08	New projected deep well	268	61.98	192	1.4	2.8	4.2	5.6	7.0	62.80	124.50	61.70	5.6	4.5			
	Ibb	Al Qafr	I-01	Asfal Bani Saba	I-01	New projected deep well	305	106.40	216	1.4	2.8	4.2	5.6	7.0	107.40	113.70	6.30	5.8	4.5		
		Al Makhader	I-02	Al Sana	I-02	New projected deep well	272	35.58	210	1.2	2.4	3.6	4.8	6.0	36.10	141.00	104.90	4.8	3.9		
			I-03	Mamasa Al Marqab	I-03	New projected deep well	78	47.78	69	1.1	1.5	2.1	2.5	3.0	48.50	55.07	6.57	2.0	1.6		
Ibb		I-04	Al Jahlah & Al Meshraq	I-04	New projected deep well	305	14.85	219	1.7	3.4	5.1	6.8	---	15.50	110.80	95.30	5.1	4.1			

# Pictures of Pumping Test Sites

Governorates  
of

Al Mahweet

Sana'a

Dahmar

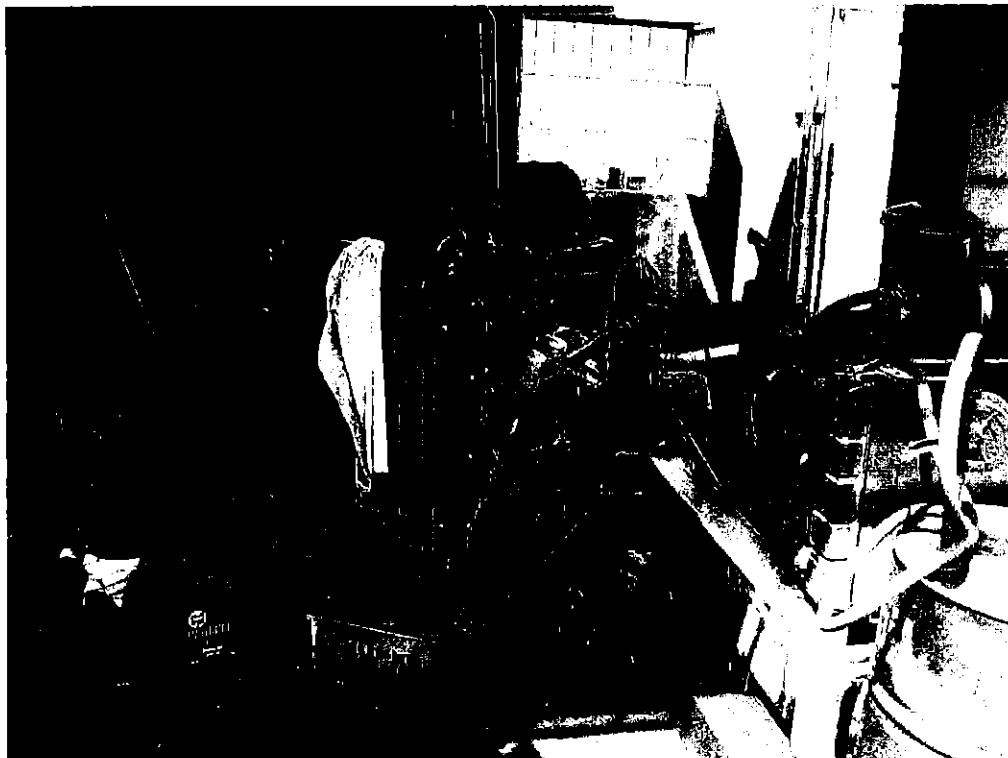
Ibb



Governorate: Al Mahweet



A-01 (Al Sha'afel Al Olyah & Al Sufla)



A-02 (Jabal Al Taraf)

Governorate: Al Mahweet

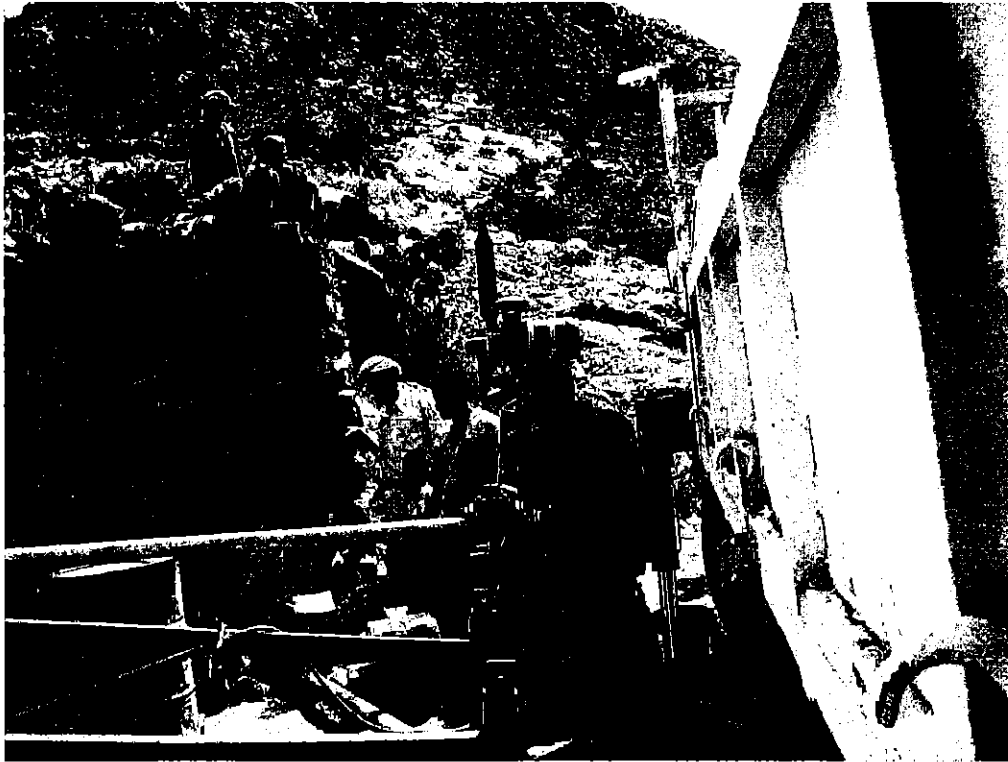


A-03 (Ozlat Al Jaradi)



A-04 (Al Khamis-Bani Ali)

Governorate: Sana'a



S-01/1 (Bani Waleed - Al Asboor) Bani Waleed



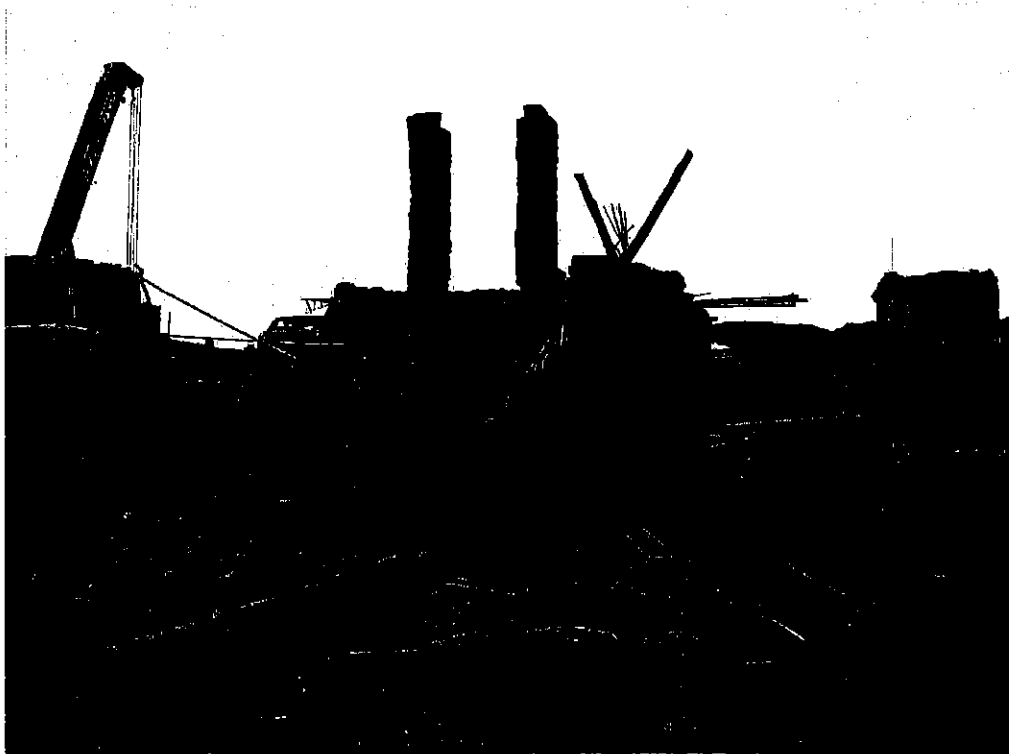
S-01/2 (Bani Waleed - Al Asboor) Al Asboor



Governorate: Sana'a



S-03 (Al Kharaba)



S-04 (Qamlan-Bait Al Najrani)

Governorate: Dahmar



D-01 (Elow Al Mikhlaf)

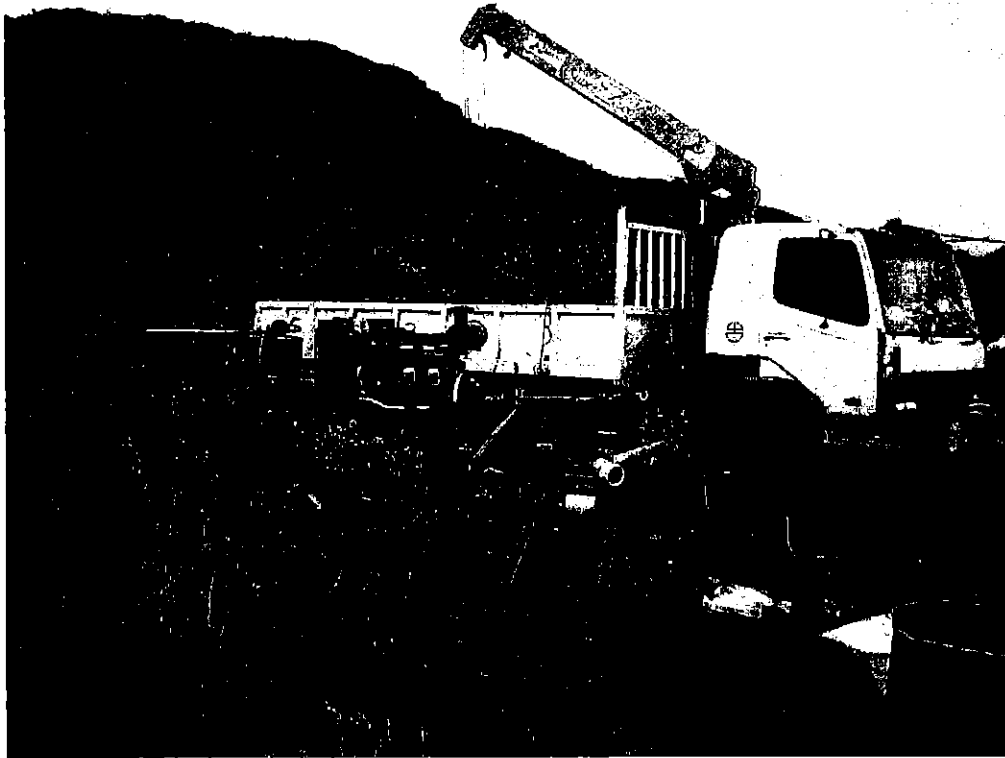


D-02 (Hamal Bait Al Jabar)

Governorate: Dahmar



D-03 (Hegrat Al A'asham)



D-04 (Al Kuob)

Governorate: Dahmar



D-05 (Mayfa'at Yaer)



D-06 (Wardasan)

Governorate: Dahmar



D-07 (Al Asakera)



D-08 (Masneat Abdul Aziz)

Governorate: Ibb

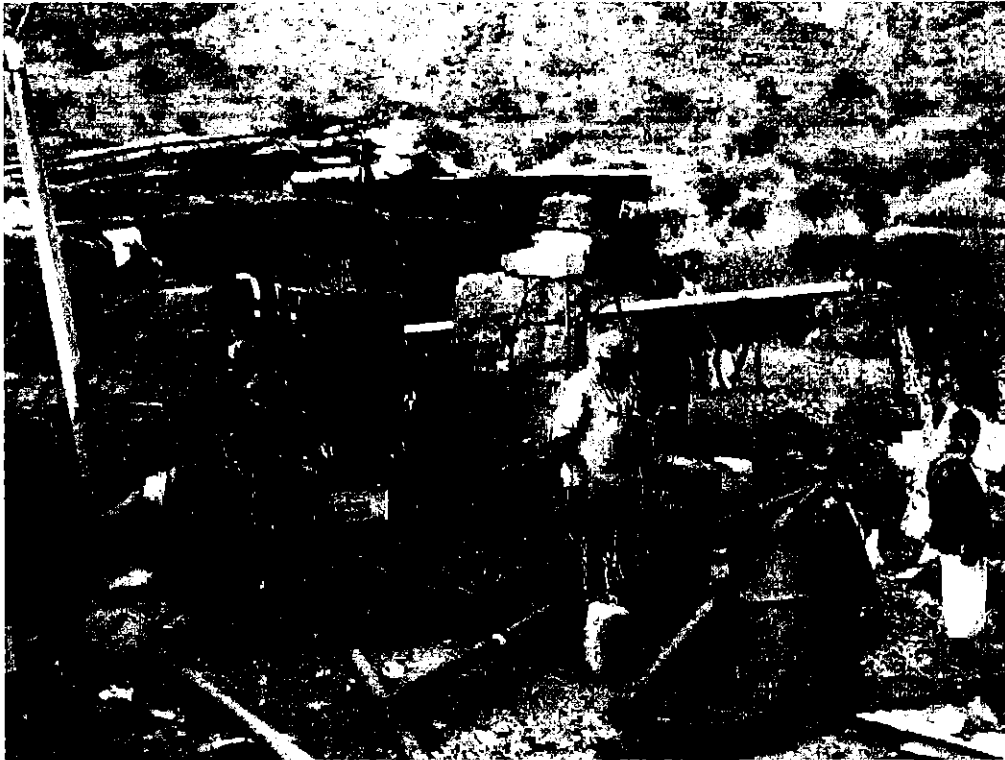


I-01 (Asfal Bani Saba)

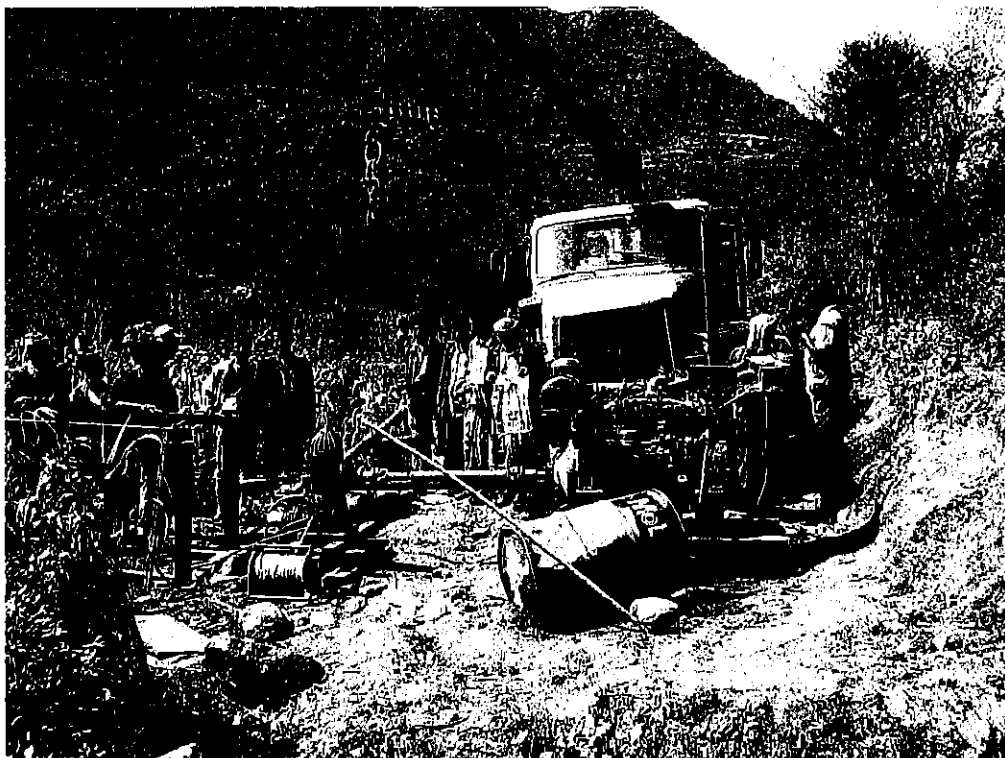


I-02 (Al Sana)

Governorate: Ibb



I-03 (Mamasa Al Marqab)



I-04 (Al Jahlah & Al Meshraq)

# Pumping Test Report Sheets

Governorate  
of

Al Mahweet





## Pumping Test Report Sheet

Well code: A-01 Site code: A-01 Site name: Al Sha'afel Al Olyah & Al Suffa  
District: Al Khabt Governorate: Al Mahweet

Target water source: New projected deep well Well depth: 192 m

Contractor: Mabkhout Al-Abraki  
Hydrogeologist in charge: Abudul Salam Sallam  
Operator: Hosein Jamell

Date of start of the test: 18/8/2006 Date of end of the test: 22/8/2006  
Pump type: Vertical pump Engine: IVECO Aifo  
Pump installation depth: 138 m Datum level: 0.95 m S.W.L.: G.L.-20.12 m

### Step drawdown test

Date/hour started: 18/8/2006 10:00pm Date/hour finished: 19/8/2006 9:15pm Total hours: 23:15  
Yield (l/sec) 1<sup>st</sup> step 2.00 2<sup>nd</sup> step 4.00 3<sup>rd</sup> step 6.00 4<sup>th</sup> step 8.00 5<sup>th</sup> step 10.00  
Water level before start the test (G.L.-m): 20.12  
Water level after end of 4<sup>th</sup> step (G.L.-m): 123.25  
Water level after recovery (G.L.-m): 20.12 Recovery hours 13:15

### Constant discharge test

Date/hour started: 19/8/2006 9:15pm Date/hour finished: 22/8/2006 6:15pm Total hours: 69:00  
Yield (l/sec) 4.40  
Water level before start of the test (G.L.-m): 20.12  
Water level after end of test (G.L.-m): 66.21  
Water level after recovery (G.L.-m): 20.12 Recovery hours 45:00  
Drawdown (m): 46.09

Revised by:

\_\_\_\_\_  
Name :

Date:

## Provisional Step Drawdown Test (1/2)

Well Code:   A-01                        Site code:   A-01                        Pump on date/hour:   18/8/2006 3:30pm    
 Site name:   Al Sha'afel Al Olyah & Al Sufla                        Pump off date/hour:   18/8/2006 6:00pm    
 District:   Al Khabt                        End of recovery hour:   18/8/2006 10:00pm    
 Governorate   Al Mahweet                        S.W.L ( m ):   21.07  

Contractor:   Mabkhout Al-Abraki    
 Hydrogeologist:   Abudul Salam Sallam    
 Operator:   Hosein Jamell  

Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	21.07	2.00	25.66	4.00	26.89	6.00	28.82	8.00	34.76	10.00	49.01
0.5	24.51		26.30		27.02		29.76		35.39		41.14
1.0	25.05		26.30		27.41		30.68		35.79		38.16
1.5	25.22		26.43		27.85		31.18		36.11		36.01
2.0	25.37		26.50		28.18		31.46		36.33		33.83
2.5	25.50		26.90		28.14		31.62		37.70		32.28
3.0	25.73		27.07		28.77		31.68		37.76		30.67
3.5	25.74		26.94		28.77		31.88		38.12		29.33
4.0	25.73		26.77		28.70		31.93		38.44		28.32
4.5	25.70		26.81		28.70		32.09		38.83		27.70
5.0	25.73		26.93		28.73		32.39		39.05		27.19
6.0	25.60		26.95		28.79		32.54		39.50		26.60
7.0	25.38		26.89		29.04		32.58		40.24		26.15
8.0	25.56		27.05		29.20		32.62		40.44		25.90
9.0	24.27		27.25		29.07		32.98		41.13		25.66
10.0	23.87		27.52		28.86		33.24		41.52		25.50
12.0	24.39		26.88		28.85		33.71		42.24		25.27
14.0	24.37		27.07		28.86		33.89		43.24		25.12
16.0	25.00		27.09		28.77		34.00		43.98		24.96
18.0	25.53		26.95		28.79		34.16		44.86		24.79
20.0	25.45		26.98		28.80		34.27		45.74		24.67
22.0	25.46		26.81		28.75		34.36		46.39		24.55
24.0	25.54		26.84		28.82		34.46		46.80		24.34
26.0	25.64		26.82		28.83		34.56		48.08		24.15
28.0	25.66		26.83		28.82		34.76		48.59		23.98
30.0	25.66		26.89		28.82		34.76		49.01		23.85
35.0											23.58
40.0											23.42
45.0											23.25
50.0											23.00
55.0											22.79
60.0											22.63
70.0											22.30
80.0											22.05
90.0											21.85
100.0											21.65
110.0											21.48
120.0											21.33
150.0											21.20
180.0											21.14



## Step Drawdown Test (1/2)

Well Code: A-01                      Site code: A-01                      Pump on date/hour: 18/8/2006 10:00pm  
 Site name: Al Sha'afel Al Olyah & Al Sufia                      Pump off date/hour: 19/8/2006 8:00am  
 District: Al Khabt                      End of recovery hour: 19/8/2006 9:15pm  
 Governorate Al Mahweet                      S.W.L ( m ): 21.07

Contractor: Mabkhout Al-Abraki  
 Hydrogeologist: Abudul Salam Sallam  
 Operator: Hosein Jamell

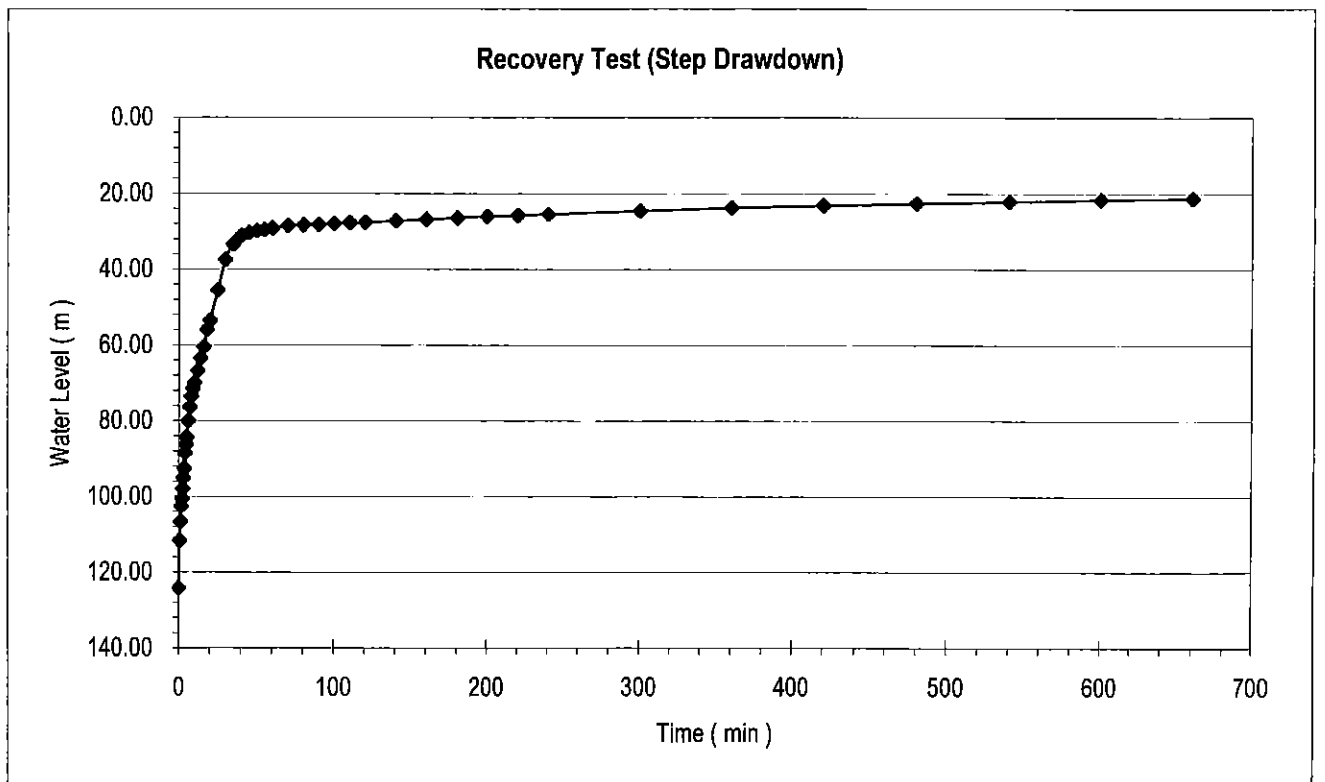
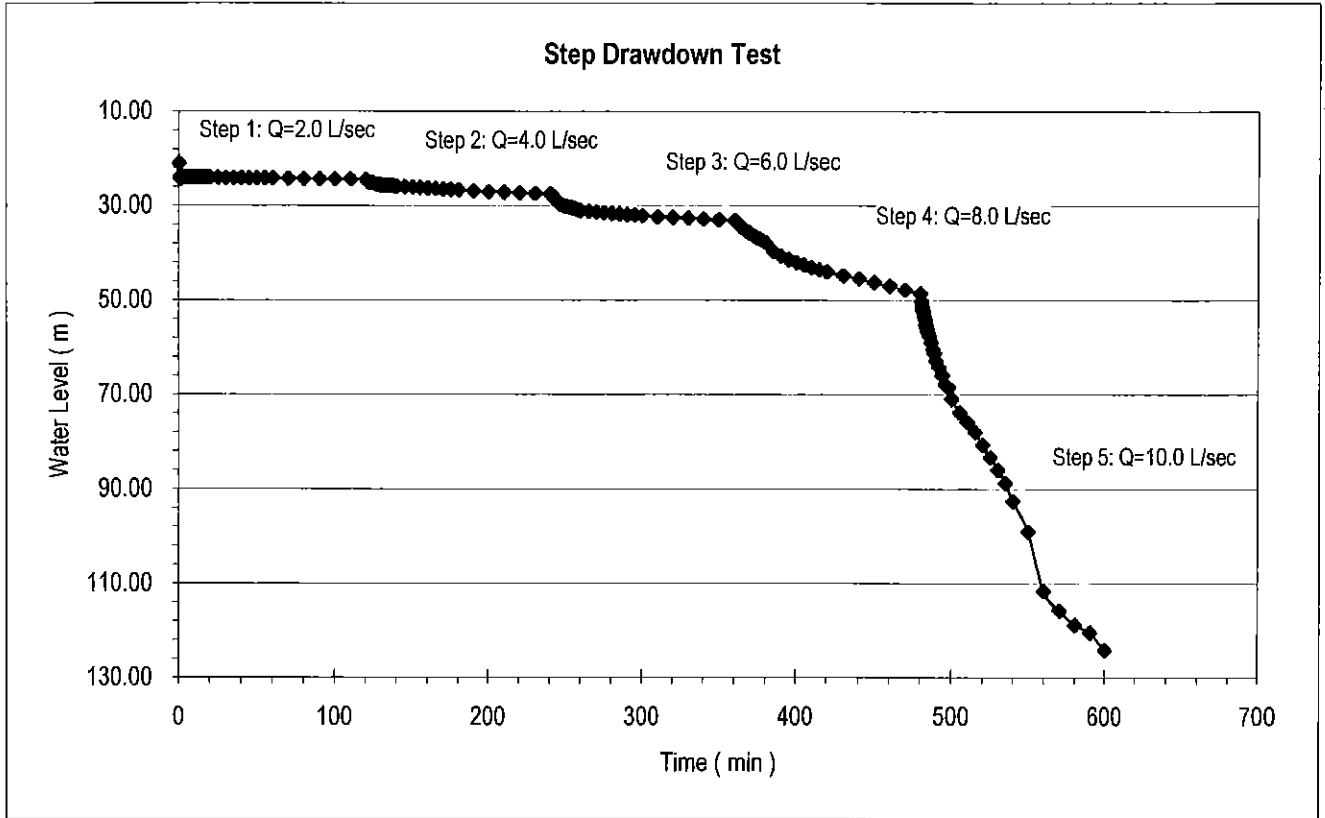
Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	21.07	2.00	24.48	4.00	27.53	6.00	33.11	8.00	48.58	10.00	124.20
0.5	23.98		24.65		27.60		33.17		50.20		111.66
1.0	24.25		24.93		27.74		33.40		51.22		106.71
1.5	24.27		25.00		27.97		33.54		52.00		102.60
2.0	24.15		25.06		28.14		33.65		52.51		100.70
2.5	24.00		25.17		28.31		33.86		53.44		97.95
3.0	23.99		25.18		28.47		34.04		54.12		95.10
3.5	23.98		25.19		28.65		34.26		55.24		92.60
4.0	23.98		25.20		28.92		34.45		55.87		88.55
4.5	23.98		25.22		29.19		34.56		56.67		86.29
5.0	23.95		25.24		29.35		34.71		56.98		84.40
6.0	23.97		25.43		29.60		35.00		57.72		80.10
7.0	23.98		25.53		29.80		35.28		58.92		76.43
8.0	23.99		25.58		29.94		35.56		60.47		73.65
9.0	23.99		25.62		30.04		35.71		61.25		71.52
10.0	23.99		25.65		30.14		35.92		62.88		69.90
12.0	24.00		25.70		30.26		36.37		64.23		66.75
14.0	24.01		25.78		30.48		36.78		65.94		63.59
16.0	24.03		25.80		30.70		37.04		67.90		60.50
18.0	24.05		25.86		30.89		37.39		68.45		56.05
20.0	24.06		25.90		30.98		37.90		70.99		53.57
25.0	24.09		26.03		31.18		39.69		73.85		45.54
30.0	24.12		26.12		31.33		40.69		75.86		37.50
35.0	24.14		26.20		31.47		41.41		77.98		33.44
40.0	24.16		26.29		31.63		42.02		80.72		31.23
45.0	24.18		26.40		31.73		42.56		83.39		30.44
50.0	24.20		26.49		31.87		43.07		86.00		29.95
55.0	24.22		26.59		31.96		43.56		88.82		29.67
60.0	24.24		26.70		32.13		43.98		92.59		29.22
70.0	24.28		26.89		32.38		44.80		99.14		28.55
80.0	24.32		27.06		32.49		45.42		111.70		28.40
90.0	24.36		27.22		32.63		46.21		115.76		28.29
100.0	24.40		27.33		32.83		47.00		118.82		28.05
110.0	24.44		27.43		32.97		47.79		120.45		27.81
120.0	24.48		27.53		33.11		48.58		124.20		27.72
140.0											27.27
160.0											26.85
180.0											26.56
200.0											26.16
220.0					14.40						25.84



# Step Drawdown Test

Well Code: A-01  
Site Code: A-01  
S.W.L. : 21.07 m

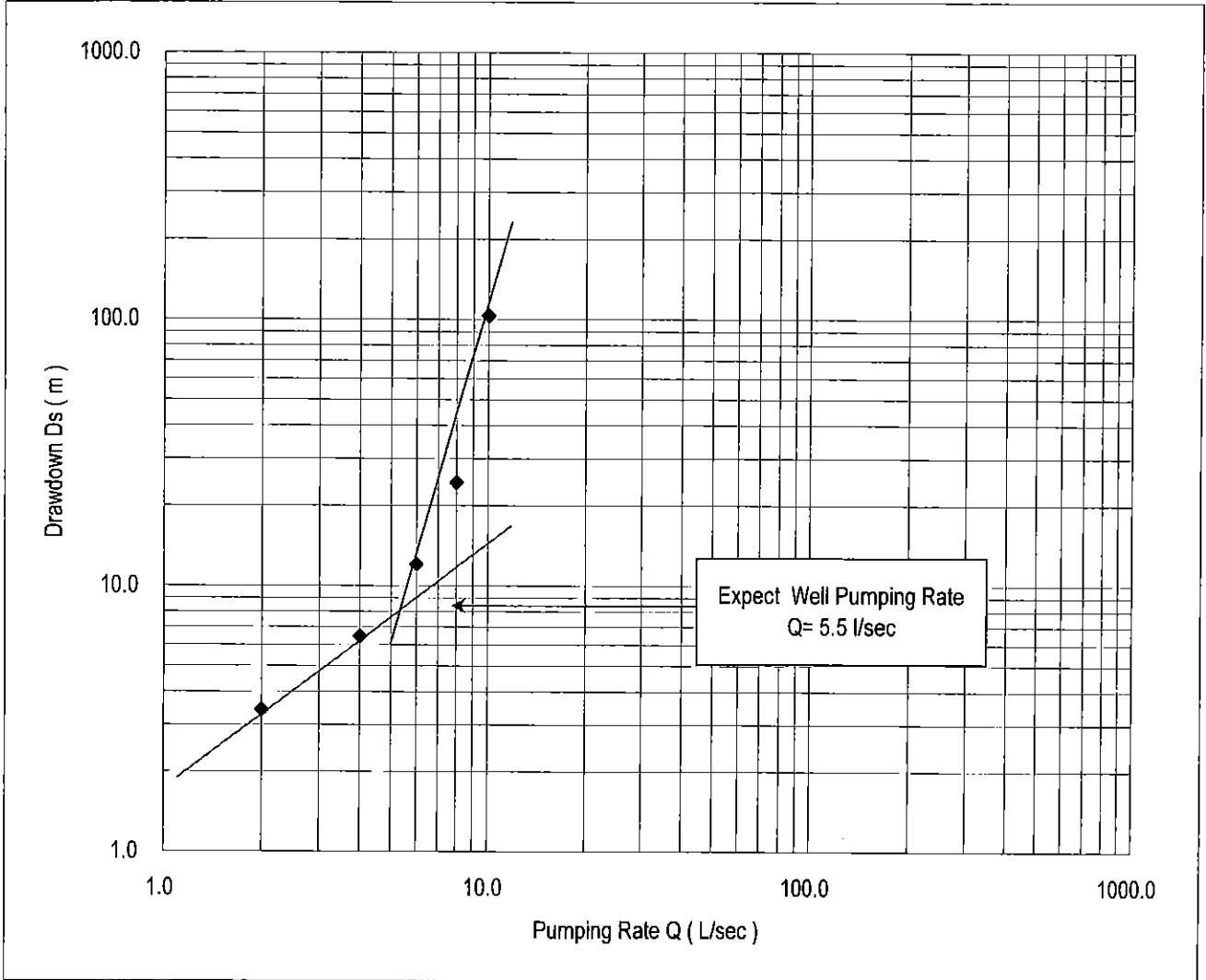
Site Name: Al Sha'afel Al Olyah & Al Sufla



