Holc No.			M98-14					Stage:			35/36				Hc	Hole No.:		M98-14	4	
Location:		Jam Av	Dam Axis (Left Bank)	Bank)			ы	Dia. of Hole <u>.</u>	010:		76	m/m			3	Location:	Dam	Dam Axis (Left Bank)	sft Bank	
Hole Inclination (a):	inutio	(i)	1		6	90 degrees	-	Packer Type:	, A	Pnc	Pneumatic			I	H	le Inclin	Hole Inclination (a):			90 Jeg
Friction Loss per meter (pr) : 1×10 ⁴ ×0 ¹⁻⁰¹	d ssor	r mele	ا. §	1×10 ⁴	×0		ч	Date :		14/Au	14/August/1999	0		I	μ. Γ.	ction Lo	Friction Loss per meter (p): 1×10 ⁻⁵ ×0 ¹⁻¹¹¹	cter (pr)	: 1×10	×° ×
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	ç	Hele Inclination (a):	Friction Loss per meter (p.) :	Ground elevation : EL.	Pipe length from pressure gauge to	boreboic mouth: (L_)=		701	-		5714	572.4	77.4	e E	N L			57.4	572.4						3		18	\$ 9	80	Friction Loss (P+) = p(Lo + Lo) [kgt/cm2]			Injection	
Hole No.:	Location:	Hole Ir	Frictio	Ground	Pipe ku	boreboie		Onugn P.	(trof/cm))	Man Fait		3	~	4	~	•	1	6	ا ^ع	11	12	5	4	15	Total	1	i eia/ii	1	Ê	Friction		Remarks :	Note :	

Water Pressure Test	8-15 Stage: 1/20	(Letit Bank) Dia. of Hole: 76 m/m	90 depress Packer Type: Mechanical, single	p): 1×10 ¹ ×0 ²⁷¹ Date: 4-Jul-99	Groundwater level (La): 4.5 m Gaug	Depth of test section Length o	00 m G(L_)= 2 m to(L_)= 7 m] 5.00 m		7 Pect Pro5 Poo Poo 1 Poo Proto 1 (sinder) - Profeer 21. 0=0-1.1 [14/min/m]	-													Q.4 Q.5 Q.6 Q.7	Water Iniection Ratio (a : Iii./min/m)) [kg/cm2] w Lugcon value : (68) Lu'	A Critical Pressure:		Injection of water should be continued for at kas 10 minutes under the specified pressure, after the injection rate per minute settles within 90 % to 110 % of the injection rate in the just previous one minute	Inspected by :
Wat	M98-15	Dam Axis (Left Bank)		Friction Loss per meter (p): 1×10 ⁺ ×0 ¹⁷¹¹	451.253 00	Pipe length from gauge to hole mouth	3.90 =	Reading of flow meter	1		ļĮ		KS8	ł							0.0	3	0.3 Q4 Q5	157.4	1 7.20 V.10	(1) vi = (1		- -	ni of water should be continued for at k within 90 % to 110 % of the injection ra	A. Hameed
-	Hole No.:	Location:	Hole Inclination (a):	Friction Low	Ground elevation : EL-	Pipe length from	bowhole month: (L_)=		Compo F. Pol	Serv terres 8: 10	0(min) 218		4		\square	8 904	-	10 1,188		4	+		t	<u>°</u>		Friction Loss (7			Note : Injectio	Prepared by :

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Hole No.:	ä		M98-15	2				Stage:			2/20			
Location:	끋	Dam	Dam Axis (Left Bank)	cit Ban	3			Dia. of Hole:	oje: I		76	E/E		
Hole Inclination (a):	clinati	ion (a):			8	90 degrees		Packer Type:	;; ,	Mech	Mechanical, single	single		
Friction Loss per meter (p) : 1×10 ⁵ ×Q ¹⁹⁷¹	Loss L	per me	ter (pı)	1×1	0, ×0	.16		Date :		29-/	29-Aug-99			
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Friction	a Loss	per mel	ler (p.)	: 1×10	Friction Loss per meter (p): 1×10° × 0 ¹⁺¹¹	-	-	Date :		8/July/1999			I
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Friction	Pose (Pr	-0.6	Friction Loss (Pr) = Pr(Lo + Lo) [kg/cm2]	ck1/cm2		1	F	Ľur	Lugcon value :	: 5.2	.3		
		-			1	5	3	Ü	Critical Pressure:		kgl/cm2		-
Remarks :													
Note :	settles v	a of wah vithin 90	er sbould	0 % of th	uueu lor w jujectik	AT KAN	the just	layection of water soould be continued for at teast to manules under the specificate settles within 90 % to 110 % of the injection rate in the just previous one munite	e minute		lujection of water sbould be continued for at Ras to manules under the spectate pressure, aner use apection rate per manue settles within 90 % to 110 % of the injection rate in the just previous one minute		5
Prepar	Prepared by :		A. Hamced					Inspected by	: vd				
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Hole No.:	.,		M98-15	S				Stage:	5 / 20	
Location:	بر	o⊒m ⊿	vis (L	Dam Axis (Leti Bank)	5		-	Dia. of Hole:	76 m/m	
Ĕ	linati	Hole Inclination (a):			8	90 degrees		Packer Type:	Mechanical, single	le
ion	soj	per mei	ler (p.)	Friction Loss per meter (p.) : 1×10 ⁵ ×0 ¹⁺¹¹	ų, č	i.		Date :	2-Sep-99	
10	Ground elevation : FL.		451,253 m	8	Cronind	water ker	Groundwater level (La):	22.5 m	Gauge beight (La):): 1.06 m
l a	h from	pressed for	Pipe length from pressure gauge to	2		u	This of I	est section	Length of section (La)	ction (La)
ŝ	mouth:	borrbole mouth: (La)=	4.10 m	8	CIL - (LL)=	-	20 m	ю (Ls) == 25 ш		e Q
1		Reg	ding of	Reading of flow meter	actor			Calcul	Calculation of Lugeon value	lue
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lie/man	9.0 0	62.4	5 X2	102.5	97.6	71.6	12.7	0	10 15	8 8
	11:40	11:51	12:02	12-15	12:26	12:17			Water Investion Ratio (q : lit/miu/m)	(mia/m)
-	200	1	L			1.09	100			
15]€ ∦	r])-d = (Friction Loss (Pv) = pr(La + Ls) [kgf/cm2]	cg0/cm2]		4	3	 Lugeon value : 	ន	
						i	1.	Critical Pressure:	e: >10 kµf/cm2	72
Remarks :										
Noke: la	le cuinos	of wak	r sbouid	he contri	uned for	al Kast	10 minut	lajection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per numute	ressure, after the injection	op rate per auoute
i	100	8			- in activ		2			-

Hole No.:	::		M98-15	S				Stage:	6 / 20	
Location:	ä	Dam A	Dam Axis (Lcft	(I Bank)				Dia. of Hole:	76 m/m	
lole Ir	Hole Inclination (a):	:(e) no	•		8	90 degrees		Packer Type:	Mechanical, single	
Priction	ssort i	per mel	Friction Loss per meter (p) : 1×10 ⁵ ×0 ^{1×11}	1×10	5×0.			Date :	3-Sep-99	-
round.	Ground elevation : El.	1	451.253 m	8	Ground	Groundwater level (L	<u>دا (ر)</u>	25.50 m	Cauge beight (La): 1.00 m	e
lipe leni	db faum	pressure	The length from pressure gauge to			Â	Depth of test	est section	Length of section (L.)	بمنصحهم
orbolc	wrbolc mouth: (Le)=	-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	4.10	8	01 (Lı)=		25 H	to (La)≖ 30 m		
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				70.01			1	Water	Water Injection Ratio (q : lit/min/m)	
5	15.0	¥Ŋ.	*	2	9.7	201	1			
riction	riction Loss (Pr)	or))a = (+ 1_+) [kg/cm2]	ر الأراقيان		3	2	Lugcon value :	(54)	-
						ā		Critical Pressure:	: >9.5 kg/cm2 -	
Cemarks :										
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	ioitorial serites y	a of wate	r sbould % to 110	the could off of th	nued for r inirclic	al keast J va rate ju	O minute the inst	lajection of water should be continued for at least 10 minutes under the specified pre- series within 90 % to 110 % of the indecidor rate in the first previous one minute	injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per munut southe within 90 % to 110 % of the interiors rate in the first previous one minute	
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reparcu by		2					1			1

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Loss por meter (ps) : Dia. of Hole: 76 m/m timation (a): 90 degree Packer Type: Mechanical, single Loss por meter (p) : 1x10 ⁵ xQ ^m 1 Date : 5.8cp-99 Loss por meter (p) : 1x10 ⁵ xQ ^m 1 Date : 5.8cp-99 Loss por meter (p) : Date : 5.8cp-99 Diameter (pr) : Date : 25.50 m Date : 5.00 m Diameter (pr) : Date : 25.60 m Date : 2.8cp-99 Diameter (pr) : Date : 2.55 m Date : 2.8cp-99 Diameter (pr) : Date : Date : Date : Date : Date : Diameter (pr) : Date :								-				
Hole Inclination (a): 90 degree Packer Type: Mechanical, single Friction Loss per meter (p): 1 MO 2 Mo <th< th=""><th>ile ol</th><th>uo</th><th>Dam A</th><th>al) six</th><th>ft Bank</th><th></th><th></th><th>•</th><th>Dia. of Hole:</th><th>76</th><th>m/m</th><th></th></th<>	ile ol	uo	Dam A	al) six	ft Bank			•	Dia. of Hole:	76	m/m	
Friction Loss per meter (Po) 1310 ¹³ x Q ^{MN1} Date: 5-Sep-99 Pipe length from preserve garge to sorrebut measure parge to sorrebut measure p	Holc I	nclinati	on (a):	•		8	degres		Packer Type:	Mechani	cal, single	
Consult of rectations: EL. 41233 m. Communator have (La): 25.50 m. Cancer being (L): 100 Spc kageth from prectator grange to consolute (La): Depth of feat section Length of section (L): 25.50 m. Cancer being (L): 100 Spc kageth from prectator grange to consolute (L): Depth of feat section Depth of feat section Largeon value 500 m. 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 <	Frictic	i ssori u	oer mel	cr (p.)	1×10	ò,	÷		Date :	5-Sep-	8	
Style kangth from pressure gauge to sveroute crosurbs. (La) Depth of feat section Langth of section. (La) So m	Growed	ckration	Б	451.253	٤	Ground	water ken	ri (L.):		Gauge !	beiybt (L):	1.00
Overheit researts (L) 3.80 m C(L) 3.60 m 5.00 m 5.00 m Reading of flow meter Reading of flow meter Calculation of Lagron value 5.00 m 5.00 m Dare // 1 γ_{12} γ_{22} γ_{23}	k be bio	MONJ dige	pressare	gauge le			a	k pi bi of 14	est section	2	ngth of werk	<u>ິງ</u>
Rending of flow matter Calculation of Largeon value $\overline{v_{even}}$ $\overline{N_1}$ $\overline{N_2}$ $\overline{N_1}$ $\overline{N_1}$ $\overline{N_1}$ $\overline{N_2}$ $\overline{N_1}$ $\overline{N_2}$ $\overline{N_1}$ $\overline{N_2}$ $\overline{N_1}$ $\overline{N_2}$ $\overline{N_1}$ $\overline{N_2}$ $\overline{N_1}$ $\overline{N_2}$ $\overline{N_2}$ $\overline{N_1}$ $\overline{N_2}$	Del Flor	e mouth:	-(1)	3.80	E	0	ł		10 (La)=	5	5.00	
mater Poil <			Read	ding of	now m	oter			Calcu	lation of Lu	reen value	
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(Po) 0.000 0.000 0.000 0.000 0.000 incrition Lorsa (Pr) = pr(Lo + Lo) [kg/kcm2] • • • Lugeon value : 0.2 Lu incrition Lorsa (Pr) = pr(Lo + Lo) [kg/kcm2] • • • • Lugeon value : 0.2 Lu incrition Lorsa (Pr) = pr(Lo + Lo) [kg/kcm2] • • • Lugeon value : 0.2 Lu kmarks : kmarks : • • • • Chilical Pressure: >13 kg/kcm2 kmarks : kmarks : • • • • • • • • kmarks : Liperitor of water abould be continued for at kast 10 minutes under the specified pressure, after the injection rate pressure, atter the injection rate pr	3	101-61	12-21			1.3:55			Wate	rr Inicction Ray	iio (a : fit/mi	(m)u
Criction Lors (Pr) = pr(Lo + L) [kg/cm2] * Lugeon value: 0.2 Lu Critical Trassure: >13 kg/cm2 Canarias: Comarias: Anarias: Anarias: Anarias: Anarias: Anarias: Critical Trassure: >13 kg/cm2 Anarias: Critical Trassure: >13 kg/cm2 Anarias: Sciller Anarias: Anarias: Sciller Anarias: Anarias: Sciller Anarias: Anarias: Sciller Anarias: Anarias: Sciller Anarias: Anarias: Sciller Anarias: Sciller An	(re)	0:00	0070		0.00	0.00	0.00	000				
ه، ها Chlical Pressure: >13 kg/em2 كوmarks : بازد المادة الماد بالمادة المادة الماد	hiction	Loss (P)-n(l	1	v.C/cm2]			4	Lugeon value		5	
Remarks : Nove : Lajection of water should be continued for at kear 10 minutes under the specufied pressure, after the injection rate per setter within 90 % to 110 % of the injection rate in the just previous one minute							•		Critical Pressu.		kg(/cm2	
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settles within 30 % to 1.0 % of the injection rate in the jast previous oue minut		lajection	new lo	r sbould	be contri	need for	at kard	10 minute	es under the specified p	orssure, aller !	lbe tajection J	rate per m
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Water Pressure Test

Hole No.:	::		M98-15	۰ ۷				Since	I		8/8			
Location:	ë	Dam	Dam Axis (Left Bank)	ft Bank				Dia. of Hole:			26	m/m		
Hole Inclination (a):	clinali	on (a):	-		8	90 degrees		Packer Type:	ц Урсі		Mechanical, single	al sing)	ų	
Frictio	ssort t	Friction Loss per meter (pt) : 1×10 ⁵ × 0 ^{12/1}	ler (p)	1×10	, v	2		Date :			6-Sep-99	8		
Ground clevation : EL	clevatio	- - - -	451.253 m	E	Grundwater level (La):	vater lev	ة تاريخ	ſ	25.5 m		Gauge b	Gauge beight (La):		۳ 8
Pipe len	th from	Pipe length from pressure gauge to	c gauge f			ĥ	t jo qida	Depth of test section			ž	Length of section (La)	ction (L	(1
borchole mouth: (La)=	mouth	Ĵ	3.80	6	CI (L.)		35 a	10 (La) u	4	8		5.00	в Q	
		Rep	Rending of flow		meter				С О	akculati	Calculation of Lugeon value	geon va	luc	÷
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Friction Loss (Pr)	(J) 5507) 	+ L-) {kg(/cm2}		 *	1	1	Seon.	Lugeon value :	0.1	3		
	•	, ,		•		3	ž	Ū	ritical F	Critical Pressure:	>13	kg(/cm2	5	
Kemarks :														
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Note :	Injectio Settles v	a of wate vithin 90	sr should % to 11(he coutu D % of th	uned tor e injectio	at icast va rate it	U muuri the just	injection of water should be continued for at least 10 minutes inder the spectrate. settles within 90 % to 110 % of the injection rate in the just previous one minute		ute nute	injection of water should be continued for at least 10 minutes under the specified pressure, atter the injection at we settles within 90 % to 110 % of the injection rate in the just previous one minute	De Tajectik		per muule
Prepared by :	: 19 F:	A. Hameed	poor					Inspected by	d by :					