## Step Drawdown Test

Well Code: **A-01**  
 Site Code: A-01  
 S.W.L. : 21.07 m

Site Name: Al Sha'afel Al Olyah & Al Sufla



Step	Q (l/sec)	D.W.L. (m)	Ds (m)
1	2.0	24.48	3.41
2	4.0	27.53	6.46
3	6.0	33.11	12.04
4	8.0	45.42	24.35
5	10.0	124.20	103.13

## Constant Discharge & Recovery Test (1/2)

Well Code:   A-01                        Site code:   A-01  

Site name:   Al Sha'afel Al Olyah & Al Sufla  

Pump on date/hour:   19/8/2006 9:15pm  

District:   Al Khabt  

Pump off date/hour:   20/8/2006 9:15pm  

Governorate:   Al Mahweet  

End of recovery hour:   22/8/2006 6:15pm  

Contractor:   Mabkhout Al-Abraki  

S.W.L ( m ):   21.07  

Hydrogeologist:   Abudul Salam Sallam  

D.W.L ( m ):   67.16  

Operator:   Hosein Jamell  

Yield (l/sec):   4.4  

Duration ( min )	Constant Dischrge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity (µS/cm)	
0.0	21.07	0.00		67.16	46.09		
0.5	25.44	4.37		62.02	40.95		
1.0	25.68	4.61		60.88	39.81		
1.5	25.83	4.76		60.46	39.39		
2.0	26.60	5.53		59.93	38.86		
2.5	26.20	5.13		59.34	38.27		
3.0	26.31	5.24		58.70	37.63		
3.5	26.44	5.37		58.10	37.03		
4.0	26.52	5.45		57.39	36.32		
4.5	26.62	5.55		56.80	35.73		
5.0	26.68	5.61		55.96	34.89		
6.0	26.88	5.81		54.80	33.73		
7.0	26.95	5.88		53.55	32.48		
8.0	27.02	5.95		52.37	31.30		
9.0	27.09	6.02		51.35	30.28		
10.0	27.16	6.09		50.30	29.23		
12.0	27.30	6.23		48.20	27.13		
14.0	27.44	6.37		46.22	25.15		
16.0	27.58	6.51		44.46	23.39		
18.0	27.68	6.61		42.20	21.13		
20.0	27.84	6.77		41.39	20.32		
25.0	28.13	7.06		38.07	17.00		
30.0	28.14	7.07		36.02	14.95		
35.0	28.60	7.53		34.79	13.72		
40.0	28.80	7.73		34.11	13.04		
45.0	28.97	7.90		33.75	12.68		
50.0	29.17	8.10		33.54	12.47		
55.0	29.23	8.16		33.24	12.17		
60.0	29.36	8.29		32.99	11.92	1970	



## Constant Discharge & Recovery Test (2/2)

 Well Code:   A-01  

 Site code:   A-01  

 Site name: Al Sha'afel Al Olyah & Al Sufia

 District:   Al Khabt  

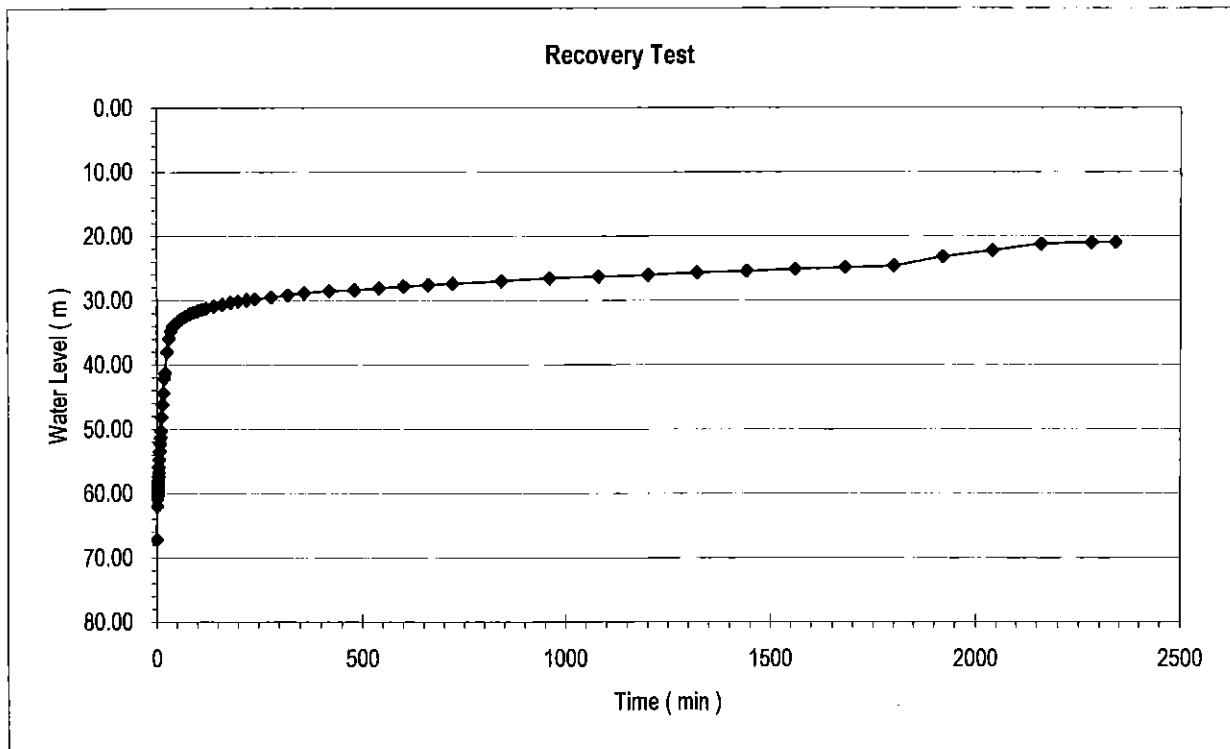
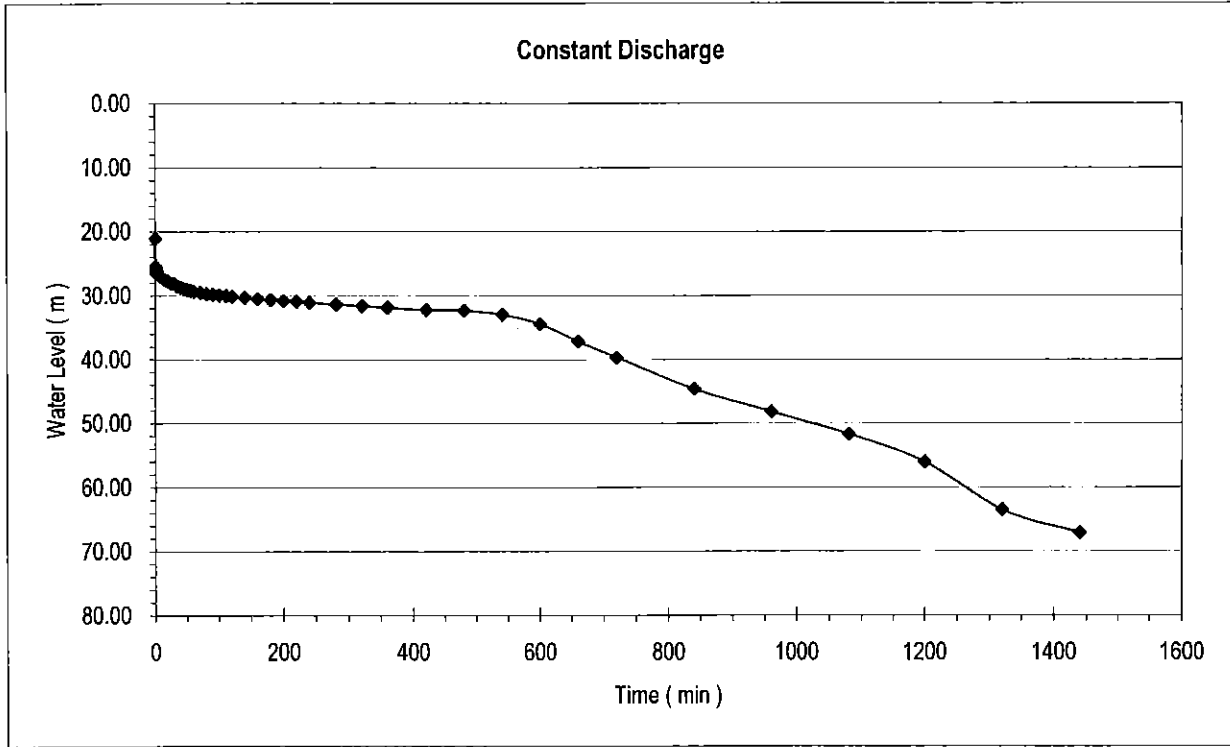
 Governorate:   Al Mahweet  

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( $\mu$ S/cm)	
70.0	29.56	8.49		32.56	11.49		
80.0	29.78	8.71		32.15	11.08		
90.0	29.85	8.78		31.92	10.85		
100.0	29.95	8.88		31.70	10.63		
110.0	30.07	9.00		31.54	10.47		
120.0	30.18	9.11		31.35	10.28	1970	
140.0	30.35	9.28		31.01	9.94		
160.0	30.56	9.49		30.72	9.65		
180.0	30.70	9.63		30.41	9.34	1970	
200.0	30.85	9.78		30.23	9.16		
220.0	30.97	9.90		30.03	8.96		
240.0	31.11	10.04		29.86	8.79	1970	
280.0	31.43	10.36		29.56	8.49		
320.0	31.68	10.61		29.26	8.19		
360.0	31.92	10.85		28.93	7.86	1970	
420.0	32.25	11.18		28.61	7.54		
480.0	32.36	11.29		28.47	7.40		
540.0	33.02	11.95		28.16	7.09	1970	
600.0	34.46	13.39		27.90	6.83		
660.0	37.24	16.17		27.69	6.62		
720.0	39.70	18.63		27.47	6.40	1970	
840.0	44.68	23.61		27.06	5.99		
960.0	48.25	27.18		26.65	5.58		
1080.0	51.76	30.69		26.40	5.33	1970	
1200.0	56.12	35.05		26.11	5.04		
1320.0	63.56	42.49		25.80	4.73	1970	
1440.0	67.16	46.09		25.52	4.45		
1560.0				25.24	4.17		
1680.0				24.98	3.91		
1800.0				24.70	3.63		
1920.0				23.30	2.23		
2040.0				22.33	1.26		
2160.0				21.34	0.27		
2280.0				21.12	0.05		
2340.0				21.07	0.00		

## Constant Discharge Test

Well Code: A-01  
Site Code: A-01  
S.W.L. (m): 21.07  
Yield (L/sec): 4.4

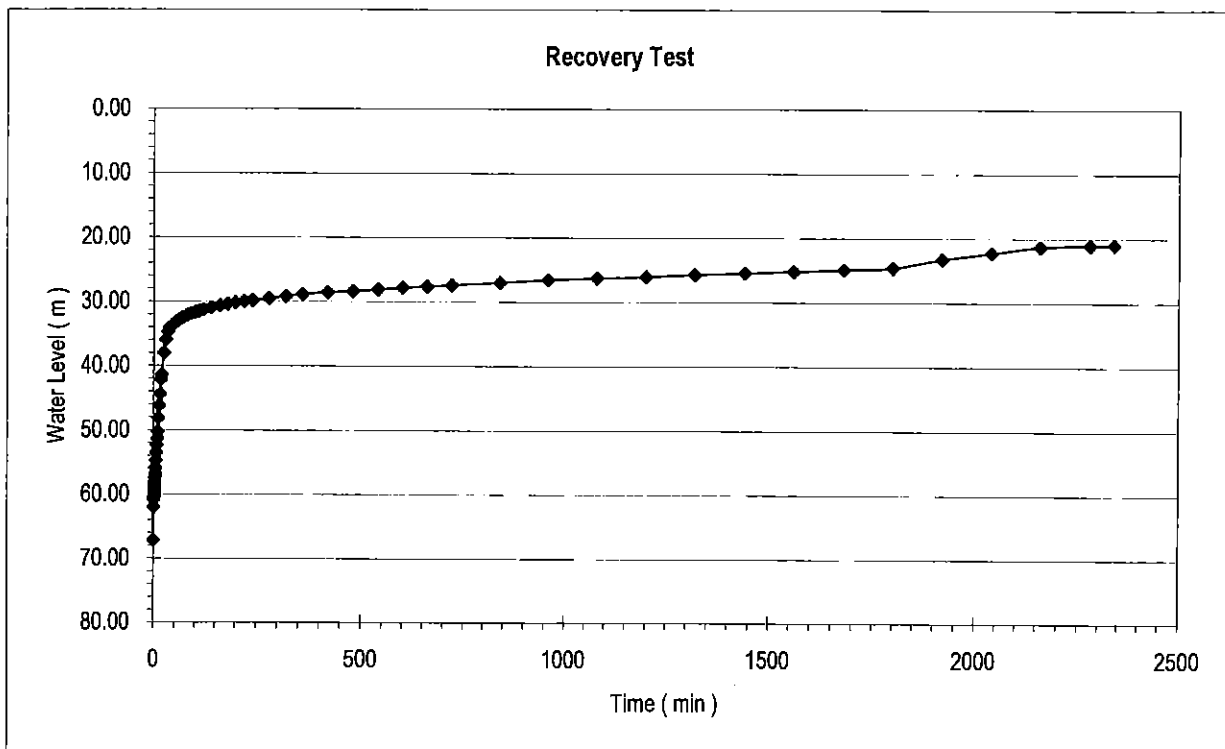
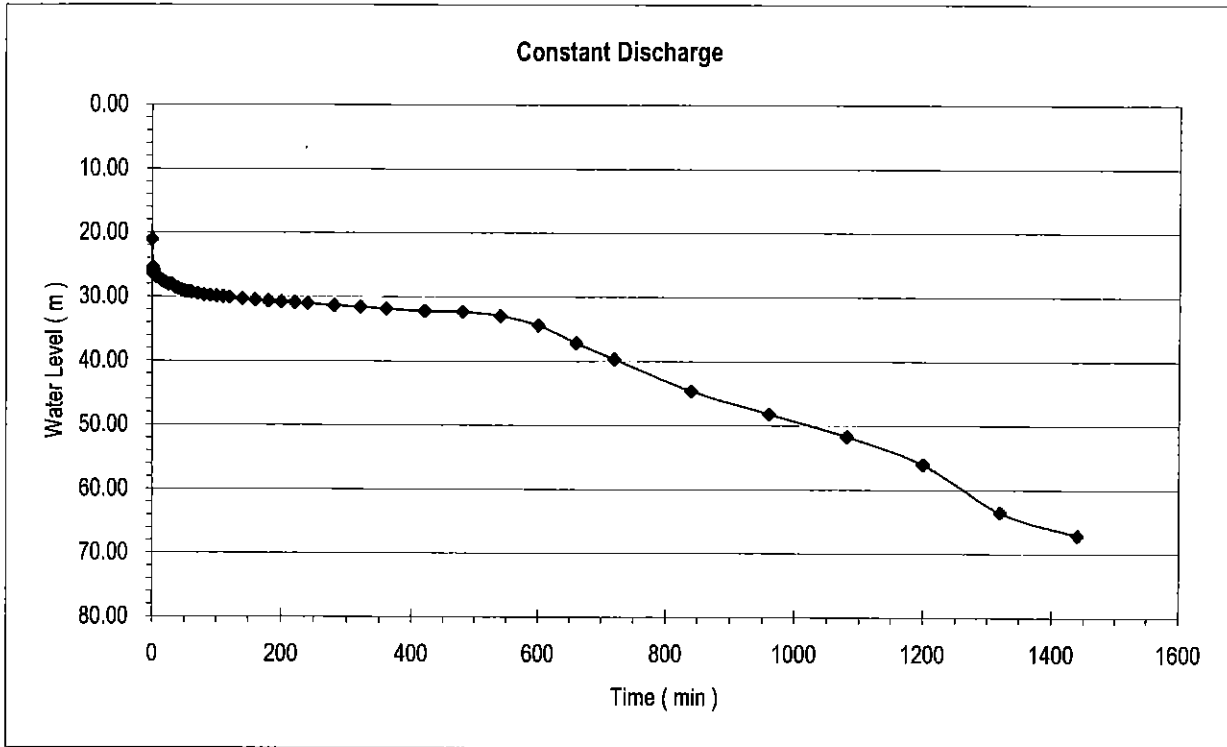
Site Name Al Sha'afel Al Olyah & Al Suffa  
D.W.L. (m): 67.16 Drawdown (m): 46.09



## Constant Discharge Test

Well Code: A-01  
Site Code: A-01  
S.W.L. (m): 21.07  
Yield (L/sec): 4.4

Site Name Al Sha'afel Al Olyah & Al Sufla  
D.W.L. (m): 67.16 Drawdown (m): 46.09



## Pumping Test Report Sheet

Well code: A-02 Site code: A-02 Site name: Jabal Al Taraf  
District: Al Mahweet Governorate: Al Mahweet

Target water source: Exisiting projected deep well Well depth: 165 m

Contractor: Mabkhout Al-Abraki  
Hydrogeologist in charge Abudul Salam Sallam  
Operator: Kaid Al Abraki

Date of start of the test: 28/8/2006 Date of end of the test: 30/8/2006  
Pump type: Vertical pump Engine: IVECO Aifo  
Pump installation depth: 117 m Datum level: 0.60 m S.W.L.: G.L.-26.00 m

### Step drawdown test

Date/hour started: 28/8/2006 3:00pm Date/hour finished: 29/8/2006 9:00am Total hours: 18:00  
Yield (l/sec) 1<sup>st</sup> step 1.60 2<sup>nd</sup> step 3.20 3<sup>rd</sup> step 4.80 4<sup>th</sup> step 6.40 5<sup>th</sup> step 8.00  
Water level before start the test (G.L.-m): 26.00  
Water level after end of 5<sup>th</sup> step (G.L.-m): 48.92  
Water level after recovery (G.L.-m): 26.00 Recovery hours 8:00

### Constant discharge test

Date/hour started: 29/8/2006 9:10am Date/hour finished: 30/8/2006 1:10pm Total hours: 30:00  
Yield (l/sec) 4.40  
Water level before start of the test (G.L.-m): 26.00  
Water level after end of test (G.L.-m): 33.76  
Water level after recovery (G.L.-m): 26.00 Recovery hours 4:00  
Drawdown (m): 7.76

Revised by:

\_\_\_\_\_  
Name :

Date:

## Provisional Step Drawdown Test

Well Code:   A-02                        Site code:   A-02                        Pump on date/hour:   28/8/2006 9:30am    
 Site name:   Jabal Al Taraf                        Pump off date/hour:   28/8/2006 12:00pm    
 District:   Al Mahweet                        End of recovery hour:   28/8/2006 3:00pm    
 Governorate   Al Mahweet                        S.W.L ( m ):   26.60  

Contractor:   Mabkhout Al-Abraki    
 Hydrogeologist:   Abudul Salam Sallam    
 Operator:   Kaid Al Abraki  

Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	26.60	1.60	27.79	3.20	30.17	4.80	33.45	6.40	39.62	8.00	46.41
0.5	29.77		28.55		30.71		33.90		39.97		34.76
1.0	29.65		28.95		31.01		34.10		40.55		31.42
1.5	29.90		29.21		31.27		34.77		40.95		29.63
2.0	30.30		29.37		31.61		35.10		41.18		28.52
2.5	30.43		29.54		31.81		35.41		41.40		27.76
3.0	30.45		29.67		31.97		35.75		41.57		27.45
3.5	30.65		29.69		32.10		36.05		41.74		27.31
4.0	30.30		29.72		32.46		36.65		41.86		27.26
4.5	29.95		29.74		32.66		37.00		41.95		27.24
5.0	29.67		29.76		32.78		37.50		42.02		27.20
6.0	29.45		29.76		32.77		38.20		42.16		27.17
7.0	29.35		29.77		33.03		38.52		42.24		27.15
8.0	28.89		29.86		33.20		38.82		42.98		27.14
9.0	28.26		29.95		33.28		38.97		43.76		27.11
10.0	27.99		30.08		33.32		39.05		44.40		27.10
12.0	27.82		30.11		33.34		39.17		45.20		27.08
14.0	27.83		30.12		33.38		39.28		45.64		27.08
16.0	27.82		30.15		33.40		39.34		45.82		27.03
18.0	27.82		30.16		33.41		39.43		45.98		27.01
20.0	27.82		30.16		33.41		39.48		46.00		27.00
22.0	27.82		30.15		33.42		39.54		46.12		26.97
24.0	27.83		30.16		33.44		39.58		46.20		26.96
26.0	27.80		30.16		33.44		39.59		46.28		26.94
28.0	27.78		30.17		33.45		39.60		46.35		26.93
30.0	27.79		30.17		33.45		39.62		46.41		26.92
40.0											26.87
50.0											26.84
60.0											26.79
70.0											26.76
80.0											26.73
90.0											26.71
100.0											26.69
110.0											26.66
120.0											26.65
150.0											26.61
180.0											26.60

## Step Drawdown Test (1/2)

Well Code:   A-02                        Site code:   A-02                        Pump on date/hour:   28/8/2006 3:00pm    
 Site name:   Jabal Al Taraf                        Pump off date/hour:   29/8/2006 1:00am    
 District:   Al Mahweet                        End of recovery hour:   29/8/2006 9:00am    
 Governorate   Al Mahweet                        S.W.L ( m ):   26.60  

Contractor:   Mabkhout Al-Abraki    
 Hydrogeologist:   Abudul Salam Sallam    
 Operator:   Kaid Al Abraki  

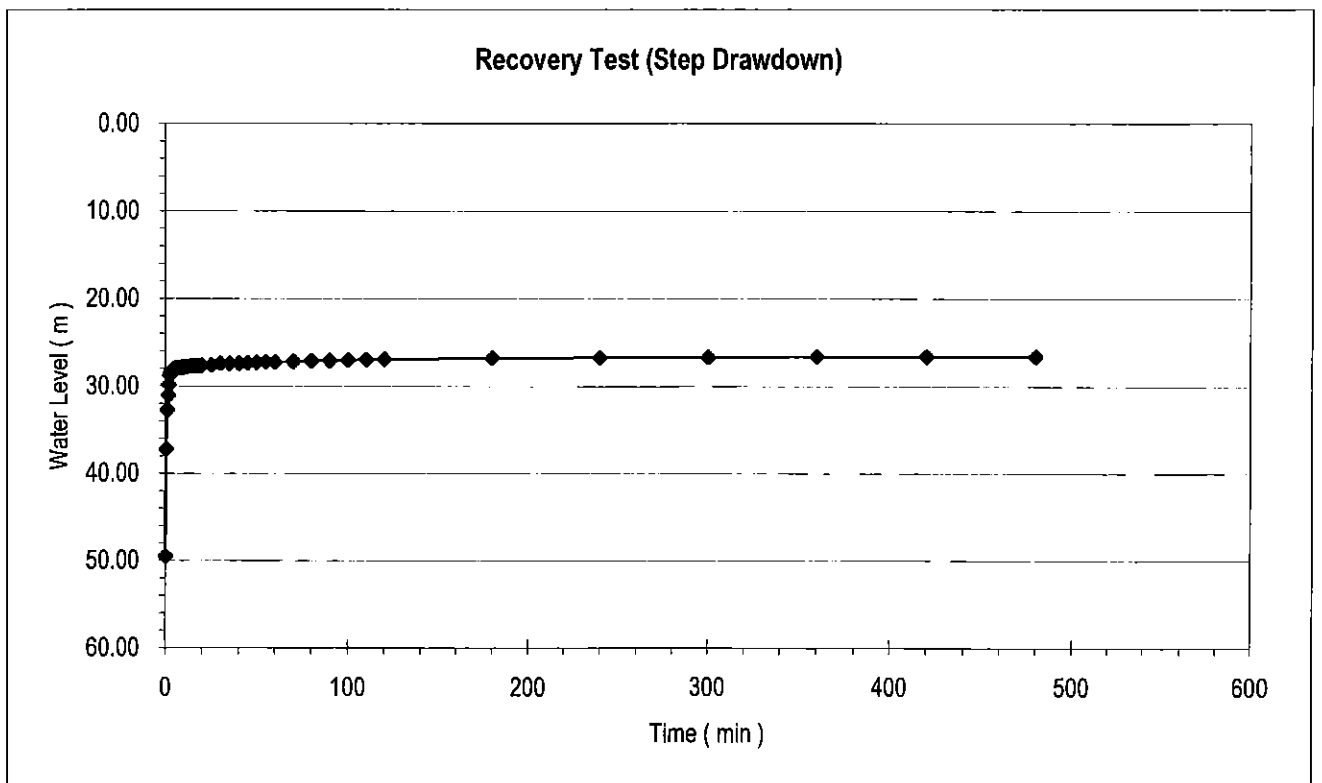
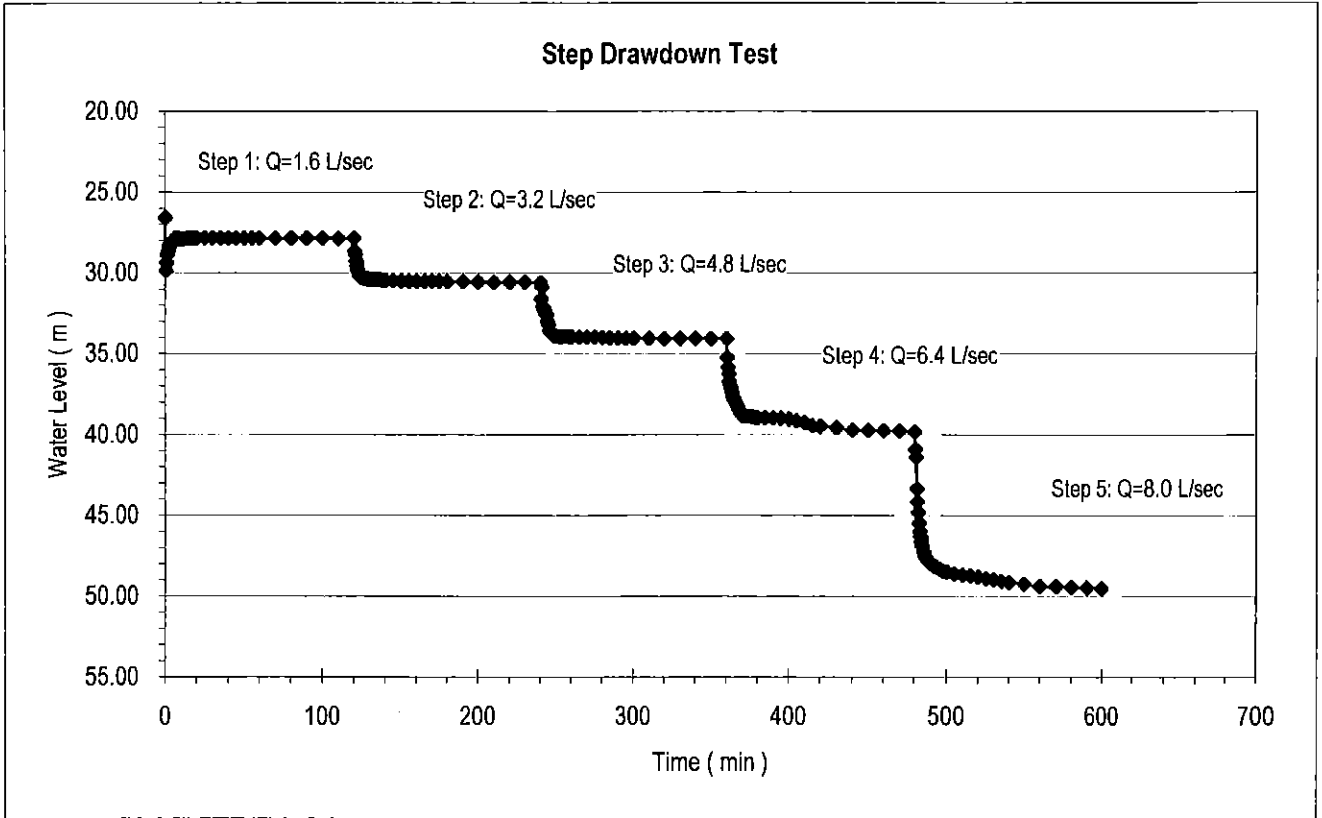
Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	26.60	1.60	27.87	3.20	30.60	4.80	34.08	6.40	39.83	8.00	49.52
0.5	29.85		28.65		31.62		35.25		40.95		37.25
1.0	29.37		28.87		30.88		35.84		41.41		32.77
1.5	28.86		29.27		32.07		36.26		43.35		31.08
2.0	28.66		29.55		32.14		36.72		44.18		29.86
2.5	28.42		29.84		32.30		36.98		44.83		28.76
3.0	28.26		29.93		32.40		37.18		45.50		28.45
3.5	28.17		30.10		32.55		37.43		46.00		28.22
4.0	28.13		30.26		32.59		37.67		46.33		28.11
4.5	28.10		30.28		32.99		37.75		46.64		28.09
5.0	28.00		30.29		33.20		37.89		46.93		28.05
6.0	27.87		30.35		33.56		38.02		47.28		27.99
7.0	27.89		30.37		33.73		38.29		47.56		27.95
8.0	27.90		30.38		33.85		38.50		47.72		27.93
9.0	27.90		30.40		33.91		38.72		47.88		27.89
10.0	27.91		30.40		33.93		38.81		47.97		27.88
12.0	27.90		30.40		33.95		38.84		48.11		27.84
14.0	27.87		30.41		33.95		38.87		48.22		27.79
16.0	27.86		30.42		33.95		38.89		48.33		27.76
18.0	27.83		30.45		33.95		38.93		48.45		27.72
20.0	27.85		30.47		33.96		38.97		48.50		27.69
25.0	27.85		30.49		33.98		38.97		48.61		27.62
30.0	27.85		30.51		33.98		38.98		48.70		27.45
35.0	27.85		30.53		33.99		38.99		48.74		27.49
40.0	27.85		30.53		34.00		39.05		48.82		27.45
45.0	27.85		30.53		34.02		39.16		48.91		27.39
50.0	27.86		30.53		34.04		39.28		48.98		27.35
55.0	27.86		30.53		34.05		39.45		49.07		27.32
60.0	27.86		30.54		34.05		39.50		49.15		27.29
70.0	27.86		30.55		34.06		39.60		49.25		27.22
80.0	27.86		30.56		34.07		39.73		49.38		27.15
90.0	27.86		30.58		34.07		39.75		49.40		27.11
100.0	27.86		30.59		34.08		39.77		49.44		27.05
110.0	27.87		30.59		34.08		39.79		49.48		27.01
120.0	27.87		30.60		34.08		39.83		49.52		26.96
180.0											26.83
240.0											26.77
300.0											26.71
360.0											26.66
420.0					14-50						26.63



# Step Drawdown Test

Well Code: A-02  
Site Code: A-02  
S.W.L. : 26.60 m

Site Name: Jabal Al Taraf

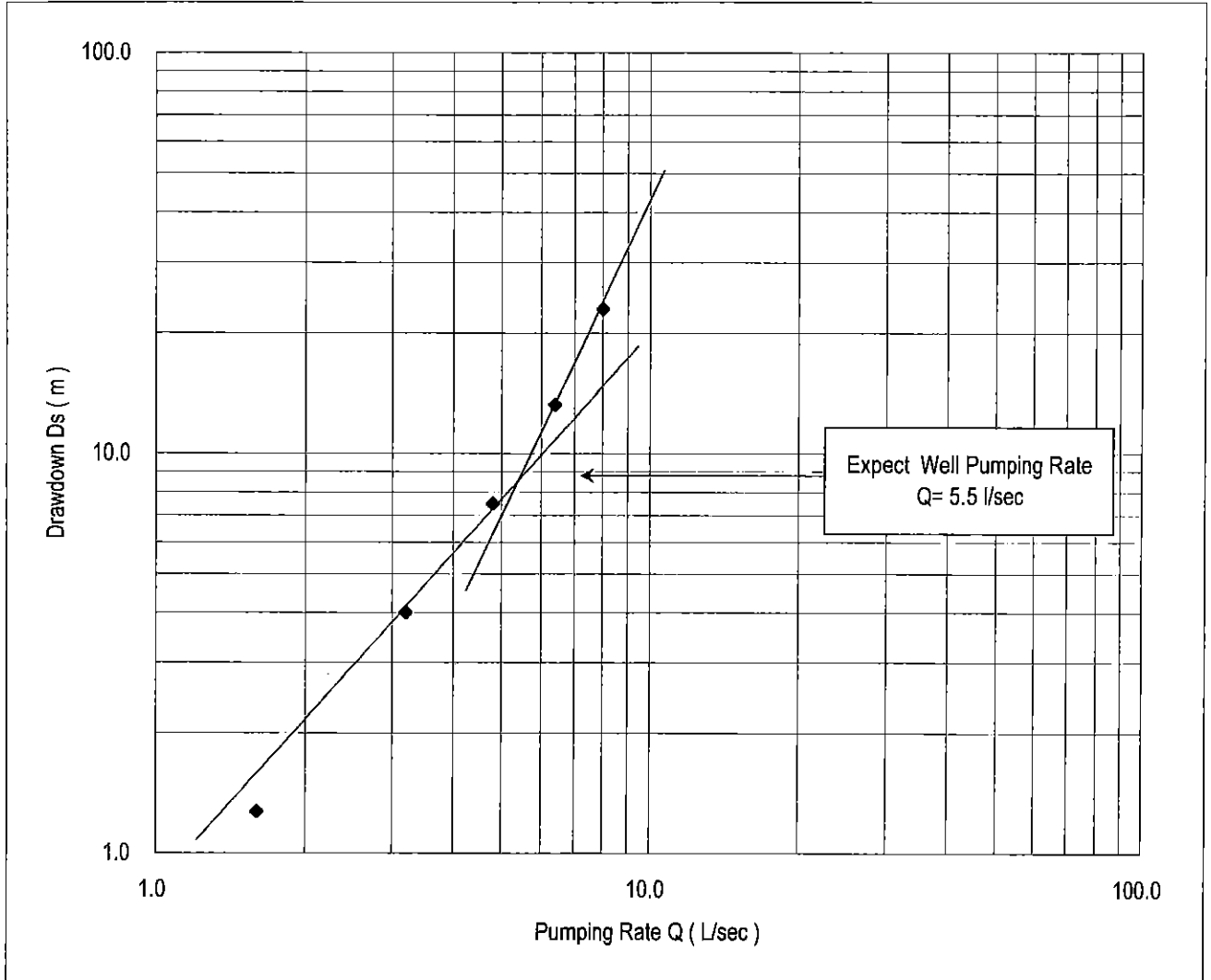




## Step Drawdown Test

Well Code:   A-02    
 Site Code:   A-02    
 S.W.L. :   26.60 m  

Site Name:           Jabal Al Taraf          



Step	$Q$ (l/sec)	D.W.L. (m)	$D_s$ (m)
1	1.6	27.87	1.27
2	3.2	30.60	4.00
3	4.8	34.08	7.48
4	6.4	39.83	13.23
5	8.0	49.52	22.92

## Constant Discharge & Recovery Test (1/2)

Well Code:   A-02                        Site code:   A-02  

Site name:   Jabal Al Taraf  

District:   Al Mahweet  

Governorate:   Al Mahweet  

Pump on date/hour:   29/8/2006 9:10am  

Pump off date/hour:   30/8/2006 9:10am  

End of recovery hour:   30/8/2006 1:10pm  

Contractor:   Mabkhout Al-Abraki  

Hydrogeologist:   Abudul Salam Sallam  

Operator:   Kaid Al Abraki  

S.W.L ( m ):   26.60  

D.W.L ( m ):   34.36  

Yield (l/sec):   4.4  

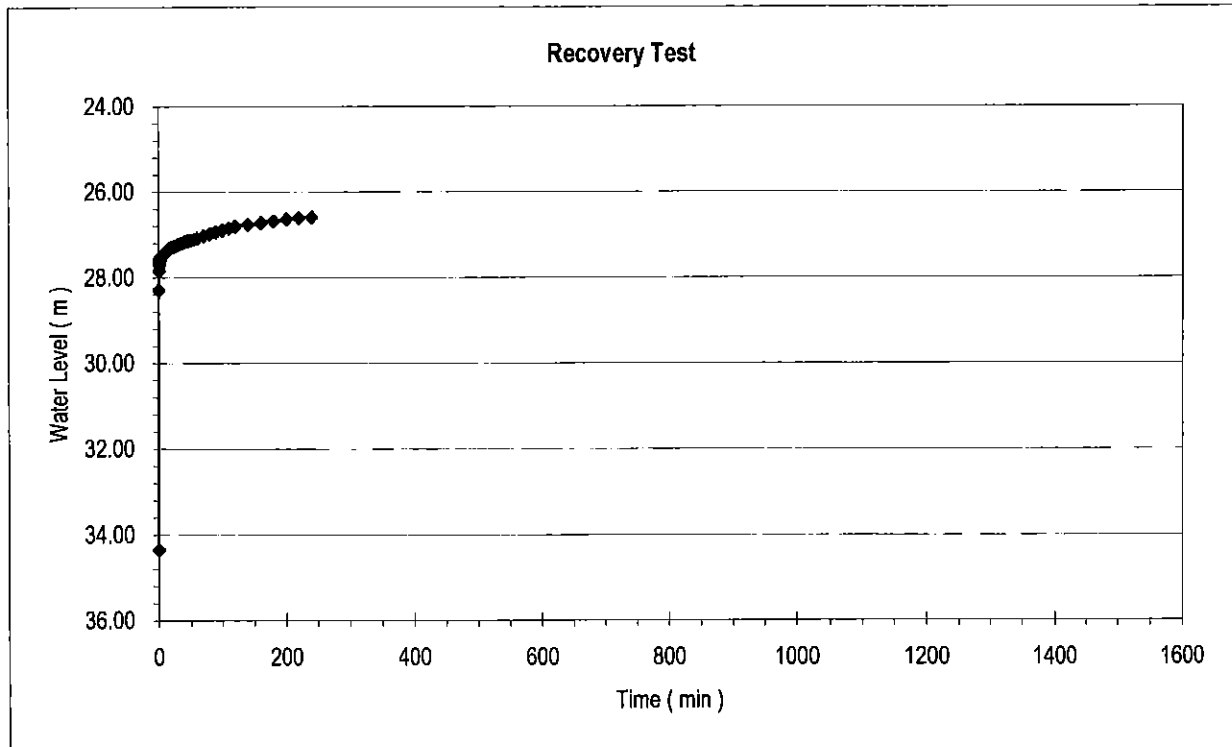
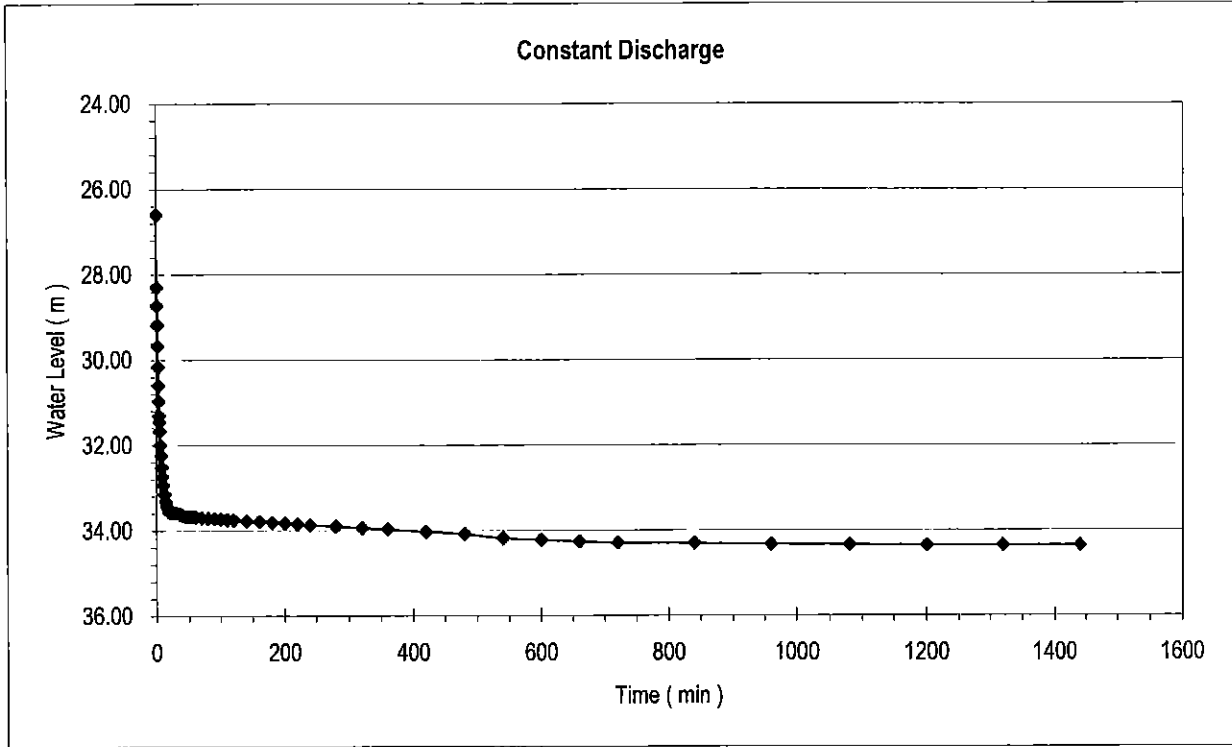
Duration ( min )	Constant Dischrg Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	
0.0	26.60	0.00		34.36	7.76		
0.5	28.30	1.70		28.30	1.70		
1.0	28.73	2.13		27.85	1.25		
1.5	29.18	2.58		27.70	1.10		
2.0	29.67	3.07		27.63	1.03		
2.5	30.17	3.57		27.58	0.98		
3.0	30.60	4.00		27.56	0.96		
3.5	30.97	4.37		27.54	0.94		
4.0	31.31	4.71		27.53	0.93		
4.5	31.46	4.86		27.51	0.91		
5.0	31.68	5.08		27.50	0.90		
6.0	32.00	5.40		27.49	0.89		
7.0	32.25	5.65		27.48	0.88		
8.0	32.52	5.92		27.46	0.86		
9.0	32.75	6.15		27.45	0.85		
10.0	32.94	6.34		27.44	0.84		
12.0	33.15	6.55		27.41	0.81		
14.0	33.32	6.72		27.39	0.79		
16.0	33.44	6.84		27.34	0.74		
18.0	33.50	6.90		27.32	0.72		
20.0	33.58	6.98		27.31	0.71		
25.0	33.58	6.98		27.28	0.68		
30.0	33.59	6.99		27.25	0.65		
35.0	33.62	7.02		27.21	0.61		
40.0	33.65	7.05		27.18	0.58		
45.0	33.68	7.08		27.16	0.56		
50.0	33.68	7.08		27.14	0.54		
55.0	33.68	7.08		27.12	0.52		
60.0	33.69	7.09		27.10	0.50		



# Constant Discharge Test

Well Code: A-02  
Site Code: A-02  
S.W.L. (m): 26.60  
Yield (L/sec): 4.4

Site Name Jabal Al Taraf  
D.W.L. (m): 34.36 Drawdown (m): 7.76



## Pumping Test Report Sheet

Well code: A-03 Site code: A-03 Site name: Jabal Al Taraf  
District: Al Rujum Governorate: Al Mahweet

Target water source: Exisiting projected deep well Well depth: 150 m

Contractor: Mabkhout Al-Abraki  
Hydrogeologist in charge: Abudul Salam Sallam  
Operator: Kaid Al Abraki

Date of start of the test: 23/8/2006 Date of end of the test: 26/8/2006  
Pump type: Vertical pump Engine: IVECO Aifo  
Pump installation depth: 107 m Datum level: 0.70 m S.W.L.: G.L.-50.80 m

### Step drawdown test

Date/hour started: 23/8/2006 2:00pm Date/hour finished: 24/8/2006 3:00am Total hours: 13:00  
Yield (l/sec) 1<sup>st</sup> step 2.60 2<sup>nd</sup> step 5.20 3<sup>rd</sup> step 7.80 4<sup>th</sup> step 10.40 5<sup>th</sup> step 13.00  
Water level before start the test (G.L.-m): 50.80  
Water level after end of 5<sup>th</sup> step (G.L.-m): 55.56  
Water level after recovery (G.L.-m): 50.80 Recovery hours 3:00

### Constant discharge test

Date/hour started: 24/8/2006 10:00am Date/hour finished: 26/8/2006 6:00am Total hours: 44:00  
Yield (l/sec) 10.40  
Water level before start of the test (G.L.-m): 50.80  
Water level after end of test (G.L.-m): 55.86  
Water level after recovery (G.L.-m): 50.80 Recovery hours 20:00  
Drawdown (m): 5.06

Revised by:

\_\_\_\_\_  
Name :

Date:

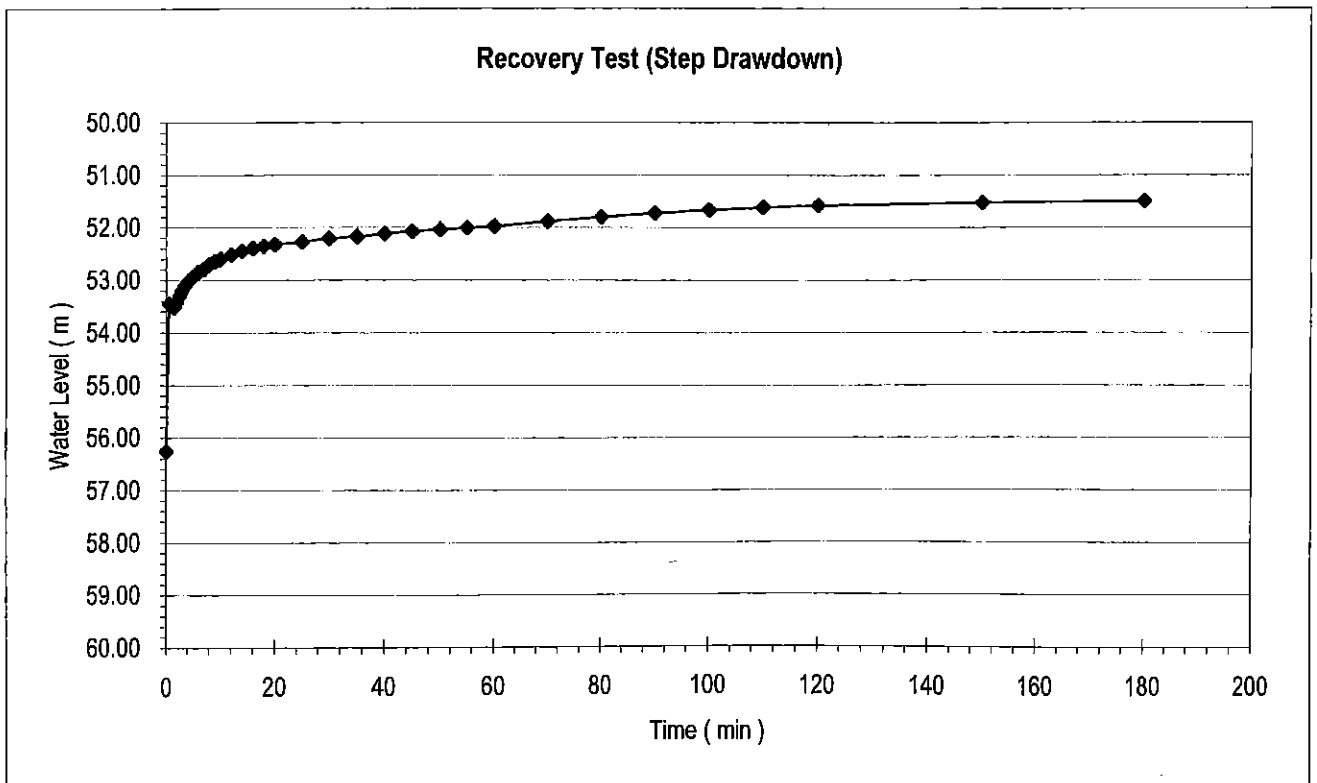
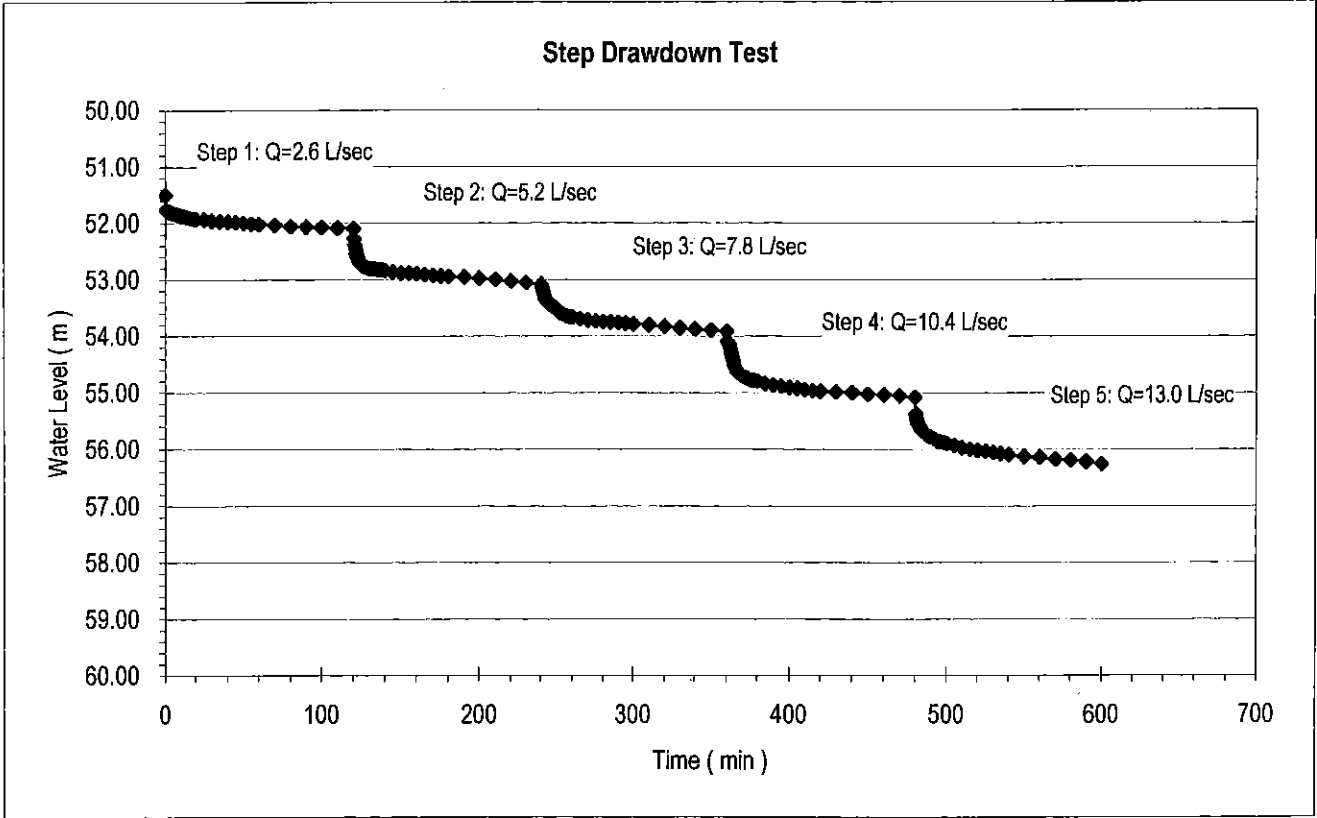




# Step Drawdown Test

Well Code: A-03  
Site Code: A-03  
S.W.L. : 51.50 m

Site Name: Jabal Al Taraf

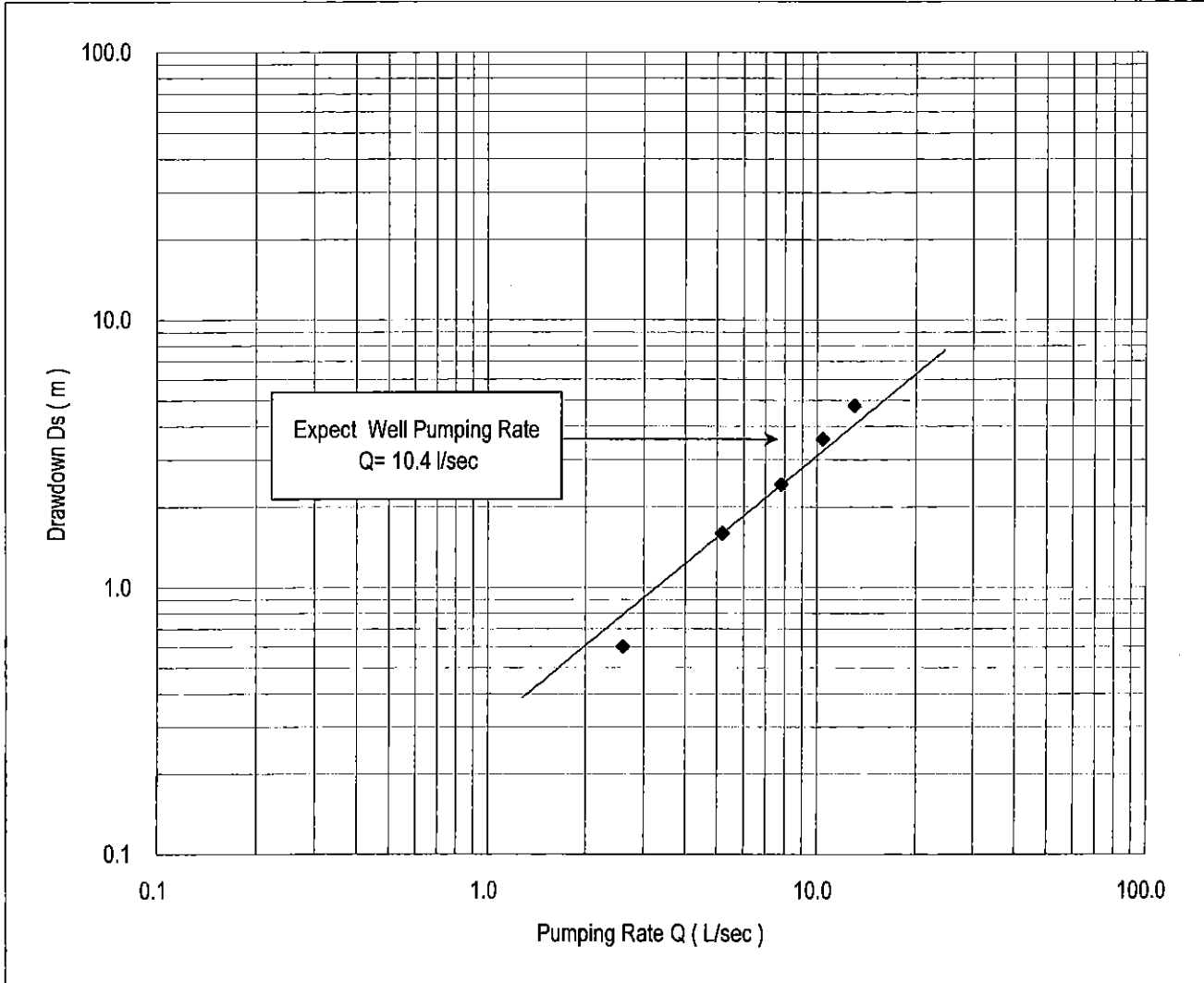




## Step Drawdown Test

Well Code: **A-03**  
 Site Code: **A-03**  
 S.W.L. : **51.50 m**

Site Name: *Jabal Al Taraf*



Step	$Q$ (l/sec)	D.W.L. (m)	$D_s$ (m)
1	2.6	52.10	0.60
2	5.2	53.09	1.59
3	7.8	53.92	2.42
4	10.4	55.08	3.58
5	13.0	56.26	4.76

## Constant Discharge & Recovery Test (1/2)

Well Code:   A-03                        Site code:   A-03  

Site name:   Jabal Al Taraf  

Pump on date/hour:   24/8/2006 10:00am  

District:   Al Rujum  

Pump off date/hour:   25/8/2006 10:00am  

Governorate:   Al Mahweet  

End of recovery hour:   26/8/2006 6:00am  

Contractor:   Mabkhout Al-Abraki  

S.W.L ( m ):   51.50  

Hydrogeologist:   Abudul Salam Sallam  

D.W.L ( m ):   56.56  

Operator:   Kaid Al Abraki  

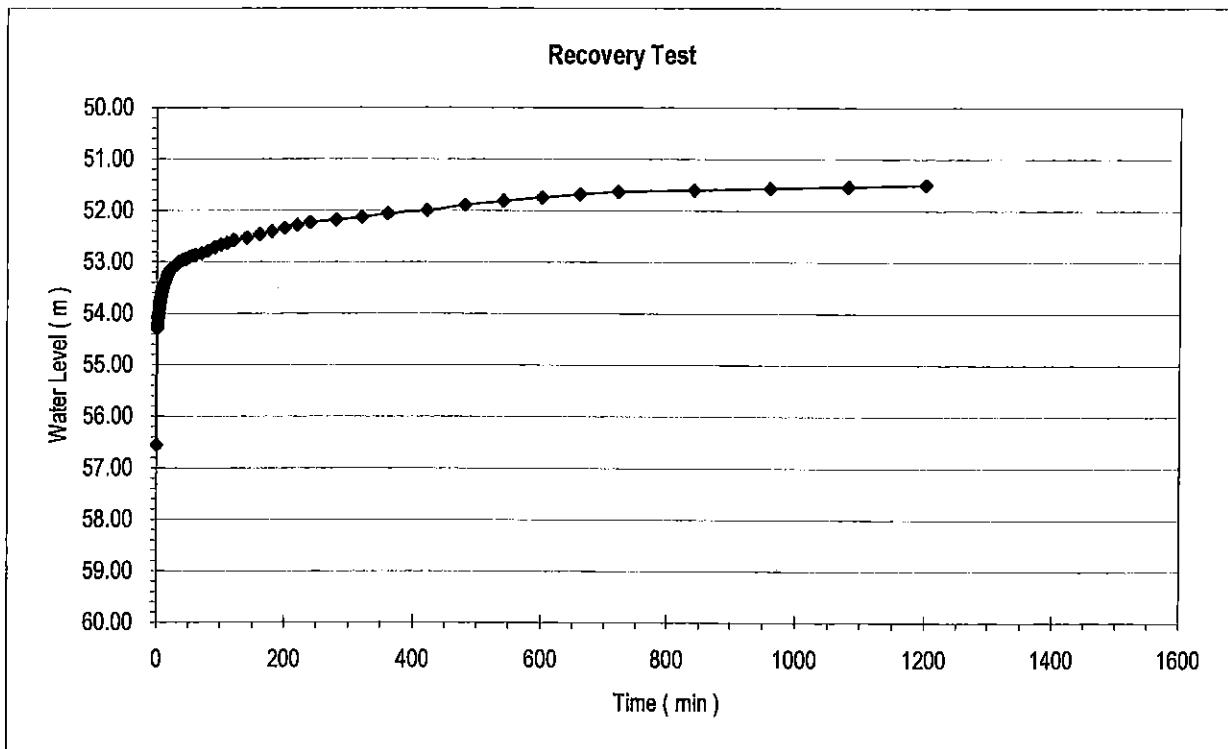
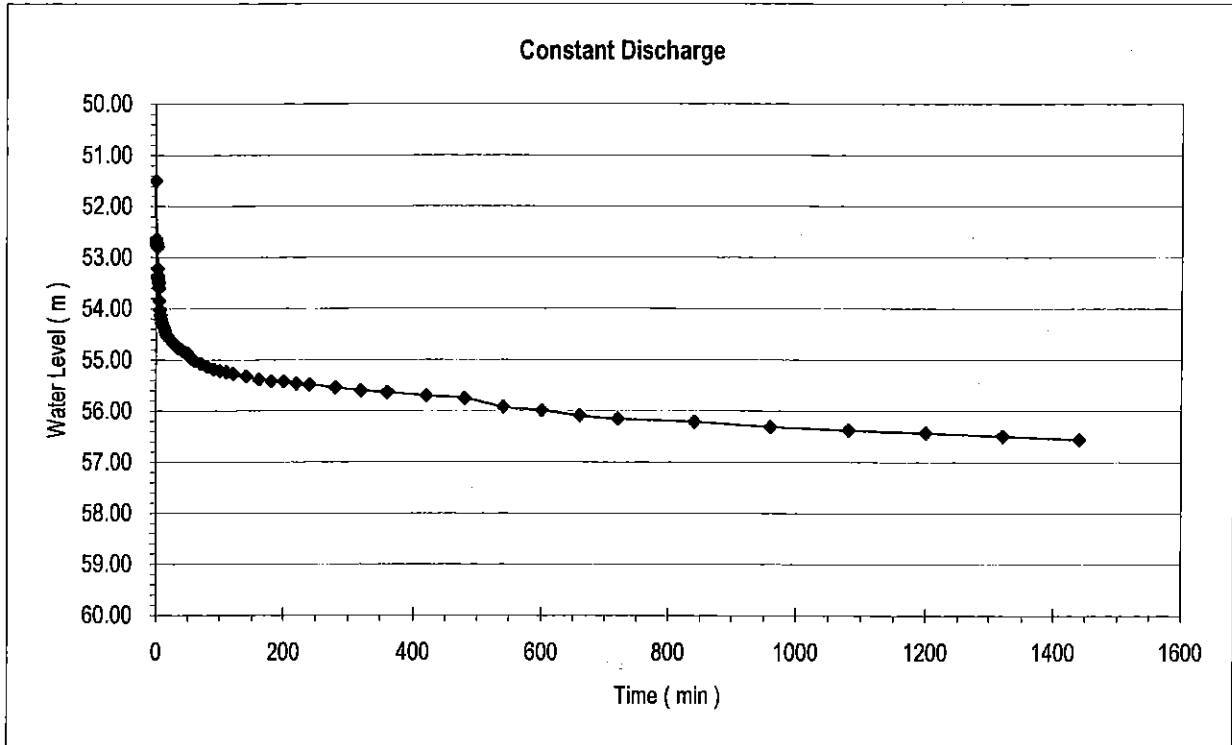
Yield (l/sec):   10.4  

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	
0.0	51.50	0.00		56.56	5.06		
0.5	52.65	1.15		54.30	2.80		
1.0	52.72	1.22		54.25	2.75		
1.5	52.76	1.26		54.20	2.70		
2.0	52.80	1.30		54.10	2.60		
2.5	53.22	1.72		54.05	2.55		
3.0	53.36	1.86		54.00	2.50		
3.5	53.43	1.93		53.92	2.42		
4.0	53.50	2.00		53.86	2.36		
4.5	53.60	2.10		53.81	2.31		
5.0	53.85	2.35		53.77	2.27		
6.0	54.03	2.53		53.69	2.19		
7.0	54.13	2.63		53.63	2.13		
8.0	54.21	2.71		53.57	2.07		
9.0	54.29	2.79		53.52	2.02		
10.0	54.32	2.82		53.48	1.98		
12.0	54.37	2.87		53.41	1.91		
14.0	54.44	2.94		53.35	1.85		
16.0	54.53	3.03		53.27	1.77		
18.0	54.54	3.04		53.22	1.72		
20.0	54.59	3.09		53.17	1.67		
25.0	54.65	3.15		53.11	1.61		
30.0	54.72	3.22		53.07	1.57		
35.0	54.78	3.28		53.00	1.50		
40.0	54.82	3.32		52.97	1.47		
45.0	54.86	3.36		52.95	1.45		
50.0	54.89	3.39		52.91	1.41		
55.0	54.98	3.48		52.89	1.39		
60.0	55.02	3.52		52.87	1.37		

# Constant Discharge Test

Well Code: A-03  
Site Code: A-03  
S.W.L. (m): 51.50  
Yield (L/sec): 10.4

Site Name Jabal Al Taraf  
D.W.L (m): 56.56 Drawdown (m): 5.06



## Pumping Test Report Sheet

Well code: A-04 Site code: A-04 Site name: Al Khamis-Bani Ali

District: Bani Sa'ad Governorate: Al Mahweet

Target water source: New projected deep well Well depth: 92 m

Contractor: Mabkhout Al-Abraki

Hydrogeologist in charge: Abdul Salam Sallam

Operator: Kaid Al Abraki

Date of start of the test: 31/7/2006 Date of end of the test: 3/8/2006

Pump type: Vertical pump Engine: IVECO Aifo

Pump installation depth: 66 m Datum level: 0.72 m S.W.L.: G.L.-6.66 m

### Step drawdown test

Date/hour started: 1/8/2006 8:07am Date/hour finished: 1/8/2006 9:47pm Total hours: 13:40

Yield (l/sec) 1<sup>st</sup> step 1.30 2<sup>nd</sup> step 2.60 3<sup>rd</sup> step 3.90 4<sup>th</sup> step 5.20 5<sup>th</sup> step 6.50

Water level before start the test (G.L.-m): 6.66

Water level after end of 5<sup>th</sup> step (G.L.-m): 56.35

Water level after recovery (G.L.-m): 6.66 Recovery hours 3:40

### Constant discharge test

Date/hour started: 1/8/2006 9:55pm Date/hour finished: 3/8/2006 1:55am Total hours: 28:00

Yield (l/sec) 4.40

Water level before start of the test (G.L.-m): 6.66

Water level after end of test (G.L.-m): 42.50

Water level after recovery (G.L.-m): 6.66 Recovery hours 4:00

Drawdown (m): 35.84

Revised by:

\_\_\_\_\_  
Name :

Date:

## Provisional Step Drawdown Test

Well Code:   A-04                        Site code:   A-04  

Pump on date/hour:   31/7/2006 7:18pm  

Site name:   Al Khamis-Bani Ali  

Pump off date/hour:   31/7/2006 9:48pm  

District:   Bani Sa'ad  

End of recovery hour:   1/8/2006 1:48am  

Governorate   Al Mahweet  

S.W.L ( m ):   7.38  

Contractor:   Mabkhout Al-Abraki  

Hydrogeologist:   Abudul Salam Sallam  

Operator:   Kaid Al Abraki  

Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	7.38	1.30	14.96	2.60	21.60	3.90	30.90	5.20	39.66	6.50	50.00
0.5	11.30		15.27		22.45		31.30		40.05		47.00
1.0	11.33		15.47		22.80		31.85		40.40		45.50
1.5	11.87		15.75		23.20		32.35		40.62		44.40
2.0	12.35		15.95		23.60		32.70		40.90		43.70
2.5	12.80		16.20		23.90		33.15		41.20		42.77
3.0	13.36		16.40		24.20		33.75		41.37		41.66
3.5	13.39		16.66		24.55		34.05		41.40		41.10
4.0	13.40		16.85		24.80		34.35		42.05		40.22
4.5	13.41		17.12		25.35		34.65		42.34		39.90
5.0	13.45		17.32		25.73		35.15		42.62		38.48
6.0	13.50		17.80		26.00		35.57		43.20		36.80
7.0	13.54		18.10		26.30		36.00		43.83		35.10
8.0	13.60		18.43		26.70		36.35		44.30		33.52
9.0	13.76		18.70		27.05		36.65		44.83		32.09
10.0	13.86		19.00		27.30		37.20		45.27		30.72
12.0	14.20		19.40		27.75		37.66		46.07		28.15
14.0	14.30		19.83		28.25		38.00		46.80		25.53
16.0	14.31		20.20		28.70		38.30		47.43		23.58
18.0	14.35		20.50		29.10		38.55		48.03		21.78
20.0	14.36		20.75		29.45		38.75		48.46		20.19
22.0	14.37		21.00		29.75		38.98		48.95		18.70
24.0	14.39		21.17		30.00		39.09		49.22		17.45
26.0	14.47		21.35		30.32		39.18		49.52		16.37
28.0	14.77		21.50		30.65		39.35		49.81		15.49
30.0	14.96		21.60		30.90		39.66		50.00		14.66
40.0											12.05
50.0											10.73
60.0											9.97
70.0											9.50
80.0											9.18
90.0											8.95
100.0											8.75
110.0											8.55
120.0											8.32
150.0											7.88
180.0											7.63
210.0											
240.0											
					14-65						

## Step Drawdown Test

Well Code:   A-04                        Site code:   A-04    
 Site name:   Al Khamis-Bani Ali    
 District:   Bani Sa'ad    
 Governorate   Al Mahweef  

Pump on date/hour:   1/8/2006 8:07am    
 Pump off date/hour:   1/8/2006 6:07am    
 End of recovery hour:   1/8/2006 9:47pm    
 S.W.L ( m ):   7.38  