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Test
Pressure
Water

9 / 20	le: 76 m/m	pe: Mechanical, single	15/July/1999	m Gaug	Length of section (L.)	45 m 5.00 m	Calculation of Logeon value		a=C (الاستارين)، ٩-(المالين)، ٩-(المالين)،	3.6 2.6	• 0.0 42* 0.02 • 9.6 q3* 0.12	12.6 qui-	9.6 q5=	6.6	3.6 q7=		*** *** *** ***************************								s 10 15 20 25	Water Injection Ratio (o : lit./min/m)		Luguon vaiue : 0.1 Lu Criteal Pressure: >13 kg/cm2		Jujection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per munue
Slage:	Dia. of Hole:	90 degrees Packer Type:	henre Date :	Groundwater level (Ls): 25.50	Depth of test section	GL - (La) = 40 = 10 (La) =		Po6 Po7	4 1	17:00		341	341] 343	342 343	ŝ		245	343 345	343 343				ડે ૪			17:00 17:10	0.00 0.00	e - Lugu		Injections of water should be continued for at least 10 minutes under the specified
M98-15	Dam Axis (Left Bank)		Friction Loss per meter (p.) : 1×10° × O ^{twn}	451.253 m Groun	re gange to	5	Row II	Past Past Past		16:20 16:30 1	315 322	300	317 325	317 326	318 327	318 328		320 331	321 332				2 2 3	9 -		16:30 16:40	0.00 0.00	o + Lu) [kgl/cm2]		er should be continued is
Hole No.:	Location: Dam /	Hole Inclination (a):	riction Loss per me	Ground elevation : EL	Pipe length from pressure gange to	borchole mouth: (La)-	Re	Course Pel Pol		16:00:1	<u>)</u>		3 312 313	312{	312	6 312 313	+	312	312	11	12	IS I	Total Q-1 Q-2	0		₫	E 1	Friction Loss (Pr) = pr(Lo + L.) [kgl/cm2]	Remarks :	Note: Jajection of wate

									x , , , ,	
Hole No.:			M98-15	5			-	Stage:	10/ 50	ī
Location:	ï	Dam A	Dam Axis (Left Bank)	(t Bank				Dia. of Hole:	76 m/m	
Hole In	Hole Inclination (a)	(a) no	•		8	90 depects		Packer Type:	Mechanical, single	1
Friction	- I Loss	Friction Loss per meter (p.) :	cr (P.)		1×10 ⁵ ×Q ¹⁷¹¹	11.		Date :	8-Sep-99	
Cound chamboo R			451.253 m			Considerator level (La)	19	25.50 m	Gauge height ([L): 1.00 m	m
Pict Ican		1 5	CAUSE 16			ľ	rph of te	Depth of test section	Length of section (La)	6
how hole mouth: (Lo)=	mouth	3	, 0 ,	8	GI (L)		45 E		5.00 m	
		Ren	Reading of flow meter	n woll	leter			Calculat	Calculation of Lageon value	
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Firmh Law	14:55		- 1		S. 22	υ C	1	-	Water Injection Ratio (q : lit/min/m)	
Ĵ	0.0	50	·	2	77.0	7710	3	-		
Friction	Loss (P	friction Lors (Pr) = pr(Lo + Lr) [kg/cm2]	1 2	(g(/cm2]	_	5 5	1 3	Critical Pressure:	212	
Remarks										
Note :	lajectio	a of wat	er sbould	be cont	nued for	al icast	10 minute	es under the specified pre-	lajection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute	12
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Prepar	Prepared by :	- 1	A. namcco							ı

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Inclination (a): 90 degree Packer Type: Mechanical, single on Lows per meter (p): 1 x10 ³ xO ¹¹¹ Date : 16.580 m 16.580 m retronon: Etc. (120 m Consolvant river (L), CL. 25.60 m Length of section appl from meter Packer (1), CL. 25.60 m Length of section 2.000 Prime Reading of from meter Date is an o(L) m 5.00 0.000 0.000 Prime Reading of from meter Date is an o(L) m 5.00 0.000 0.000 0.000 0.000 Prime Prime Prime Prime Prime 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.00	ت	ocatio	ë	Dam A	vis (L	cli Bun	5			Día, of Hole:	76	ш <u>/ш</u>	
	Ĭ	ole In	clinuti	(a) no			8	degrees	_	Packer Type:	Mcchanic	al, single	
	ц Ц	riction	NON I	per met	ter (p.)	1×1	0 ⁵ ×0	14	_	Date :	16-Sep-	8	
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	Hok]	nclinati	on (a):			8	degrees		Packer Type:	Ň	chanical,	single	
	Frictic	svort n	per mei	ler (p.)	Ĭ	10,× 0,			Date :	1	1-Scp-99		
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			Kcar	ding af	Г Пом п	heter			Cal	culation	of Lupeo	n value	
	Owner P		Po2	PG	Port	PuS	Pa6	Pe7					
	(UNA)(DA)							1	P=P0+0.1(sin(a)L1+	[12)-Pr [kg		0-/- [!!	/mia/m]
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ia 124 - 124 - 12	(r.)	00'0	00'0	0.0	0.00	000	0.00	0.00	•				ĥ
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Test
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	ared by	: Mash	taque						127	

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Water Pressure Test	ssure Test			Water]	Water Pressure Test		
Hole No.: M98-15	Stage:	15 / 20	Hole No.:	M98-1S	Stage:	16 /20	
Location: Dam Axis (Left Bank)	Dia. of Hole:	76 m/m	Location: Dam A	Dam Axis (Leli Bank)	Dia. of Hole:	76 m/m	
Hole Inclination (a): 90 degrees	Packer Type:	Mechanical, single	Hole Inclination (a):	90 degrees	Packer Type:	Mechanical, single	
Friction Loss per meter (pt): 1×10 ⁵ ×0 ¹⁵⁷¹	Date :	19-Scp-99	Friction Loss per met	Friction Loss per meter (p.) : 1×10 ⁻⁵ × 0 ¹⁻³¹	Date :	20-Sep-99	
Ground cirvation : EL 451.253 m Groundwater level (L1):	25.50 m	Gauge height (La): 1.00 m	Ground elevation : EL	451.253 m Groundwater level (La):	(Li): 25.50 m	Gauge bright (L.): 1.00 m	~~
to gauge to	tst section	Length of section (La)	Pipe length from pressure gauge to		Depth of test section	Leagth of average (La)	
GL -(L)- 70	m to ([_a)= 75 m		borrhole mouth: (La)=	4.00 m Cl(L.)- 7	75 m to (La) = 80 m	5.00 m	
iding of flow meter		Calculation of Lugeon value	Rend	Reading of flow meter	Calculat	Calculation of Lugeon value	
Comp. P. [16] P22 P43 P64 P65 P66 P67 Comp. P1 1	P*P+0.1(sia(s)L++L)-P* [kg/cm2],	r• [k@/cm2], q=O∞/Lı [li/miw/m]	Ceruge P. Pol Po2 (kcf/cens) 1 4	Pa3 Pu4 Pa5 Pa6 7 10 7 4	Po7 1 P=P0+0.1(siu(s)Li+Li)-P1	P=P++0.1(siu(s)L++L>P*[kgd(cm2]q=Q=/L+[1](ymin/m]	
9:15 9:25 9:35 9:46 9:56 10:16	P1= 3.6	.	Start tune 15:00 15:11	15:43 1		q1= 0.02	-
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	anica uosărru	5	LINCHOR LOSS (r.) = pr(- + -) [Ky/cm/		Turgeon value :		~
	Crucal Pressure:	>1.5 KPUCINE	Permeter Due to birth we	Benneks : Due to birth water loss all states cuild not be completed		>1.0 K(0/007	-
NETATING : FACKET KANEG BI I NOVCHIL BOO 2 NOVCHIL.		<u> </u>	Equipment condi	. Due to unge where now an emperatory then had to be stopped three times due to puncture of dilivery hose Equipment condition unsatisfactory. Test had to be stopped three times due to puncture of dilivery hose	opped three times due to punctur	e of dilivery hose.	
under der sonder in der sonder sonder der sonder der sonder der sonder der sonder der sonder der sonder sonder Andere sonder	and he have seen to be the	and a start of the	Note - Interdion of water	when the continued for at least 10	munites under the specified mes	tuistelion of waterstoodd by continued for at leas 10 minuter under the specified measure. After the injection was an answe	
	previous one minute		settles within 90	cettles within 90 % to 110 % of the injection rate in the just previous one minute	ie just previous one minute		
Prepared by : Mashtaque	Inspected by : A. Fayaz	ZCÁ	Prepared by : Mashtague	auc	Inspected by : A. Fayaz	27.	

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Prepared by : Mashtaque

Test
Pressure
Water]

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Location:	-	Dam A	Dam Axis (Left Bank)	(1 Bank				Dia. of Hole:	Tole		76	E/E		
Holc II	Hole Inclination (a):	on (a):				90 degrees		Packer Type:	ίζη Έλ		Acchani	Mechanical, single		
Frictio	Friction Loss per meter (p.) :	Ser met	در (کم): در		1×104×01*1	,12		Date:			19-Scp-99	8		
Control of	Genued elevation : El.	19	451.253		Ground	Groundwater level (L.):	(j) 7		25.50 m		Gauge	Gauge beight (L.):	1.8	٤
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Johnor	borbole mouth (Le)=	-(1) -(1)	4.00 m	. 8	ר <u>י</u> טיינ	ł	80	m io (La)=	85	£		5.00	٤	
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Bemark	e 10 kg	Vicm2. Dr	C STURE	vulu pot	built du	e lo mon	e than m	Bemarks : 10 kei/cm2 pressure could not built, due to more than maximum discharge of pump	scharge	dang lo				
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Note :	lajection	o of wate	r should	be couti	med for	at least	lo main The initial	Injection of water should be countined for at least 10 minutes under the specified	be spect	fied press	ure, affer	Injection of water should be couloured for at least 10 minutes under the specified pressure, after the injection rate per minute	D tate per	mino
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Hole No.:	.: 0		M98-15					Stage:	18 / 20	
Location:	ŝ	Dam A	Dam Axis (Left Bank)	(t Bank	2			Dia. of Hole:	76 m/m	
Hole Ir	Hole Inclination (a):	on (a):				90 depects		Packer Type:	Mechanical, single	
Friction	n Loss	Friction Loss per meter (pt) : 1x10 ⁵ xO ^{LPTI}	י. כו נו	1×10	75 × QL*	5		Date :	22-Sep-99	
General	Ground elevation : EL-	-121	451.253 m	ε	Groundy	Groundwater level (Li)-	j.	25.50 m	Cauge beight (L.): 1.00	E
Pine len	eth from	ΙĔ	gauge to			Á	cpib of t	Depth of test section	Length of section (Ls)	
horhole	burbole mouth: (Lo)-	ż	4.00	e	(<u>-)</u>		<u>85</u>	m 06 =(v]) 0	5.00 =	
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Average		3	3	3			ja	• •	10 25 20	X
	2			1						
	Ì	+	J	•	1	L.				
Friction	d) see	-12	<u>ן</u>	wt/cm2		8		Lugeon value :	0.1	
						1	421	Critical Pressure:	>13 kg//cm2	
Remarks :										
Note :	lujectio settles y	on of wate within 90	rr should % to 11(be could	inued for he injecti	on rate i	10 minut a the just	lajiectiva of water sbould be cuglinged for at least 10 minutes under the specified pre settles within 90 % to 110 % of the injection rate in the inst previous one minute	lajietica of water should be continued for at kast 10 minutes under the specified pressure, after the injection rate per muute settles within 90 % to 110 % of the injection rate in the inst previous one minute	anut a
Prenar	24 00	Prenared hv : A Hameed	meed						Fayaz	

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Location:	ü	Dam A	Dam Axis (Left Bank)	(t Bank				Dia. of Hole:			75	E/E			
olc I	Hole Inclination (a):	:(n) no			8	90 degrees		Packer Type:	ğ		Mechanical, single	ical, sin	빙		
ictio	Friction Loss per meler (pr) : 1×10 ⁴ × O ^{LMI}	per mel	द (P) :	1×10	5×0	2		Date :			22-Sep-99	66-			
Pano	Ground elevation : El-		451.253 m	E	Groundwater level (Ls):	vater lev	(j.) 1	25.50	0 8	Π	Sally Gally	Gauge height (La):		8.1	ε]
8	Pipe length from pressure gauge to	DIESSUIC	A Sauge h			۵	cpch of te	Depth of test section			د	Leagth of serion (La)	erion ()	3	
, da	borrhole mouth: (La)-	3	40	c	с <u>г</u>). С		- 06	m to (La)=	\$	£		S.	5.00 m		
		R.	Reading of flow meter	E woo	leter				Q	kculati	Calculation of Lugeon value	Jgcon V	pluc		- 1
Canaco P.	Pol	P.2	Pal	Pot	542	Pat	7.4								
(cmo/pho)	Ι.	 	5	10	2	4	-	P=Po+0.1(sin(a)Lu+Lu)-Pe [kg//cm2].	J(a)lr	ようち	[kg/cm2		(m/uin/ii) _//_0+p	(m/m)	
Mart Incore	18:00	18:11	18:22	18:32	118:42	18:52	19:02		<u>-</u>	3.7			83		
Q(min)		749		- 62	14	AT.	130		ដ	6.6			0.19		
-		749				76	2		2	9.6					
1	747	750				Ē	Ļ		-	12.6			0.18		
	747	22				Ē	2		ż.	9.6			0.10		
4	747	751				E	Ĩ		2	9.9			8		
5	14-L	751				738	Ĩ	_	ŝ	3.7			8		
	747	752				778	770								
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×	747	753				21	74	81 T	:					;	
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		19	1-	8	8	0.0	000		0	Ś	ð	3	ຊ	ä	ม
	141			18 42						Water fo	Weter faiterion Balio (a : Vit /min(m)	i - e lo le	1 /min/m		
2	, i		80	8	Ł	0.0	0.10								
	<pre>which is a contract of a likelicity.</pre>			of/cm2]		3			ceon v	Lugeon value :	0	ľ			
			ŝ			3	1		ilical Pl	Critical Pressure:	>13		ky£/cm2		
Remarks :															
Nok:	lajection	a of wate	r sbould	the could	nued for	al kasi J	0 miuut	tajection of water should be continued for at least 10 minutes under the specified pressure, after the nujection rate per minute	e apecil	fied pres	are, aller	the nject	tion rate	per mit	2
	settles y	vithin 90		10%0	ve injection	on tale to	the just	ettles within 90 % to 110 % of the injection rate in the just previous one minute	oc mu	۲,					
			•					Transfer burn A Corner		4	5				

Water Pressure Test

Hole No.:	•		M98-15	S			-,	Stage:		20 / 20			ļ
Location:		Dam A	ads (Le	Dam Axis (Left Bank)	9		-4	Dia. of Hole:		76	m/m		1
Hole Inclination (a)	linatic	(a) (a)			8	90 degrees	-	Packer Type:	5	Mechanic	Mechanical, single		1
Friction Lows per meter (p.) :	- SNO-	Per met	с (р)		1×10 ⁵ ×Q ¹⁷⁷¹	71	1	Date :		24-Sep-99	8		
Ground elevation : EL	cvatiou		451.253 m	E	Cround	vater kev	Croundwater level (La) GL-	L- 25.50	8	Gauge 1	Cauge beight (La):	1.00	
Pipe length from pressure gauge to	low of	ΙĔ	Kange 6				pib of te	1 9		2	Length of section (Lo)	(ما) ٥٥	
borchole mouth: (La)=	nouth:	ż	4	6	CL - (L)-	-	95 m	≡(ब.I) अ	100 m		5.00	6	
	Ì	Rep	ding of	Reading of flow meter	refer				Calculat	ion of Lu	Calculation of Lugeon value	U	
Outge P.	Pol	P.2	Pa3	Po4	201	7a6	Po7						
(trict/cirro)		4	7		2	4		P=Po+0.1(sin(a)L+LJ)-P= [kg0/cm2],	4-(=1+1-)(e	r [kg0/cm2]		q=Q-/ل (ان/mia/m)	
Sinct time	9.6			Ĭ	Ē	٦	10:36	1		Ť			
(uiu))	<u>≩</u> [5	2	ł	ĺ			2 8		•	47= 20-0 20-0		
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li1./mm	0.2						- 1	•	'n	2	5	ผ	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
\mathbf{H}	946								Water]	injection Ra	Water Injection Ratio (q : lit./mia/m)	ie a)	
(44)	80	80	80	000	8	200	3			ç			
Friction Loss (Pr) = pr(Lo + Lo) [kg/cm2]	ож (Ъ		- - -	kut/cm2		1 3	<u> </u>	Chike	Chikal Prensure:		ket/cm2		
Kemarks :													
Note : L	ajection	a of wak	rr sbould	the conti	inued for	al kas	() minute	lojection of water should be continued for at kast 10 minutes under the specified pressure, after the injection rate per minute	scificd pre	ssure, alter	the injection	t rate per mi	JIN
	닅	vithin 90	5 10 11	0 % 01	be injecti	100 8	In the	settles within 90 % to 110 % of the injection rale in the just previous one munic					Т
Prepared by :	섥		A. Hamced / Iqubal	Iqubal			1	Inspected by	₹	rayaz			