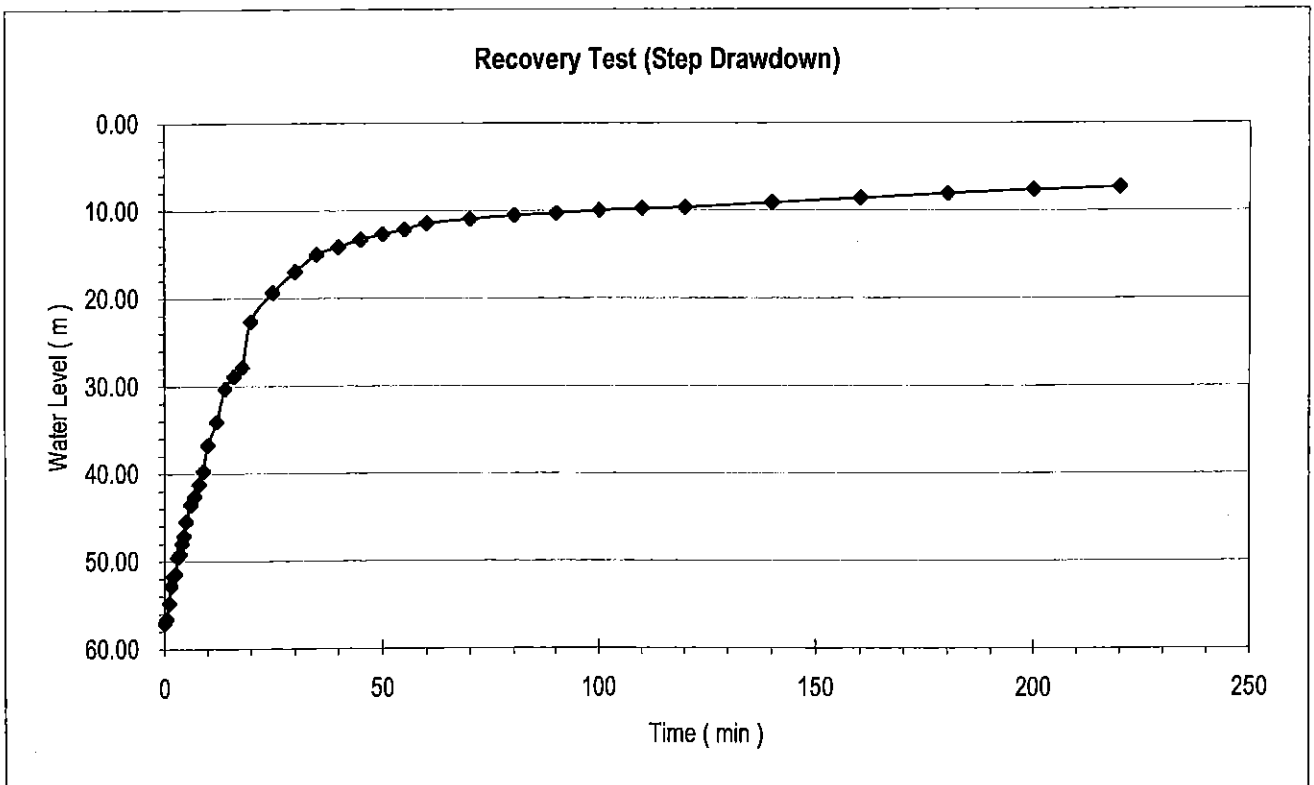
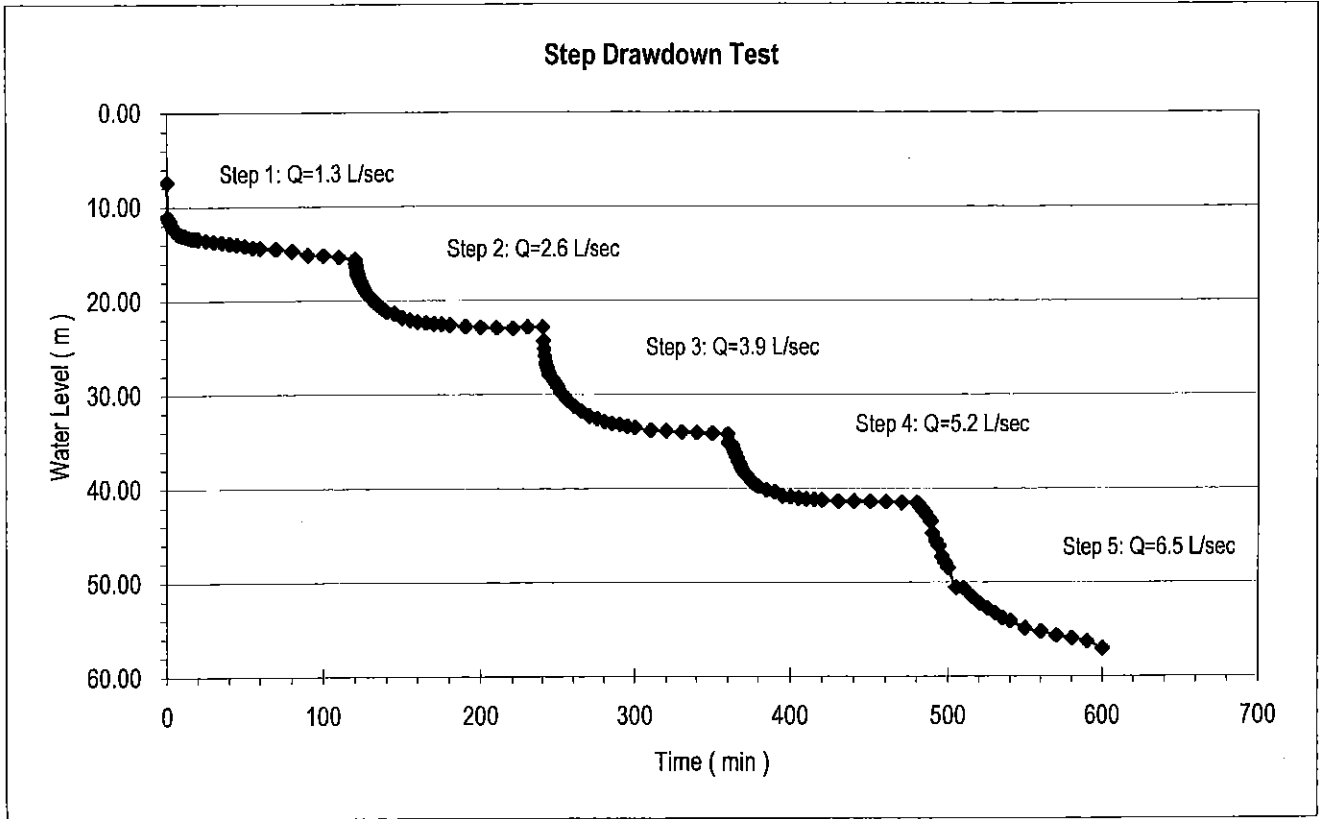
Contractor:   Mabkhout Al-Abraki    
 Hydrogeologist:   Abudul Salam Sallam    
 Operator:   Kaid Al Abraki  

Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	7.38	1.30	15.65	2.60	22.85	3.90	34.22	5.20	41.57	6.50	57.07
0.5	11.05		16.10		24.35		35.13		41.60		56.60
1.0	11.23		16.50		25.15		35.26		41.68		54.78
1.5	11.41		16.99		25.90		35.30		41.84		52.80
2.0	11.55		17.30		26.60		35.20		41.90		51.72
2.5	11.80		17.53		26.86		35.25		42.05		51.46
3.0	11.92		17.75		27.16		35.40		42.12		49.56
3.5	12.13		17.98		27.47		35.72		42.23		49.17
4.0	12.30		18.18		27.73		35.91		42.45		48.02
4.5	12.36		18.33		27.98		36.17		42.50		47.16
5.0	12.47		18.50		28.10		36.30		42.60		45.50
6.0	12.67		18.80		28.25		36.75		42.92		43.55
7.0	12.85		19.10		28.37		37.16		43.00		42.64
8.0	12.94		19.33		28.70		37.47		43.20		41.22
9.0	12.96		19.55		28.93		37.82		43.56		39.74
10.0	13.02		19.80		29.22		38.15		44.80		36.78
12.0	13.13		20.04		29.80		38.60		45.57		34.12
14.0	13.24		20.47		30.18		38.95		46.12		30.39
16.0	13.39		20.75		30.63		39.45		47.30		28.94
18.0	13.41		20.97		30.95		39.63		47.93		27.90
20.0	13.43		21.20		31.25		39.82		48.47		22.68
25.0	13.57		21.37		31.83		40.17		50.60		19.40
30.0	13.70		21.90		32.33		40.38		50.66		17.00
35.0	13.81		22.10		32.60		40.82		51.53		15.05
40.0	13.92		22.29		32.90		40.93		52.24		14.20
45.0	14.05		22.40		33.10		41.06		52.80		13.35
50.0	14.17		22.50		33.20		41.17		53.30		12.71
55.0	14.35		22.53		33.42		41.21		53.80		12.20
60.0	14.42		22.64		33.55		41.28		54.15		11.50
70.0	14.53		22.76		33.82		41.39		54.92		11.00
80.0	14.72		22.87		33.90		41.40		55.27		10.59
90.0	15.15		22.93		34.02		41.43		55.72		10.34
100.0	15.23		22.98		34.10		41.45		55.99		10.00
110.0	15.40		22.85		34.15		41.53		56.30		9.80
120.0	15.65		22.85		34.22		41.57		57.07		9.68
140.0											9.12
160.0											8.60
180.0											8.11
200.0											7.66
220.0					14-66						7.38

# Step Drawdown Test

Well Code: A-04  
Site Code: A-04  
S.W.L. : 7.38 m

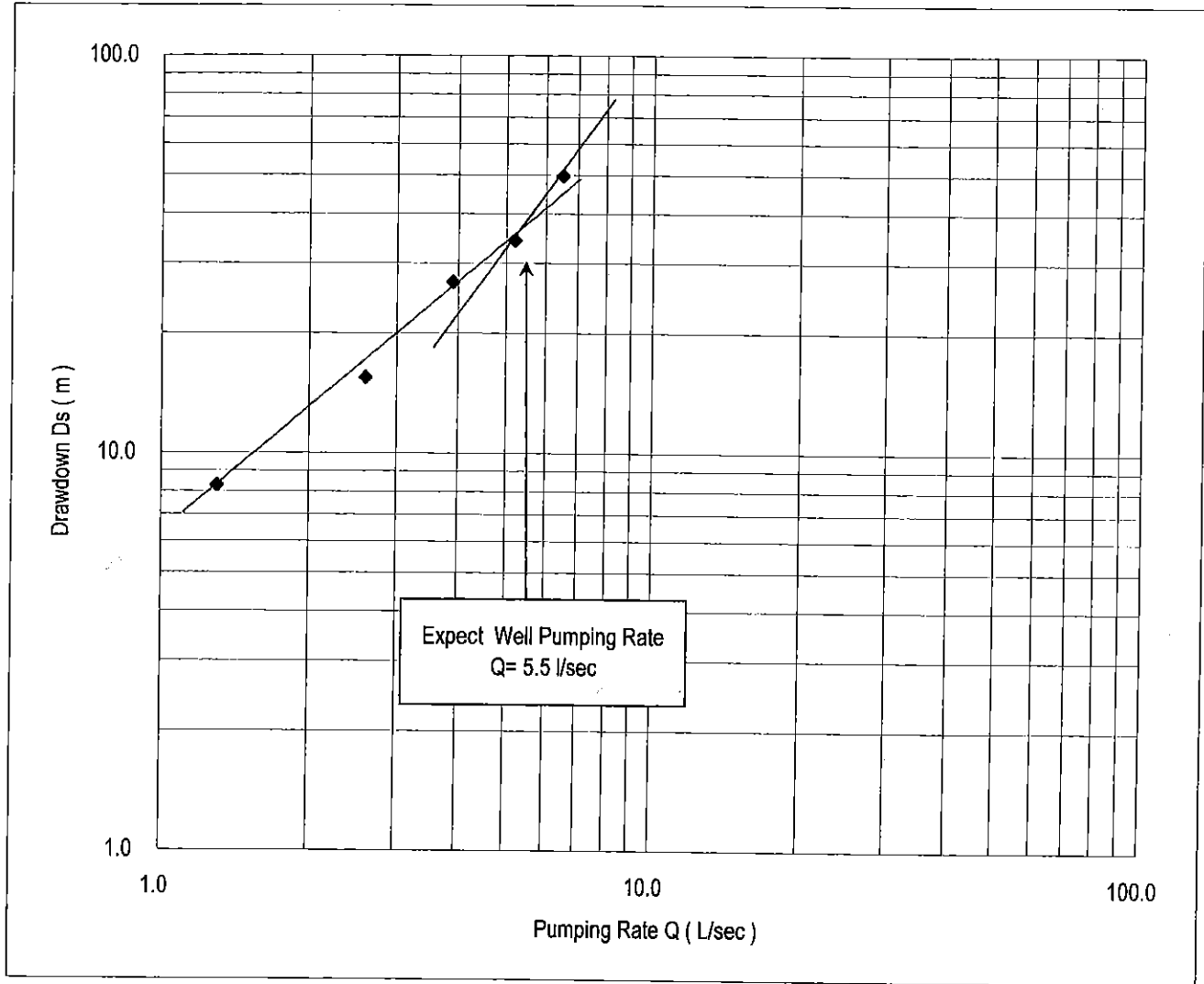
Site Name: Al Khamis-Bani Ali



## Step Drawdown Test

Well Code: A-04  
 Site Code: A-04  
 S.W.L.: 7.38 m

Site Name: Al Khamis-Bani Ali



Step	$Q$ (l/sec)	D.W.L. (m)	$D_s$ (m)
1	1.3	15.65	8.27
2	2.6	22.85	15.47
3	3.9	34.22	26.84
4	5.2	41.57	34.19
5	6.5	57.07	49.69



## Constant Discharge & Recovery Test (1/2)

Well Code:   A-04                        Site code:   A-04  

Site name:   Al Khamis-Bani Ali  

Pump on date/hour:   1/8/2006 9:55pm  

District:   Bani Sa'ad  

Pump off date/hour:   2/8/2006 9:55pm  

Governorate:   Al Mahweet  

End of recovery hour:   3/8/2006 1:55am  

Contractor:   Mabkhout Al-Abraki  

S.W.L ( m ):   7.38  

Hydrogeologist:   Abudul Salam Sallam  

D.W.L ( m ):   43.22  

Operator:   Kaid Al Abraki  

Yield (l/sec):   4.4  

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( $\mu$ S/cm)	
0.0	7.38	0.00		43.22	35.84		
0.5	12.80	5.42		38.03	30.65		
1.0	13.77	6.39		36.92	29.54		
1.5	14.27	6.89		36.20	28.82		
2.0	14.83	7.45		35.36	27.98		
2.5	15.45	8.07		34.70	27.32		
3.0	16.13	8.75		33.98	26.60		
3.5	16.64	9.26		33.33	25.95		
4.0	17.20	9.82		32.78	25.40		
4.5	17.74	10.36		32.14	24.76		
5.0	18.26	10.88		31.52	24.14		
6.0	19.20	11.82		30.40	23.02		
7.0	20.18	12.80		29.32	21.94		
8.0	20.86	13.48		28.33	20.95		
9.0	21.80	14.42		27.30	19.92		
10.0	22.37	14.99		26.34	18.96		
12.0	23.80	16.42		24.74	17.36		
14.0	24.95	17.57		23.21	15.83		
16.0	25.90	18.52		21.92	14.54		
18.0	26.98	19.60		20.71	13.33		
20.0	27.37	19.99		19.74	12.36		
25.0	28.81	21.43		17.80	10.42		
30.0	29.73	22.35		16.60	9.22		
35.0	30.47	23.09		15.59	8.21		
40.0	30.97	23.59		14.98	7.60		
45.0	31.40	24.02		14.43	7.05		
50.0	31.65	24.27		13.94	6.56		
55.0	31.87	24.49		13.64	6.26		
60.0	32.08	24.70		13.31	5.93	3250	

## Constant Discharge & Recovery Test (2/2)

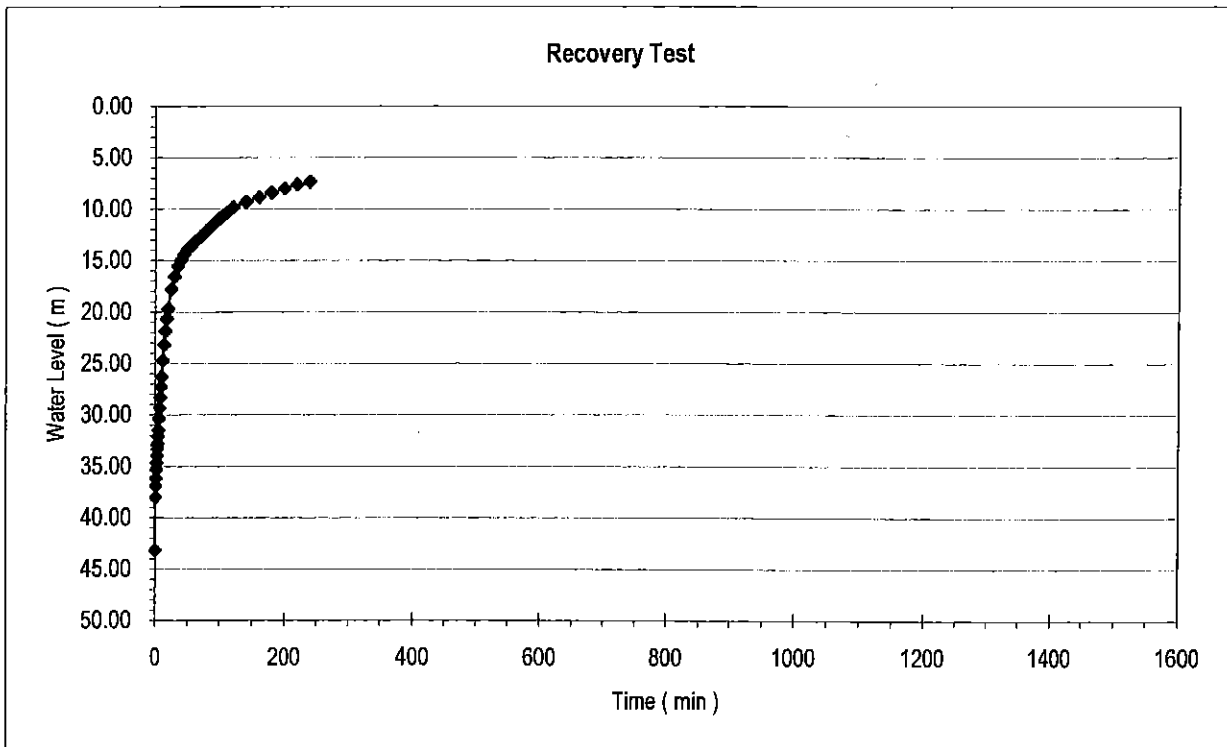
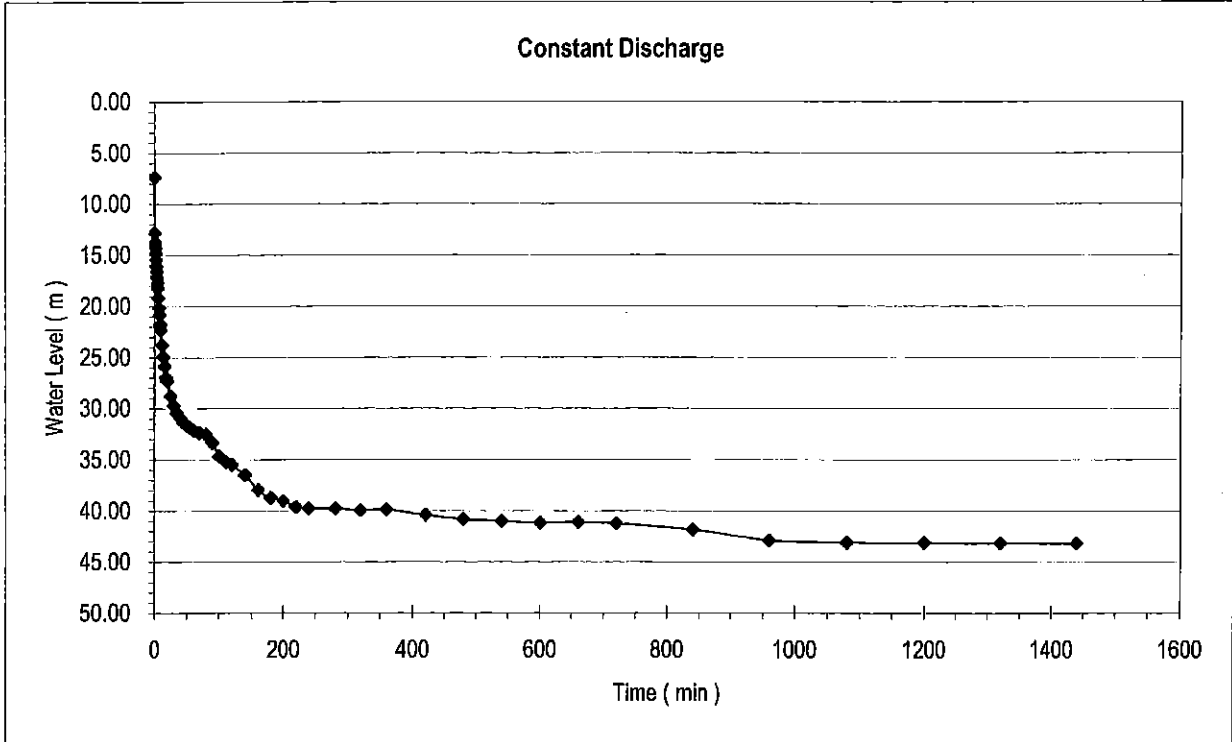
Well Code:   **A-04**        Site code:   **A-04**        Site name:   **Al Khamis-Bani Ali**    
 District:   **Bani Sa'ad**        Governorate:   **Al Mahweet**  

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( $\mu$ S/cm)	
70.0	32.39	25.01		12.71	5.33		
80.0	32.56	25.18		12.10	4.72		
90.0	33.39	26.01		11.51	4.13		
100.0	34.70	27.32		10.94	3.56		
110.0	35.24	27.86		10.40	3.02		
120.0	35.55	28.17		9.85	2.47	3250	
140.0	36.54	29.16		9.36	1.98		
160.0	37.97	30.59		8.88	1.50		
180.0	38.77	31.39		8.44	1.06	3250	
200.0	39.03	31.65		8.03	0.65		
220.0	39.67	32.29		7.68	0.30		
240.0	39.80	32.42		7.38	0.00		
280.0	39.80	32.42					
320.0	39.97	32.59					
360.0	39.92	32.54					
420.0	40.45	33.07				3250	
480.0	40.85	33.47					
540.0	41.05	33.67					
600.0	41.20	33.82					
660.0	41.15	33.77					
720.0	41.25	33.87				3250	
840.0	41.87	34.49					
960.0	42.90	35.52					
1080.0	43.10	35.72				3250	
1200.0	43.14	35.76					
1320.0	43.18	35.80				3250	
1440.0	43.22	35.84					
1560.0							
1680.0							
1800.0							
1920.0							
2040.0							
2160.0							
2280.0							
2340.0							

## Constant Discharge Test

Well Code: A-04  
Site Code: A-04  
S.W.L. (m): 7.38  
Yield (L/sec): 4.4

Site Name Al Khamis-Bani Ali  
D.W.L (m): 43.22 Drawdown (m): 35.84



# Pumping Test Report Sheets

Governorate  
of

Sana'a



## Pumping Test Report Sheet

Well code: S-01/1 Site code: S-01 Site name: Bani Waleed - Al Asboor

District: Al Haymah Al Kharijjah Governorate: Sana'a

Target water source: New projected deep well (Bani Waleed) Well depth: 348 m

Contractor: Mabkhout Al-Abraki

Hydrogeologist in charge: Abudul Salam Sallam

Operator: Kaid Al Abraki

Date of start of the test: 15/8/2006 Date of end of the test: 26/8/2006

Pump type: Vertical pump Engine: IVECO Aifo

Pump installation depth: 247 m Datum level: 0.91 m S.W.L.: G.L.-112.59 m

### Step drawdown test

Date/hour started: 15/8/2006 12:00pm Date/hour finished: 18/8/2006 1:00am Total hours: 68:00

Yield (l/sec) 1<sup>st</sup> step 0.60 2<sup>nd</sup> step 1.20 3<sup>rd</sup> step 1.80 4<sup>th</sup> step 2.40 5<sup>th</sup> step 3.00

Water level before start the test (G.L.-m): 112.59

Water level after end of 5<sup>th</sup> step (G.L.-m): 162.29

Water level after recovery (G.L.-m): 115.79 Recovery hours 58:00

### Constant discharge test

Date/hour started: 18/8/2006 9:10am Date/hour finished: 22/8/2006 5:10pm Total hours: 102:00

Yield (l/sec) 1.60

Water level before start of the test (G.L.-m): 115.79

Water level after end of test (G.L.-m): 142.93

Water level after recovery (G.L.-m): 124.09 Recovery hours 78:00

Drawdown (m): 27.14

Revised by:

Name :

Date:

## Step Drawdown Test (1/2)

Well Code: S-01/1 Site code: S-01 Pump on date/hour: 15/8/2006 12:00pm  
 Site name: Bani Waleed - Al Asboor Pump off date/hour: 15/8/2006 10:00pm  
 District: Al Haymah Al Kharijiyah End of recovery hour: 18/8/2006 1:00am  
 Governorate Sana'a S.W.L ( m ): 113.50

Contractor: Mabkhout Al-Abraki  
 Hydrogeologist: Abudul Salam Sallam  
 Operator: Kaid Al Abraki

Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	
0.0	113.50	0.60	116.40	1.20	121.70	1.80	128.90	2.40	139.14	3.00	163.20
0.5	117.95		116.67		121.95		129.03		139.30		157.50
1.0	117.73		117.20		122.10		129.10		139.42		152.70
1.5	117.17		117.31		122.18		129.25		139.50		
2.0	116.74		117.44		122.25		129.37		140.40		147.50
2.5	116.56		117.67		122.40		130.06		140.60		146.70
3.0	116.41		117.80		122.99		130.70		140.78		145.80
3.5	116.25		117.93		123.37		131.08		141.00		145.25
4.0	116.10		118.03		123.43		131.60		141.14		144.35
4.5	115.66		118.12		123.48		131.85		141.30		143.75
5.0	115.48		118.25		123.52		132.02		141.45		143.00
6.0	115.21		118.00		123.57		132.30		141.70		141.50
7.0	115.02		117.90		123.70		132.53		141.85		140.35
8.0	114.87		117.90		123.84		132.70		142.28		139.70
9.0	114.74		118.02		124.00		132.85		142.45		139.00
10.0	114.70		118.29		124.10		132.95		142.67		138.30
12.0	114.57		118.55		124.23		133.25		143.00		137.20
14.0	114.54		118.66		124.33		133.48		143.32		136.70
16.0	114.56		118.80		124.46		133.67		143.57		136.40
18.0	114.61		118.85		124.58		133.82		143.74		136.30
20.0	114.65		118.93		124.68		133.94		144.04		136.12
25.0	114.78		119.21		125.06		134.27		144.70		135.80
30.0	114.90		119.40		125.30		134.55		145.45		135.50
35.0	114.95		119.60		125.58		134.80		145.93		135.25
40.0	115.00		119.74		125.80		135.06		146.10		135.03
45.0	115.15		119.93		125.95		135.82		146.56		134.73
50.0	115.25		120.03		126.60		136.20		147.03		134.43
55.0	115.45		120.20		126.80		136.50		147.26		134.10
60.0	115.55		120.30		127.03		136.69		147.50		134.00
70.0	115.71		120.60		127.40		137.29		150.55		133.55
80.0	115.86		120.82		127.84		137.80		152.50		133.18
90.0	116.00		121.16		128.10		138.12		154.96		132.72
100.0	116.12		121.45		128.38		138.56		156.90		132.39
110.0	116.27		121.60		128.70		138.74		160.00		132.03
120.0	116.40		121.70		128.90		139.14		163.20		131.75
150.0											131.00
180.0											130.28
240.0											129.35
300.0											128.60
360.0					14.74						127.95



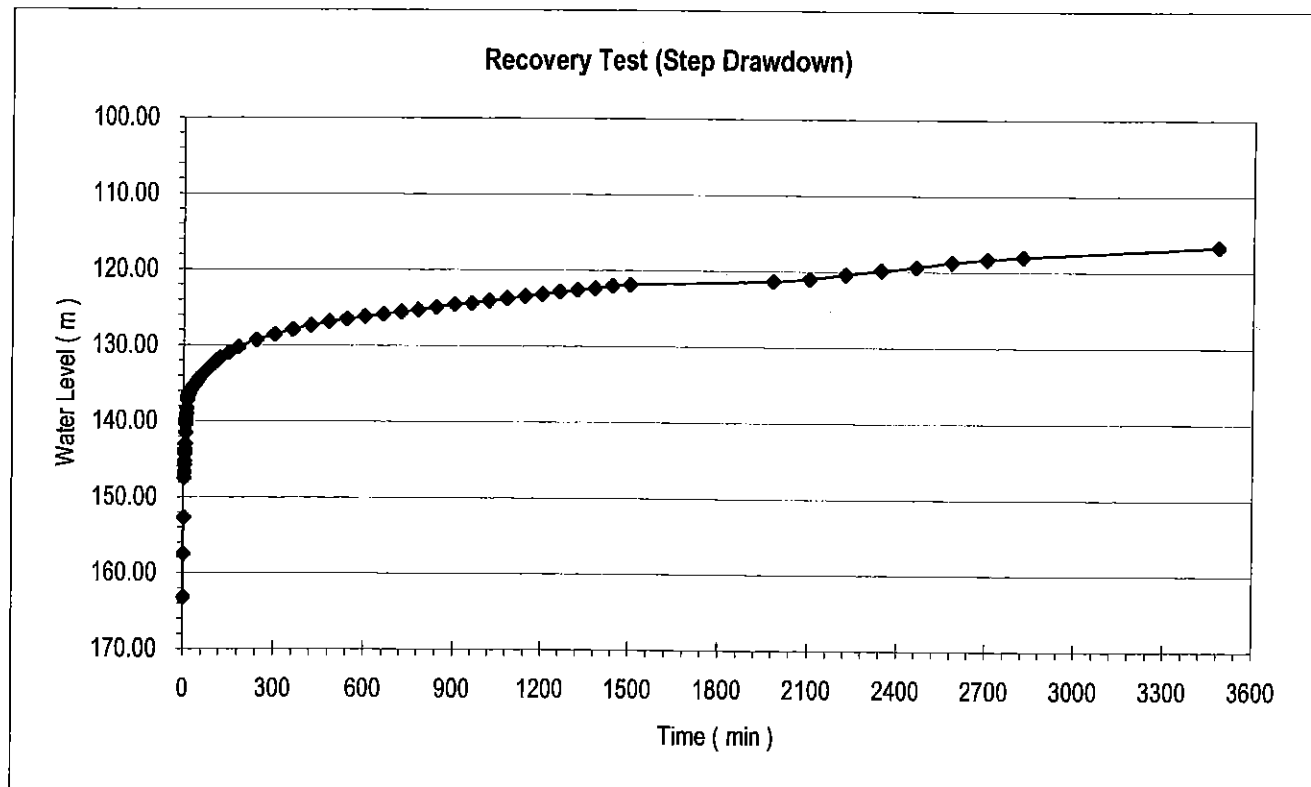
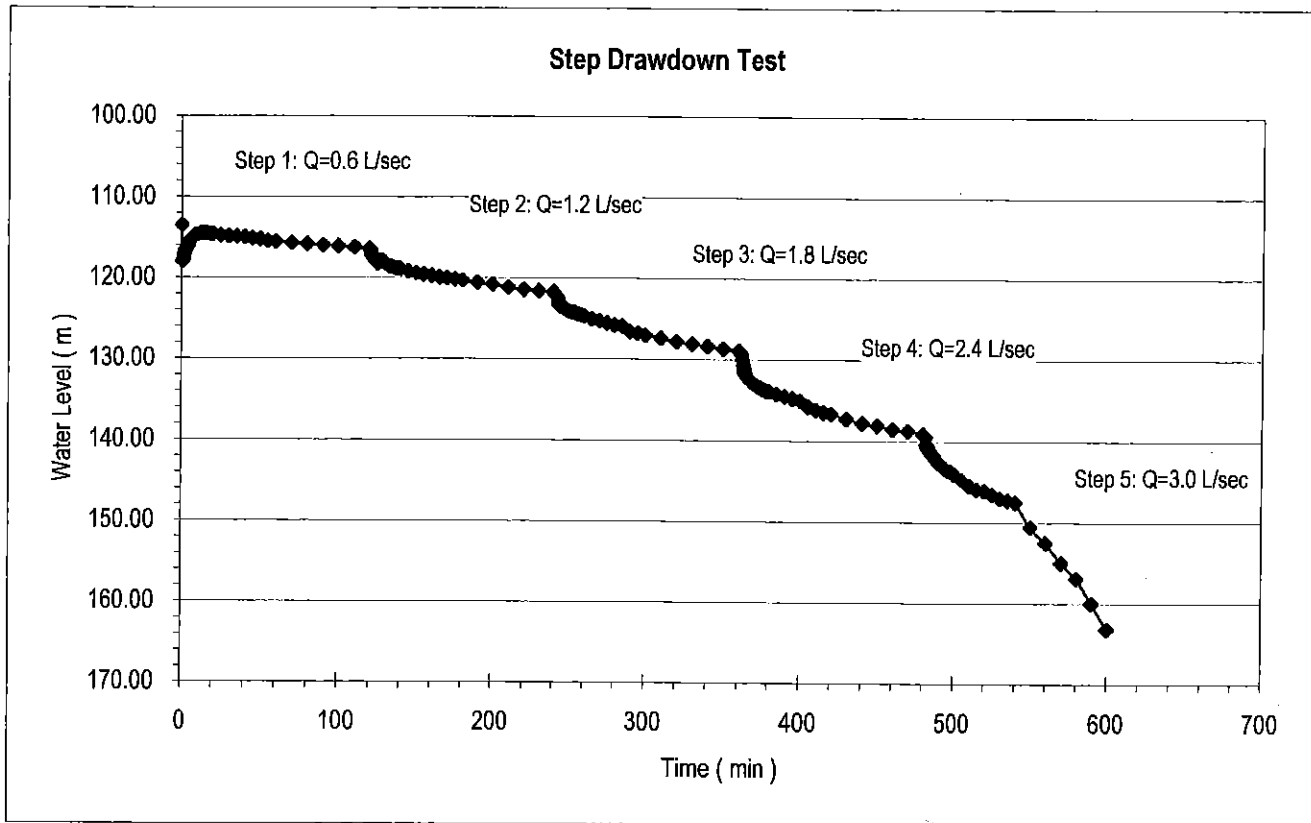
## Step Drawdown Test

Well Code: S-01/1

Site Code: S-01

Site Name: Bani Waleed - Al Asboor

S.W.L. : 113.50 m

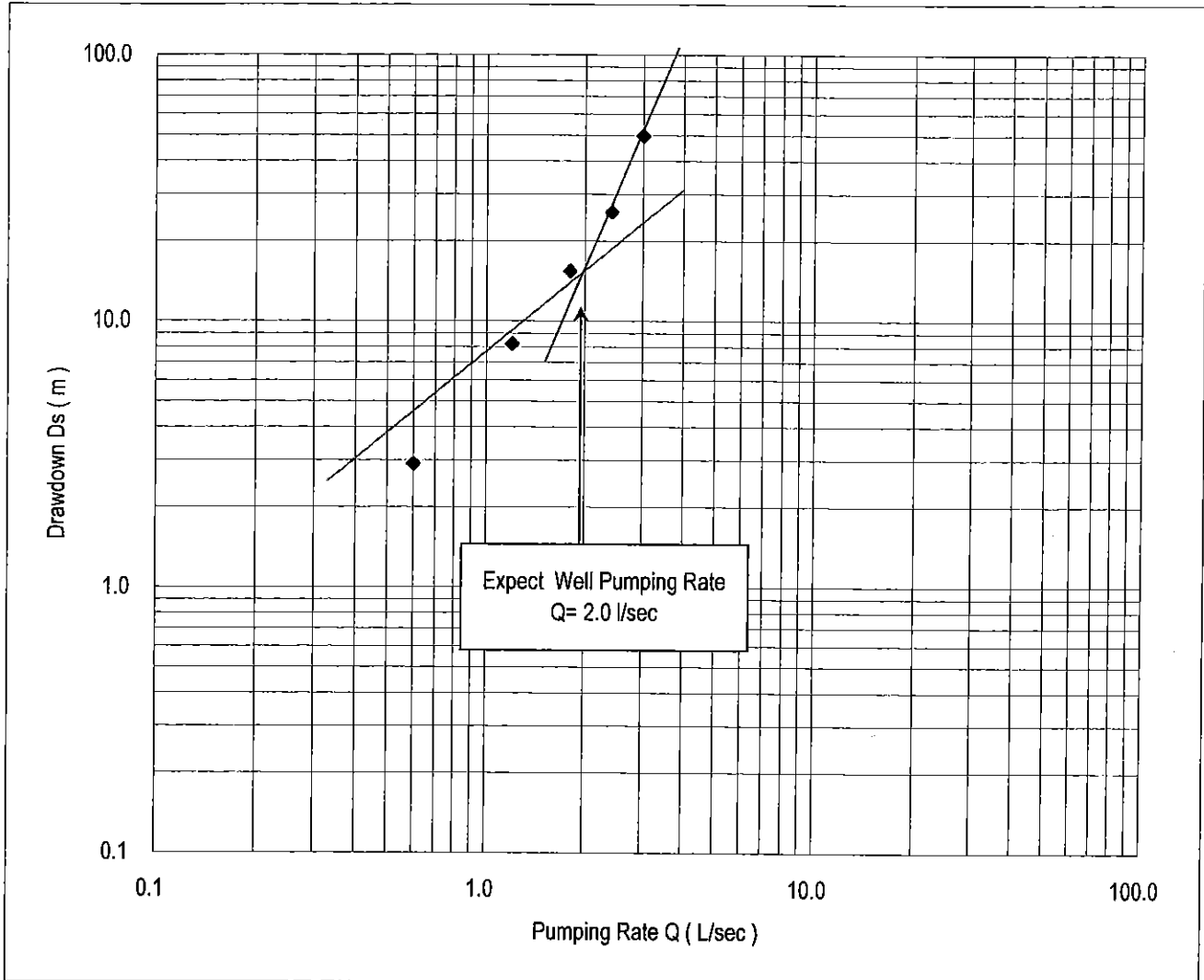




## Step Drawdown Test

Well Code: S-01/1  
 Site Code: S-01  
 S.W.L. : 113.50 m

Site Name: Bani Waleed - Al Asboor



Step	$Q$ (l/sec)	D.W.L. (m)	$D_s$ (m)
1	0.6	116.40	2.90
2	1.2	121.70	8.20
3	1.8	128.90	15.40
4	2.4	139.14	25.64
5	3.0	163.20	49.70

## Constant Discharge & Recovery Test (1/3)

Well Code: S-01/1 Site code: S-01

Site name: Bani Waleed - Al Asboor

District: Al Haymah Al Kharjiyah

Governorate: Sana'a

Pump on date/hour: 18/8/2006 9:10am

Pump off date/hour: 18/8/2006 9:10am

End of recovery hour: 22/8/2006 5:10pm

Contractor: Mabkhout Al-Abraki

Hydrogeologist: Abudul Salam Sallam

Operator: Kaid Al Abraki

S.W.L ( m ): 116.70

D.W.L ( m ): 143.84

Yield (l/sec): 1.6

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	
0.0	116.70	0.00		143.84	27.14		
0.5	121.92	5.22		142.20	25.50		
1.0	122.50	5.80		142.03	25.33		
1.5	122.20	5.50		141.87	25.17		
2.0	122.23	5.53		141.70	25.00		
2.5	122.00	5.30		141.54	24.84		
3.0	121.90	5.20		141.37	24.67		
3.5	121.67	4.97		141.21	24.51		
4.0	121.66	4.96		141.04	24.34		
4.5	121.60	4.90		140.88	24.18		
5.0	121.50	4.80		140.71	24.01		
6.0	121.18	4.48		140.55	23.85		
7.0	120.93	4.23		140.38	23.68		
8.0	120.90	4.20		140.22	23.52		
9.0	120.91	4.21		140.05	23.35		
10.0	121.05	4.35		140.01	23.31		
12.0	121.35	4.65		140.00	23.30		
14.0	121.61	4.91		139.96	23.26		
16.0	121.78	5.08		139.95	23.25		
18.0	122.00	5.30		139.90	23.20		
20.0	122.20	5.50		139.88	23.18		
25.0	122.65	5.95		139.80	23.10		
30.0	123.07	6.37		139.73	23.03		
35.0	123.41	6.71		139.60	22.90		
40.0	123.68	6.98		139.55	22.85		
45.0	124.02	7.32		139.50	22.80		
50.0	124.32	7.62		139.40	22.70		
55.0	124.68	7.98		139.36	22.66		
60.0	124.85	8.15		139.30	22.60		

## Constant Discharge & Recovery Test (2/3)

Well Code: S-01/1      Site code: S-01      Site name: Bani Waleed - Al Asboor  
 District: Al Haymah Al Kharijiyah      Governorate: Sana'a

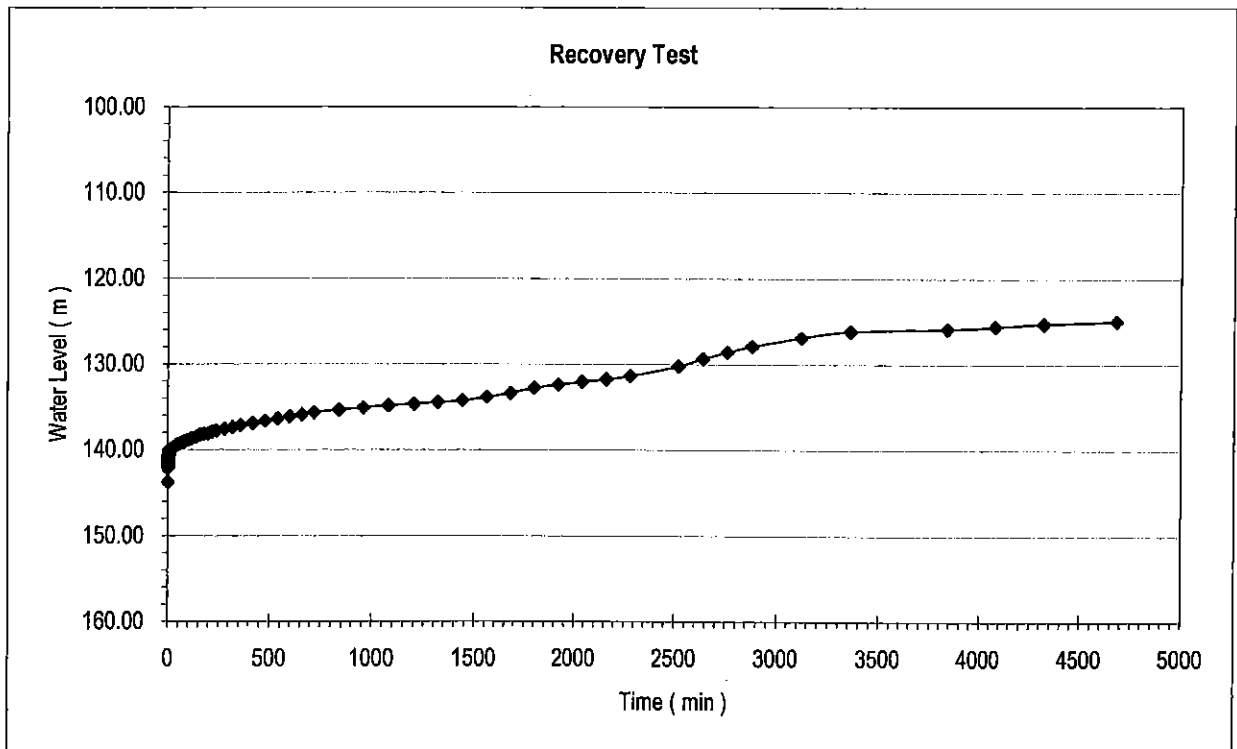
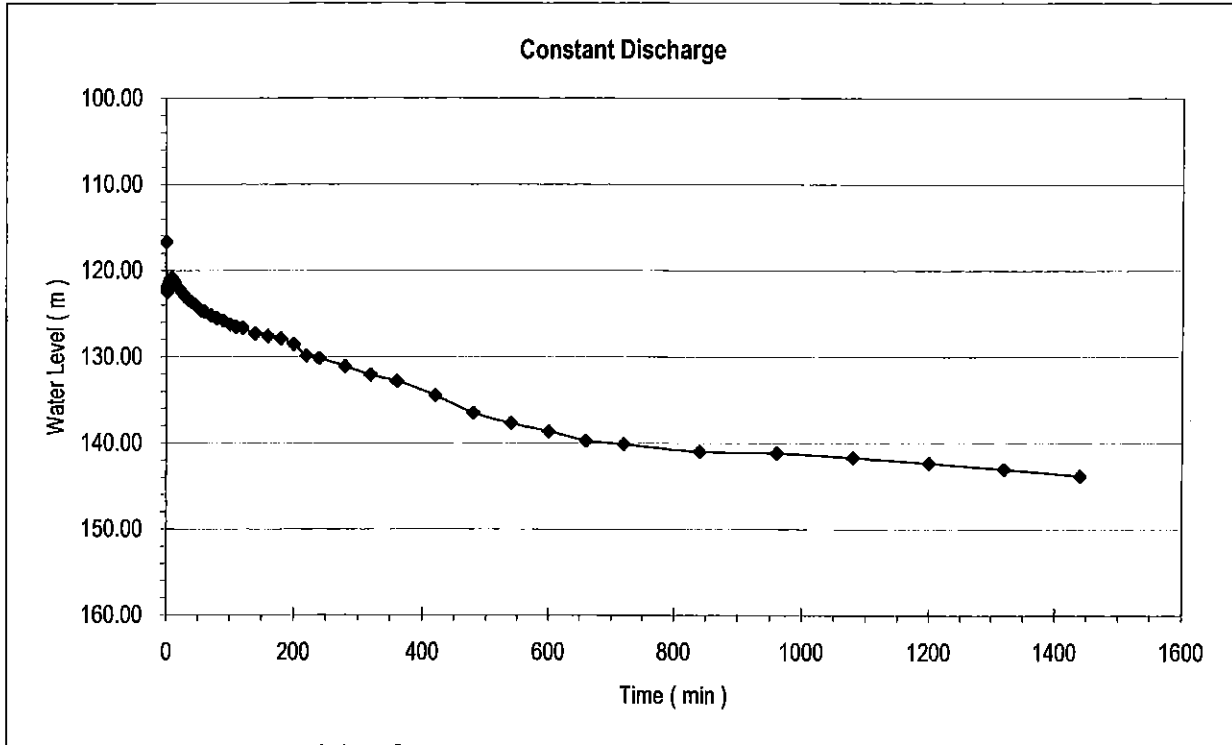
Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	
70.0	125.25	8.55		139.20	22.50		
80.0	125.56	8.86		139.10	22.40		
90.0	125.88	9.18		139.00	22.30		
100.0	126.30	9.60		138.90	22.20		
110.0	126.57	9.87		138.78	22.08		
120.0	126.70	10.00		138.70	22.00		
140.0	127.33	10.63		138.55	21.85		
160.0	127.62	10.92		138.30	21.60		
180.0	127.93	11.23		138.20	21.50		
200.0	128.59	11.89		138.10	21.40		
220.0	129.90	13.20		137.95	21.25		
240.0	130.20	13.50		137.80	21.10		
280.0	131.10	14.40		137.64	20.94		
320.0	132.13	15.43		137.46	20.76		
360.0	132.86	16.16		137.20	20.50		
420.0	134.48	17.78		136.96	20.26		
480.0	136.55	19.85		136.69	19.99		
540.0	137.75	21.05		136.43	19.73		
600.0	138.67	21.97		136.18	19.48		
660.0	139.73	23.03		135.93	19.23		
720.0	140.16	23.46		135.70	19.00		
840.0	141.05	24.35		135.40	18.70		
960.0	141.20	24.50		135.13	18.43		
1080.0	141.70	25.00		134.85	18.15		
1200.0	142.35	25.65		134.70	18.00		
1320.0	143.05	26.35		134.50	17.80		
1440.0	143.84	27.14		134.30	17.60		
1560.0				133.89	17.19		
1680.0				133.46	16.76		
1800.0				132.82	16.12		
1920.0				132.45	15.75		
2040.0				132.10	15.40		
2160.0				131.80	15.10		
2280.0				131.43	14.73		
2400.0							
2520.0				130.28	13.58		



# Constant Discharge Test

Well Code: S-01/1  
Site Code: S-01  
S.W.L. (m): 116.70  
Yield (L/sec): 1.6

Site Name Bani Waleed - Al Asboor  
D.W.L (m): 143.84 Drawdown (m): 27.14



## Pumping Test Report Sheet

Well code: S-01/2 Site code: S-01 Site name: Bani Waleed - Al Asboor

District: Al Haymah Al Kharijiyah Governorate: Sana'a

Target water source: New projected deep well (Al Asboor) Well depth: 300 m

Contractor: Mabkhout Al-Abraki

Hydrogeologist in charge: Abudul Salam Sallam

Operator: Al Raboi

Date of start of the test: 3/8/2006 Date of end of the test: 18/8/2006

Pump type: Vertical pump Engine: IVECO Aifo

Pump installation depth: 213 m Datum level: 0.72 m S.W.L.: G.L.-34.78 m

### Step drawdown test

Date/hour started: 6/8/2006 2:30pm Date/hour finished: 10/8/2006 1:20pm Total hours: 84:10

Yield (l/sec) 1<sup>st</sup> step 1.60 2<sup>nd</sup> step 3.20 3<sup>rd</sup> step 4.80 4<sup>th</sup> step 6.40 5<sup>th</sup> step 8.00

Water level before start the test (G.L.-m): 42.56

Water level after end of 5<sup>th</sup> step (G.L.-m): 137.68

Water level after recovery (G.L.-m): 42.56 Recovery hours 73:20

### Constant discharge test

Date/hour started: 15/8/2006 9:50am Date/hour finished: 20/8/2006 10:30am Total hours: 124:00

Yield (l/sec) 3.40

Water level before start of the test (G.L.-m): 52.78

Water level after end of test (G.L.-m): 106.18

Water level after recovery (G.L.-m): 52.81 Recovery hours 100:00

Drawdown (m): 53.40

Revised by:

\_\_\_\_\_  
Name :

Date:

## Provisional Step Drawdown Test (1/2)

Well Code: S-01/2 Site code: S-01

Pump on date/hour: 3/8/2006 8:30pm

Site name: Bani Waleed - Al Asboor

Pump off date/hour: 3/8/2006 11:00pm

District: Al Haymah Al Khariyyah

End of recovery hour: 5/8/2006 1:00am

Governorate Sana'a

S.W.L ( m ): 35.50

Contractor: Mabkhout Al-Abraki

Hydrogeologist: Abudul Salam Sallam

Operator: Al Raboi

Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	
0.0	35.50	1.60	38.00	3.20	46.73	4.80	60.57	6.40	76.20	8.00	93.02
0.5	35.60		38.07		47.07				76.63		88.10
1.0	35.60		38.15		48.40		60.93		77.40		83.75
1.5	35.60		38.27		48.65		61.55		77.80		71.45
2.0	35.63		38.55		49.02		62.13		78.43		79.68
2.5	35.63		38.82		49.33		62.63		78.93		78.19
3.0	35.66		39.28		49.70		63.05		79.50		76.75
3.5	35.86		39.58		50.03		63.47		79.93		75.39
4.0	35.90		39.90		50.27		63.83		80.43		74.05
4.5	35.92		40.10		50.56		64.53		80.82		72.80
5.0	35.94		40.42		51.20		64.96		81.20		71.83
6.0	35.98		41.03		51.96		65.60		82.00		69.83
7.0	36.05		41.62		52.57		66.10		82.74		68.17
8.0	36.17		42.08		53.27		66.54		83.34		66.75
9.0	36.28		42.35		53.88		67.00		84.00		65.53
10.0	36.40		42.88		54.93		67.47		84.70		64.40
12.0	36.63		43.83		55.65		68.33		85.80		63.07
14.0	36.85		44.42		56.33		69.64		86.90		61.82
16.0	37.08		44.95		56.95		70.82		87.55		60.77
18.0	37.26		45.30		57.46		71.85		88.50		60.00
20.0	37.40		45.75		57.90		72.55		89.42		59.32
22.0	37.65		46.06		58.42		73.43		90.18		58.70
24.0	37.73		46.26		59.07		74.24		90.86		58.20
26.0	37.85		46.52		59.60		74.96		81.48		57.76
28.0	37.94		46.62		60.07		75.66		82.16		57.35
30.0	38.00		46.73		60.57		76.26		93.02		59.98
40.0											56.10
50.0											55.30
60.0											54.52
70.0											53.77
80.0											53.03
90.0											52.34
120.0											51.43
180.0											50.12
240.0											49.08
300.0											48.03
360.0											47.15
420.0											46.35
480.0											45.64
540.0											45.04





## Step Drawdown Test (1/2)

Well Code: S-01/2      Site code: S-01      Pump on date/hour: 6/8/2006 2:30pm  
 Site name: Bani Waleed - Al Asboor      Pump off date/hour: 7/8/2006 1:00am  
 District: Al Haymah Al Kharjiyah      End of recovery hour: 10/8/2006 1:20pm  
 Governorate Sana'a      S.W.L ( m ): 43.28

Contractor: Mabkhout Al-Abraki  
 Hydrogeologist: Abudul Salam Sallam  
 Operator: Al Raboi

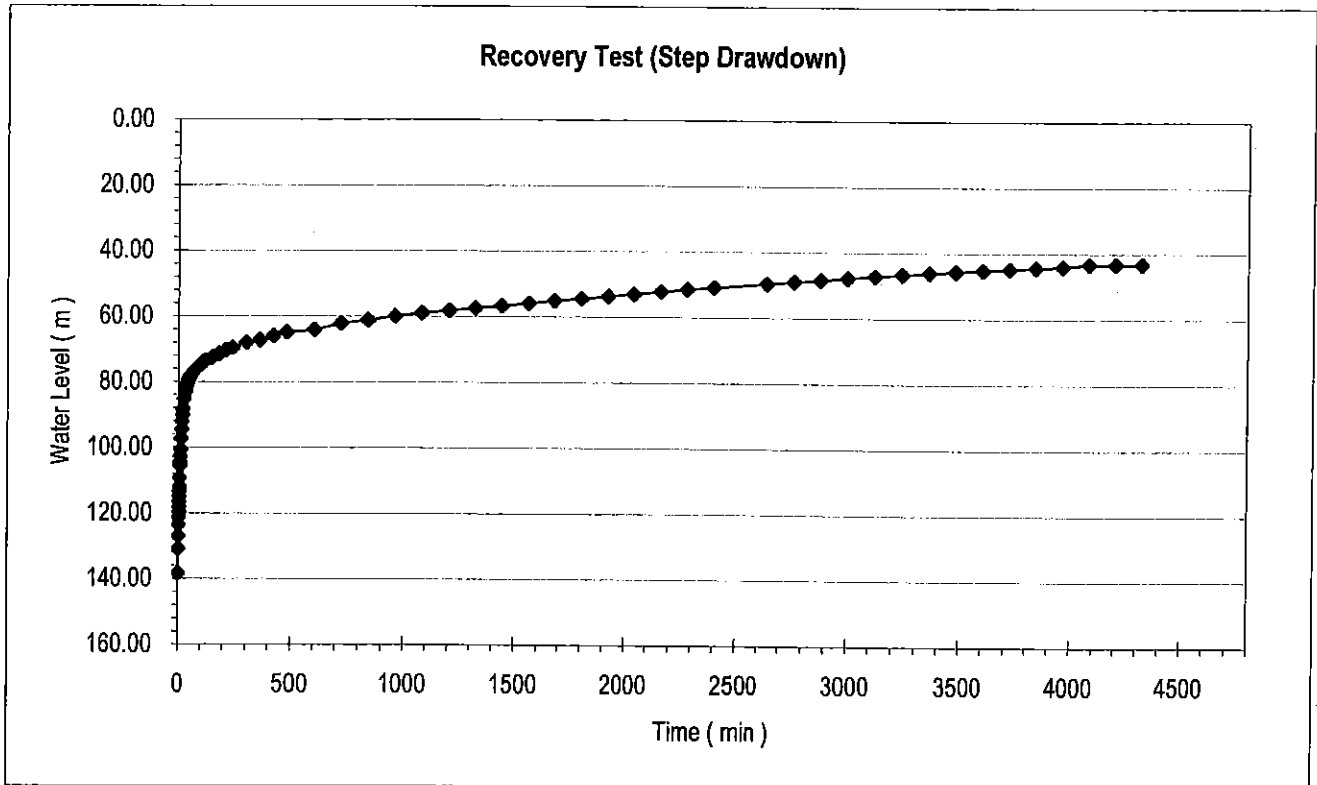
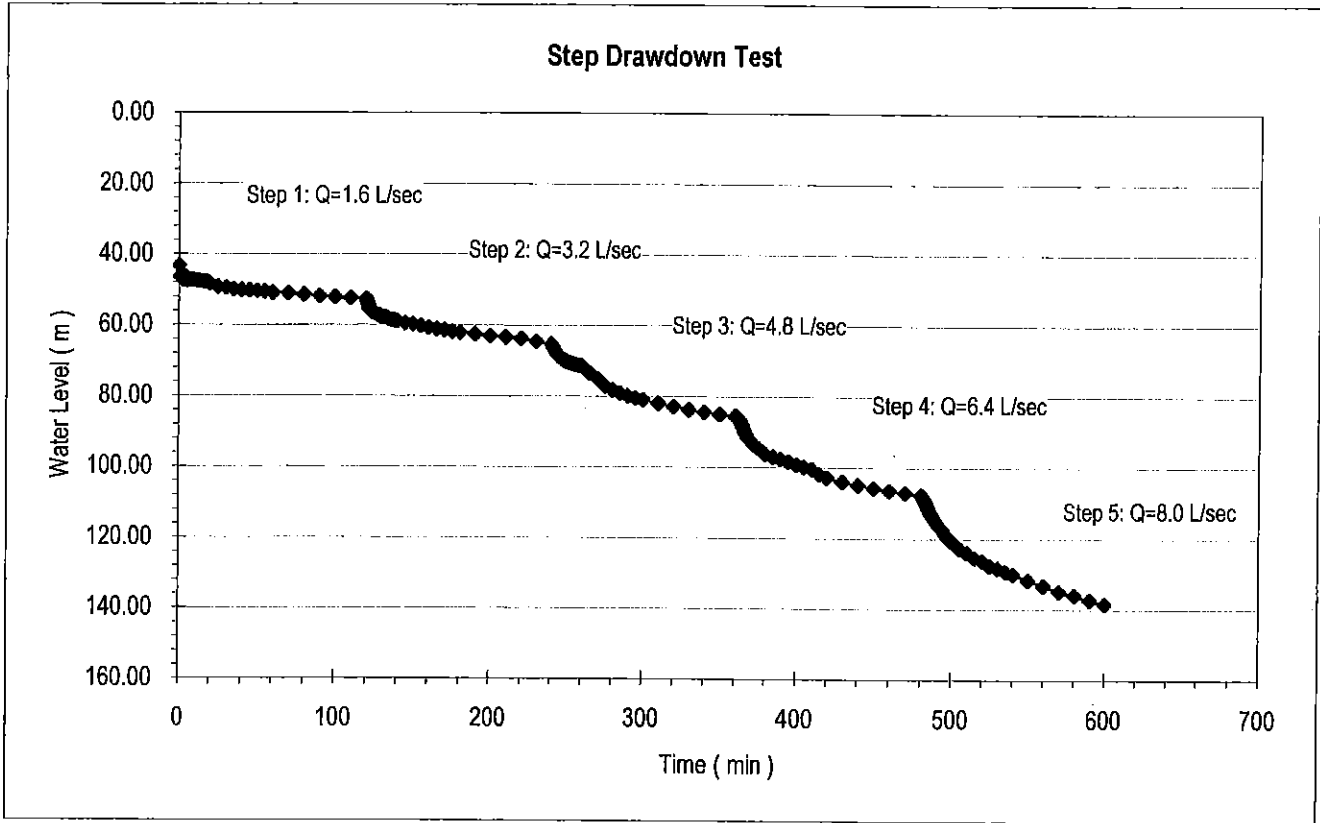
Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	43.28	1.60	52.80	3.20	65.40	4.80	85.68	6.40	107.69	8.00	138.40
0.5	46.38		53.44		65.62		85.71		107.86		131.00
1.0	46.32		54.33		66.02		85.87		108.15		127.03
1.5	46.39		55.26		66.60		86.11		108.57		123.50
2.0	46.47		55.80		67.00		86.30		109.07		121.33
2.5	47.32		55.90		67.36		86.47		109.36		119.62
3.0	47.20		56.30		67.70		86.76		109.82		118.13
3.5	46.72		56.37		68.05		87.29		110.23		116.53
4.0	46.46		56.40		68.30		87.70		110.70		114.90
4.5	47.15		56.53		68.60		88.31		111.24		113.33
5.0	47.51		56.68		68.86		88.79		111.70		111.97
6.0	47.20		56.94		69.20		89.81		112.67		109.30
7.0	47.40		57.20		69.55		90.63		113.43		105.80
8.0	47.42		57.43		69.82		91.60		114.10		104.70
9.0	47.45		57.65		70.10		92.00		114.80		102.68
10.0	47.47		57.83		70.30		92.52		115.45		100.75
12.0	47.65		58.03		70.73		93.60		116.63		97.42
14.0	47.75		58.33		70.98		94.23		117.44		94.58
16.0	47.86		58.64		71.24		94.80		118.80		92.15
18.0	47.95		58.83		71.40		95.58		119.82		90.21
20.0	48.40		59.05		71.65		96.25		120.71		88.40
25.0	49.35		59.52		73.50		96.97		122.75		85.26
30.0	49.58		59.94		75.15		97.60		123.98		83.06
35.0	50.00		60.30		77.20		98.47		125.36		81.55
40.0	50.20		60.85		78.36		99.15		126.30		80.40
45.0	50.33		61.27		79.25		99.90		127.60		79.50
50.0	50.52		61.50		79.98		100.45		128.38		78.70
55.0	50.70		61.96		80.56		102.00		129.32		78.10
60.0	51.03		62.22		81.03		102.92		130.00		77.75
70.0	51.16		62.65		82.02		104.07		131.68		76.70
80.0	51.45		63.08		82.95		105.01		133.22		76.00
90.0	51.93		63.49		83.84		105.77		134.87		75.37
100.0	52.18		63.80		84.47		106.50		136.01		74.75
110.0	52.53		64.65		85.15		107.10		137.27		74.10
120.0	52.80		65.40		85.68		107.69		138.40		73.65
150.0											72.60
180.0											71.55
210.0											70.40
240.0											69.68
300.0											68.10



# Step Drawdown Test

Well Code: S-01/2  
Site Code: S-01  
S.W.L. : 43.28 m

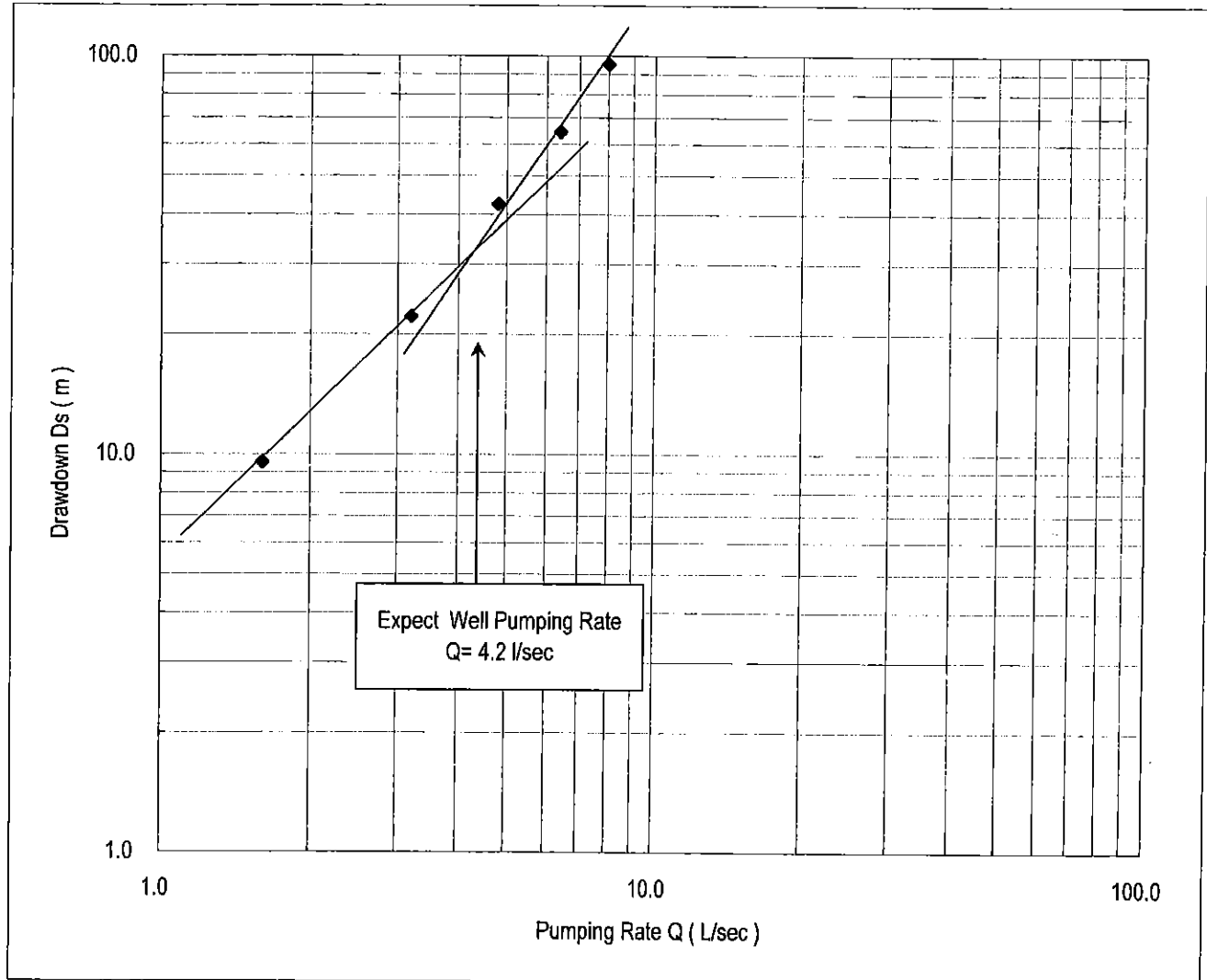
Site Name: Bani Waleed - Al Asboor



## Step Drawdown Test

Well Code: S-01/2  
 Site Code: S-01  
 S.W.L. : 43.28 m

Site Name: Bani Waleed - Al Asboor



Step	$Q$ (l/sec)	D.W.L. (m)	$D_s$ (m)
1	1.6	52.80	9.52
2	3.2	65.40	22.12
3	4.8	85.68	42.40
4	6.4	107.69	64.41
5	8.0	138.40	95.12

## Constant Discharge & Recovery Test (1/3)

Well Code: S-01/2                      Site code: S-01

Site name: Bani Waleed - Al Asboor

Pump on date/hour: 15/8/2006 9:50am

District: Al Haymah Al Kharijiyah

Pump off date/hour: 16/8/2006 9:50am

Governorate: Sana'a

End of recovery hour: 20/8/2006 10:30am

Contractor: Mabkhout Al-Abraki

S.W.L ( m ): 53.50

Hydrogeologist: Abudul Salam Sallam

D.W.L ( m ): 106.90

Operator: Al Raboi

Yield (l/sec): 3.4

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	
0.0	53.50	0.00		106.90	53.40		
0.5	56.40	2.90		102.52	49.02		
1.0	56.85	3.35		99.26	45.76		
1.5	57.35	3.85		97.96	44.46		
2.0	57.88	4.38		97.53	44.03		
2.5	58.24	4.74		97.15	43.65		
3.0	58.50	5.00		96.85	43.35		
3.5	59.07	5.57		96.35	42.85		
4.0	59.14	5.64		96.06	42.56		
4.5	59.39	5.89		95.87	42.37		
5.0	59.51	6.01		95.39	41.89		
6.0	59.87	6.37		94.86	41.36		
7.0	60.32	6.82		94.39	40.89		
8.0	60.54	7.04		93.90	40.40		
9.0	60.73	7.23		93.52	40.02		
10.0	61.29	7.79		93.20	39.70		
12.0	62.21	8.71		92.53	39.03		
14.0	62.43	8.93		92.10	38.60		
16.0	62.44	8.94		91.70	38.20		
18.0	62.57	9.07		91.38	37.88		
20.0	63.09	9.59		91.05	37.55		
25.0	63.34	9.84		90.45	36.95		
30.0	63.69	10.19		89.95	36.45		
35.0	64.35	10.85		89.68	36.18		
40.0	65.03	11.53		89.20	35.70		
45.0	65.12	11.62		89.90	36.40		
50.0	65.22	11.72		88.62	35.12		
55.0	65.44	11.94		88.35	34.85		
60.0	65.65	12.15		88.18	34.68		

## Constant Discharge & Recovery Test (2/3)

Well Code: S-01/2      Site code: S-01      Site name: Bani Waleed - Al Asboor  
 District: Al Haymah Al Kharijiyah      Governorate: Sana'a