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Holc No.:		M98-16	Š				Stage:		1/14		·
Location:	Dam A	Dam Axis (Left Bank)	() Ban	2			Dia. of Hole:	ole:	76	m/m	
Hole Inclination (1):	;(n) no	•		8	90 degrees		Packer Type:	, bit	Mechanical		
n Loss	per met	Friction Loss per meter (pt) : 1×10 ⁵ ×0 ⁴⁷¹¹	1×1	1,×0,	į		Date :	3	23/July/1999		
Ground elevation : EL.		546.267 m	а	Crowned	water In	Croundwater level (La):	ΠZ		Gauge bright (La):		0.75 m
mon la	t gauge le	Pipe length from gauge to hole mouth	d'un		н	Septh of	Depth of test section		Juni	Length of section (L)	3
borehole mouth: ([[]])=	3	6.9	ε	<u>ר</u>	ł	2 9	=(•]) ot	۲ В		5.00 m	
		Reading of Now meter	Row n	actor				Calcula	Calculation of Lugeon value	con value	
2	Pu2	2	ž	PaS	90 2	Po7					
1	22	1					P=Pu+0.1(>	P=Pu+0.1(siv(a)L+L+L+L*[kgf/cm2].		ĩ	[m/m]
17:45	18:00	18:15					~		÷.		
0(mia) 9,077	9.457						Α.		42 -		
	9,961	11,870					<u>م:</u> - ۱۳	Pa- 13	-13-	11.76	
9217	10.070						ē.	P4=	45 '		
22.0	10,177	11,984					<u>~</u> ;	.	-\$ -		
9.338	10,285						<u>د</u>	-	yb		
9,387	261.01	•					<u>م</u>	P7=	- ² -		
9,446	10.505										
9,507	10,012						10				F
9,567			ł	Ī							
9,629	10,828						∞ ⊔,]				, , ,
9,687	10,935	12.395	Í				۲ 81 - Т				
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0.10	N.10	0.00	Ţ	Ī			-	Water J	nicction Ratio	Water Injection Ratio (9: [it/mia/m)	~
CC:/1	18:10	22	T				-1-				
0.24	160	0.27					, - -				
(J) SSOL	•) = p·([•	Friction Loss (Pr) = p.(Le + L.) [kg(/cm2]	g(/cm2]		3			Lugeon value :	(in 2007) (in 20		
	ļ				2			CITICAL PRESSURE:	7.1	KENCERT	
Injection	a of wate	r should	be coult	uurd lor	al kast	JU MIINU	lajection of water should be continued for at least 10 minutes under the specification of the	specified pre-	sure, alter the	lajection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per munute	per musule
× 53,14	No. of the local division of the local divis	-	000		Contraction of the second		2011 C. 11 A 2461 1				

Axis (Laft Bank) Dia. of Hole: 76 m/m :: 90 degree Packer Type: Macchanical :: 90 degree Packer Type: Macchanical eter (p) Its/10 ⁴ x/0 ⁴⁷¹ Date: 24/Julty/13999 eter (p) Eter (p) Eter (p) Eter (p) 0 swazir m Goomadwater kevet (L.): Nit Casuge beight (L.): 0 swazir m Goomadwater kevet (L.): Nit Casuge beight (L.): 0 swazir m Goomadwater kevet (L.): Nit Casuge beight (L.): 0 swazir m Goomadwater kevet (L.): Nit Casuge beight (L.): 0 starge state Date: 2.24/Julty/13999 2.1560 0 adding of flow meter Long/base (L.): Nit Casuge beight (L.): 0 starge state Date: Date: 2.1560 2.1560 2.1560 15.866 19.866 2.1570 2.1980 2.1560 2.1560 15.866 19.866 2.1560	Actis (Left Bark) 90 degrees 91 degrees 90 degrees 11 (10 ³ × Q ^{L+T1}) 540.257 m 540.257 m Groundwater kevel (La): 540.05 m GL-1(L). 5 m 6400 m GL-1(L). 5 m 12 (201 120):13:09 23.252 23.135 13 (19):15:200 13.950 23.050 13 (19):15:200 23.050 23.135 13 (19):15:200 23.050 23.135 13 (19):15:200 23.135 23.050 13 (19):15:200 23.135 23.050 13 (19):15:200 23.135 23.050 13 (19):15:200 23.135 23.050 13 (10):15:200 23.135 23.050 13 (10):15:200 23.135 23.050 13 (10):15:200 23.135 23.050 13 (10):15:200 23.135 23.050 13 (10):15:200 23.135 23.050 13 (10):15:200 23.135 23.050 13 (10):15:200 23.135 23.050 13 (10):15:200 23.464 23	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	90 degrees eter (p) : 1x10 ³ x0 ³ rr1 S46.267 m Creund/water k-vet (L): S46.267 m Creund/water k-vet (L): s46.267 m Creund/water k-vet (L): regarge to 6.00 m CL-(L) = 5 m Depth of to 1. Not colspan="2">S46.257.01 Depth of to 1. Not colspan="2">S46.257.01 District 1. Not colspan="2">S46.22.258.00 District 1. Not colspan="2">S2.1159 District 1.197.09 District 1.197.	76
eter (p) : $1 \times 10^3 \times 0^{471}$ Date : $24/1ul/1990$ 8.6.207 m Croundwater Ferei (L-): Nit Cauge beight (L-): 0 regarge to Clonedowater Ferei (L-): Nit Cauge beight (L-): 0 $10^{-1} \times 10^{-1} \times 0^{-11}$ Calculation of Largeon value cauge beight (L-): 0 $10^{-1} \times 10^{-1} \times 10^{-1} \times 10^{-1}$ Date : $24/1ul/1990$ $10^{-1} \times 10^{-1} \times 10^{-1} \times 10^{-1}$ Date : $24/1ul/1990$ $10^{-1} \times 10^{-1} \times 10^{-1} \times 10^{-1}$ Date : $24/1ul/1990$ $10^{-1} \times 10^{-1} \times 10^{-1} \times 10^{-1}$ Date : 200 n $10^{-1} \times 10^{-1}$ Date : $20^{-1} \times 10^{-1} \times 10^{-1} \times 10^{-1}$ Date : $20^{-1} \times 10^{-1$	eter (p) : 1x10 ³ × Q ^{1/711} s6,227 m Croundwater level (La): 6,00 m Cl (L.)= 5 m 6,00 m Cl (L.)= 5 m 1,328 Cl. 19,577 20,314 21,320 22,520 1,328 Cl. 19,577 20,314 21,320 22,520 1,328 Cl. 19,577 20,314 21,320 22,520 1,328 Cl. 19,577 20,314 21,320 22,520 1,329 Cl. 19,577 20,500 21,327 22,520 1,329 Cl. 19,577 20,500 21,327 22,520 1,329 Cl. 19,577 20,500 21,327 22,520 1,320 Cl. 19,510 21,320 22,520 22,520 1,320 Cl. 19,510 21,320 22,520 22,520 1,320 Cl. 10,50 20,500 21,327 22,520 22,520 22,520 Cl. 19,233 20,500 21,327 22,520 22,520 22,520 22,520 1,320 Cl. 10,50 20,500 21,327 22,520 22,520 22,520 22,520 1,320 Cl. 10,50 20,500 21,327 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 25,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 22,520 2	
Sec.267 m. General-water kvet (La): Nill Gauge beight (La): 0 6,00 m. $(T_{1-1}(L_{1}) = 5$ m. Z_{11} (construction (1 L_{12} (construction (1 6,00 m. $(T_{1-1}(L_{1}) = 5$ m. Z_{11} (construction (1 Z_{12} (construction (1 E_{12} E_{12} E_{12} E_{12} E_{12} E_{12} E_{12} (construction (1 E_{12}	S46,267 m Croundwater level (Lu): re gauge to D-prh of (L e gauge to D-1(L.)= 5 n adiary of flow meter D-1(L.)= 5 n Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss Piss<	24/July/1999
regarge to 6.00 m Expth of test section Length of certion Length of certion Length of certion adding of flow meter $(1, -(1,) = 5 m)$ $10 m$ $2.00 m)$ $5.00 m)$ adding of flow meter $2.3 m)$ $2.1 m)$ $11 m)$ $12 m)$ $13 m)$ $12 m)$ $13 m)$ $12 m$	re gauge to 6.00 m CL(L)= 5 m 6.00 m CL(L)= 5 m 6.00 m CL(L)= 5 m 12.2 2.5 2.15 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	0.75
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	6,00 m CL-(L)a 5 m uding of flow meter 2 2 1 1 1 2 2 2 1 1 1 1 1 1 2 2 2 1 1 1 1 1 1 1 1 14560 19,480 20,723 21,820 2,931 2,932 2,932 2,932 2,932 2,932 2,932 2,932 2,932 2,932 2,932 2,932 2,932 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133 2,133	Length of "ection (La)
diag of flow meter Calculation of Largeon value $\frac{1}{2}$ 1	uding of flow meter Poi	Ē
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Pair Pair <th< td=""><td>Calculation of Lugcon value</td></th<>	Calculation of Lugcon value
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	1 1.5 2.5 2.5 2.1 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	14:12 14:20 14:20 14:20 14:20 14:20 14:20 15:20 15:12 15:20 15:12 15:20 15:12 15:20 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 12:70 <th< td=""><td></td></th<>	
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1019 804 605 0 1 1 1 1 0 20 90.4 605 0 10 20 20 40 1019 80.4 60.5 0 10 20 30 40 15:10 15:22 15:34 Water Injection Ruito (q: lit/miu/m 1.00 0.53 0.36 Lurgeon value : (35) Lu' Chitcal Pressure: 21 kg/ten2	1,019,804,605 Q5 Q6 Q7 101,9 80,4 60.5 115,10 15:22 15:34 1,00 0,63 0,56 11,00 0,57 0,56 11,00 0,57 0,56 11,00 0,57 0,56 11,00 0,57 0,56 11,00 0,57 0,56 11,00 0,57 0,57 0,57 0,57 0,57 0,57 0,57 0	
Quest Quest <th< td=""><td>Q-5 Q-6 Q-7 101,9 80,4 0.05 15:10 15:22 15:34 1.00 0.63 0.36 1.00 0.63 0.36</td><td></td></th<>	Q-5 Q-6 Q-7 101,9 80,4 0.05 15:10 15:22 15:34 1.00 0.63 0.36 1.00 0.63 0.36	
101.9 80.4 60.5 0 10 20 30 40 15:10 15:21 15:34 Water fajection Raito (q: lit/min/m 1.00 0.63 0.54 Lugeon value: (35) La' 1.00 0.63 0.54 Chical Pressure: 2.1 kg/cm2	101.9 80.4 60.5 15:10 15:22 15:34 1.00 0.63 0.36 1.00 0.63 0.36	
15:10 15:22 15:34 Water lajection Ratio (a: lit/miu/m 1:00 0.65 0.56 Lageon value: (35) La' wa u Chical Pressure: 2.1 kg/cm2	15:10 15:22 15:34 15:10 0.63 0.36 11:00 0.63 0.36	10 20 30 40
1.00 0.05 Largeon value : (35) La' w w Chical Pressure: 2.1 kgf/cm2	100 002 030	Water Injection Ratio (a : lit_min/m)
u u Lugeon value : (35) Lu' u u Chical Presure: 2.1 kg/cm2	3 3	
us up Critical Pressure: 2.1 kg/cm2	3	(35) LLI'
		2.1

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Inspected by : A. Fayaz

Prepared by : Mushtag

Water Pre	Water Pressure Test		Water Pressure Test	
Holc No.: M98-16	Stage:	3/14	Hole No.: M98-16 Stage:	2/14
Location: Dam Axis (Left Bank)	Dia. of Hole:	76 m/m	Location: Dam Axis (Let) Bank) Dia. of Hole:	76 m/m
ilan	Packer Type:	Mechanical	Hole Inclination (a): 20 degrees Packer Type:	Mechanical
Friction Loss per meter (p) : 1×10 ⁻⁵ ×0 ^{1×11}	Date : 2:	25/July/1999	Friction Loss per meter (p): 1x10 ⁵ xQ ^{1471 Date:}	26/Julv/1999
Constant elevations : EL 546.267 m Groundwater level (La):	EN	Gauge bright (L.): 0.75 n	Ground elevation : EL 546207 m Groundwater level (Ls): Nil	Cauge beight (La): 0.73 m
to paired to	Depth of test section		ire gauge to	Length of section (L.)
1 Cl (L)- 10	m to (La)≖ 15 m	5.00 m	n (CL(L.). 15 m lo(L.).	m 5.00 m
ading of flow m	Calculat	Calculation of Lugeon value	ading of flow meter	Calculation of Lugeon value
Pa		وــــــــــــــــــــــــــــــــــــ	Lo4	
		01= 6.44	51 16:02 16:12 16:22 16:32	
24,000 29,3801 30,340(31,430) 32,410(3		-	39.941 40.070 40.260 40.600 41,481 41,854 42.044 72=	3
28,330 28,744 29,452 30,440 31,522 32,497	- F3-		39,954 2,308 40,295 40,740 41,516 41,875 42,056 P3=	Ŷ
28,808 29,536 30,548 31,613 32,573	21		39,965 2,311 40,330 40,815 41,552 41,895 42,067 84	
28.391 28,873 29,608 30,652 31,705 32,653	2 X		29,975 2,313 40,368 40,395 41,590 41,913 42,076	.
12808		97.6 9.16	2318 40,440 41,055 41,664 41,951 42,097	-20
28,487 29,065 29,828 30,962 31,992 32,885	19		40,003 2.321 40,478 41,138 41,701 41,969	
7 28.519 29,138 29,492 31,046 32,090	~		40,012 2,324 40,516 41,220 41,739 41,988 42,118	
X11 11 11 11 11 11 11 11 11 11 11 11 11	रव		2 170 40 501 41 105 41 818 42 006 42 138	
28.622 29.319 30.117 31.377 32.389 33,195	- 1 × - 1 ×		40,040 40,254 40,630 41,481 41,854 42,044	
Ξ	1 ai			
	4 5 5 1 7 7 7 7 7			
5 5	•••A		1 01 02 04 04 05 05	
322 639 737 1.037 953 785			1×4 170 791 373 150 102	
Average Que1 Que2 Que3 Que4 Que5 Que6 Que7	-	15 20 25 30 35 40 45 50	0	10 20 30 40 50
0 15:50) 16:00 16:10 16:20 16:30	, , 15	tion Ratio (o - lit /min/m)	15:40 15:50 16:01 16:12 16:22 16:32 16:42	finication Ratio (a · 10 /min/m)
0.15 0.57 0.76 1.49 1.26	[]		0.02 0.07 0.27 1.19 0.27 0.07 0.02	
12 Love (P+) = pr(Lu + Lu) [kgl/cm2]	u) Luguon value :	(34) Lu [*]	Friction Loss (P) = pr(Lo + Lo) [kyt/cm2] ** ** Lugeons value :	13
	. Critical Pressure:	4.6 kg0/cm2	une and Chical Pressure:	ure: >10 kpt/cm2
			Remarks :	
-				
Note : Injection of water should be continued for at kast 10 minutes under the speculied pressure, after the injectiou rate per minute series within 90 % to 110 % of the injection rate in the just previous our minute.	nutes under the speculied pre- ist previous one minute	ssure, after the injection rate per minute	Note: Injection of water showld be continued for at kass 10 minutes under the specified pressure, after the sujection rate per minute settles within 90 % to 110 % of the injection rate in the just previous one minute	pressure, alter the injection rate per minute
Prepared by : Shakil / Mushtaq	Inspected by : A. Fayaz	Ztrk	Prepared by : Mushtaq [Inspected by : A. Fayaz	Payar,