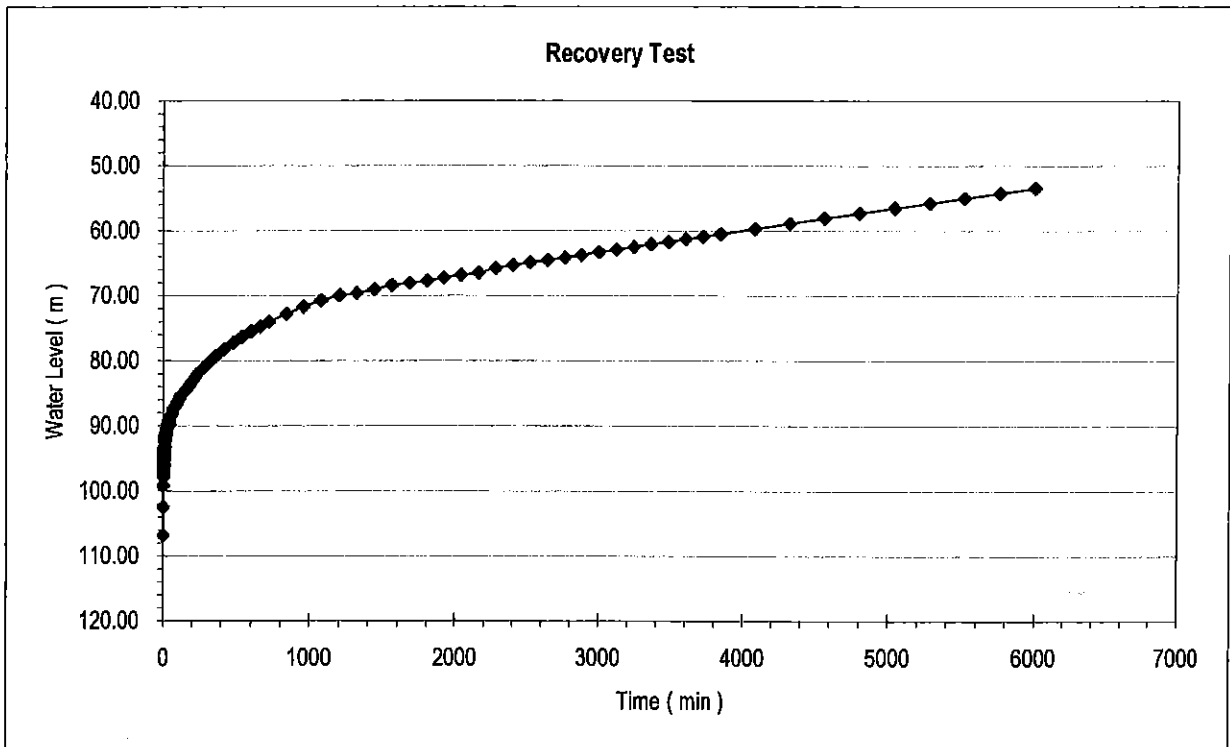
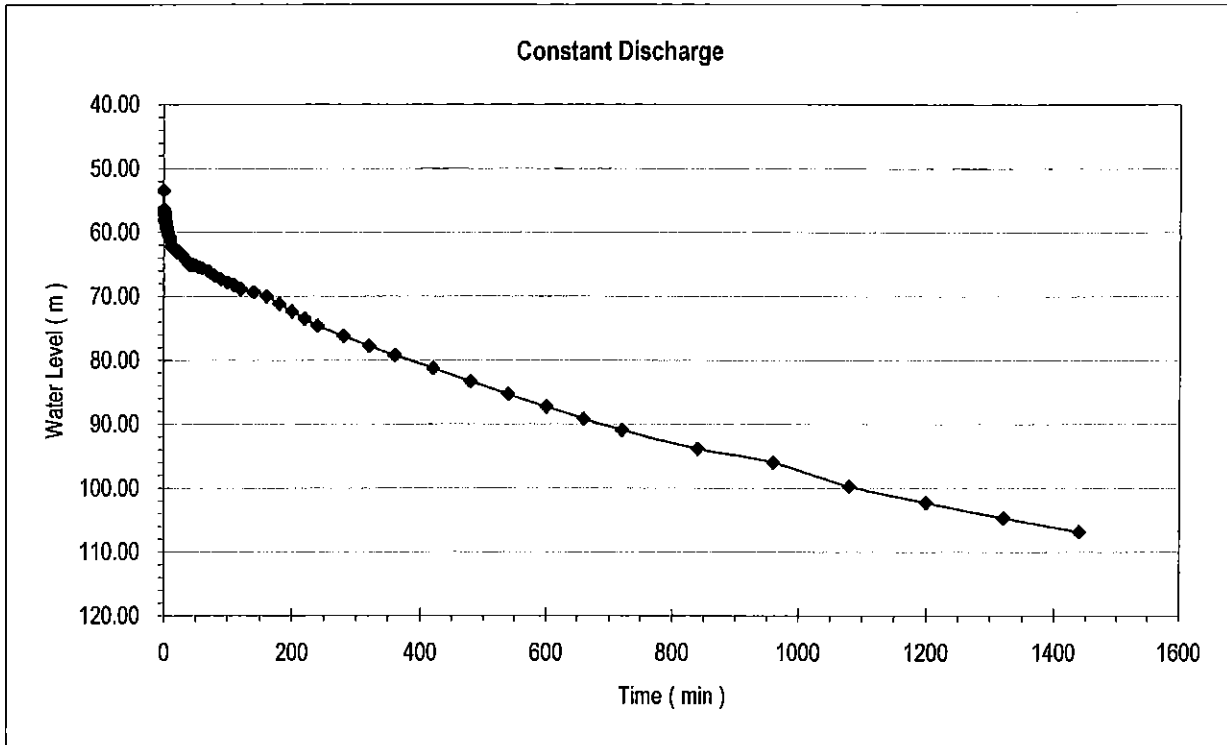
Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	
70.0	66.11	12.61		87.40	33.90		
80.0	66.81	13.31		87.20	33.70		
90.0	67.35	13.85		86.79	33.29		
100.0	67.89	14.39		86.35	32.85		
110.0	68.32	14.82		85.91	32.41		
120.0	68.89	15.39		85.43	31.93		
140.0	69.39	15.89		84.96	31.46		
160.0	70.05	16.55		84.38	30.88		
180.0	71.28	17.78		83.84	30.34		
200.0	72.43	18.93		83.20	29.70		
220.0	73.58	20.08		82.60	29.10		
240.0	74.69	21.19		81.98	28.48		
280.0	76.25	22.75		81.14	27.64		
320.0	77.80	24.30		80.32	26.82		
360.0	79.27	25.77		79.42	25.92		
420.0	81.34	27.84		78.35	24.85		
480.0	83.39	29.89		77.38	23.88		
540.0	85.40	31.90		76.45	22.95		
600.0	87.32	33.82		75.54	22.04		
660.0	89.20	35.70		74.83	21.33		
720.0	91.00	37.50		74.08	20.58		
840.0	93.89	40.39		72.83	19.33		
960.0	96.07	42.57		71.74	18.24		
1080.0	99.78	46.28		70.78	17.28		
1200.0	102.30	48.80		70.05	16.55		
1320.0	104.70	51.20		69.65	16.15		
1440.0	106.90	53.40		69.12	15.62		
1560.0				68.48	14.98		
1680.0				68.12	14.62		
1800.0				67.75	14.25		
1920.0				67.31	13.81		
2040.0				66.90	13.40		
2160.0				66.53	13.03		
2280.0				65.85	12.35		
2400.0				65.35	11.85		
2520.0				64.95	11.45		



# Constant Discharge Test

Well Code: S-01/2  
Site Code: S-01  
S.W.L. (m): 53.50  
Yield (L/sec): 3.4

Site Name Bani Waleed - Al Asboor  
D.W.L. (m): 106.90 Drawdown (m): 53.40





## Pumping Test Report Sheet

Well code: S-03 Site code: S-03 Site name: Al Kharaba  
District: Bani Matar Governorate: Sana'a

Target water source: Existing projected deep well Well depth: 150 m

Contractor: Mabkhout Al-Abraki

Hydrogeologist in charge: Abudul Salam Sallam

Operator: Kaid Al-Abraki

Date of start of the test: 11/8/2006 Date of end of the test: 14/8/2006

Pump type: Vertical pump Engine: Iveco aifo

Pump installation depth: 111 m Datum level: 0.82 m S.W.L.: G.L.-44.93 m

### Step drawdown test

Date/hour started: 11/8/2006 5:45pm Date/hour finished: 12/8/2006 11:52am Total hours: 18:07

Yield (l/sec) 1<sup>st</sup> step 1.30 2<sup>nd</sup> step 2.60 3<sup>rd</sup> step 3.90 4<sup>th</sup> step 5.20 5<sup>th</sup> step 6.50

Water level before start the test (G.L.-m): 44.93

Water level after end of 5<sup>th</sup> step (G.L.-m): 110.58

Water level after recovery (G.L.-m): 44.93 Recovery hours 8:07

### Constant discharge test

Date/hour started: 12/8/2006 2:00pm Date/hour finished: 14/8/2006 8:00pm Total hours: 54:00

Yield (l/sec) 3.50

Water level before start of the test (G.L.-m): 44.93

Water level after end of test (G.L.-m): 80.82

Water level after recovery (G.L.-m): 44.93 Recovery hours 30:00

Drawdown (m): 35.89

Revised by:

\_\_\_\_\_  
Name :

Date:



# Step Drawdown Test

Well Code: S-03      Site code: S-03      Pump on date/hour: 11/8/2006 5:45pm  
 Site name: Al Kharaba      Pump off date/hour: 12/8/2006 3:45am  
 District: Bani Matar      End of recovery hour: 12/8/2006 11:52am  
 Governorate Sana'a      S.W.L ( m ): 45.75

Contractor: Mabkhout Al-Abraki  
 Hydrogeologist: Abudul Salam Sallam  
 Operator: Kaid Al-Abraki

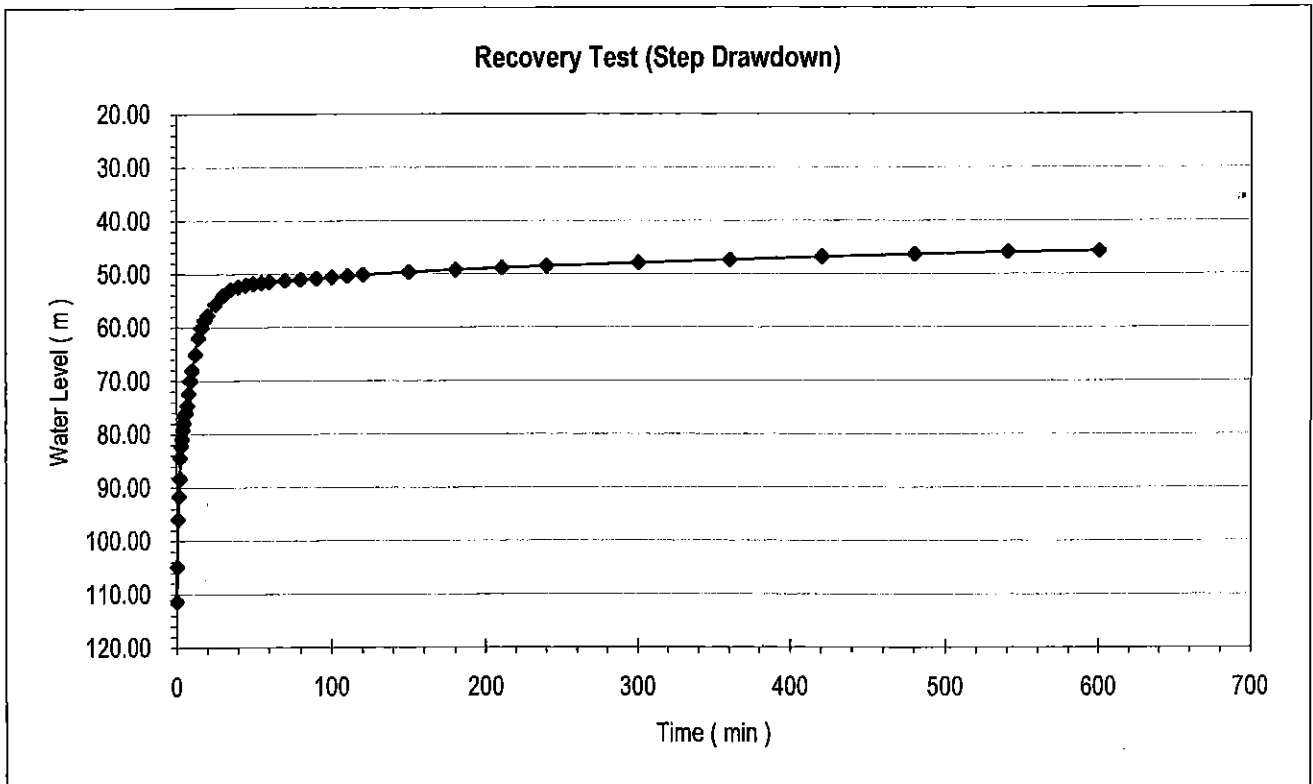
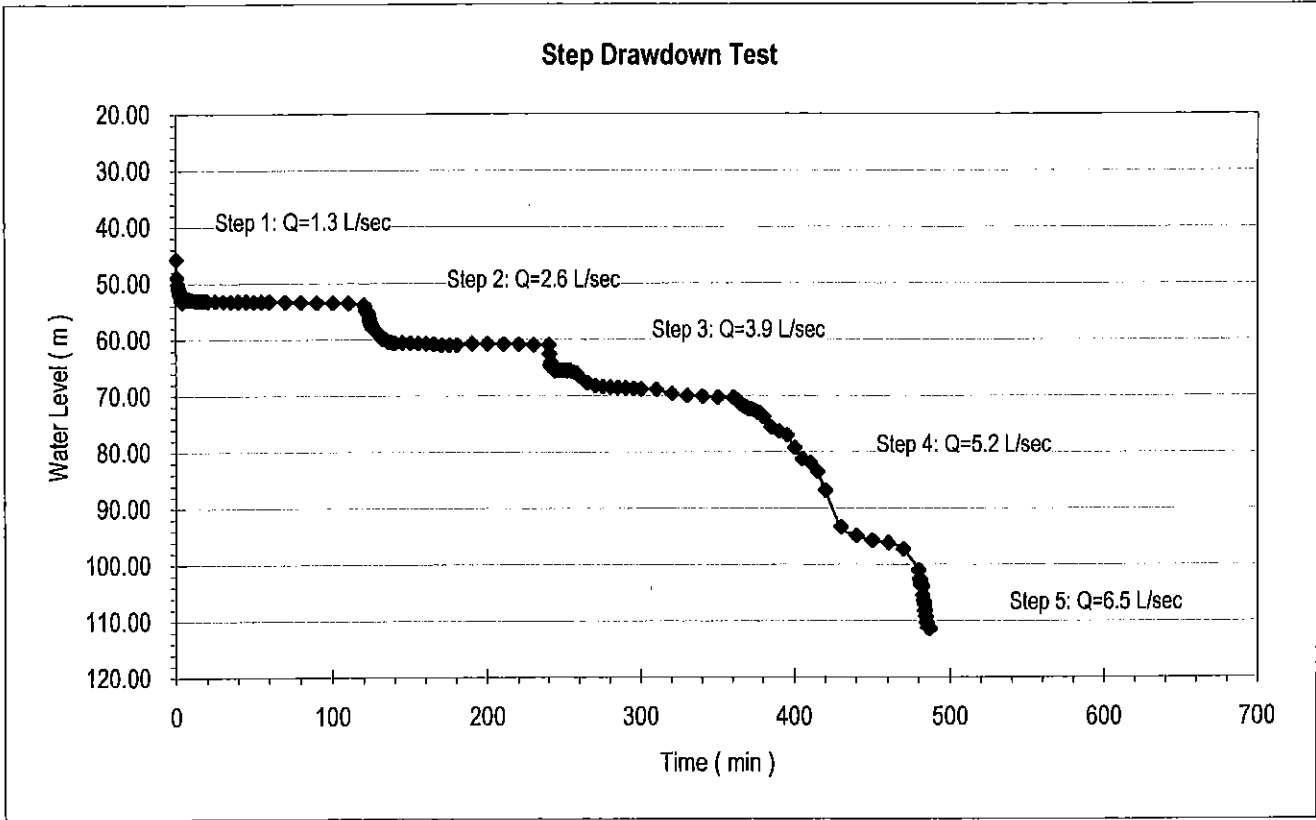
Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	
0.0	45.75	1.30	53.78	2.60	61.04	4.20	70.42	5.20	101.03	6.50	111.40
0.5	48.90		54.02		62.60		70.45		102.55		104.88
1.0	50.20		54.88		64.65		70.49		103.22		95.95
1.5	50.83		54.96		64.15		70.60		103.65		91.66
2.0	51.38		55.06		64.70		70.74		104.00		88.36
2.5	51.92		55.10		65.11		70.86		105.52		84.48
3.0	52.42		55.55		65.38		70.97		106.43		82.26
3.5	52.88		56.34		65.55		71.16		107.11		80.98
4.0	53.30		56.87		65.60		71.24		108.22		79.31
4.5	53.19		57.26		65.58		71.32		109.29		77.96
5.0	53.03		57.58		65.50		71.51		110.32		76.54
6.0	52.81		58.14		65.52		71.72		111.27		76.02
7.0	52.76		58.32		65.54		71.90		111.40		74.64
8.0	52.84		58.70		65.55		72.04				72.44
9.0	52.90		58.98		65.56		72.17				70.10
10.0	52.97		59.02		65.58		72.32				68.12
12.0	53.03		59.86		65.60		72.43				65.12
14.0	53.06		59.98		65.62		72.68				62.05
16.0	53.10		60.44		65.82		72.94				60.09
18.0	53.18		60.55		66.00		73.20				58.72
20.0	53.20		60.60		66.60		73.79				57.82
25.0	53.21		60.62		67.75		75.64				55.69
30.0	53.24		60.65		68.22		76.36				54.12
35.0	53.27		60.70		68.43		77.05				52.98
40.0	53.26		60.76		68.50		79.34				52.46
45.0	53.26		60.85		68.57		81.23				52.16
50.0	53.27		61.00		68.65		81.94				51.90
55.0	53.28		61.00		68.76		83.56				51.69
60.0	53.32		61.02		68.88		86.85				51.55
70.0	53.34		60.75		68.92		93.38				51.28
80.0	53.40		60.82		69.64		94.87				51.08
90.0	53.47		60.87		70.06		95.77				50.90
100.0	53.52		60.90		70.19		96.19				50.68
110.0	53.56		61.00		70.36		97.28				50.42
120.0	53.78		61.04		70.42		101.03				50.16
150.0											49.70
180.0											49.27
210.0											48.90
240.0											48.57
300.0											47.98



# Step Drawdown Test

Well Code: S-03  
Site Code: S-03  
S.W.L. : 45.75 m

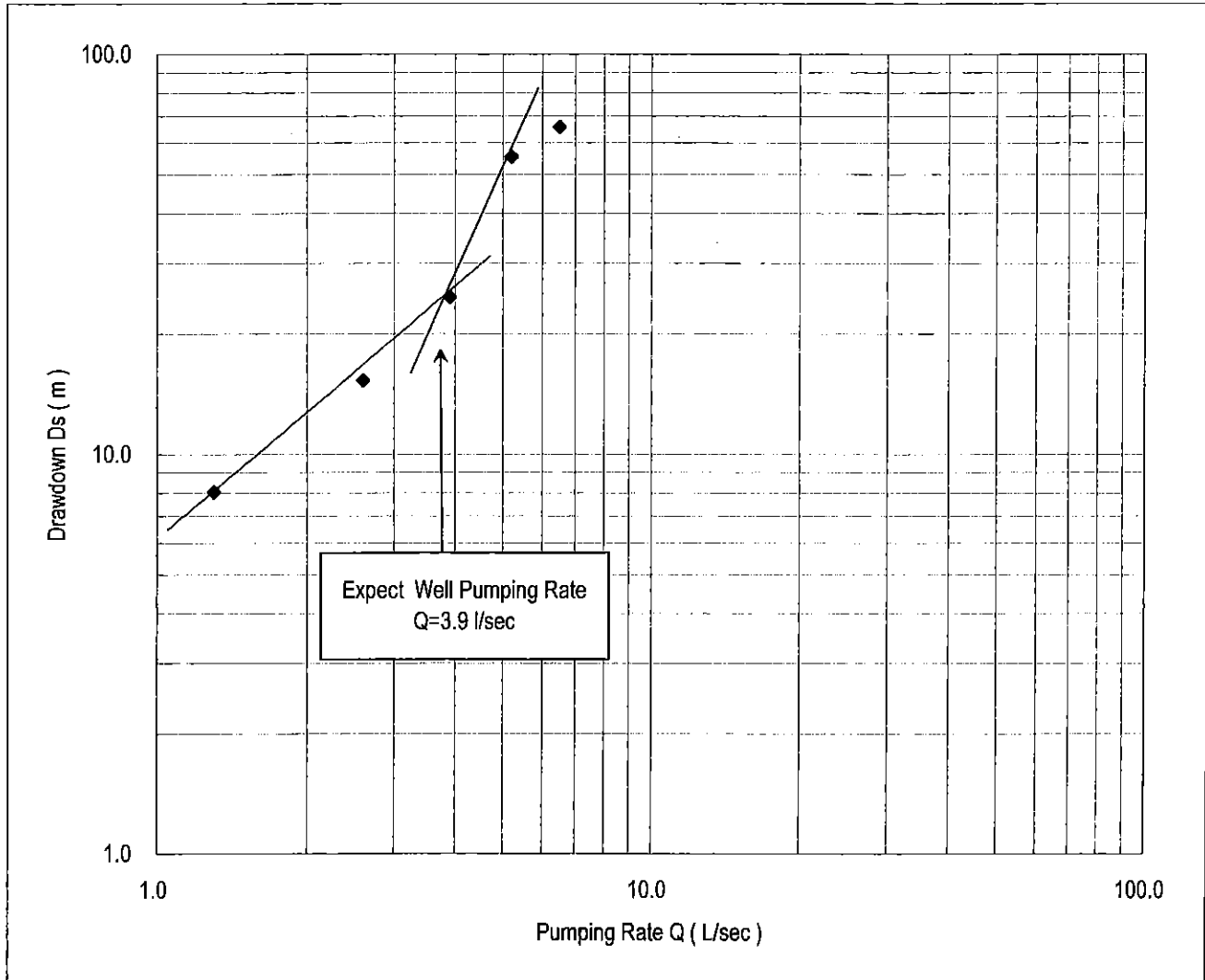
Site Name: Al Kharaba



## Step Drawdown Test

Well Code: S-03  
 Site Code: S-03  
 S.W.L. : 45.75 m

Site Name: Al Kharaba



Step	$Q$ (l/sec)	D.W.L. (m)	$D_s$ (m)
1	1.3	53.78	8.03
2	2.6	61.04	15.29
3	3.9	70.42	24.67
4	5.2	101.03	55.28
5	6.5	111.40	65.65

## Constant Discharge & Recovery Test (1/2)

Well Code:   S-03                        Site code:   S-03  

Site name:   Al Kharaba  

District:   Bani Matar  

Governorate:   Sana'a  

Pump on date/hour:   12/8/2006 2:00pm  

Pump off date/hour:   13/8/2006 2:00pm  

End of recovery hour:   14/8/2006 8:00pm  

Contractor:   Mabkhout Al-Abraki  

S.W.L ( m ):   45.75  

Hydrogeologist:   Abudul Salam Sallam  

D.W.L ( m ):   81.64  

Operator:   Kaid Al-Abraki  

Yield (l/sec):   3.5  

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( μS/cm )	
0.0	45.75	0.00		81.64	35.89		
0.5	47.90	2.15		78.10	32.35		
1.0	51.10	5.35		76.25	30.50		
1.5	52.64	6.89		75.99	30.24		
2.0	53.90	8.15		75.23	29.48		
2.5	54.98	9.23		74.78	29.03		
3.0	56.00	10.25		73.90	28.15		
3.5	57.10	11.35		72.93	27.18		
4.0	58.25	12.50		71.82	26.07		
4.5	59.35	13.60		71.03	25.28		
5.0	60.43	14.68		69.98	24.23		
6.0	61.45	15.70		67.92	22.17		
7.0	62.52	16.77		67.16	21.41		
8.0	63.45	17.70		66.24	20.49		
9.0	64.30	18.55		65.55	19.80		
10.0	65.10	19.35		64.61	18.86		
12.0	65.20	19.45		63.23	17.48		
14.0	65.35	19.60		62.29	16.54		
16.0	65.45	19.70		61.44	15.69		
18.0	65.45	19.70		61.10	15.35		
20.0	65.46	19.71		60.79	15.04		
25.0	65.46	19.71		59.84	14.09		
30.0	65.50	19.75		59.10	13.35		
35.0	66.00	20.25		58.95	13.20		
40.0	66.55	20.80		58.42	12.67		
45.0	68.19	22.44		58.20	12.45		
50.0	68.40	22.65		57.95	12.20		
55.0	68.47	22.72		57.80	12.05		
60.0	68.50	22.75		57.55	11.80	764	





## Step Drawdown Test (1/2)

Well Code:   D-04  

Site code:   D-04  

Pump on date/hour:   1/9/2006 9:00am  

Site name:   Al Kuob  

Pump off date/hour:   1/9/2006 7:00pm  

District:   Duran  

End of recovery hour:   2/9/2006 1:00am  

Governorate   Dahmar  

S.W.L ( m ):   85.50  

Contractor:   Mabkhout Al-Abraki  

Hydrogeologist:   Abudul Salam Sallam  

Operator:   Kaid Al Abraki  

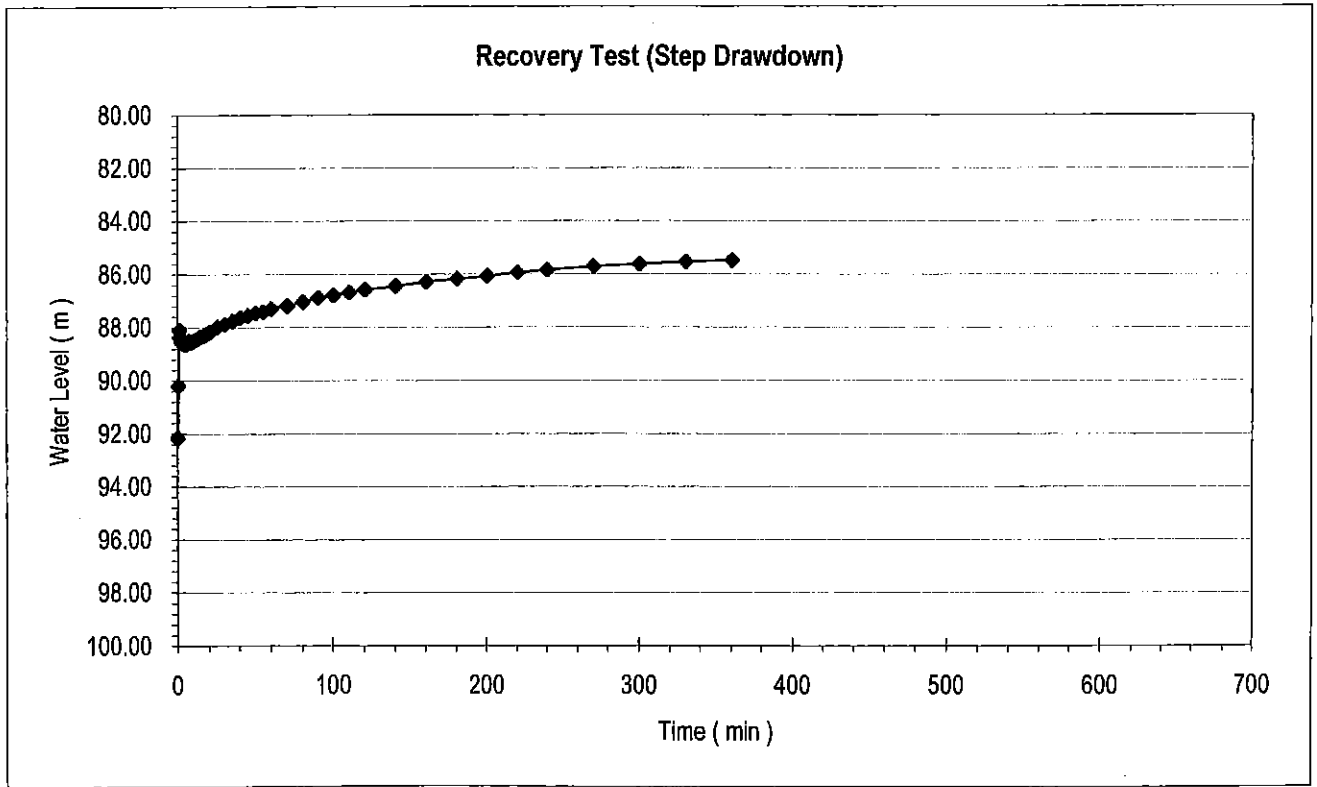
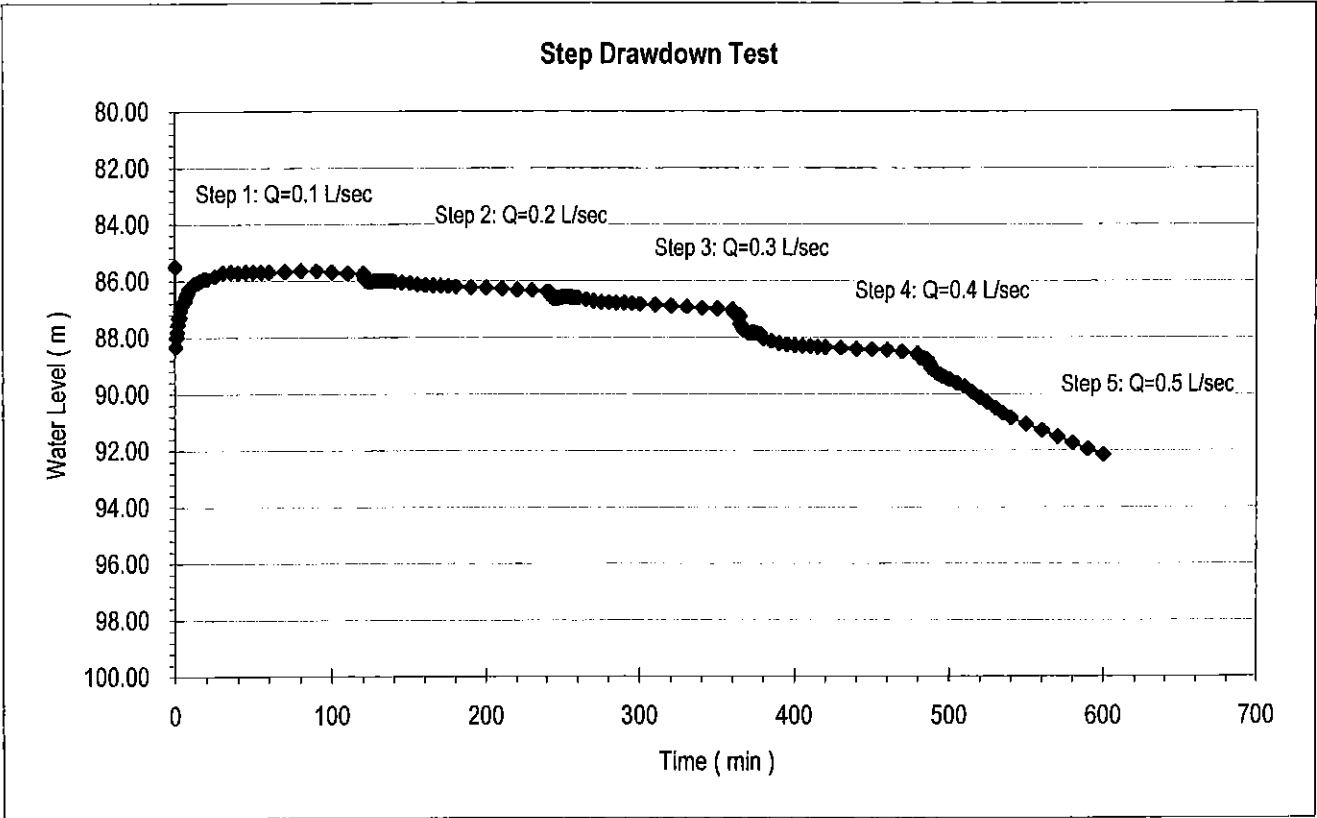
Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	W.L. ( m )	Yield ( l/sec)	
0.0	85.50	0.10	85.75	0.20	86.40	0.30	87.03	0.40	88.58	0.50	92.16
0.5	88.33		85.85		86.41		87.10		88.67		90.20
1.0	88.00		85.95		86.41		87.15		88.70		88.10
1.5	87.82		86.00		86.41		87.18		88.72		88.37
2.0	87.55		86.02		86.45		87.19		88.73		88.50
2.5	87.33		86.02		86.53		87.20		88.74		88.55
3.0	87.28		86.03		86.57		87.20		88.75		88.60
3.5	87.05		86.03		86.62		87.21		88.76		88.60
4.0	86.90		86.04		86.63		87.22		88.76		88.62
4.5	86.84		86.04		86.63		87.28		88.76		88.62
5.0	86.75		86.05		86.63		87.55		88.77		88.62
6.0	86.73		86.02		86.63		87.65		88.78		88.61
7.0	86.55		86.00		86.63		87.75		88.90		88.52
8.0	86.43		86.00		86.62		87.77		89.00		88.57
9.0	86.30		86.00		86.60		87.80		89.13		88.55
10.0	86.23		86.00		86.58		87.85		89.17		88.51
12.0	86.13		86.00		86.57		87.85		89.28		88.45
14.0	86.08		86.00		86.58		87.85		89.33		88.37
16.0	86.00		86.01		86.60		87.87		89.38		88.33
18.0	85.95		86.02		86.61		87.90		89.44		88.26
20.0	85.95		86.04		86.62		88.06		89.49		88.19
25.0	85.85		86.07		86.67		88.15		89.63		88.00
30.0	85.72		86.10		86.72		88.23		89.75		87.90
35.0	85.70		86.14		86.77		88.26		89.95		87.77
40.0	85.72		86.16		86.78		88.29		90.14		87.63
45.0	85.70		86.17		86.79		88.32		90.32		87.56
50.0	85.70		86.19		86.79		88.33		90.50		87.46
55.0	85.70		86.20		86.80		88.35		90.68		87.42
60.0	85.70		86.22		86.82		88.36		90.85		87.31
70.0	85.68		86.24		86.86		88.39		91.08		87.20
80.0	85.65		86.26		86.90		88.42		91.30		87.05
90.0	85.65		86.29		86.94		88.43		91.52		86.90
100.0	85.70		86.33		86.98		88.45		91.74		86.80
110.0	85.75		86.35		87.00		88.51		91.95		86.70
120.0	85.75		86.40		87.03		88.58		92.16		86.60
140.0											86.46
160.0											86.31
180.0											86.20
200.0											86.09
220.0											85.96



# Step Drawdown Test

Well Code: D-04  
 Site Code: D-04  
 S.W.L. : 85.50 m

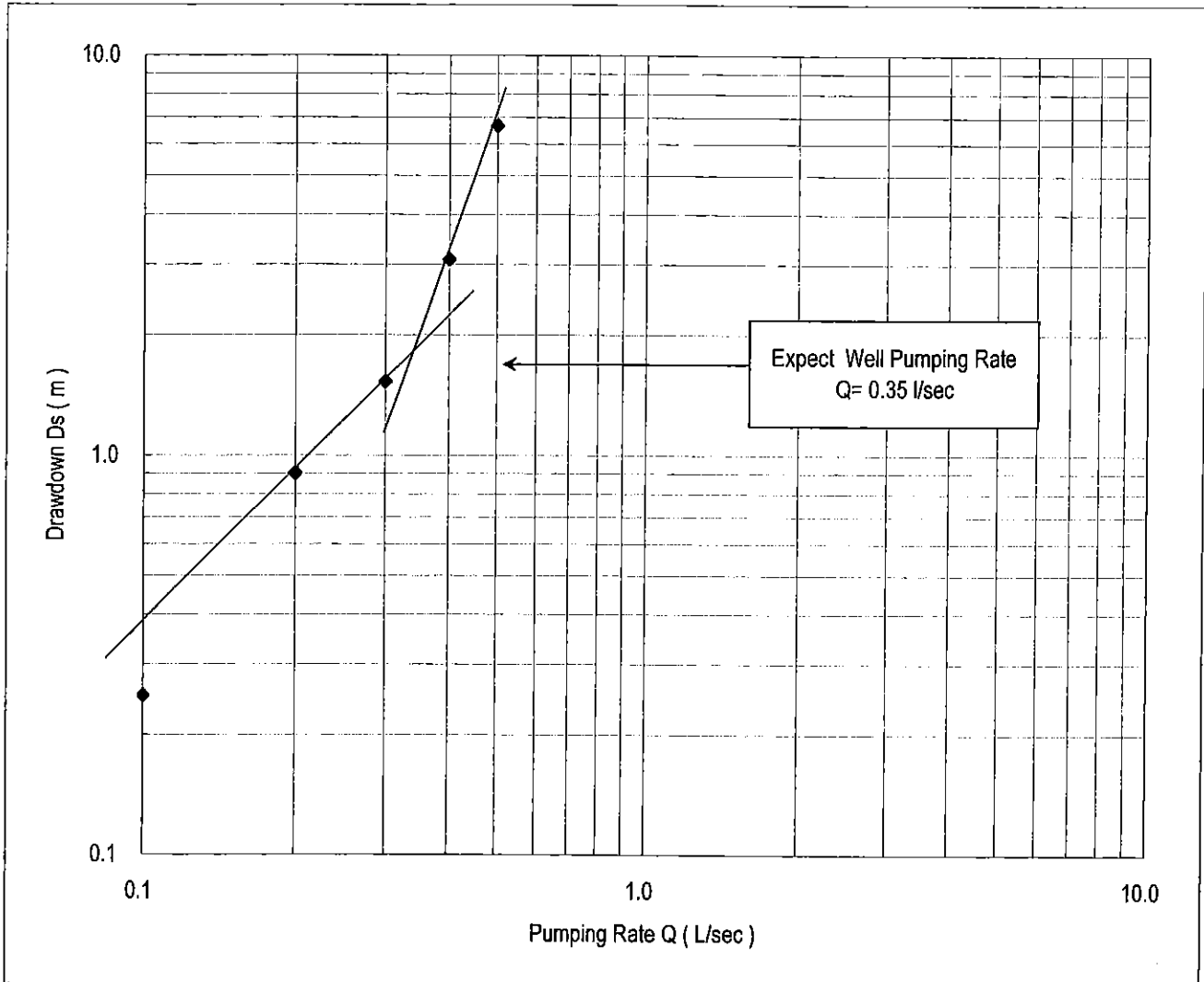
Site Name: Al Kuob



## Step Drawdown Test

Well Code: D-04  
 Site Code: D-04  
 S.W.L. : 85.50 m

Site Name: Al Kuob



Step	Q (l/sec)	D.W.L. (m)	Ds (m)
1	0.1	85.75	0.25
2	0.2	86.40	0.90
3	0.3	87.03	1.53
4	0.4	88.58	3.08
5	0.5	92.16	6.66

## Constant Discharge & Recovery Test (1/2)

Well Code: D-04                      Site code: D-04

Site name: Al Kuob

Pump on date/hour: 2/9/2006 12:00pm

District: Duran

Pump off date/hour: 3/9/2006 12:00pm

Governorate: Dahmar

End of recovery hour: 3/9/2006 11:00pm

Contractor: Mabkhout Al-Abraki

S.W.L ( m ): 85.50

Hydrogeologist: Abudul Salam Sallam

D.W.L ( m ): 92.02

Operator: Kaid Al Abraki

Yield (l/sec): 0.3

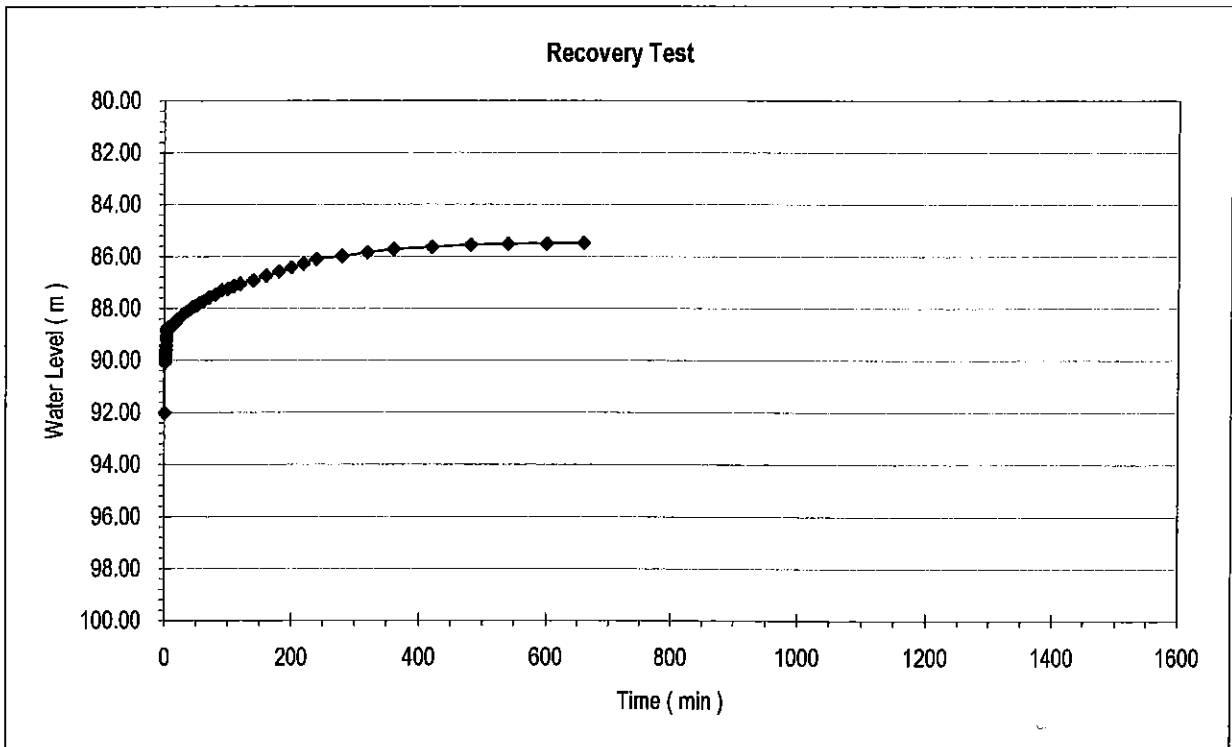
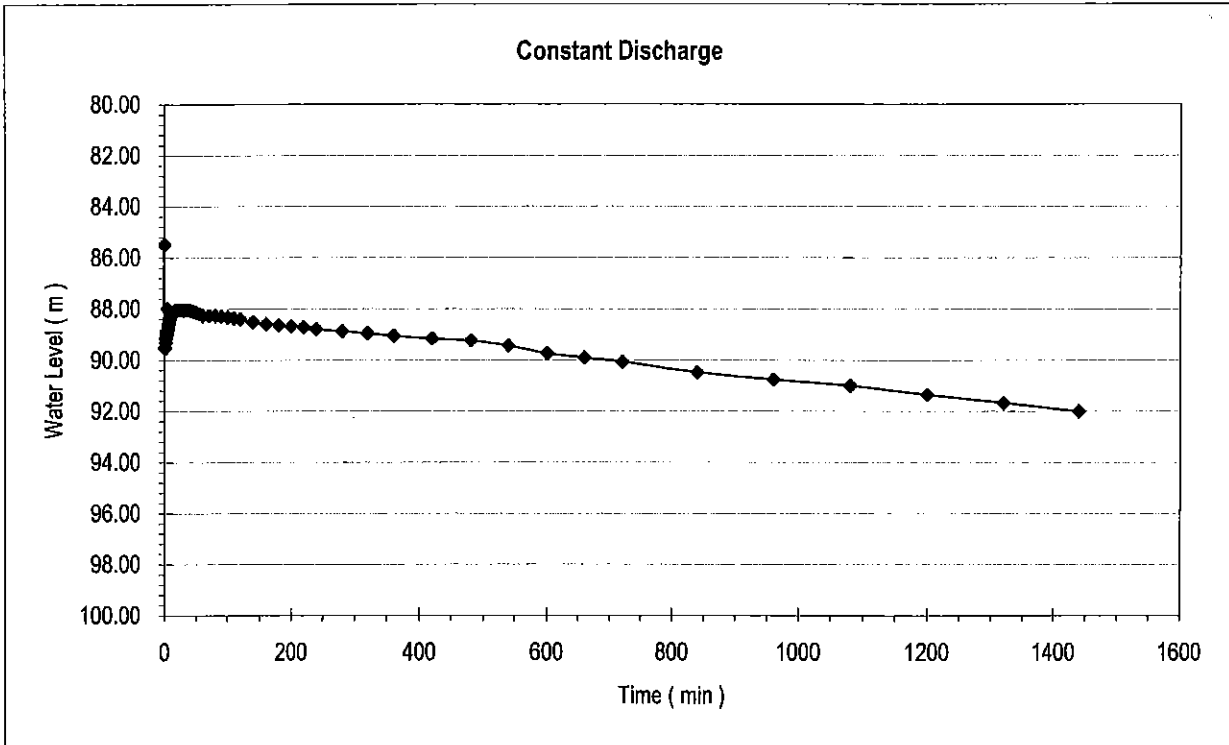
Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	
0.0	85.50	0.00		92.02	6.52		
0.5	89.50	4.00		90.10	4.60		
1.0	89.55	4.05		89.93	4.43		
1.5	89.52	4.02		89.76	4.26		
2.0	89.33	3.83		89.59	4.09		
2.5	89.14	3.64		89.45	3.95		
3.0	89.05	3.55		89.24	3.74		
3.5	89.00	3.50		89.07	3.57		
4.0	88.93	3.43		88.90	3.40		
4.5	88.00	2.50		88.77	3.27		
5.0	88.84	3.34		88.76	3.26		
6.0	88.68	3.18		88.75	3.25		
7.0	88.55	3.05		88.75	3.25		
8.0	88.41	2.91		88.75	3.25		
9.0	88.33	2.83		88.74	3.24		
10.0	88.30	2.80		88.73	3.23		
12.0	88.24	2.74		88.63	3.13		
14.0	88.10	2.60		88.62	3.12		
16.0	88.06	2.56		88.59	3.09		
18.0	88.05	2.55		88.54	3.04		
20.0	88.05	2.55		88.44	2.94		
25.0	88.05	2.55		88.33	2.83		
30.0	88.06	2.56		88.22	2.72		
35.0	88.07	2.57		88.14	2.64		
40.0	88.08	2.58		88.05	2.55		
45.0	88.12	2.62		87.95	2.45		
50.0	88.15	2.65		87.90	2.40		
55.0	88.20	2.70		87.80	2.30		
60.0	88.26	2.76		87.75	2.25		



# Constant Discharge Test

Well Code: D-04  
Site Code: D-04  
S.W.L. (m): 85.50  
Yield (L/sec): 0.3

Site Name Al Kuob  
D.W.L (m): 92.02 Drawdown (m): 6.52



## Pumping Test Report Sheet

Well code: D-05 Site code: D-05 Site name: Maifa'at Yaer  
District: Ans Governorate: Dahmar

Target water source: Existing projected deep well Well depth: 127 m

Contractor: Mabkhout Al-Abraki  
Hydrogeologist in charge: Abudul Salam Sallam  
Operator: Hezan Jameel

Date of start of the test: 23/7/2006 Date of end of the test: 26/7/2006  
Pump type: Vertical pump Engine: Iveco aifo  
Pump installation depth: 96 m Datum level: 0.78 m S.W.L.: G.L.-59.56 m

### Step drawdown test

Date/hour started: 24/7/2006 11:00am Date/hour finished: 25/7/2006 6:00am Total hours: 19:00  
Yield (l/sec) 1<sup>st</sup> step 1.60 2<sup>nd</sup> step 3.20 3<sup>rd</sup> step 4.80 4<sup>th</sup> step 6.40 5<sup>th</sup> step 8.00  
Water level before start the test (G.L.-m): 59.56  
Water level after end of 5<sup>th</sup> step (G.L.-m): 74.12  
Water level after recovery (G.L.-m): 59.56 Recovery hours 9:00

### Constant discharge test

Date/hour started: 25/7/2006 10:35am Date/hour finished: 26/7/2006 9:35pm Total hours: 35:00  
Yield (l/sec) 2.60  
Water level before start of the test (G.L.-m): 59.56  
Water level after end of test (G.L.-m): 62.78  
Water level after recovery (G.L.-m): 59.56 Recovery hours 11:00  
Drawdown (m): 3.22

Revised by:

\_\_\_\_\_  
Name :

Date:





## Step Drawdown Test (1/2)

Well Code:   D-05                        Site code:   D-05    
 Site name:   Maifa'at Yaer    
 District:   Ans    
 Governorate   Dahmar  

Pump on date/hour:   24/7/2006 11:00am    
 Pump off date/hour:   24/7/2006 9:00pm    
 End of recovery hour:   25/7/2006 6:00am    
 S.W.L ( m ):   60.34  

Contractor:   Mabkhout Al-Abraki    
 Hydrogeologist:   Abudul Salam Sallam    
 Operator:   Hezan Jameel  

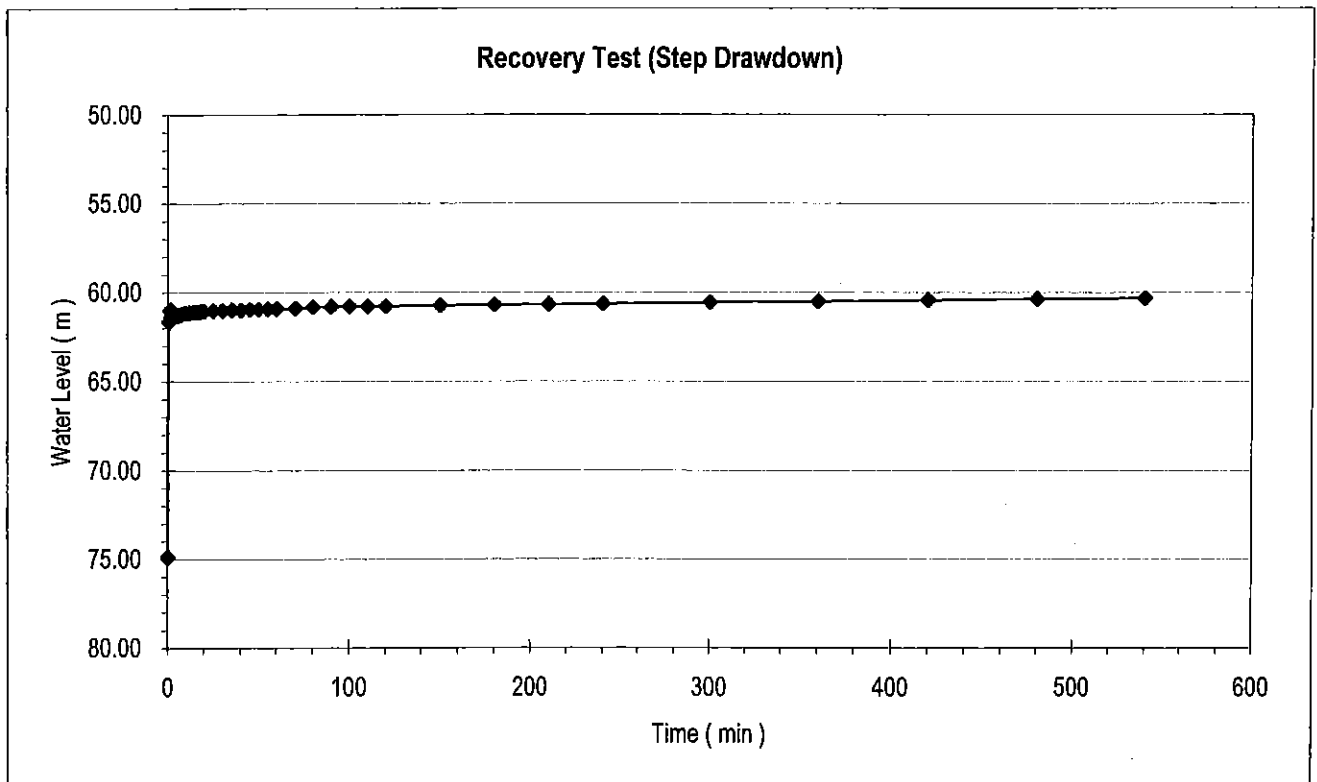
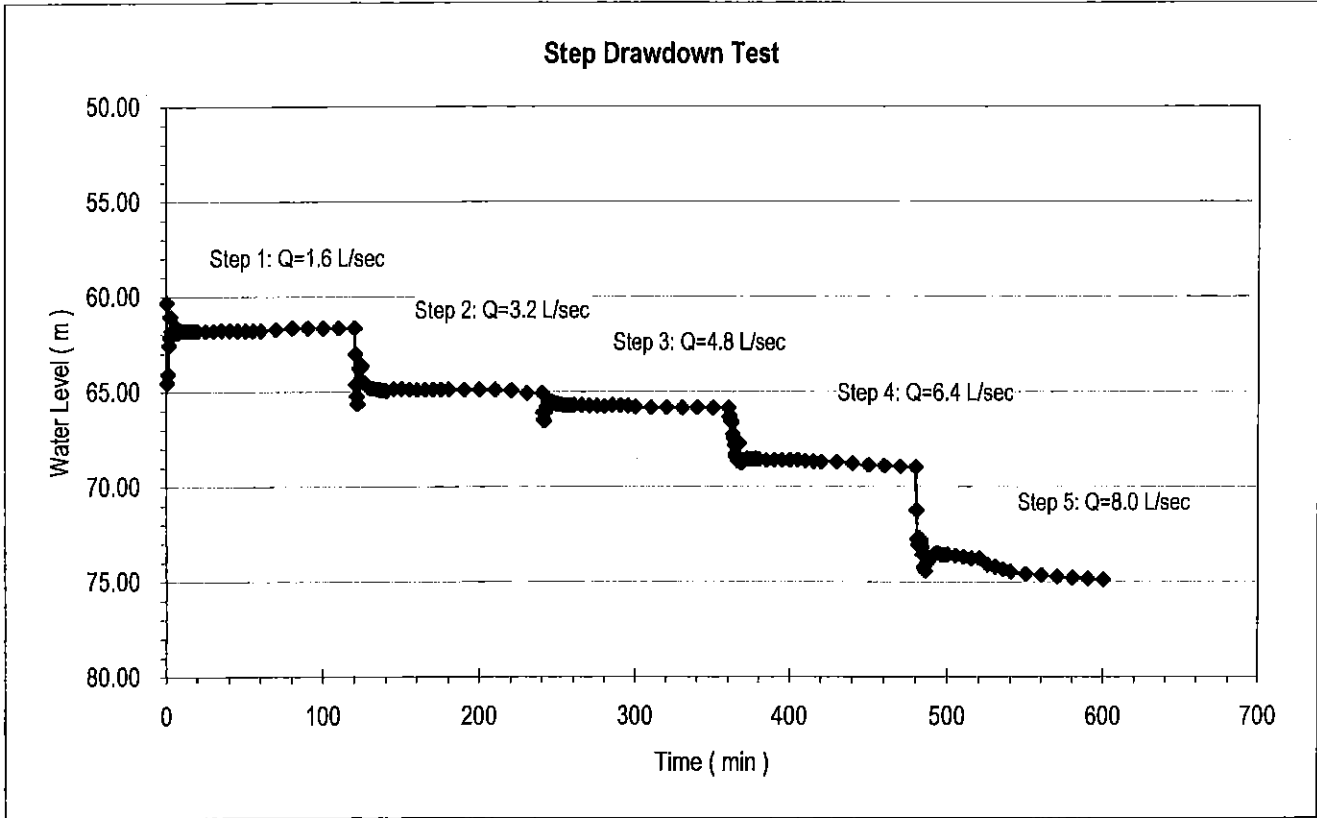
Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	60.34	1.60	61.67	3.20	65.10	4.80	65.86	6.40	68.97	8.00	74.90
0.5	64.54		63.03		66.10		66.34		71.24		61.65
1.0	64.09		64.66		66.48		66.30		72.74		61.00
1.5	62.56		65.26		66.55		66.50		73.06		60.98
2.0	62.16		65.65		66.09		66.59		72.71		61.39
2.5	61.06		64.58		66.05		66.61		72.74		61.45
3.0	61.82		63.78		65.78		67.25		72.75		61.42
3.5	61.80		63.80		65.74		67.48		73.00		61.36
4.0	61.78		63.72		65.48		67.82		73.20		61.33
4.5	61.80		63.62		65.50		68.30		73.59		61.32
5.0	61.77		64.54		65.56		68.44		74.25		61.31
6.0	61.60		64.54		65.53		68.66		74.44		61.30
7.0	61.92		64.62		65.60		67.73		74.04		61.25
8.0	61.85		64.71		65.62		68.76		73.74		61.22
9.0	61.79		64.81		65.66		68.73		73.81		61.19
10.0	61.83		64.82		65.67		68.60		73.66		61.18
12.0	61.80		64.86		65.68		68.55		73.53		61.15
14.0	61.81		64.88		65.73		68.57		73.50		61.13
16.0	61.82		64.93		65.74		68.56		73.59		61.11
18.0	61.80		64.96		65.75		68.53		73.58		61.09
20.0	61.82		64.98		65.74		68.58		73.59		61.08
25.0	61.82		64.88		65.74		68.62		73.63		61.04
30.0	61.83		64.88		65.75		68.59		73.70		61.02
35.0	61.79		64.90		65.77		68.61		73.78		61.00
40.0	61.79		64.92		65.78		68.62		73.77		61.00
45.0	61.81		64.92		65.74		68.60		74.10		60.98
50.0	61.81		64.90		65.75		68.65		74.23		60.97
55.0	61.80		64.90		65.76		68.68		74.36		60.95
60.0	61.80		64.89		65.82		68.69		74.48		60.94
70.0	61.74		64.92		65.85		68.70		74.59		60.92
80.0	61.66		64.91		65.85		68.78		74.66		60.85
90.0	61.68		64.92		65.86		68.86		74.74		60.83
100.0	61.67		64.94		65.85		68.90		74.80		60.80
110.0	61.67		65.09		65.86		68.94		74.85		60.80
120.0	61.67		65.10		65.86		68.97		74.90		60.79
150.0											60.75
180.0											60.72
210.0											60.69
240.0											60.66
300.0											60.58



# Step Drawdown Test

Well Code: D-05  
Site Code: D-05  
S.W.L. : 60.34 m

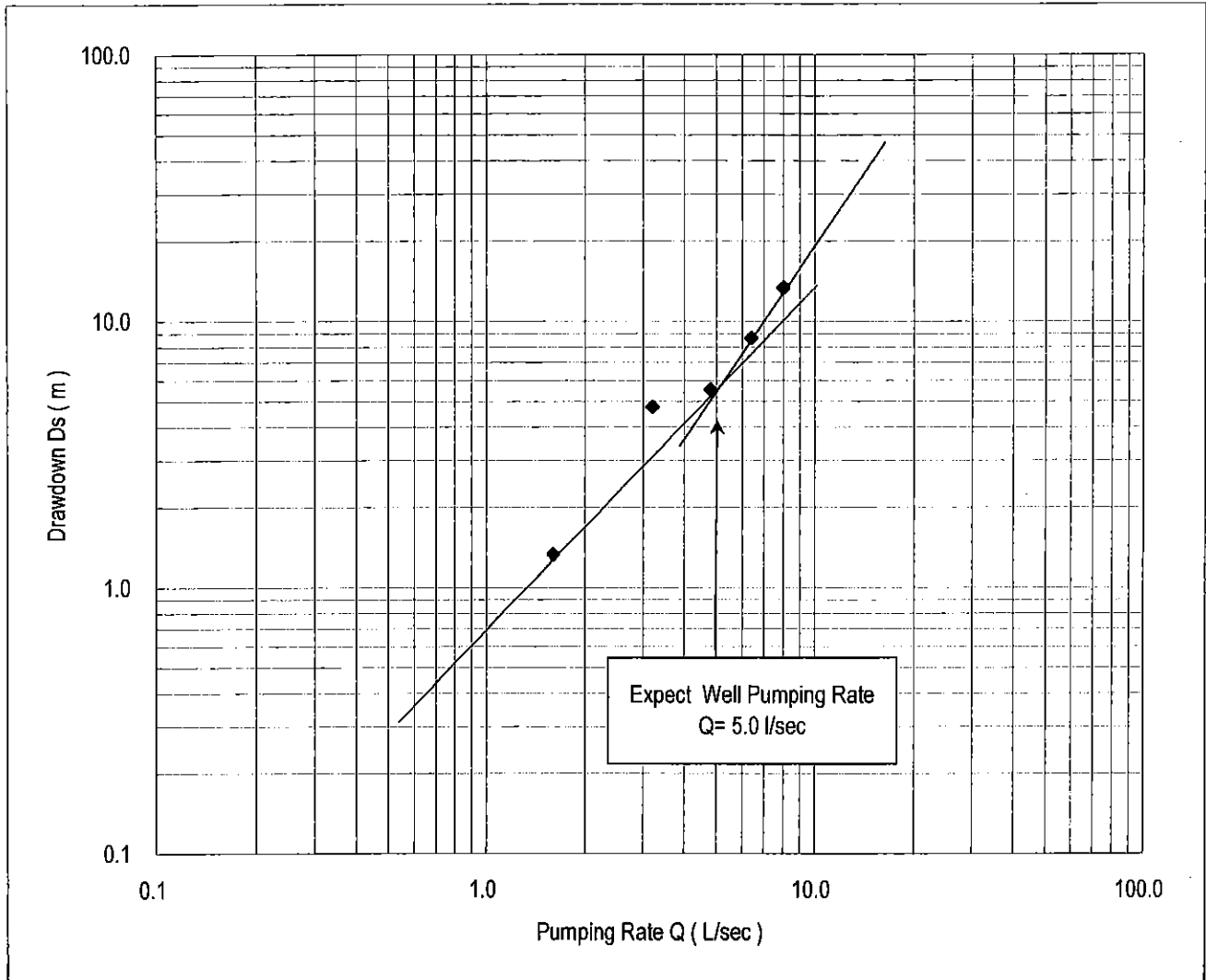
Site Name: Maifa'at Yaer



## Step Drawdown Test

Well Code: D-05  
 Site Code: D-05  
 S.W.L. : 60.34 m

Site Name: Maifa'at Yaer



Step	Q (l/sec)	D.W.L. (m)	Ds (m)
1	1.6	61.67	1.33
2	3.2	65.10	4.76
3	4.8	65.86	5.52
4	6.4	68.97	8.63
5	8.0	73.70	13.36

## Constant Discharge & Recovery Test (1/2)

Well Code:   D-05                        Site code:   D-05  

Site name:   Maifa'at Yaer  

District:   Ans  

Governorate:   Dahmar  

Pump on date/hour:   25/7/2006 10:35am  

Pump off date/hour:   26/7/2006 10:35am  

End of recovery hour:   26/7/2006 9:35pm  

Contractor:   Mabkhout Al-Abraki  

S.W.L ( m ):   60.34  

Hydrogeologist:   Abudul Salam Sallam  

D.W.L ( m ):   63.56  

Operator:   Hezan Jameel  

Yield (l/sec):   2.6  

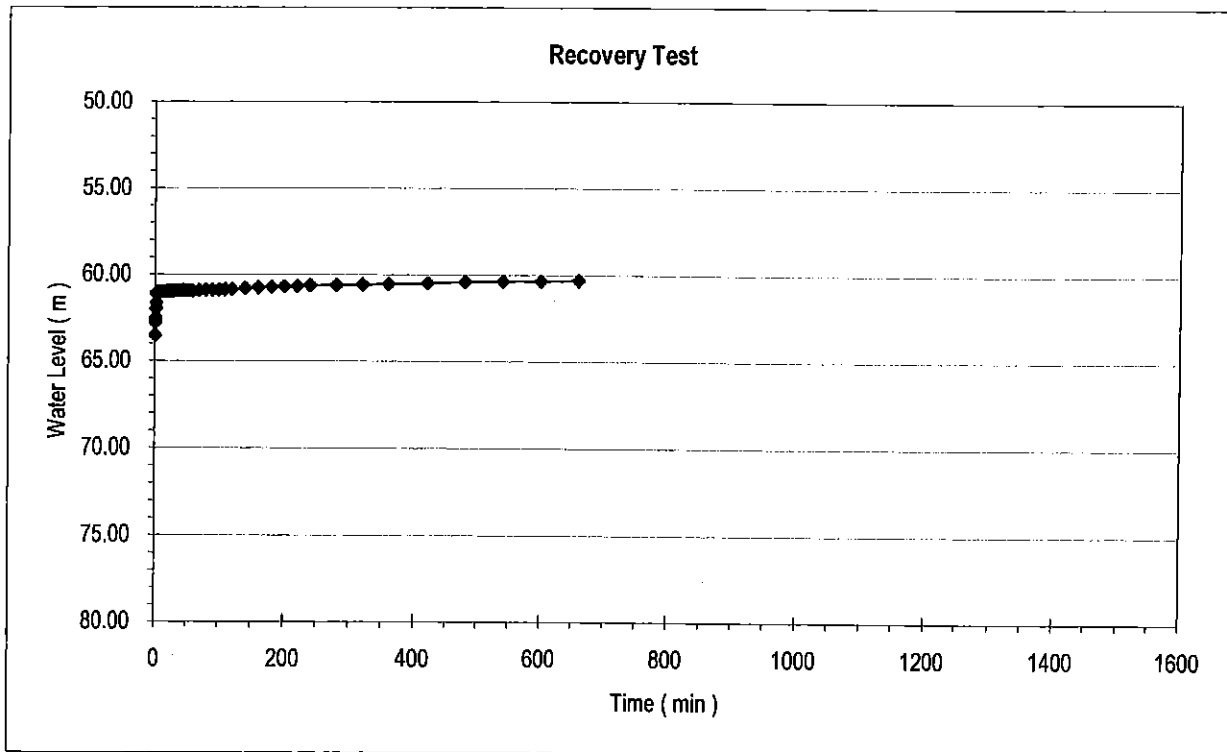
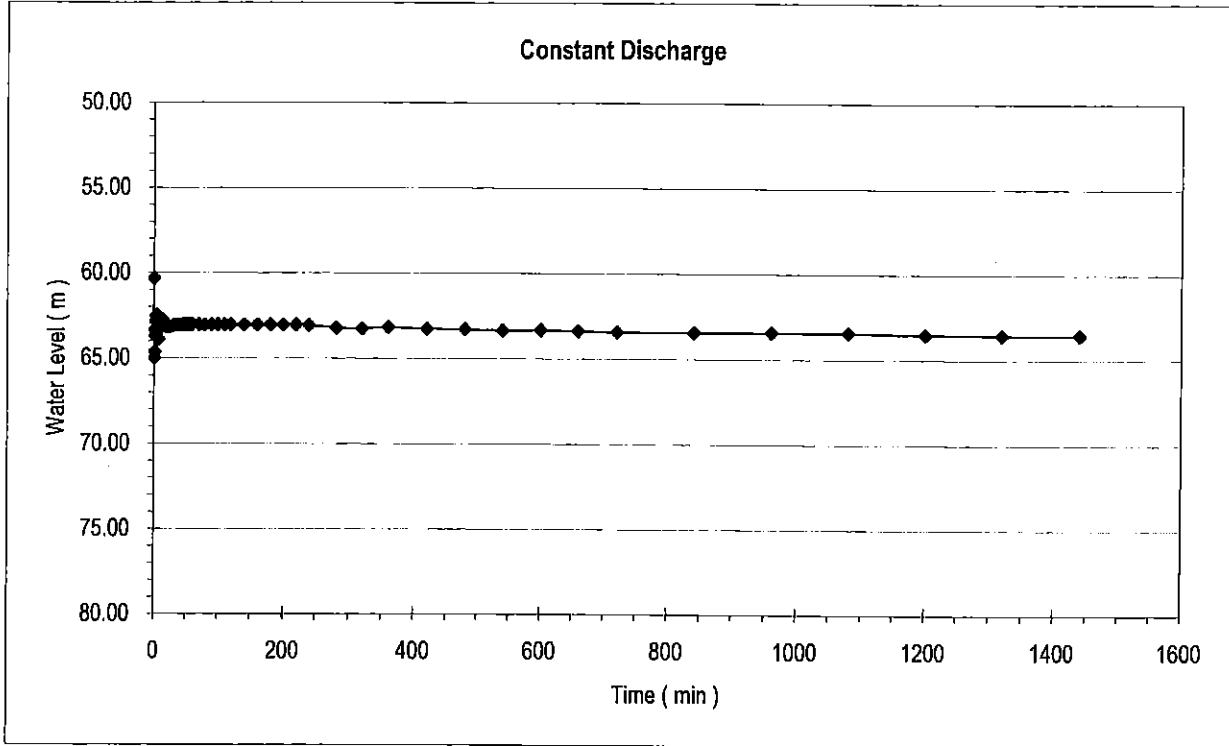
Duration ( min )	Constant Dischrge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity (µS/cm)	
0.0	60.34	0.00		63.56	3.22		
0.5	65.00	4.66		62.80	2.46		
1.0	64.62	4.28		62.54	2.20		
1.5	63.74	3.40		62.00	1.66		
2.0	63.39	3.05		61.65	1.31		
2.5	63.28	2.94		61.17	0.83		
3.0	62.82	2.48		61.16	0.82		
3.5	62.56	2.22		61.05	0.71		
4.0	62.49	2.15		61.04	0.70		
4.5	62.51	2.17		61.04	0.70		
5.0	62.55	2.21		61.04	0.70		
6.0	62.54	2.20		61.04	0.70		
7.0	63.90	3.56		61.04	0.70		
8.0	63.31	2.97		61.04	0.70		
9.0	62.71	2.37		61.03	0.69		
10.0	62.88	2.54		61.03	0.69		
12.0	62.74	2.40		61.03	0.69		
14.0	62.85	2.51		61.02	0.68		
16.0	63.10	2.76		61.02	0.68		
18.0	63.15	2.81		61.00	0.66		
20.0	63.18	2.84		61.00	0.66		
25.0	63.18	2.84		60.99	0.65		
30.0	63.09	2.75		60.99	0.65		
35.0	63.09	2.75		60.98	0.64		
40.0	63.08	2.74		60.98	0.64		
45.0	63.05	2.71		60.97	0.63		
50.0	63.05	2.71		60.97	0.63		
55.0	63.04	2.70		60.96	0.62		
60.0	63.03	2.69		60.96	0.62	594	