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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Axis (Left Bank) cter (p) : 1×10 ⁵ × O ^{LPTI state (p) : 1×10⁵ × O^{LPTI} state (p) : 0×11⁵ × O^{LPTI} state (p) : 0×}	Dia, of Hole, Packer Type Date: Intel Lettion Intel Lettion Intel Lettion Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra-	1 9 0 1 2 3 M - A A A A A A A A A A A A A A A A A A	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	90 degrees Packer Type: Mechanics second Dopth of rest revel 26/JUJV/1990 second Dopth of rest revel Date : 26/JUJV/1990 second Second Second Date : 26/JUJV/1990 second Se	90 degree ctcr (p) : 1×10 ⁵ ×0 ^{1×11} std.207 m Groundwater k std.207 m Groundwater k std.207 m Groundwater k std.207 m Groundwater k 6.85 m GL-(L_J)_a adding of flow metter P 7 P 7 4 6.553 6.509 6.831 0.975 6.905 6.519 6.714 6.881 6.905 6.905 6.606 6.773 6.801 6.905 6.905 6.606 6.773 6.801 6.905 6.905 6.600 6.773 6.905 6.905 6.905 6.600 6.773 6.905 6.905 6.905	Packer Type Date : Ni rest seriou Pase Pase Pase Pase Pase Pase Pase Pase		
eter (p) : 1×10 ⁵ ×Q ⁴ ⁴¹ Date: 26/Jully/1999 s66.257 m Connedwarr/revel (L): Nii Caure bright (Li): 0.80 resuge to <u>Depth of rest acvion</u> <u>Length of section (L)</u> 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Length of section (L) 6.85 m Ci(L)= 20 m o(L)= 25 m Ci(L)= 2.8 m Length of section (L) 6.60 m Ci(L)= 20 m o(L)= 2.5 m Ci(L)= 2.8 m Length of section (L) 6.60 m Ci(L)= 2.9 m Length of section (L)= 2.8 m Length of section (L) 6.60 m Ci(L)= 2.0 m Ci(L)= 2.8 m Length of section (L)= 2.8 m Lendt of section (L)= 2.8 m Lendth of s	Frection Loss per meter (p): 1×10 ³ × Q ^{UPN. Dict: Z6/Jully(1990 Comma derevation: EL. solar Commandererhort (L): S0 Commandererhort (L): 0.00 0.00 Pre-bale month: (L): 6.86 m Commandererhort (L): 2.810 m 0.00 0.00 Pre-bale month: (L): 6.86 m Commandererhort (L): 2.8 m 0.00 0.00 Derebale month: (L): 6.80 0.801 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901 0.901<!--</sup-->}	$\begin{array}{c} \mbox{ctcr} (p_{a}) := \frac{1 \times 10^{5} \times Q^{\mu \pi \nu}}{1 \times 10^{5} \ m} \\ \mbox{s6.207 m} & \mbox{Groundwater} h \\ \mbox{s6.207 m} & \mbox{Groundwater} h \\ \mbox{s6.205 m} & \mbox{Groundwater} h \\ \mbox{s6.205 m} & \mbox{s6.205 m} \\ \mbox{s6.205 m} \\ \mbox{s6.205 m} \\ s6.205 $	Datc : I test section Pare Pro- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- Pra- P	0117181 14	
S6.207 m Connedwater level ([]): Nil Cauge beight ([1]: 0.80 re gauge to 6.85 Depth of test arction Depth of test arction Length of section ([) 0.80 re gauge to 6.85 CL(L_). 20 m to (L_). 25 m 5.00 m re gauge to 1.7 Find Pis Pis Pis 23 qta 0.80 re gauge to 1.7 Find Pis Pis Pis Pis 0.41 0.80 re 1.7 Pis Pis Pis Pis Pis Pis 0.61 0.55 0.90 0.71 0.60 0.82 0.90 0.71 0.70 0.70 0.75 0.70 0.70 0.75 0.70 0.75 0.70 0.75 0.70 0.75 0.75 0.70 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	S46.207 m Groundwater k ire gauge to 6.85 m Cli(L.). 6.85 m Cli(L.). m ading of flow metter Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois Pois <td>Nit Control (1997)</td> <td>2123 161</td>	Nit Control (1997)	2123 161	
regarder to 6.85 m Depth of feat action Length of feat action Length of feat action 6.85 m CL(L). 20 m to (L). 25 m Length of feat action 7 10 7 10 7 10 7 10 7 10 7 10 1 Perpendicition of Largeon values 5.00 m 5.00 m 6.853 6.990 9.011 6.993 7.001 7.20 7.24 2.54 6.573 6.793 6.971 6.951 7.001 7.20 7.24 2.54 6.651 6.771 6.881 7.001 7.20 7.24 2.54 2.54 6.651 6.771 6.991 5.916 7.001 7.2 4.2 2.54 6.651 6.771 6.991 5.916 7.001 7.2 4.2 0.2 2.66 6.651 6.771 6.991 5.911 7.011 7.7 7.2 4.2 0.2 0.2 0.2 0.2 0.2	Prior tength from pressure garge to beneformer garge to Depth of test services Length of services L	re gauge to 6.85 m Cit(1.) 6.85 m Cit(1.) ading of flow metter Point 13:06 10 7 m 13:06 13:07 13:04 13:05 6.5556 5.704 5.441 13:05 6.5579 5.704 5.441 0.573 6.5579 5.704 5.441 0.573 6.5579 5.704 5.441 0.573 6.5579 5.704 5.441 0.573 6.5579 5.704 5.905 6.905 1.5566 5.704 5.904 5.905 1.5566 5.9056 1.5566 5.	test sertion to (L.)= 10	3 M #N##N%	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	20 m lo (L.) P-Po-0.1(sin(- 1.1) P-Po-0.1(sin(- 7.000 7.000 7.000 7.000 7.000 7.001 7.001 7.001 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.001 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011 7.011	101	
Reading of flow meter Calcellation of Lageon value Pair		$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Port 1 Port 1 Port 1 7.000 P1 P2 7.000 P2 P2 7.000 P3 P4 7.000 P3 P4 7.001 P3 P4 7.000 P4 P4 7.001 P3 P4 7.001 P4 P4 7.011 P4 P4	Ketlafton of Lagcon value -L.)-P. [kg/cm2], q=O./L. [li/miu/m] 3.3 6.3 9.3 9.4 9.5 9.4 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5	
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	I	Remarks :			
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		1	10 minutes under the specif	ied pressure, after the injection rate per m	

Water Pressure Test

Hole No.:	;;		M98-16	6				Stage:		6/14		
Location:	ë	Dam A	<u>vi: (L</u>	Dam Axis (Left Bank)				Dia. of Hole:		8	ш/ш	
Hole Inclination (a)	clinatí	:(n) uo			8	90 degrees		Packer Type:		Mechanical	17	
Friction Loss per meter (p.) : 1×10 ⁵ ×0 ¹⁹⁷¹	Loxs	per met	(d) 10	1×1(v ⁵ ×0	12		Date :	28/	28/July/1999		
Ground elevation : EL	levation 1		S46.267 m	E	Cround	Groundwater level (Li)	;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	EN		Gauge be	Gauge beight (La):	0.80 m
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bowhole mouth: (Lo)=	month:	į	6.85	E	Cit (L)-	1	۳ ۲		я 30		5.00	E
		Rep	Rending of flow		meter				Calculatic	u of Lug	Calculation of Lugeon value	
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2	10.0	25-0	5		5	4	~		, and an i	10.0	1	
Friction Loss (Pr) = pr(Lo + Lo) [kgl(cm2)	er (P	-)	<u>,</u>	g(cm2)		1 2	1 1	Critical	Chical Pressure:	(cr) 1:1	kg(/cm2	-1.9984E-15
Kemarks									1			
Note: 1	Diectio	n of wale	r should	be couti	ned for	at least	U CILIBUT	injection of water should be continued for at kast 10 minutes under the specified pressure, after the injection rate per minute	cated press	ure, alter t	se injection ra	te per maule
Ĩ	cilles v	vithin 90	% to 11	0 % 0 19	K IBICCI	on rate i		settles within 90 % to 110 % of the injection rate in the just previous fine manue	1			
Prepared by :	: Xq p		Mushtaq / Hamced	mccd				Inspected by :	A. Favaz	N		

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Hole No.:		M98-16	ę				Stage:	11	7/14	
Location:	Dam A	al) six	Dam Axis (Left Bank)				Dia. of Hole:	[-	76 m	m/m
Hole Inclination (n):	alion (a):			8	90 degrees		Packer Type:	Mech	Mechanical	
riction Lo	Friction Loss per meter (p.) : 1×10 ⁶ × 0 ^{1×11}	ध स (b)	1×10	10× 51	F		Date :	31/July/1999	6661	
Ground elevation : EL	Lioa : EL	546.267	a	Ground	Groundwater level (Li):	;(');	ΒZ	Gau	Gauge height (La):	(La): 0.80 m
be knoth (15	EDURE D			۵	n dig	Depth of test action		Length of	Length of section (Lo)
borebole mouth: (L)=	ا ر الح	5.98 m	8	<u>ci. (l.)</u>		ш 90	no (La) a	E		5.00 m
	Rea	ding of	Reading of flow meter	leter			Crt	Calculation of Lugeon value	Lugoon	value
4	┝┼	2	ž	Sol	9 n e	Po7				(m/njm/sill - V)
_1				_1	4	1	1.4.1.0+0.1(210(2)1*1+1*2/11/(2)0201+0/ 21-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-	*1.27FT7 (52UG)	-	4 5.4
1	_		15:10	12:41	1	7 260		13		00'01
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		.1			1		P4=	8.0		26.00
	1			Ł	6.598	•	×.	6.2		2.0
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Amme Qui	20	3	3	3	ŝ	3	`		ę	05 07
-	-	x7.0							} .	
Ŧ	5	10:01	12:01				*	Water Injection Ratio (q : ht/min/m)	s Katio (q :	: iii./mio/m)
1.0 (-1)	11/0	3					I noon vile			I.a
nction Los	incrion Loss (17) = pr(10 + 10) [424 mil	<u>-</u> 	in and the second second second second second second second second second second second second second second se		Ĕ	1			7.9 kg	kg//cm2
Nemarks :										
Note : Inje	tion of wat	er should	t be cont	aued for	at kast	10 miaut	es under the specific	e "ourseute" a	dier the jup	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute
	and the owner of the owner of the owner of the owner of the owner of the owner of the owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner owner o		0.00	the initial	in the second	The tax	and a state of the part of the principle rate in the fact method of the			

TOIC NO.	;;		M98-16	ć				Jugv.		
ocation:	겉	Dam A	Dam Axis (Left Bank)	(î Banl	ç			Dia. of Hole:	76 m/m	
Hole Inclination (a)	climatic	:(m) uc			8	90 degrees		Packer Type:	Mechanical	
riction	Loss	oer met	Friction Loss per meter (p.) :		1×10 ⁵ ×Q ^{471'}	11.		Date :	1/August/1999	
Ground elevation : El-	levation	8	S46.267	E	Gmundy	Gmundwater krvel (Li)	<u>داران</u>	Nil	Guuge beight (La):	0.80 m
ine kroe	th from	DICSSUIC				Á	epth of te	Depth of test section	Leagth of section	(سة) aoi
vor hole mouth: (L_)=	mouth:	į	5.80	8	-(r)- 10		35 m	to (La)= 40	m 5.00	6
		Rep	Reading of Now	n woll	meter			Calcu	Calculation of Lugeon value	ue
Ouv.eP	7	24	2	Pe4	کەل	φd	Po7			
(kg(/em3)	16-16	4	7	01	7 37-27	4 17:33	17:45	P=P0+0.1(sin(a)Li+Li)-P=[kgUcm2], P1= 4.8 0	-	q=Q=//mia/m] 0.16
(Mmin)	2	69		114	4	1	ŝ	P2= 7.8	2	
]_	58	2				·	525		5 -	
~	53	14	16			212	95Z			
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15								42		
Total	3	3	ટ	3	3	8	2			- 6
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Juny	2	2 0	3	J	S.	Ş,	5		20 10 20 10 20	
let./min	8.0	1.4		1				1'A A'A	/" on cn +n cn 7	NT 60 00
'unach time	16:45	16:57	_	1					Water Injection Ratio (q : lit./min/m)	bie/m)
3	0.00	30			10:0	2		-		
nction	5) SS (5)	Friction Loss (Pr) = pr(Lo	<u>=</u> ();	+ L+) [ky/cm2]		2 ;		Contex nonger	(<u>)</u>	ç
						'				
Note :	Injectio settles v	n of wat	rr sbould	be cont 0 % of 1	inued for	r at least ion rate ii	10 minut a the just	lajection of water should be continued for at least 10 minutes under the specified settles within 90, % to 110,% of the injection rate in the just previous one minute	lajection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute setter within 00 % to 110 % of the injection rate in the just previous one minute	a rate per mi

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tion Loss per meter (p): _ 1x10 ⁴ x 0 ⁴ ^{mt} . Dut: _ 2/August/1399 metervino: EL. 54.26 m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f m _ 24.26 f	e Inchinatic	on (a);	•		8	degrees		Packer Type:	Mc	thanical	
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Resulting of New more: Depth of text section Langth of cercion Langth of cercion <thlangth cercion<="" of="" th=""> Langth of cercion<!--</td--><td>nud elevation</td><td>1</td><td>46.267</td><td>la</td><td>Ground</td><td>water lev</td><td>(m) 1</td><td></td><td></td><td>auge height (La)</td><td>0.80</td></thlangth>	nud elevation	1	46.267	la	Ground	water lev	(m) 1			auge height (La)	0.80
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Reading of Ruse meter Calculation of Laycon value No No <th< td=""><td>ole month:</td><td>3</td><td>5.85</td><td>a</td><td>CL. (1</td><td>5</td><td></td><td>=(a.1) of</td><td>ε</td><td>5.0</td><td>- 1</td></th<>	ole month:	3	5.85	a	CL. (1	5		=(a.1) of	ε	5.0	- 1
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on Loss (Pr) = pr(Lo+Lo) [kg/cm2] u v Lugcon value: 0.6 Lu v Luscon Pressure: >14 kg/cm2 urbs:	┢	000	100								
or us Critical Pressure: >14 kpf/cm2.	on Loss (Pr	2	<u>ב</u> ן	glem2]		2					
: SM			r			5			rssure:		2
	14:										
					ADDING -				2		