# Constant Discharge Test

Well Code: D-05  
Site Code: D-05  
S.W.L. (m): 60.34  
Yield (L/sec): 2.6

Site Name Maifa'at Yaer  
D.W.L (m): 63.56 Drawdown (m): 3.22





## Pumping Test Report Sheet

Well code: D-06 Site code: D-06 Site name: Wardasan  
District: Ans Governorate: Dahmar

Target water source: Existing projected deep well Well depth: 220 m

Contractor: Mabkhout Al-Abraki  
Hydrogeologist in charge: Abudul Salam Sallam  
Operator: Al Raboi

Date of start of the test: 23/7/2006 Date of end of the test: 29/7/2006  
Pump type: Vertical pump Engine: Iveco aifo  
Pump installation depth: 165 m Datum level: 0.80 m S.W.L.: G.L.-89.65 m

### Step drawdown test

Date/hour started: 25/7/2006 4:55pm Date/hour finished: 26/7/2006 3:33pm Total hours: 22:33  
Yield (l/sec) 1<sup>st</sup> step 0.50 2<sup>nd</sup> step 0.70 3<sup>rd</sup> step 0.90 4<sup>th</sup> step 1.10 5<sup>th</sup> step \_\_\_\_\_  
Water level before start the test (G.L.-m): 89.65  
Water level after end of 3<sup>th</sup> step (G.L.-m): 154.76  
Water level after recovery (G.L.-m): 89.65 Recovery hours 16:00

### Constant discharge test

Date/hour started: 26/7/2006 3:50pm Date/hour finished: 28/7/2006 8:50pm Total hours: 53:00  
Yield (l/sec) 0.50  
Water level before start of the test (G.L.-m): 89.65  
Water level after end of test (G.L.-m): 131.90  
Water level after recovery (G.L.-m): 89.65 Recovery hours 29:00  
Drawdown (m): 42.25

Revised by:

\_\_\_\_\_  
Name :

Date:

## Provisional Step Drawdown Test (1/3)

Well Code: D-06 Site code: D-06  
 Site name: Wardasan  
 District: Ans  
 Governorate Dahmar

Pump on date/hour: 23/7/2006 2:00am  
 Pump off date/hour: 23/7/2006 2:42 am  
 End of recovery hour: 23/7/2006 4:42pm  
 S.W.L ( m ): 90.45

Contractor: Mabkhout Al-Abraki  
 Hydrogeologist: Abudul Salam Sallam  
 Operator: Al Raboi

Pump set depth: 156 m

Duration ( min )	1st Step		2nd Step		3rd Step		Recovery			
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	Duration ( min )	W.L. ( m )	Duration ( min )	W.L. ( m )
0.0	90.45	1.30	128.93	2.60			0.0	156.00	420.0	97.75
0.5	99.50		129.92				0.5	145.00	480.0	96.80
1.0	99.87		132.26				1.0	133.50	540.0	95.90
1.5	99.98		130.50				1.5	128.65	600.0	95.10
2.0	100.24		135.60				2.0	127.65	720.0	92.28
2.5	100.60		137.80				2.5	127.40	840.0	90.45
3.0	102.04		139.04				3.0	126.90		
3.5	104.08		140.60				3.5	126.35		
4.0	105.85		141.57				4.0	125.90		
4.5	107.29		142.20				4.5	125.40		
5.0	108.30		143.00				5.0	124.85		
6.0	109.32		143.40				6.0	123.90		
7.0	109.57		144.70				7.0	123.00		
8.0	110.72		148.80				8.0	122.07		
9.0	111.00		151.71				9.0	121.20		
10.0	111.20		154.30				10.0	120.35		
12.0	113.70		156.00				12.0	118.75		
14.0	118.68						14.0	117.30		
16.0	121.18						16.0	115.90		
18.0	121.70						18.0	114.57		
20.0	123.35						20.0	113.30		
22.0	123.85						22.0	112.15		
24.0	124.10						24.0	111.28		
26.0	124.91						26.0	110.15		
28.0	126.90						28.0	109.12		
30.0	128.93						30.0	108.05		
							35.0	107.60		
							40.0	107.20		
							45.0	106.82		
							50.0	106.47		
							55.0	106.14		
							60.0	105.84		
							90.0	104.77		
							120.0	103.82		
							150.0	102.94		
							180.0	102.14		
							240.0	100.94		
							300.0	99.79		
							360.0	98.74		

## Provisional Step Drawdown Test (2/3)

Well Code: D-06                      Site code: D-06  
 Site name: Wardasan  
 District: Ans  
 Governorate Dahmar

Pump on date/hour: 23/7/2006 5:20 pm  
 Pump off date/hour: 23/7/2006 6:06 pm  
 End of recovery hour: 24/7/2006 12:06pm  
 S.W.L ( m ): 90.45

Contractor: Mabkhout Al-Abraki  
 Hydrogeologist: Abudul Salam Sallam  
 Operator: Al Raboi

Pump set depth: 165 m

Duration ( min )	1st Step		2nd Step		3rd Step		Recovery			
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	Duration ( min )	W.L. ( m )	Duration ( min )	W.L. ( m )
0.0	90.45	1.30	128.93	2.60			0.0	162.60	420.0	98.10
0.5	99.60		129.93				0.5	139.30	480.0	97.26
1.0	99.80		132.27				1.0	136.80	540.0	96.46
1.5	99.95		134.47				1.5	134.75	600.0	95.69
2.0	100.22		135.97				2.0	134.12	720.0	94.39
2.5	100.57		137.97				2.5	133.80	840.0	93.20
3.0	102.07		139.00				3.0	133.12	960.0	92.11
3.5	104.08		140.10				3.5	132.55	1080.0	90.45
4.0	105.85		140.60				4.0	131.97		
4.5	107.27		141.55				4.5	131.62		
5.0	108.27		142.20				5.0	131.10		
6.0	109.35		143.38				6.0	130.15		
7.0	110.06		144.70				7.0	129.12		
8.0	110.72		148.70				8.0	128.30		
9.0	111.03		151.74				9.0	127.32		
10.0	111.20		154.30				10.0	126.60		
12.0	113.70		185.00				12.0	124.91		
14.0	118.70		160.90				14.0	123.45		
16.0	121.18		162.60				16.0	122.05		
18.0	121.70						18.0	120.75		
20.0	123.35						20.0	119.51		
22.0	123.85						22.0	118.35		
24.0	124.10						24.0	117.31		
26.0	124.95						26.0	116.23		
28.0	126.90						28.0	115.34		
30.0	128.93						30.0	114.45		
							35.0	112.10		
							40.0	110.70		
							45.0	109.23		
							50.0	107.90		
							55.0	106.75		
							60.0	105.69		
							90.0	104.70		
							120.0	103.77		
							150.0	102.93		
							180.0	102.16		
							240.0	101.03		
							300.0	99.99		
							360.0	99.00		

## Provisional Step Drawdown Test (3/3)

Well Code: D-06

Site code: D-06

Pump on date/hour: 24/7/2006 3:15pm

Site name: Wardasan

Pump off date/hour: 24/7/2006 4:48pm

District: Ans

End of recovery hour: 25/7/2006 4:48pm

Governorate Dahmar

S.W.L ( m ): 90.45

Contractor: Mabkhout Al-Abraki

Hydrogeologist: Abudul Salam Sallam

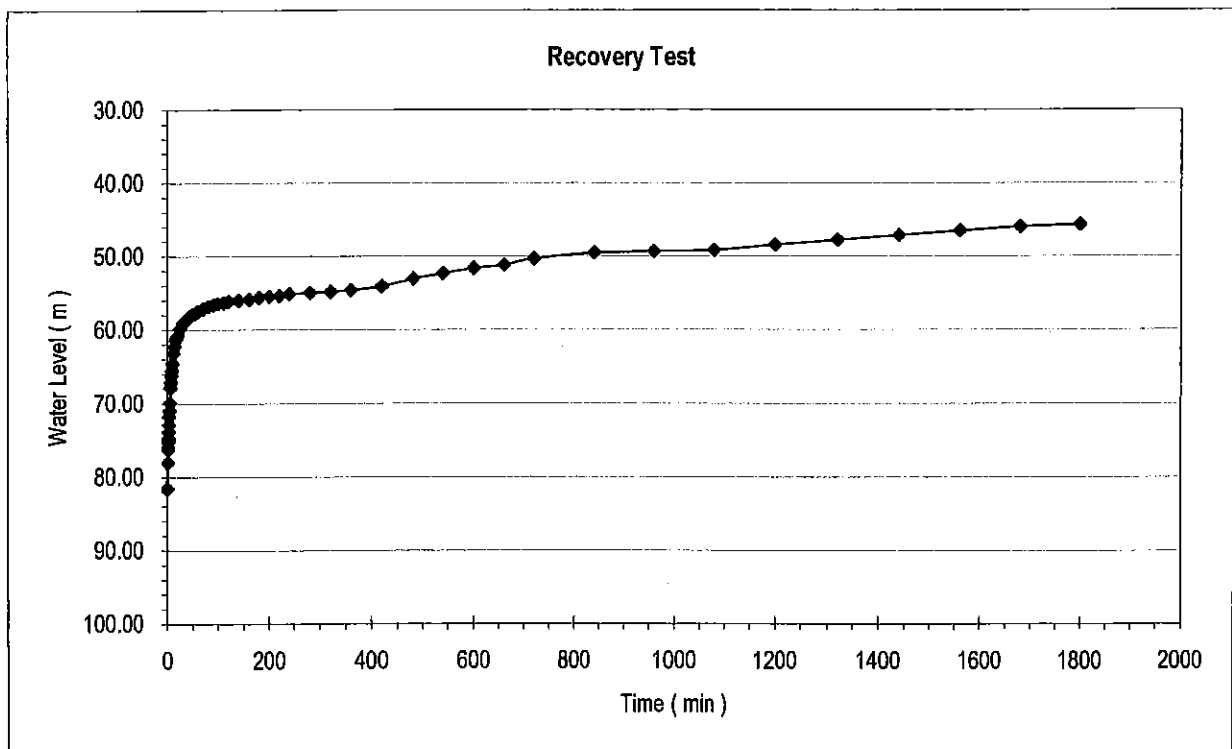
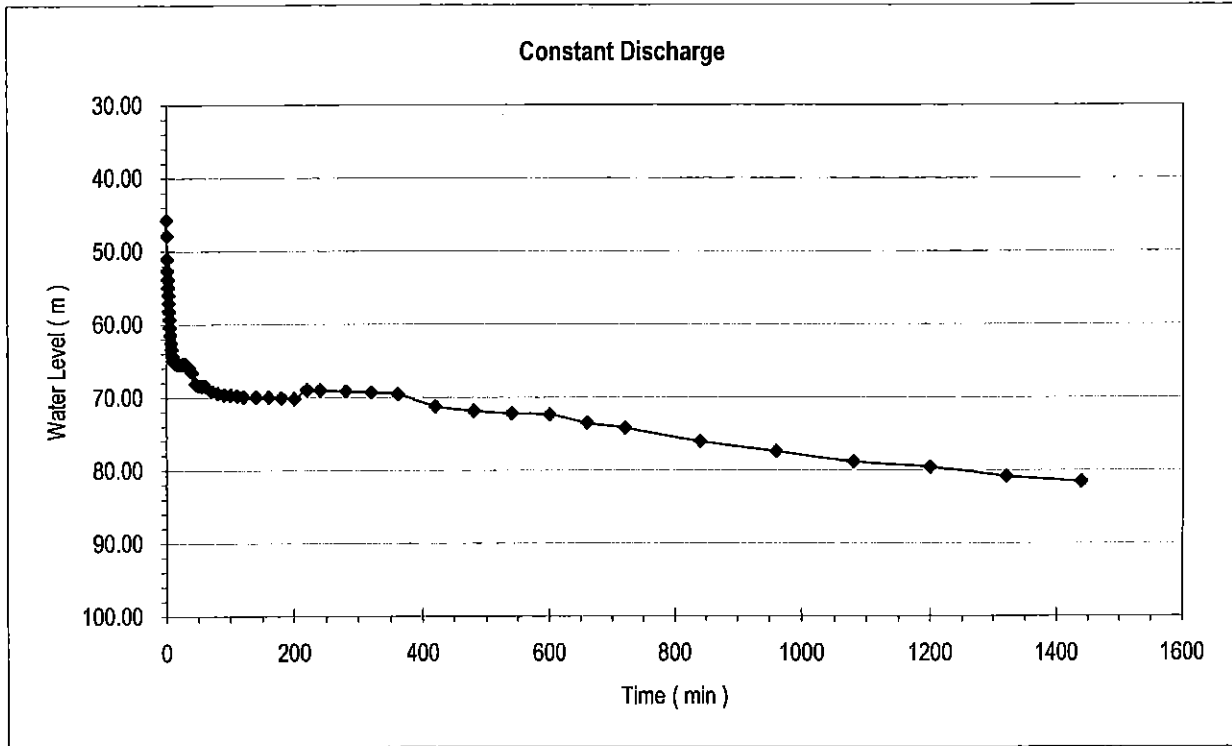
Operator: Al Raboi

Duration ( min )	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery ( m )
	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	W.L. ( m )	Yield ( l/sec )	
0.0	90.45	0.50	118.62	1.00	134.14	1.50	155.67	2.00			162.00
0.5	116.00		118.80		134.72		156.12				146.35
1.0	116.17		118.93		153.27		157.75				138.60
1.5	116.20		118.95		153.73		158.47				135.25
2.0	116.27		119.00		136.15		159.66				134.90
2.5	116.34		119.30		136.56		160.90				134.62
3.0	116.42		119.60		136.83		161.77				134.25
3.5	116.55		120.54		137.47		162.00				133.90
4.0	116.72		121.57		137.87						133.65
4.5	116.83		121.87		138.53						133.40
5.0	116.95		122.33		139.37						133.10
6.0	117.14		122.84		140.50						132.58
7.0	117.22		123.15		141.42						132.03
8.0	117.30		123.20		142.00						131.52
9.0	117.30		123.30		142.50						131.00
10.0	117.40		123.50		143.70						130.53
12.0	117.54		125.93		149.43						129.56
14.0	117.62		127.20		146.33						128.69
16.0	118.15		127.80		147.75						127.75
18.0	118.35		128.18		148.54						126.90
20.0	118.60		129.00		149.15						126.00
22.0	118.55		132.18		149.97						125.15
24.0	118.50		133.12		152.73						124.30
26.0	118.55		133.67		153.80						123.58
28.0	118.60		133.90		154.40						122.80
30.0	118.62		134.14		155.67						122.00
60.0											120.60
90.0											119.31
120.0											118.09
180.0											115.84
240.0											113.05
300.0											111.38
420.0											108.17
540.0											105.20
660.0											102.14
780.0											99.03
900.0											95.38
1200.0											92.10
1440.0											90.45

# Constant Discharge Test

Well Code: S-03  
Site Code: S-03  
S.W.L. (m): 45.75  
Yield (L/sec): 3.5

Site Name Al Kharaba  
D.W.L. (m): 81.64      Drawdown (m): 35.89



## Pumping Test Report Sheet

Well code: S-04 Site code: S-04 Site name: Qamlan-Bait Al Najrani  
District: Bani Matar Governorate: Sana'a

Target water source: Existing projected deep well Well depth: 145 m

Contractor: Mabkhout Al-Abraki  
Hydrogeologist in charge: Abudul Salam Sallam  
Operator: Al Raboi

Date of start of the test: 11/8/2006 Date of end of the test: 14/8/2006  
Pump type: Vertical pump Engine: Iveco aifo  
Pump installation depth: 105 m Datum level: 1.19 m S.W.L.: G.L.- 10.01 m

### Step drawdown test

Date/hour started: 11/8/2006 4:35pm Date/hour finished: 12/8/2006 11:35am Total hours: 19:00  
Yield (l/sec) 1<sup>st</sup> step 1.40 2<sup>nd</sup> step 2.80 3<sup>rd</sup> step 4.20 4<sup>th</sup> step 5.60 5<sup>th</sup> step 7.00  
Water level before start the test (G.L.-m): 10.01  
Water level after end of 5<sup>th</sup> step (G.L.-m): 10.90  
Water level after recovery (G.L.-m): 10.01 Recovery hours 9:00

### Constant discharge test

Date/hour started: 12/8/2006 2:10pm Date/hour finished: 14/8/2006 2:10am Total hours: 36:00  
Yield (l/sec) 5.60  
Water level before start of the test (G.L.-m): 10.01  
Water level after end of test (G.L.-m): 10.92  
Water level after recovery (G.L.-m): 10.01 Recovery hours 12:00  
Drawdown (m): 0.91

Revised by:

\_\_\_\_\_  
Name :

Date:



## Step Drawdown Test (1/2)

Well Code: S-04 Site code: S-04

Pump on date/hour: 11/8/2006 4:35pm

Site name: Qamlan-Bait Al Najrani

Pump off date/hour: 12/8/2006 2:35am

District: Bani Matar

End of recovery hour: 12/8/2006 11:35am

Governorate Sana'a

S.W.L (m): 11.20

Contractor: Mabkhout Al-Abraki

Hydrogeologist: Abudul Salam Sallam

Operator: Al Raboi

Duration (min)	1st Step		2nd Step		3rd Step		4th Step		5th Step		Recovery (m)
	W.L. (m)	Yield (l/sec)	W.L. (m)	Yield (l/sec)	W.L. (m)	Yield (l/sec)	W.L. (m)	Yield (l/sec)	W.L. (m)	Yield (l/sec)	
0.0	11.20	1.40	11.28	2.80	11.44	4.20	11.66	5.60	11.90	7.00	12.09
0.5	11.47		11.39		11.49		11.66		11.90		11.76
1.0	11.45		11.36		11.50		11.67		11.91		11.58
1.5	11.44		11.38		11.50		11.68		11.91		11.56
2.0	11.34		11.38		11.51		11.70		11.92		11.54
2.5	11.28		11.38		11.52		11.70		11.92		11.52
3.0	11.29		11.39		11.53		11.71		11.93		11.51
3.5	11.28		11.39		11.54		11.71		11.93		11.51
4.0	11.27		11.39		11.53		11.74		11.93		11.50
4.5	11.27		11.39		11.54		11.74		11.93		11.50
5.0	11.25		11.40		11.55		11.75		11.94		11.49
6.0	11.27		11.40		11.56		11.75		11.98		11.49
7.0	11.28		11.38		11.57		11.76		11.99		11.47
8.0	11.28		11.38		11.56		11.76		11.99		11.47
9.0	11.28		11.39		11.57		11.77		11.99		11.46
10.0	11.25		11.39		11.56		11.77		11.99		11.45
12.0	11.25		11.39		11.57		11.77		12.00		11.44
14.0	11.25		11.39		11.58		11.82		12.01		11.44
16.0	11.27		11.40		11.58		11.83		12.01		11.42
18.0	11.27		11.40		11.58		11.84		12.01		11.42
20.0	11.26		11.40		11.58		11.84		12.01		11.41
25.0	11.27		11.40		11.59		11.85		12.02		11.41
30.0	11.26		11.40		11.60		11.84		12.04		11.40
35.0	11.26		11.41		11.61		11.84		12.05		11.40
40.0	11.26		11.41		11.61		11.84		12.04		11.38
45.0	11.26		11.41		11.62		11.85		12.05		11.37
50.0	11.27		11.41		11.62		11.85		12.05		11.37
55.0	11.27		11.41		11.62		11.85		12.06		11.36
60.0	11.27		11.42		11.63		11.85		12.06		11.36
70.0	11.27		11.42		11.63		11.85		12.07		11.35
80.0	11.28		11.43		11.64		11.86		12.07		11.35
90.0	11.28		11.43		11.64		11.87		12.08		11.34
100.0	11.28		11.44		11.65		11.88		12.08		11.34
110.0	11.28		11.44		11.65		11.89		12.09		11.33
120.0	11.28		11.44		11.66		11.90		12.09		11.33
150.0											11.32
180.0											11.31
210.0											11.30
240.0											11.29
300.0											11.27

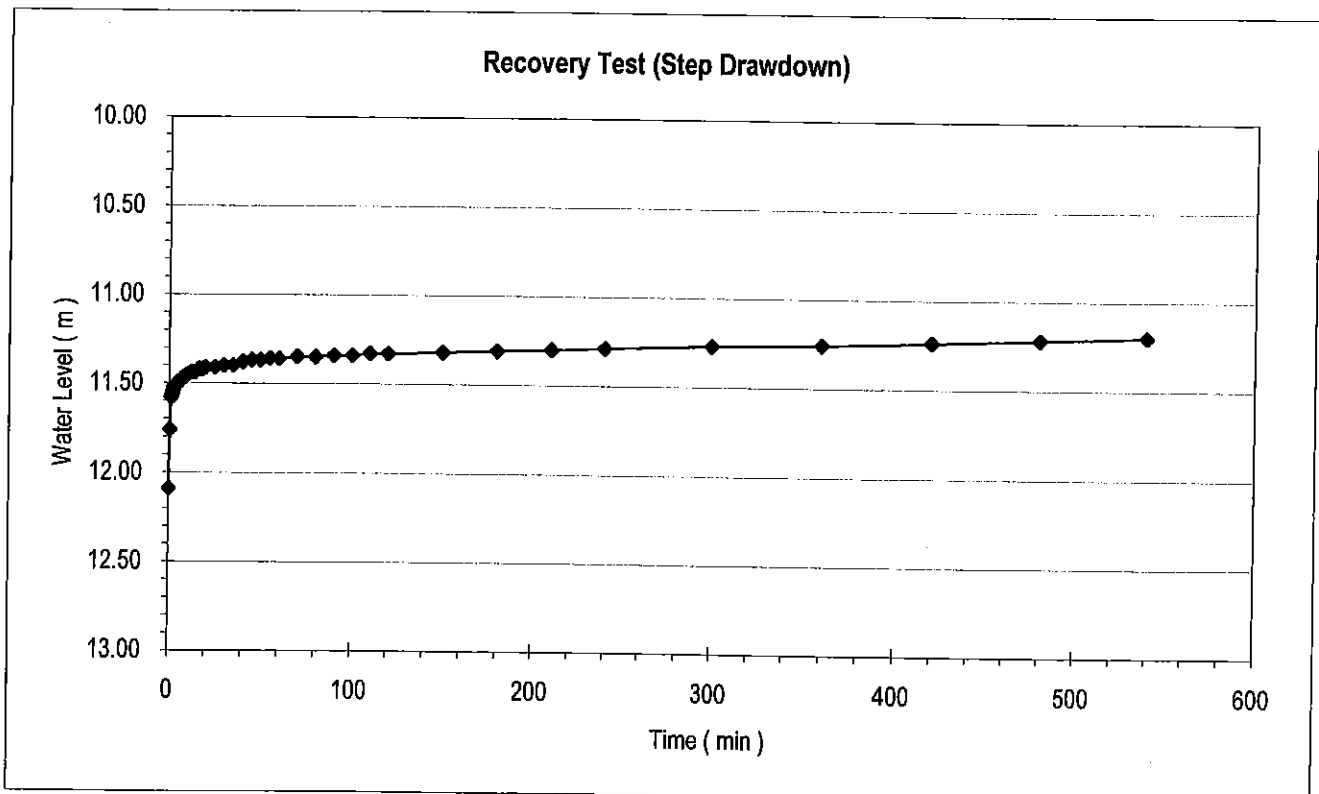
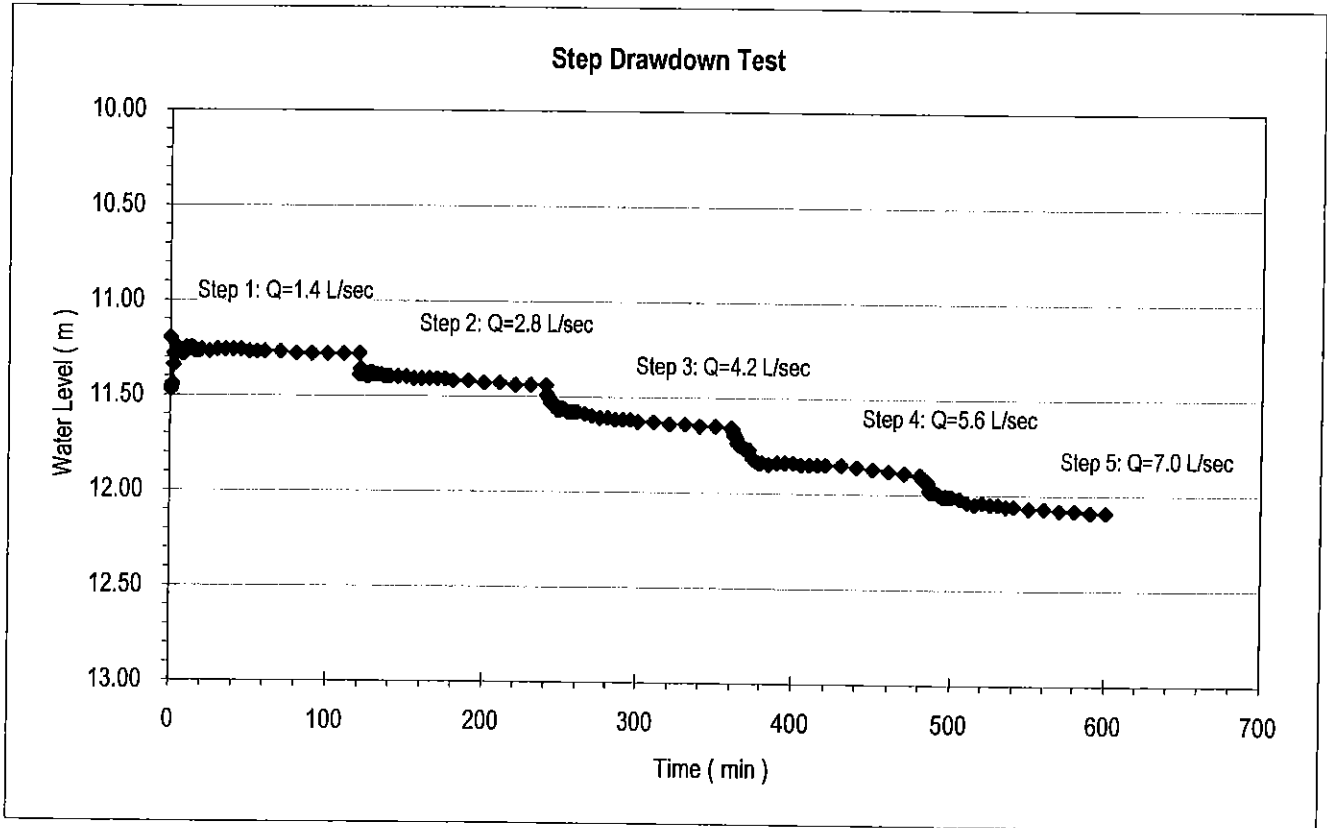




# Step Drawdown Test

Well Code: S-04  
Site Code: S-04  
S.W.L. : 11.20 m

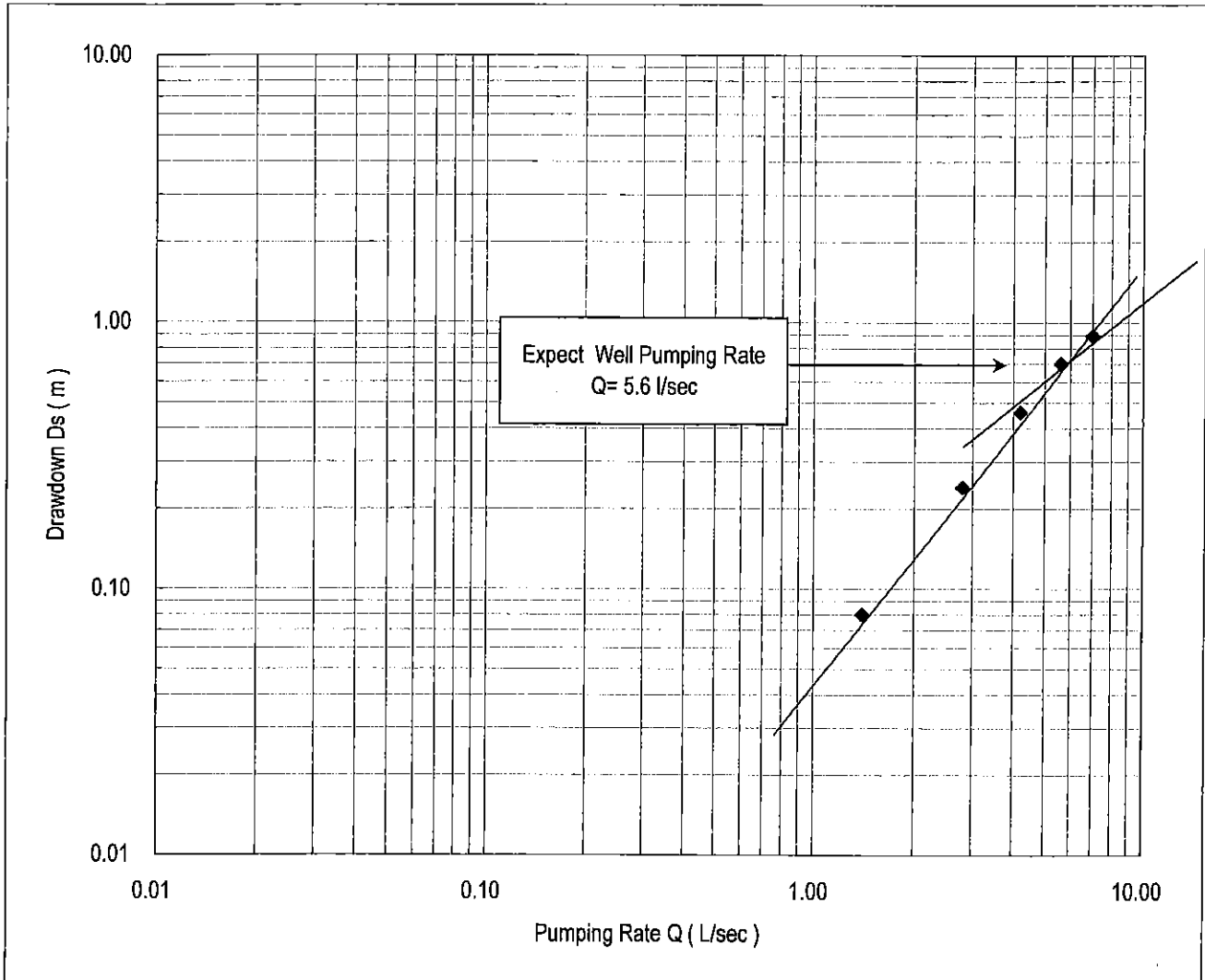
Site Name: Qamlan-Bait Al Najrani



# Step Drawdown Test

Well Code: S-04  
 Site Code: S-04  
 S.W.L. : 11.20 m

Site Name: Qamlan-Bait Al Najrani



Step	$Q$ (l/sec)	D.W.L.(m)	$D_s$ (m)
1	1.4	11.28	0.08
2	2.8	11.44	0.24
3	4.2	11.66	0.46
4	5.6	11.90	0.70
5	7.0	12.09	0.89

## Constant Discharge & Recovery Test (1/2)

Well Code:   S-04   Site code:   S-04  

Site name:   Qamlan-Bait Al Najrani  

Pump on date/hour:   12/8/2006 2:10pm  

District:   Bani Matar  

Pump off date/hour:   13/8/2006 2:10pm  

Governorate:   Sana'a  

End of recovery hour:   14/8/2006 2:10am  

Contractor:   Mabkhout Al-Abraki  

S.W.L ( m ):   11.20  

Hydrogeologist:   Abudul Salam Sallam  

D.W.L ( m ):   12.11  

Operator:   Al Raboi  

Yield (l/sec):   5.6  

Duration ( min )	Constant Discharge Test			Recovery Test		Water Analysis	Remarks
	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( μS/cm )	
0.0	11.20	0.00		12.11	0.91		
0.5	11.60	0.40		11.87	0.67		
1.0	11.54	0.34		11.78	0.58		
1.5	11.56	0.36		11.73	0.53		
2.0	11.63	0.43		11.80	0.60		
2.5	11.62	0.42		11.82	0.62		
3.0	11.65	0.45		11.79	0.59		
3.5	11.72	0.52		11.77	0.57		
4.0	11.70	0.50		11.75	0.55		
4.5	11.69	0.49		11.70	0.50		
5.0	11.70	0.50		11.68	0.48		
6.0	11.70	0.50		11.68	0.48		
7.0	11.70	0.50		11.68	0.48		
8.0	11.69	0.49		11.67	0.47		
9.0	11.69	0.49		11.67	0.47		
10.0	11.70	0.50		11.66	0.46		
12.0	11.70	0.50		11.66	0.46		
14.0	11.71	0.51		11.65	0.45		
16.0	11.72	0.52		11.64	0.44		
18.0	11.72	0.52		11.64	0.44		
20.0	11.73	0.53		11.63	0.43		
25.0	11.75	0.55		11.63	0.43		
30.0	11.76	0.56		11.63	0.43		
35.0	11.77	0.57		11.62	0.42		
40.0	11.78	0.58		11.62	0.42		
45.0	11.79	0.59		11.61	0.41		
50.0	11.79	0.59		11.61	0.41		
55.0	11.80	0.60		11.60	0.40		
60.0	11.81	0.61		11.58	0.38	426	



## Constant Discharge Test

Well Code: S-04  
Site Code: S-04  
S.W.L. (m): 11.20  
Yield (L/sec): 5.6

Site Name Qamlan-Bait Al Najrani  
D.W.L. (m): 12.11 Drawdown (m): 0.91