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ure Test	Stage: 12/14	Dia. of Hole: 76 m/m	Packer Type: Mechanical	Date : S/August/1999	Nil Gauge bright (La): 0.80 m	Length	m to (Lu)= 60 m 5.00 m	Calculation of Lugcon value	P=P0+0.1(sia(a)L+L3-Pr{kgl/cm2}. q=Q=/L4[L3[il/mia/m}	Pil= 6.8 qi= 0.56	44	15.6 q4=	12.7 85		+								r lujection Ratio (q : lit/min/m)		Lugeon value : 0.9 Lu Chikal Pressure: 11 kg/cm2		lajection of water should be contained for al kast 10 miantes under the specified pressure, alter the injection rate per miaute settle-within 90 % to 110 % of the injection rate in the just previous one miante	Inspected by : A. Fayaz
Water Pressure Test	Hole No.: M98-16 Sta	Location: Dam Axis (Left Bank) Dis	Hole Inclination (a): 90 degrees Pac	Friction Loss per meter (p) : 1×10 ^s × 0 ¹⁴¹¹ Da	Ground elevation : El. 546.267 m Groundwater level (L.):	ire gauge to	CI(LJ)- 55	ding of flow meter	Po6 Po7	15:00 15:12 15:25 15:37 15:48 16:00 16:12	140 190 311 220 600	148 209 353 556 708	110 152 219 372 567		435 617 740	121 164 258 456 632 751	123 175 268 476	181 288 517 680 775		14		0.1 0.2 0.3 0.4	20.6 10.0 0.0 0.0 0.0 0 0 0 0 0 0 0 0 0 0 0	(P*) 0.00 0.01 0.05 0.24 0.14 0.04 0.01	Friction Loss (Pr) = pr(Lo + Ls) [kg/km2] 44 **	Remarks :	 Noie : lajection of water sbould be continued for al kast 10 miantes under the specified series within 90 % to 110 % of the injection rate in the just previous oue miante	Prepared by : Mushtag / Iqbal
sure Test	Stage: 11/14	Dia. of Hole: 76 m/m	Packer Type: Mechanical	Date : 4/August/1999	Nit Cauge beight (La): 0.85 m	Leugh	m to (Le)= 55 m 5.00 m	Calculation of Lugeon value	P=P+0.1(sia(s)L+L+L+P={kgf/cm2}. q=Q+/L []it/mia/m]	Pi= 6.3 qi= 0.66	1	15.1 q4=	-SP 221	1 2	;				aj nst				r lajection Ratio (q : lit/min/m)		Lugeon value : 1.1 Lu Criical Pressure: 11 kg/cm2 -		s under the specified pressure, alter the injection rate per minute previous one minute.	Inspected by : A. Fayaz
Water Pressure Test	Hole No.: M98-16 S	Location: Dam Axis (Left Bank) D	Hole Inclination (a): 90 deprets	Friction Loss per meter (p): 1×10 ³ ×Q ¹⁷⁰¹	Gound elevation : EL \$46.267 m Groundwater level (L.):	ire gauge to	Gi (Li)- 50	ading of Now meter	5 Po6 Po7 4 1	14:45 14:55 15:00 15:17 15:28	0(min) 1,971 2,015 2,082 2,094 2,499 2,633 2,725	2025 2,102 2,244 2,485 2,643	1,982 2,030 2,113 2,266 2,502 2,653	2127 - 200 - 200 - 217 - 220 - 200	2,144 2,326 2,552 2,689	1,934 2.048 2,154 2,351 2,569 2,692	1.997 2.052 2.166 2.375 2.586 2.702	2055 2,184 2,422 2,619	12			0-1 0-2 0-1	5 15:05 15:16 15:27 15:34 15:50	(P+) 0.01 0.01 0.05 0.24 0.15 0.05 0.01	Friction Loss (Pr) = ps (Lo + Lo) [kgl/cm2]	Kematks :	Noie : Jujection ol water should be continued for al kast 10 minutes under the specified pressure, after the in settles within 90 % to 110 % of the injection rate in the just previous tune minute	Prepared by : Mushtag / Jgbat

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Hole No.:	:;		M98-16					Stage:		13/14	
Location:	Ë	Dam A	Dam Axis (Left Bank)	ît Bank				Dia, of Hole:	ole:	76	m/m
olc Ir	Hole Inclination (a):	(a) 00				90 degrees		Packer Type:	ype:	Mcchanical	
ictio	1 Loss	Friction Loss per meter (p.) : 1×10 ⁵ ×0 ²⁴⁷¹	נו (b) נו (b)	1×10	,~×0	1.		Date:	Ŷ	6/August/1999	
	General clovelion : F1 -	1	S40.267 m	F	Gened	Gronndwater level (La):	Ĵ		Nii	Gauge height (La):	n (La): 0.82 H
	nh from	15	gauge lo			٩	cpih of L	Depth of test section		Leugth	Length of section (Ls)
	how hole month: (Le)-	-(1)-	6 <i>S</i> 7 m	-	<u>-</u>	ł	е 99 ш	10 (La)=	е 92 9		5.00 H
		Rene	Reading of flow meter	E AO	veter				Calcula	Calculation of Lugeon value	n value
di sano	191	284	2	I	PuS	Pv6	Po7				
(trafform)	1	4	~	2	2			P=Po+0.1(PaPo+0.1(sin(a)Lu+L;)-1'r (KgU <m2).< td=""><td></td><td></td></m2).<>		
Shurt (tene	15:23	-	15:45	15:57	Ē	ř	-				0.16
(aim)	Ĩ	ł	3	<u></u>		Ţ					0.74
	2		363		1	à î	έx Λ		P4- 16.2		
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H. min	y; Ö	8.0	2	117	- E				70 100 0		
and damps	15:33	15:44	15:55	16:07	. L	1			Waler	Water Injection Ratio (q : lit/min/m)	q : litt/mia/m)
(P.)	000	0.0	10.0	60 0	<u>6</u> 0	9.0	300			ć	
riction	Loss (P	iriction Loss (Ps) = ps(La + La) [kgf/cm2]	ž î	g(/cm2)	_	: :			Critical Pressure:	12	L.U kyt/cm2
Remarks :											
Note:	Injectio	a of wale	r should	he cout	inted for	al least	10 minut	lajection of water should be continued for at least 10 minutes under the speculied	e specified pr	rssure, alter the I	lojection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute
								A STREAM			

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Water Pressure Test	ure Test				Water Pressure Test	ssure Test	
Hole No.: M98-17 Str	Stage:	1/12	Hole No.:	M98-17		Stage:	2/12
Dam Axis (Left Bank)	Dia. of Hole:	76 m/m	Location:	Dam Axis (Left Bank)	lank)	Dia. of Hole:	76 m/m
nation (a): 90 degrees	Packer Type: N	Mechanical	Hole Inclination (a):	ation (u):	90 degrees	Packer Type:	Mechanical
tter (p): 1×10 ⁵ ×Q ⁴⁷¹¹	Date : 4/A	4/August/1999	Friction Lo	Friction Loss per meter (p): 1×10 ⁵ ×0 ¹⁹¹¹	×10' ⁵ ×0 ^{4971'}	Date : 5	5/August/1999
Ground chroation : F1 _ 571,860 m Grouwbrater level (La):	ĒZ	Gauge beight (La): 0.82 m	Ground elevation : EL.	tion : EL. 571.860 m	Groundwater kevel (La):	EN	Cauge beight (La): 0.78 m
to bole month	section	Length of section (L.)	Pipe length f	Pipe length from pressure gauge to	Depth of 1	Depth of lest section	Length of section (L)
		5.00 m	horehole mouth: (Ls)=	nh: (La)= 5.63 m	GL-(L)= 5 m	10 (La) ==	5.00 H
iding of flow meter	Calculatio	Calculation of Lugeon value		Reading of f	1 2 2 1	Calcula	Calculation of Lugeon value
Counter Pol Part Part Port Port Port Port Port Port Port Po	P=Po+0.1(siu(a)Lı+Lz)-P+ [kgf/cm2],	kg//cm2], q=O=/Ls [li/min/m]	Ounge P. Pul	Poz Po3	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	P=Po+0.1(sin(a)L+L2)-P> [kgl/cm2].	Į.
17:30 17:45	P1- 1.5			14:10 14:22	14:17 15:00	-14	
6,396	P2= 3.8	q2= 20.69	0(min) 1-	1,566 1,610	3,170 4,000	72n 4.8	928 0.96
6,402	- C4	4.4 1	╉		XLI P 010 P PLL C 0177	2	
2 0,408 0,605	ł ł			1576 1.735	3 412 4,060	x	
	-94		╎	1780	3,492 4,040	P6=	q6m 3.34
123	۳? *	q7=	2	1,581 1,830	3,573 4,095	3	
6,427			+	1,584 1,883	2,742 3,652 4,111 4,197	-	
7 6,432			- ×	1 55k 1 600 1 900 2	3,811 4,140		
			┢	1.603 2.045	3,892 4,153	(D)	
+	0 F		┼┤	1,609 2,100	3,9772 4,167	121	
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2			Ŀ	3	ટ		
- <u>30</u> 724			1j.	43 490	802 167		
j P	0 5 10 1	10 15 20 25 30 35 40 45 50	_	0.2 0.3	3		
· ·	Weter In	W.ter Intertion Ratio (o 1 lit /min/m)	-+-	4.7 49.0	104.7 10.2 10.7 4.5	• •	ç
17.40			Present tioned 14: 10	0.00 0.23	0.60 0.03	.	Water Jujection Ratio (q : lit/miu/m)
	Turcon volue :	(74) I.u.	Entorion 1 on	the rection Lab like	1	- Lurcon value :	
	Critical Pressure:	>3.8 kgt/cm2			t		×9.8
		an aftactha minutina asta asta mat minuta		1	anational freed least 10 minu	ter under the specified on	1
[Noie : lajection of water abouil be continued for at Reast 10 minutes under the Specified pressure, after the higher part minute set and set within 90 % to 110 % of the injection rate into previous one minute.	under the specifical press evidus one minute	NIC' MICLIDE ID/CLINE LUC DEL TITAN	Note : Juje setti	CLIGE OF WART SECURE DE EA WILDIE 90 % to 110 %	lujection of water socielo de confinance for al east to minutes adort de april tetter within 90 % to 110 % of the injection rate in the just previous ruse minute	it previous one minute	
Prepared by : Mushtaque / Iqbal	Inspected by :		Prepared by : Iqbal	y: Iqbal		Inspected by :	

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GE2 - 117

Stage: 3/12	Bank) Dia. of Hole: 76 m/m	90 degrees Packer Type: Mechanical	1×10 ⁵ ×Q ¹⁷⁷¹ Date : 6/August/1999
Hole No.: M98-17	ocation: Dam Axis (Left Bank)	Hole Inclination (a):	Friction Loss per meter (p): 1×10° ×Q ^{1×1}

:	The second second second second second second second second second second second second second second second s	LE LY	i e i e i e i e i e i e i e i e i e i e	X	ò	•		Date :	
Friction Loss per meter (Pr) : 1×10 ×V		į							
	Consultations 151	1	S71.860 m		Groundwater level (La)	alcr ky	<u>(</u>]	EN	Gauge beight (La): 1.00 m
		15					ph of te	Depth of test section	Length of section (L)
	rape sengua arom pressu boorbole menths (1 a)=		4.55 m	e	3	1	а 2	10 (T_a)= 15 m	5.00 m
101CTNV		Read	Reading of flow meter	Nov n	der			Calculat	Calculation of Lugeon value
Come P.	Ter.	c d	12	P.a.	5	P.46	Po7		
(ret/cm)		 4 	-	ŝ	2	4	-	Ę.	Ş.
100	1X:25	18.27	1 N.S.W.	05:X1	10,01	19-12	14:30		
O(mma)	6.141	6.724	0.520	7.530		9.5.0	1		
ן 1	6.149	6,249	6,604	7,638	8.76.	9,619			
7	6.156	6,275	0,000	7.743	8,854	9,647		54 - 53	
9	6,163	6.302	•		8 8 8	9.674	- 1		
4	512	632.9	۱ I	7.973	9,036	9.702	800 800		70'C #00
5	0.17	6.356			NZI 6	17.6	- 1	P7= 2.3	04'' =/b
¢	6,184	638	- 056		9:218	9,758			
-	6191	6.411	7.150		6.70	6,787	- 1	2	
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la la la la la la la la la la la la la l	3	<u>5-0</u>	Ś	3	Š	S	5		2
ii.	<u> </u>	26.9	¥.06	111.0	513	28.1	5	02 3 0	₽
A mark	18:25	18:37	18:48	19:00	19:11	19:22	945	Waler I	Water Injection Ratio (q : lit./min/m)
ê	10'0	0.10	80	1.57	6.1	9	5		
Friction	Friction Loss (P>) = pr(Lo + Ls) [kg0/cm2	2)-6-(ŝ	g(/cm2]		ł	2	-	(j) (j)
						Å	-	Critical Pressure:	>9.8 kgl/cm2
								-	
Note:	Injection sember s	a of wale	r should	be conti 3 % of th	ured tor c injection	at least in rate in	EO minut	Injection of water should be continued for at least 10 minutes under the specified pre- contact within 00% to 110% of the intervious rate in the just previous one minute	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute contra within 00 % to 110 % of the injection rate in the just previous one minute
	Contraction of the								

Water Pressure Test

Hole No.:	.: ö		M98-17	7			v,	Stage:		4/12	1
Location:	•	Dam A	al) six	Dam Axis (Left Bank)	- G	1	-	Dia. of Holc:		76 m/m	1
Hole In	Hole Inclination (a):	(n) uo			8	90 degrees	-	Packer Type:		Mechanical	l
Friction	i Loss I	per met	(đ) 5	1×10	Friction Loss per meter (pr) : 1×10 ⁵ ×0 ⁴⁷¹¹	2	-	Date :	12	7/August/1999	
Cimund elevation : El-	clevation	: EL	m 00% 172	E	Ground	Groundwater level (La):	Ë	PN		Gauge beight (La): 0.81 m	ε
Pine leur	th from	1 5	Pine levelsh from pressure gauge to			۵ ۵	pth of le	Depth of test section		Length of section (La)	7
- Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post - Post -	borchule mouth: (Lo)=	3	5.40 m	E	<u>د</u> .		т З	to (L.)= 20	٤	5.00 m	٦
		Real	ding of	Reading of flow meter	Act or			J	kulati	Culculation of Lugeon value	Ĩ
Chunce P.	Pol	Po2	P."3	4	745	Pa6	P ₀ 7				
(red/cm))	1	4	2			4	_	ž	ŝ	¥,	
Shert future	18:30	18-42	IX:53	_		12-61	19:37		, 8 1 7	Q1= 0.20	
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	2943	2094	3546	4750	6114	8	2		25		
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	01.8		19-03	19.15	19:26		19-47	-	Water In	Water Infortion Ratio (a - lit /min/m)	
2	8	E	1.5.1	2.17	143	0.27	0.00				
į	9.801	inition Loss (Pa) = Or(Lo		+ 1.4) [kuf/cm2]		3	1	Lugeon value :	alue :	(23) I.u.	
					_	å	5	Critical Pressure:	CSSURC:	>9.7 kyt/cm2	
Remarks											
											T
Note :	Lujection Settles v	a of wald vithio 90	cr sbould	t be contr 0 % of th	inned for the injection	at least) on rale is	(0 minute the jurt	Injection of water about the continued for at kast 10 minutes under the specified settles within 90 % to 110 % of the injection rate in the just previous one minute	ied pres ste	lujection of water should be continued for at kast 10 minutes under the specified pressure, after the injection rate per minute setter within 90 % to 110 % of the injection rate in the just previous one minute	ž
Prenar	Prenared by :	Mushtaouc	aouc					Inspected by :			٦

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Water Pressure Test	Stage: 6/,2	c) Dia. of Hole: 76 m/m	90 degrees Packer Type: Mechanical	1 ⁵ ×Q ⁴⁷¹¹ Date : 9/August/1999	Groundwater level (Lu): Nil Gange beight (Lu): 0.80 m	est section	$GL_{-}(L) = 2.5 m w (L) = 30 m$ 5.00 m	reter Calculation of Lugeon value	PoS PoS 7 4 1 ParPart0.1(siz(s)L+L2)+Ps [ktdlcm2], q=Qadla, [ii/0niz/m]	19:23 19:34 19:45 P1= 3.8 q1	<u>8,750 9,535 10,012</u> P2- 6,7	8,8191 9,5781 10,025 13= 9,4 0,5 8,801 0,6771 10,0181 94= 10.9	8,946 9,644 10,052 P5= 8.5 q5=	9,036 9,708 10,065 P6= 6.3 q6=	9,108; 9,750 10,077 P7= 3.8 97=	9,252 9,837 10,104	9.323 9,881 10,118	9 465 9.968 10.145 Et 1						Q.6 Q.7	0 0 10.1 10.4 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5	1.35 0.50	u u Lugeon value : (6.3) Lu' u u Critical Pressure: 8.9 kol'en2		Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute settles within 90 % to 110 % of the injection rate in the just previous one minute.	Inspected by : A. Fayaz
	Hole No.: M98-17	Location: Dam Axis (Left Bank)	Hole Inclination (a):	Friction Loss per meter (p.) : 1×10 ⁵ ×Q ¹⁹⁷¹	Cround elevation : EL 571.860 m	15	horehole mouth: (La)= 4.74 m	Reading of flow meter	Chauge P. Hall Pro Pro Post	18:35 18:47 19:00	7,101 7,342	7,120 7,120 7,31 7,913	7.057 7.461	7,075 7,502	7,047 7,199 7,543	129'L 112'L	7,068 7,250 7,670	100/ 1/1/ 100/ 1/1/1/1/1/1/1/1/1/1/1/1/1			14		1001 - 0-1 - 0.2 - 0.3 - 0.4	0-1 0-2 0-3	18.6	0.01 0.09 0.46	n Loss (Pr)	Kernarks :	Note : Lujection of water should be could settles within 90 % to 110 % of th	Prepared by : A. Hameed
	S/12	76 m/m	Mechanical	8/August/1999	Gauge height (La): 0.82 m	Length of section (La)	5.00 m	Calculation of Lugeon value	Ĭ,		q2= 7.08			qfa 7.46													: (25) Lu c: >9.4 kpt/cm2 -		resoure, after the injection rate per minute	
Water Pressure Test	Stage:	Dia. of Hole:	Packer Type:	Date :	Lu): Nil	Depth of test section	10 (La) w		Po7 P=Po+0.1(siu(a)Lu+L2)-P* [kgd/cm2].	-l	9500 121 121 121 121 121					9557	9565	5/J ²	1 ai	sins		T) ,	בר		 Lugeon value : Critical Pressure: 		lajection of water sbould be continued for at kast 10 minutes under the specified pressure, after the in settles within 90 % to 110 % of the injection rate in the just previous one minute	Inspected by :
Water P		ank)	90 Jugares	×10° ×0 ¹⁹⁷¹	Groundwater level (La):	Depub	GL-(L.)= 20 m		Put Pus Pus Pus Pus Pus Pus Pus Pus Pus Pus	17:26 17:37	0118		SN16 91N2	0226	XC20 1348	875.0 93.31	6906	9026 9443					N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			1.87 0.32			lajectiou of water sbould be continued for at kast 10 minutes under the specified settles within 90 % to 110 % of the injection rate in the just previous one minute	
	M98-17	Dam Axis (Left Bank)	Hole Inclination (a):	Friction Loss per meter (p): 1×10 ⁵ ×0 ¹⁵¹¹	Ground clevation : FL 571,860 m	Pipe length from pressure gauge to	hurbole mouth (1_) - 5.33 m	Rending of flow meter	Part Part Part Part Part Part Part Part	16:52 17:0M	S471 5850	5506 5942	5577 6126	5613 6218	2013 44-95	5717 6495	5753 65K7	-1572 5725					3 2 2	3	PI-21 20-21	0.2 0 1.90	inition Loss (P+) = pr(Lo + L+) [kg/km2]		ou of water should be c within 90 % to 110 %.	Prepared by : Iqbal
	Hole No.:	-	pati	8	0	Ű.	, atb		<u>-</u>	16:40	5374			3	315	Ì		Ĵ					γ¦γ	ð	22	0.01	i i		ě š	

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Hole No.:			M98-17				••	Stage:	8/12
Location:		Dam Axis (Left Bank)	xis (Le	tî Bank				Dia. of Hole:	76 m/m
Hole Inclination (a):		:(च) u				90 Jeynes		Packer Type:	Mechanical
Friction Loss per meter (p.) : 1×10 ⁶ ×0 ¹⁹⁷¹	1 Loss J	Scr met	cr (p.)	1×10	r ^s × O ^k	2		Date : 10	16/August/1999
German alevation : FL-	la valand	FL.	571.860 m		Cround	Groundwater level (Ln):	Ë	ΡN	Cauge height (La): 0.82 m
Pire length (rom pressure cauge to	th (mm	1 5	cause lo			Å	pth of te	Depth of test section	Length of section (La)
hurbole month: (La)=	mosth	3	4	 F	<u>cr) - 10</u>		35 m		5.00 m
		Rene	Rending of flow		meter			Calculat	Calculation of Lugcon value
Church P.	Pol	Pa2	۴۵۹	404	Su ⁴	P ₀ Q	Po7		
(cmo/pax)	-	4	5	ğ		•	-		
Stury Inner	13:10	9	100	-		1	1		
(min)			ţ			1 <u>5</u>	1	ŕ	
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-inter the	13:20	06-01	. 1					-	Water Injection Ratio (q : lit/min/m)
(1)	0.00	0 0 0	000	10 0	8	800	0000	•	
Priction	Loss (P	inictions Losss (Pr) = pr(Lo + Lo) [kgd/cm2]	- 	kg(/cm2]	_	3 3	; 1	Lugeon value : Critical Pressure:	: 0.3 Lan : >14 knd/cm2
Remarks :									
									
Note :	lujectio	a of wat	cr should	1 be coul	inted for	at least	IC ONBIL	tes under the specified pr	unection of water should be coultinued for at least 10 munits under the specified pressure, after the injection rate per minute
	settles	within 90	11 01 %	U 20	he injecti	on rate ii	a the jus	settles within 90 % to 110 % of the injection rate in the just previous one minute	

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Vater Pressure	•
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Lugcon value: 0.4 Critical Pressure: >14	8	_	0.00	<u>8</u>	90 0	000		•	:	
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					2				kpl/cm2	
	2	tor should	he cout	med for	at least	Juanta OI	es under the specified p	reswire, aller l	be uncerion fai	C DET IDIGU
f water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute	hin 9	0% 10 11	5 % o(15	e injeetk	ou rate in	n the just	pervious one minute			
layetion of water Abouid be continued for at least 10 minutes under the specified pressure, after the injection rate per minute testiles within 90 % to 110 % of the injection rate in the just previous one minute	· · · · · · · · · · · · · · · ·	ŧ								

Water Pressure Test

Hole No.:			M98-17					Stage:	10/12	
Location:	•	Dam A	Dam Axis (Left Bank)	it Ban	5			Dia. of Hole:	76 m/m	
Hole Inclination (a)	inatic	(a) no			8	90 degrees		Packer Type:	Mechanical	
Friction Loss per meter (pi) :	t ssor	per met	(d) ;;		1×10° ×01×1	71.		Date :	20/August/1999	
Growind elevation : EL	Valion		S71,860 m		Groundy	Groundwater level (L.1):	(`]	IN	Cauge beight (La): 0.85	E
Pipe length from pressure gauge to	Lon	19	, gange 6			Á	cptb of Ic	Depth of lest section	Length of section (L.)	
borchole mouth: (Lo)=	outh:	3	4.78	E	<u>10</u>		45 m	10 (Fu)= 50	m 5.00 m	
		1 Š	Reading of flow meter	Row n	oder			Culo	Calculation of Lugcon value	
Church P.	Pol	2.1	5	Po4	294	9°6	Po7			
(kut/cm3)	_		5				-	P=Po+0.1(sin(a)Li+Li).P* [kg0/cm2],	¥,	÷
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_1	-	_	15.9			. 1			-	>
╉	222	_	12:42				Ł		Water Injection Ratio (q : lit/min/m)	
Ē	10:0	100	0.12	2	020	01.0	3			
Priction Loss (Pr) = pr(Lo + Lr) [kgl/cm2]	e) 8	-) &	= ; ;	(gl/cm2)		\$ 5	1	Logeon value : Chilcal Pressure:	u€: 2.0 Lm ыте: >15 kg/cm2	
Remarks :										
Note: 1	10L	a of wate	r should	K Cont	and for	at least	O minut	es under the specified	luiection of water shund be contrated for at feast 10 minutes under the specified pressure, after the tapection rate per minute	naute
.	r.	witks within 90	% N 1	0 % of t	be injectio	on rak ir	the just	% to 110 % of the injection rate in the just previous one minute		
Prepared by :	 م		Iqbal / Mushtaq	(जप				Inspected by : A. Fayaz	. Fayax	

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Test
Pressure
Water

Hole No.:	;;;		M98-17					Stage:	11/12
Location:	:uc	Dam A	Dam Axis (Left Bank)	(L Bank				Dia. of Hole:	76 m/m
Hole I	Hole Inclination (a)	on (a):				90 degrees		Packer Type:	Mechanical
Frictio	a loss	Friction Loss per meter (pt) : 1×10 ⁻⁵ ×Q ¹⁺¹¹	ст (р.). -	1×1	,0×,			Date : 21	21/August/1999
		Ē				Connadurates level (1.1)		Ż	Cauge height (La): 0.88 m
	Urund cicvalion : Ed.	15	Contract 10) o que	Denth of test section	Length of section (Lo)
	tipe e ugia multi (1 a)=	-(-1)	4.60	. 6	(<u>-</u>)	1	9 9 9	io (La) = 55 m	5.00 m
		Kend			der				Calculation of Lugeon value
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Plant & second	15:26	15:37	15:48	15:59	ŀ		- 1		Water Injection Ratio (q : lit/min/m)
(f.)	0.00	0.00	0.0%	0.15	6) 0	0.05	0.02		-
Friction	Loss (P	itiction Loss (Pr) = pr (Lo + Lo) [kg0/cm2]	*)(***	g(/cm2]		: :	2 2	Lugcon value : Critcal Pressure:	2.0 Lu >15 kpt/cm2
Remarks :	'n								
	lujectio etites	a of wate 00 of the	7 should % to 110	be cout	uned for e injection	al feast In rate in	to minut the just	injection of water should be continued for at least 10 minutes under the specified pre- cerbe-within 90 % to 110 % of the intertion rate in the just previous one minute	Injection of water should be couldured for al feasi 40 minutes under the specified pressure, after the injection rate pet minute corressoring 80 % to 110 % of the injection rate in the just previous one minute.
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90 dcyne Stri 800 m Groundwater h Stri 800 m Ground m Stri 800 m Ground m Stri 800 m <trr></trr>	Packer Type: Mechanica Date : 23/August/15 East section 1 Gauge Mainer est section 1 Cauge Mainer Nil Gauge Mainer Nil Gauge Mainer Part 12,8 43 Part	0.30 (LL) E
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sss (٢٢) = pr(i.o + ١) [kgt/cm2]	0.00	•
narks :	 Lagcon value: 0.4 La Criteal Pressure: >16 kg/cm² 	9
Noic : Injection of water should be continued for at least 10 minutes under the specified sector of the specified sector in the sector sector sector sector minutes and the sector minutes of the injection rate in the just be previous one minutes and the sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sector sec	Direction of water should be continued for at kast 10 minutes under the specufied pressure, after the injection rate per minute verties within 90 % to 110 % of the injection rate in the just previous one minute	a rate per nainute
Drensred by C. A. Humced	Inspected by : A. Fayaz	

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Ë	Hole No.		M98-18		1		S	Stage:		2/36	
	l ocation:	V min Dium	Dam Axis (Left Bank)	Bunk)			u	Dia. of Hole:		76 m/m	
ב ו ו	Hole Inclination (a):	(a) noi			8	90 degrees	ይ	Packer Type:	2	Mechanical	
	Frietion Loss per meter (p.) : 1×10 ⁵ × O ¹⁹⁷⁴	ber mel	cr (p.) :	1×10	*012		ц	Date :		1/9/99	
[[[10	755 0AA		Geomedwater level (Li):	ater leve	ίŢ)	н 8		Cauge beight (La):	. 0.81
- <u>-</u> -	Ground clevation : El-	12:00	of minutes a			Å	Depth of test section	(section		Length of section (L)	(n) aoit
<u> </u>	ripe kragna irom pressure guide to	n pressua (T _)	1,70 m	 8		L	E	to (La)= 10	8	5.00	8
	horrhole mouth: 14/-		Panding of Rive meter		ļ				Iculatio	Calculation of Lugeon value	ÿ
<u> </u>	Churd P. Pri	102	E'd	404	PaS	Pu6	Pa7				
(ke	1	4	s	4	1		-	P=Po+0.1(sin(a)L+L)-P= [kgUcm2].			q=0-/LJ [b\/mi#/8] 20.00
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	(Pr) 0.23	9 0.89	1.85	F.	50			1			
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bu rate per minute	Note : Injec Settle	tion of wa	iter should 0 % to 11	he could	mod for	l kasi l n rah in	0 minute the just	Injection of water should be continued for at least 10 minutes under the specification of an in 111 of on the interior rate in the just previous one minute	ticu press uite	Injection of water should be communed for at least 10 minutes under the specifical pressure, and the injection area for manue.	
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GE2 - 123

	Test	
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	J. J.	
•	Water	

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Location:	:uo	Dam A	Dam Axis (Left Bank)	(I Ban	2			Dia. of Hole:	lole:	76	e/e		
Hole I	Hole Inclination (a):	(a) (on (a):			8	90 degrees		Packer Type:	ype:	Mechanical	cal		
Frictic	n Loss	Friction Loss per meter (p.) :	. (a) ປ		1×102×04**1	3	•	Date :		3/9	3/9/99		
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(6)	10.0	0,17	0.82	5	5	0.41	0.02						
Friction	Loss (P	Friction Loss (Pr) = pr(Lo + Lo) [kg0cm2]	1) (*1 +	gt/cm2]		1 2			Lugeon value : Critical Pressure:	7.4	Lu' kri/cm2		•
Note:	Injectio	o of wate	r should To b 10	be could	nued for r faiectic	al least I so rate iu	10 minut	lijectios of water should be continued for at least 10 minutes under the specific action within 90 st ac 110 St of the iniccion strein the junt previous of minute	algection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute auto-within 60 % to 110 % of the injection rate in the inst newtonst one minute	ssine, alter	the sujection	raic per m	pulo

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Hole Ir	Hole Inclination (a):	on (u):			8	90 degrecs		Packer Type:	Mechanical	
Frictio	n Loss	Friction Loss per meter (pt) : 1×10 ⁵ × 0 ¹⁺³¹	י: כו כו	1×10	•.0×.	i.		Date :	4/9/99	
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j.	Pipe length from pressure gauge to	pressure	gauge to				Depth of	est section		Leavth of section (L)	section (E)	<u>ک</u> ا	Pipe leugth from press	d woy	2
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Reading of flow meter Calculation of Lugeon value $\frac{1}{4}$ $\frac{1}{7}$ $\frac{1}{4}$ $\frac{1}{11}$ $\frac{1}{1200}$ $\frac{1}{1000}$
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Hole No.:			M98-19	6				Stage:		8/36		ļ
Location:	ç	Dam A	uis (L	Dam Axis (Left Bank)	R)			Dia. of Hole:		26	m/m	
Hole In	Hole Inclination (a):	:(a) no				90 degrees		Packer Type:		Mechanical	cal	
Frictio	l Loss	per mei	ter (p.)	×.	Friction Loss per meter (p) : 1×10 ³ ×0 ¹⁹¹¹	÷.		Date :		1/9	1/9/99	
Cround	Ground elevation : EL-		488.720 m	8	Ground	Groundwater level (La):	rel (La):	37.5 т	E	Gauge	Gauge beight (La):	<u>,</u>
Pipe ka	hipe length from pressure gauge to	15	c gauge	9	 	Q	Person of t	Depth of test section		ב 	(ساً) section (لم)	. <u>ē</u> l
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(km2/J24)		4	7	10	~	4		P=P0+0.1(sia(a)L+L2)-Pr [kg(/cm2],		Pr [kgf/cm2	f.	Ę.
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				43	Ι.		J		Laveon value :	4.6	La	
			ŝ		-	I			Critical Pressure:			덛
Remarks :				-								
Note :	lujectio.	n ol wat	er shoul	d be cou	buued to	r at kast	10 minu	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute	ecified pr	essure, alter	the injectio	2
-				C	the pice	NO FACE	Dilbe all	welles within 91 % to 110 % of the precision rise in the 19% previous oue minute	Churce		,	

Hole No.: Location:	.,		01-86M	,				State:			776			
Location														
	•	Dam A	Dam Axis (Left Bank)	(1 Bank				Dia. of Holc:	ij		76	8/E		
Hole Inclination (a):	linatic	:(a) nc	I		8	90 degrees		Packer Type:	ij	2	Mechanical	I.		1
Friction Loss per meter (p.) :	Loss Loss	ocr met	د (م) د		1×10°×Q ^{1×11}			Date:		7	29/08/99			
Commission - Fl.	- united	Œ	488,720		Groundwater level (La):	vater kev	(¹ 1)	32.50	5		Cauge h	Cauge height (La):	0.80	٤
Pine knoth from messure gauge to	h from	Dressure	gauge to			ſ	thth of te	Depth of test section		Η	1	(cL) Length of section (L)	(cl) noi	
horhole month: (Le)=	octath:	2	4.85	ć	(r) U	1	30 B	to (La)=	35	8		5.00	2	
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(curs/phi)	-	2	4	7	-			P=Po+0.1(sin(a)L+L)).Pr kgUcm2],	1+17(a)u		kgt/cm2],		q=Q-/L- [liVmin/m]	÷
Nurd Nurd	17:10	17:21	17:32	17:44	17:55			<u>د</u> 1		20	a			
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Remarks														
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Hole No.:	.: 0		M98-19	_				Slage:		9	9/36			ł	Hole	Hole No.:		M98-19	
Location:		Dam A	Dam Axis (Left Bank)	ft Bank	0			Dia. of Hole:	Hole:		29	۳/a		1	Loca	Location:	Dam A	Dam Axis (Left Ban	ft Ban
Holc I	(ten	on (a):	•			90 Jegres		Packer	Packer Type:	Mecl	Mechanical			1	Hole	Hole Inclination (a):	ion (a):	•	
Frictio	n Luss	Friction Loss per meter (p): 1×10° × 0 ^{1×11}	er (p.)	1×10	, X X	.1.		Date :			1/9/99			1	Frict	Friction Loss per meter (p) : IxI	per me	ler (p+) ;	1×1
Croted	Ground elevation : 23-	10	4X8.720 m	E	Cround	water le	Croundwater level (Li):		42.50 m	ර –	Gauge beight (La):	i(1)	0.80	E	Crou	Cround clevation : EL 488.720	и: П.	488,720	ε
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thorehole	borchole mouth: (L.)=	<u>;</u>	4.85 m	ε	GL . (L)=	1	र २	40 m to (1a)=		ε		8	6	T	thore is	harehole mouth: (Lo)=	3	87	ε
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Circle P	10-1	3	P.2. P.3. P.4 P.5	40	202	1	2	0-1-0	b=B++0 1/s(n/s)1 and 3-De+[ko//sm2] = sm0=/La [[[k/m]m/m]	-\-P=1kof/r	m2). o	0-14	lit/mim/m]		Cauga P.		2		2 2
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I-repar	ca by :	Prepared by : A. Hameed	mece]]		-		

ole No.:	, r		M98-19				.,	Stage:	10/36
ocution:	 	Dam A	Dam Axis (Left Bank)	ft Bank				Dia. of Hole:	76 m/m
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riction	Loss	riction Loss per meter (p+) :	:: ניד ניד		1×10,2×0,121			Date :	2,0,99
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rcpare	repared by :	- 1	A. Hamced					4	

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Pressure
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Banky Dia. of Itole: 76 m/m 90 drepres Packer Type: Mechanical 3.09/99 1×10 ⁴ × Q ^{1×11} Date : 3.09/99 3.09/99 n Cionendwarer level (LJ.) CLL. 52.50 m Cance height (L.); 0.80 n Cionendwarer level (LJ.) CLL. 52.50 m Cance height (L.); 0.80 n Ci (LJ.) = \$0 m bott 2.1 3.09/99 n Ci (LJ.) = \$0 m bott 2.1 0.00 13:10 13:21 13:41 P=Pn-0.1 (sin(x)L_4-L): P1 (kg/m2), q=Q_m/L] [it/mid/m] 13:10 779 780 811 819 770 786 811 819 72 9.3 770 786 811 819 72 9.3 9.4 770 780 811 819 72 9.4 0.30 770 770 811 819 72 9.4 0.30 770 780 811 819 7 9.4 0.30 770 811 8												
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Water Pressure Test

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Holc No.:	:		M98-19	~				Stage:	12/36	
Location:		Dam A	Dam Axis (Left Bank)	ft Bank				Dia. of Hole:	76 m/m	1
Hole In	Hole Inclination (a):	;(e) uc	•		8	90 degrees	•	Packer Type:	Mechanical	I
Friction	1 Loss I	per met	Friction Loss per meter (p.) :		1×10,×0, 1	2		Date :	4/9/99	1
Ground elevation : EL	levation		488.720 B	a	Groundy	Groundwater level (La). GL-	(r)	5L- 57.50 m	Gauge height (La): 0.80	E
Pipe kov	th [rem	Ì¥	Pipe leaved from pressure sauge to			ľ	oth of te	Depth of test section	Length of section (L.)	
horeboke	horebole month: (Lo)=	3	4.85	8	(r) Ur (r)		55 m	m to (La)≖ 60	m 5.00 m	
		Read	Reading of flow meter	Row n	ktler			Calc	Calculation of Lugeon value	1
Outro P.	Pol	Po2	594	Ч Ро	Suq	8	P.7			
(m)/(m)	-	4	5	10		4	-	Ę.	Ë,	
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Final State	00.3	_	- L.	_L		8	05.4	-	Water Injection Ratio (q : lit./min/m)	
Ĵ	000	0.00	00	2010	10'0	10.0	3			
liniction	Loss (Pi	1) & = 6	iriction Loss (Pr) = pr(Le + Le) [kgl/cm2]	kgf/cm2]		3 3	5 1	Lugeon value : Critical Pressure:	ure: U.O Eur ure: 11 kg0/cm2	T
Remarks :										
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Note :	fujectio. settles v	a of wat vithin 90	er sbould 75 to 1 h	0 76 of 1	he injecti	at Kast og rate it	the part	Injection of water should be continued for at Kasi 10 minutes under the previous one minule setting within 90 % to 110 % of the injection rate in the just previous one minule	lojection of water about de continued for at Kas to nitures uner the periods presents, at at the injection of w settles within 90 % to 110 % of the injection rate in the just previous one minute	
Prenare	Prenared by :	A H	A. Hameed					Inspected by : A.	Fayaz	-

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Note : injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute series within 90 % to 110 % of the injection rate in the just previous one minute Prepared by : Mashtague (m/mia/m) د//ــــO=-p 0.03 0.06 0.09 0.12 0.15 0.18 Gauge beight (La): 0.80 Length of section (La) Water Injection Ratio (q : lit/min/m) 6 . Culculation of Lugcon value Lu kelom2 5.00 E/E 66/6/9 5 Mechanica! P=Po+0.1(sin(a)Li+Lz)-P+ [kgt/cm2], 0.0 14/36 22 Lugcon value : 8 Critical Pressure: 7.8 10.8 15.8 15.8 15.8 15.8 7.8 20 Ì Packer Type: E Dia. of Hole: 2222222 0 Groundwater level (La) GL- 67.50 8 9 7 1 Q 8 ŵ 4 10 0 65 m to (La)= Depth of test section Date: Stage: Smolig & ai mozens mist 13.40 ŝ Pu5 Pu6 Po7 2 2 8 551 551 551 90 degrees Qui Q2 Q3 Q4 Q5 Q6 00 10 80 90 50 10 Q-1 Q-2 Q-3 Q-4 Q-5 Q-6 0.00 0.10 0.80 0.90 0.50 0.10 <u>cr-(r</u>)-Friction Loss per meter (p.) : 1×10⁴ × Q^{49/1} 537 546 538 546 538 546 539 547 540 547 541 548 542 549 38 3 Reading of flow meter Dam Axis (Left Bank) <u>527</u> 536 537 R E l'riction Lons (Pr) = pr(Lo + Lo) [kg(/cm2]] 3 2 Ground elevation : EL 488.720 m corehole mouth: (L.)= 4.85 m 01-86M 82 Fal 225 533 <u>888888</u>8 24 Hole Inclination (a): 2 Pol 517 tole No.: .ocation: Remarks : lil Aveniza lit./min (P+) 2 Genge P. Total (iiiii)) ŝ

GE2 - 132

	Feasibility Test - 01 (Open End Constant Head Method)	est - 01 Head Method)			Feasibility Test - 02 (Open End Constant Head Method)	'est - 02 Head Method)	
I acation	Munda Dam			Location:	Munda bunda		
Borcholc No.:		Dia. of Borchole (21):	hole (2r): <u>90.0 m/m</u>	Borcholc No.:	M98-20	Dia. of Borehole (21):	hole (2r): 90.0 m/m
lollom of Bc	Boutom of Borchole (GL h1): 2.0 m	Bettom of Casing:	asing: 2.0 m	Bollom of Bore	Bottom of Borchole (GL - h1): 3.0 m	Bottom of Casing:	asing: 3.10 m
iroundwater	IEN	Constant Head Level (GL, + h3)	il (GL+ h3) 2.0 m	Groundwater L	Groundwater Level (GL- h2): Nil C	Constant Head Level (GL + h3	cl (GL + h3 3.10 m
	Test Record		Date: (15 /09/1999)	Shrit Time: (12:05)	Test Record		Date: (15 /09/1999)
			Calculation		Reading of Flow Meter		Calculation
/min/	Production (m)	Volume of Flow (cm ³)		(mia.)	Reading (m)	Volume of Flow (cm ³)	
Ì		0		0	250.587	0	
-	249.532	6	Calculation Formula	<i>F</i> .	250.590	3	Calculation Formula
2	249.538	9	<u>, </u>	2	250.592	2	0
6	249.544	6	55rH	3	250.595	3	HZR - Y
4	249.550	6			250.598		: ;; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;
\$	249.556	ę	lk : Coefficient of Perneability (cm/src) 		250.600	7	k: Coefficient of Permentury (cm/sec)
6	700.442	7	111- Woter Hard form) -		250 606	3	II: Water Head (cm) ;
	400.442	, 6	when groundwater is Nill 14-b1+b3		250.608	2	when groundwater is Nill H=b1+b3
	249.581		When there is groundwater Hab2-b3	6	250.611	6	when there is groundwater [1= h2-h3
	249.587	6	q : Constant Injection Rate into Hole	10	250.613	5	g: Constant Injection Rate into Hole
	249.594	7	(cm3/sec)	[]	250.616	5	(cm3/sec)
с 1	249,600	6		12	250.619	3	
13	249,605	5	r= 45	13	250.621	2	
14	249,610	5	H= 400	14	250.624	3	H= 610
15	249.616	6	q= 98	15	250.627	3	
8	249.622	6	k= 0.00993266	16	250.629	2	k= 0.00292543
17	249.627	5		17	250.632	3	
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Test
Pressure
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Hole Inclination (a): 90 dences Packer Type: Micchanical Friction Loss per meter (p): $1 \times 10^4 \times Q^{M1}$. Date : 160999 Friction Loss per meter (p): $1 \times 10^4 \times Q^{M1}$. Date : 160999 Pipe kength from pressure gauge to Depth of test section Langth of section (LJ). 0.77 Pipe kength from pressure gauge to Depth of test section Langth of section (LJ). 0.77 Pipe kength from pressure gauge to Denthle month: (LJ). 125 100 7 4 12 0.77 0.77 Owners 110 220 200 120 750 100 7 4 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	nclination n Loss per geb from pre Pol P					Dia. of Hole:		÷	ដ ម		
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cution: Din of Hole: 76 m/m re Inclination (a): Din Asis (Left Bank) Din of Hole: 76 m/m re Inclination (a): Din Asis (Left Bank) Din of Hole: 76 m/m ction Loss per meter (p): $1 \times 10^{4} \times Q^{4/1}$ Date: 22009/99 0.75 m etengib from pressure gauge to Depth of test section Depth of test section Length of test section (LJ) 27.5 m 2009/99 etengib from pressure gauge to Depth of test section Depth of test section Logo Date: 22.00/99 etengib from pressure gauge to Depth of test section Date: 22.00/99 Date: 22.00/99 etengib from pressure gauge to Depth of test section Length of test section Lub China 25.6 Date etengin from of target from of target from of target from of target from of target from of target from of target from test Date 25.6 Date 25.6<	Dam Axis (Le(i, Bank) Dia. of Holc: 76 nation (a): 90 depress Packer Type: Metchanical oss per meter (p): 1 x10 ⁴ x Q ^{DMT} Date: 22.09/99 oss per meter (p): 1 x10 ⁴ x Q ^{DMT} Date: 22.09/99 niou::El. 418.0 Cl(L)= 20 m to (La) 20.00 niou::El. 418.0 Cl(L)= 20 m to (La) 22.09/99 niou::El. 4 x 7 7 10 7 0 7 1 4 7 10 7 10 7 0 4 7 100 7 1 4 7 10 7 0 4 1 1 1 4 7 0 4 0 1 4 1 1 1 4 1 1 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <th>natio Alion Sultin</th> <th>am Axis (</th> <th>Left B</th> <th>14</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	natio Alion Sultin	am Axis (Left B	14									
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Water Pressure Test

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Hole Inclination (a):	inatio	n (a):			8	90 degrees		Packer Type:	Type:	Mec	Mechanical			I
Friction Loss per meter (p_i) : $1 \times 10^4 \times 0^{1871}$	d SSO	ocr mel	ст (р) :	1×1	0, ×0"	Ę		Date :		13/Jan	13/January/1999			1
Contract elevation - FL	. Include	EI.	528.24 m	E	Ground	Groundwater level (L.): GL-	ן <u>ר</u> ו		0-30 m	Ö	Gauge height (L.):		0.35	F
Pice leavely from pressure sauge to	l l	- THE	vauer to			Â	cpth of t	Depth of test section	ę		Length of section (L.)	section	<u>(</u>]	
hole mouth: (Lo)	5		21.00 m	£	CL. (L.)-		E	n (L) o		E		ŝ	E	T
		1 1	Reading of flow meter	flow r	neter		1 1		Calc	ulation o	Calculation of Lugeon value	alue		T
L	Å,	Pu2	2	404	2	2	La i	P=Po+0.	P=Po+0.1(sin(a)L+L2)-Pr [kgf/cm2],	z)-Pr [kg(/		q-O-/L [livmin/m]	min/m}	
	1.5	1	14.42						P1-		1	5.3		-
O(min)	520	1,293	L.			i	,		72= 2.0	0	4 -	20.0		
	5	1,390					;			5		6.6		
	614	1,489		i		i	İ		Y4					
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	53	8	} §	l	1				× •	X0 X5 2	20 22 23	ñ	40 45	8
+-	13:25	E	E		_				ž	ater Injecti	Water Injection Ratio (q : lit./min/m)	liu/min/	ê	
L	0.47													
Friction Loss (Pr) = pr(Lo + Lo) [kgUcm2]	4) 70	7) = b(r	: 	lg(/cm2	-	2 1	1 4		Lugeon value : Critical Pressure:	lue : sure:	(84) Lu >2.0 kr	Lu' kkľicm2		T.
Kemarks :														
		and the second	- About	2	Protect for	r at least	10 minut	es ander	the specified	Dressure,	terration of memory here the provint of the second for all least 10 minutes under the specified pressure, after the injection rate per minute	ction rat	c per min	ų
Note : If	nyceno erties y	n ol war vithin 90	CT SMOULK	0 % of	the inject	ion rate i	ihe juri	Dreviou	injection of water should be continued for a new ye minute a rest for the just previous one minute settles within 90 % to 110 % of the injection rate in the just previous one minute					
Prepared by :	à	Fafha	Fafhat M. Shah	4 F				Inspe	Inspected by : M. Suga	A. Suga				
						İ		Ļ						

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	Water P	Water Pressure Test				Water P	Water Pressure Test	
Hole No.: Qs-1		Stage:	2/10	Hole No.:	I-sõ		Stage:	3/10
Location: Suppare Quarry Site	ury Site	Dia, of Hole:	76 m/m	Location:	Sappare Quarry Site	Site	Dia, of Hole:	76 m/m
Hole Inclination (a):	90 degrees	Packer Type:	Mechanical	Hole Inclination (a):	nation (a):	90 degrees	Packer Type:	Mechanical
Friction Loss per meter (p) : 1×10 ⁺ ×0 ^{w11}): 1×10 ⁺ ×0 ^{1×11;}	Date :	14/January/1999	Friction Lc	Friction Loss per meter (p) : 1×10 ⁴ ×0 ^{1,711}	1×10+×01**1	Date :	01/February/1999
Ground elevation : EL 523.24 m	A m Groundwater level (L.); GL-	u):GL- 0.60 m	Gauge height (La): 0.35 m	Ground elevation : EL	ation : EL 528.24 m	Groundwater level (Li): GL-	Li): CL- 0.30 m	Gauge height (La): 0.30
Price length from pressure gauge to		Depth of test section 5 m to (LA)= 10) m 5 m	Pipe length from pi	Pipe length from pressure gauge to		Depth of test section 10 m to (LA)= 15	m Length of section (Lu)
	ow meter		culation of Lugeon v		Read			
Gauge P. Pol Pa2 Pa3	çi d	P=P=+0.1(sin(a)L	P=P++0.1(sin(a)L++L:)-P* kg//cm2],	Gauga P. Pal	F.	Pe6	_Pu7_ 1 P=Pe+0.1(sin(a)),+1,2)-Pr [kg/(cm2].	L)-Pr [ke/(cm2],
Mart 14:07 14:20 14:32			0.6 ql= 9.4	1	7:15 17:27 17:51	23 18:14 18:25	18:37 PL= 0	
3,835 4,415 5		8 8	21 q2m 18,8	1	555	8,805 9,865	23	
505						8,929 9,948		1
2 3,92/ 4,688 5,663	:	2	42 -	N [67	5.125 5.731 6.766	10,080	2	4.5 q5= 19.9
4,781 5		2	dó=	- '	5,805	9,220 10,154	P6=	.
5 4,067 4,875 5,758	· · · · · · · · · · · · · · · · · · ·		¢/=		5,202 5,876 6,960	8,160 9,316 10,227 10 8,770 9,410 10,227 10	2	#7 #
4,169 5,066	; ; ;				0.015	9,510 10,370		
8 4,206 5,162 5,900				× ×	80.9	8,505 9,607 10,444 10		
4,00)911 			5,394 6,230 7,447	9,801 10590) 81 1	•
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15 0-1 0-2 0-3		(1 =)18,44	•	Toral C	3	8	2 	
468 939	-				304 705 962	906 725		
Average Quil Que2 Que3	:	0	10 15 20 25 30 35 40 45 50	Average Q	Oul 0.2 0.3	0 1 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 م	10 15 20 25 30 35 40 45
14-17 14:30			Water Injection Ratio (q : lit/min/m)	1.	5 17:37	3 18:24 18:35	4	Water Injection Ratio (g : l/t/min/m)
0.0				[1.34	2.73 1.46	0.2K	
friction Loss (P1) = pr(Lo + L) [kgl/cm2]	[kg(/cm2]	Lugeon value :	value: (68) Lu'	Friction Los	Friction Loss (Pr) = pr(Lo + Lo) [kgl/cm2]		ы	(£)
Kemarks :			77	Kemarks :		ā		
Note: Injection of water about settles within 90 % to 1	Injection of water should be continued for at least. IV numles under the specifie, serifie within QV 4., to 110 % of the injection rate in the just previous one minute	inutes under the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification of the specification	Injection of water should be continued for at least. It nimules under the specified pressure, after the injection rate per minute settler within QV %, to 110 % of the injection rate in the just previous one minute	Note : Inje	ction of water should b les within 90 % to 110	injectuon of water should be cuntimued for at least 10 minutes under the specifies testific within 90 % to 110 % of the injection rate in the tust previous one minute	unutes under the specifies riust previous one minute	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute while works within 80 % to 110 % of the injection rate in the just previous one minute

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Water Pressure Test	Hole No.: Os-1 Stage: 5/10	Location: Sappare Quarry Site Dia, of Hole: 76 m/m	Hole Inclination (a): 90 degrees Packer Type: Mechanical	Friction Loss per meter (pi) : 1x10 ^{-x} ×0 ¹⁺⁷¹¹ Date : 05/February/1999	er levei (L.): GL- 0.30 m Gaug	ire gauge to	Cal	5 PV6 PV7 PV7 A PV0.1(sin(a)L+L2)-Pr [kg2(cm2), q=0.	12:32 12:44 12:55 13:00 13:17	14,674 14,715 14,780 14,880 13,124 15,223 15,227 73 73 70 93	14,724 14,803 14,920 15,164 15,344 15,430 P4= 9.9 94=	14,648 14,740 14,822 14,967 15,198 15,364 15,436 PG PG 4,0 96	14,691 14,745 14,630 14,992 15,215 15,374 15,439 F/F 1.1 4/1 14,693 14,751 14,839 15,017 15,232 15,384 15,443 // ·	14,695 14,756 14,848 15,040 15,248 15,394 15,446	14,097 14,701 14,857 15,000,c1 15,867 15,413 15,423 15,452			0.1 0.2 0.3 0.4 0.5 0.6 0.7 W	20 Qui Qui Qui Qui Qui Qui Qui Qui Qui Qui	12:42 12:54 13:05 13:10 15:27 13:38	- 0.01 - 0.02 - 0.00 - 1.1.0	- Critical Pressure: 6.8	Remarks :	Note : Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute writes within 90 % to 110 % of the injection rate in the just previous one minute.	Prepared by : Fathat M. Shah Inspected by : M. Suga
Water Pressure Test	Hole No: Os-1 Stage: 4/10	Connere Output Sile	90 degrocs	tter (ba): 1×10 ⁻¹ ×0 ^{1,111}	11. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	ction Longth of section	$\frac{(L_{a})_{m}}{15} = \frac{15}{10} = \frac{10}{10} = \frac{20}{10} = \frac{1}{10}$	Pat Pa2 Pa3 Pa4 26 Pa6 Pa7 Pa7 Pa7 Pa7 Pa7 Pa7 Pa7 Pa7 Pa7 Pa7	3 15:55 16:04 10:19 10:30 P1= 1.1 q1=	10,967 11,043 11,540 12,353 13,218 13,933 14,450 P2= 3.3 92= 3.3 92= 3.5 92= 3.5 92= 3.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 93= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 5.5 95= 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14,135 14,135 14,135 14,135 14,135 14,135 14,135 14,135 14,135	11275 11,000 12,780 13,560 14,182 14,515 P7= 0.9 97=	13,700 14,292 14,560	11,416 12,124 13,015 13,768 14,342 14,590 11,453 12,197 13,014 13,838 14,392 14,618	11,512 12,270 13,178 13,907			469 7.00 N.2. 0m3 0.4 0.5 0.6	31 16:05 16:14 16:29	1.53 [0.34] 0.13	Friction Lors (Pr) = pr(L+ L) [kgf(cm2] Lu Lugeon value: (29) Lu Critical Pressure: >7.9 kgf(cm2	Remarks :	Note : Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute	extites within vy 's to 110' to 1 merupanism and the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of the process of 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Test ģ XX at

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ន Nute: Injection of water should be continued for al least 10 minutes under the specified pressure, after the injection rate per minute cetter within 90 % to 110 % of the injection rate in the just previous one minute. Prepared by : Fathat M. Shah. 5 10 15 20 25 30 35 40 45 hePu+0.1(sin(a)Lu+Lu)-Pr [kgf/cm2], q=Q=/Lu+Lu[li/min/m] ما المالية Gauge height (La): 0.40 Length of section (La) Water Injection Ratio (q : lit/min/m) Calculation of Lugeon value Ľu' keľom2 2.0 18.0 18.0 18.0 18.0 18.0 18.0 e/e 06/February/1999 Mechanical (9<u>6</u>) >7.0 6/10 26 Lugeon value : Critical Pressure: ε 0.0.4.5.5.68 8 Water Pressure Test Packer Type: level (Li); CL-- 0.20 m Dia. of Hole: 2 0 Stage: 25 m to (L4)= Depth of test section Dulc: ŝ 0 N T A A 0 Valet Pressure in Lgf/cm2 19.620 19,875 19,670 19,897 19.748 19,570 19,854 19,709 19,728 19,466 19,810 38 ភិទ្ត 19,519 19,832 10.04 ł 0.0 2 ł 90 degrees 19,294 19,120 19,120 ŝ 19,236 19.406 ĴĴ 1 ł 32 9 6 ł Croundwater OL (L) Friction Loss per meter (p) : 1×16⁴ ×0^{1,911} 18,622 18,856 19,014 18,463 18,542 18,934 i 3× 38 : ļ 2 Reading of flow met 18,183 20 2 ë 17,270 17,280 18,083
 Number
 17:07
 17:18
 17:29
 17:40

 (Pr)
 0.03
 1.08
 2.08
 3.01

 Princion Loss (Pr)
 pr(L+L) (kg/Cm2)
 10
 17.45 i Sappare Quarry Site <u></u> 2 8.50 m 528.24 m Pipe length from pressure gauge to 17,113 2 16,935 17.024 į ì 32 Ś 2 16,135 16,197 16,260 15,826 Hole Inclination (a): 15.058 15.710 15.769 15.858 15.950 16.074 38 29 29 29 Ground elevation : EL 3 ; i I note mouth: (La)= 1255 1255 1255 15,610 10-57 38 3≋ Z Hole No.: Location: Kcmarks : Gauge P. (initial line) TOIA (helicm 853825 30

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Water Pressure Test	Stage: 8/10	arry Site Dia, of Hole: 76 m/m	90 degrees Packer Type: Mechanical	x): 1x10 ⁴ x0 ^{1311:} Date: 09/February/1999	Commutator level (L1): CL- 0.30 m Caug	Depih of test section	(Lu) 32 m m (Lu)	5 Pub. Pub. Pub. (sin(a)1.+1.a)-P. [kgUcm2], q=0	10:33 13:44 13:55 14:46 P1= 0.8 91=	27,010 28,115 28,930 28,503 72 24,030 28,503 72 2.0 91 4.3 03	27.221 28.275 29.040 28.50k P4= 6.2	27,325 28,355 29,093 28,511 P5 4.7 95	27,429 28,435 29,147 26,514 PT 24,514 24,250 24,514 24,250 24,514 24,250 24,514 27	27,634 28,592 29,266	27,735 28,673 29,320 28,520	27,833 28,753 29,273 28,524 E	28,030 28,910 29,481 28,526 2 7	() () ()	4	1 1	0.4 0.5 0.6 0.7 W	0.4	21 13:43 13:54 14:05 14:16 Water Inje	3.90 2.39 1.16 0.00	Lugeon value: (35) Lu Critical Pressure: >6.2 kg/cm2	Injection of water should be continued for at kess. 10 minutes under the specified pressure, after the injection rate per minute	
Wat	0:-1	Suppare Quarry Site		Friction Loss per meter (p.) : 1×10 ⁴ ×0 ^{1,911}	$\left\ \right\ _{2}$	Γ	3	-	22 13:33 13 44	27,010 28,115	28,275	27,325 28,355	28,435	27,634 28,592	27,735 28,673	28,753	28,000 28,910			÷ł	3ř	0.4	2 13:43 13:54	3:40	Friction Loss (Pr) = pr(Lo + Ls) [kgt/cm2]	r should be continued for at	% to 110 % of the injection

8 Note: trijection of write should be continued for at least 10 munites under the specified pressure, after the injection rate per munite vertiles within 90 % to 110 % of the injection rate in the just previous one minute. Prepared by : Fathat M. Shah Ş quOu/Lo [lit/min/m] 0.35 (in the section (L.) 10 15 20 25 30 35 40 Water Injection Ratio (q : lii./min/m) Ę Calculation of Lugeon value L.u. kgt/cm2 6.5 19.7 9.8 0.1 Gauge height (La): m/m 14/February/1999 Mcchanical 55.4 23 P=P++0.1(sin(=)L++L-)-P+ [kgUcm2]. 9/10 22 Lugcon value : Critical Pressure: E 82142461 45 • Groundwater level (L.): GL- 0.25 m 'n Dia. of Hole: Packer Type: 775755 0 Date : 40 m lo (La)= Depth of test section 0000 0 N 4 M N ~ 0 Stage: Water Pressure in Bgl/em2 22,522 33,735 33,786 32,522 33,335 33,786 72,620 33,348 33,789 72,762 33,483 33,790 72,860 33,531 33,790 132,860 33,531 33,790 132,860 33,578 33,792 131,050 33,678 33,792 133,243 33,774 33,793 1 12:11 1.16 0.00 8. 99 2 12:00 3 ဒိန္ဒဒိန္ 90 degrees 33,283 2 ici...(L)... Friction Loss per meter (pi) : 1×10* ×0¹²¹⁵ 2 K3 3835 2 Reading of flow meter 1 31,843 32,140 32,326 32,334 32,532 31,446 243 2.93 4.61 2828 ruction Loss (Pr) = pr(Lo + Lo) [kgl/cm2] i Sappure Quarry Site **X**;2 ł ì Prepared by : Fathat M. Shah 14.00 m 528.24 m
 10:55
 11:16
 11:17

 01
 259:500
 259:821
 30:667

 02
 259:501
 259:667
 30:667

 25
 50:040
 30:645
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 29:51
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 30:756
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kg/km2]
Contraction Pressure: Add

ge: 10/10	Dia. of Hole: 76 m/m	Packer Type: Mechanical	Date : 15/February/1999		0.30 m Gaug	:	to (La)= 50 m 5 m	Calculation of Lugeon value		a)Li+L2)-Pr [kgi/cm2], q=U.				6.4	3.8 96=		10			181	···	•••• ••• •••			• •			Water Injection Ratio (q : lit/min/m)	Y	(1.1)			and the source state of the state of the state of minutes under the specified pressure, after the injection rate per min
Stage:	Dia	Pac	D		Groundwater level (Li): GL-	Depth of test section	45. m to		Pu7	<u> </u>	15:07	35,234	10000	35.244	35.284	35,284	35,284		140040				· .	T	n 3<	6	- 1	- E	00'0	<u></u>	Ŧ		U minutes u
		90 degrees	5		aler leve				9 A	-			000.00	35,121	35.142	35,163	35,183	35,204		35.267	!			Ī	Şž	ð	205	15:04	0.27	3	1		at least 1
		ŝ	×O		roundw			fer	2 .4	٢	14.43	34,708	4.43	6//60	A KON	14,883	34,918	34,953		35,052		i			3	13	34.4	14:53	0.63				tor
	Site		1×10						4	01	14-32	34,166	777	212.00		424	24.47	34,521	2	34,667	ļ	1			3	ξĮ	48.1	14:42	121	[(cm2)]			be contro
5-1 S	Ouarry		; (6) 1	ţ	528.24 m	Tuge to	13.47 m	1 10 20	2	2	14:21				_	1010	24,040	34,063	200	53	. [:			3	50	22.8	14:31	0.2K	= pr(l_+ l_+) [kg(/cm2]			- Aberda
	Sappare Quarry Site	(iii) (iii)	tr mete			COSURE 1		Read	244	4	14:10		_	03,821						768,55		Ì	i		3	-1-	8.0	14-20	0.05	1)4			of units
ا ب		lination	tors to		evation :	d mon a	- (- (-)-		174	. =	14:00				2					22	,	ļ			3	•[2		14:10	0.00	(v1) 550°			
Hole No.:	Location:	Hote Inclination (a):	Eriction I ass per meter (B) : 1×10 ⁴ ×0 ^{1,71}		Ground elevation : EL-	Pine length from pressure gauge to	hole mouth: (Le)		(intege P.		Varia Line	() (Umuu)	-	10	2	4 v		, 1		°,0		ដ	3 2	15	- Joer Joer	1	41 / HALP	17	(Pe)	Friction Loss (Pr)		Kcmarks :	

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Hole No. Or.2 Stage: 219 Hole IN Location: Sopare CuarrySite Dia of Hole: 7 Minet/1999 Location Location: Sopare CuarrySite Dia of Hole: 7 Minet/1999 Location Friction: Sopare CuarrySite Dia of Fole: Neter Type: Location Location Friction: Sopare CuarrySite Dia of Fole: Neter Type: Location Location Friction: Dia of Fole: Dia of Fole: Dia of Fole: Location Location Friction: Dia of Fole: Dia of Fole: Dia of Fole: Location Location Friction: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Location Friction: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Location Friction: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole: Dia of Fole:	$\begin{array}{c c} 0.5-2 \\ \hline 0.5-2 \\ \hline cc Ouarry Site \\ p \\ er (p) : 1 x 0^4 x 0^{4911} \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 \\ \hline 0.5 $	age: 2/ ia. of Hote: 7 cker Type: Mech ate : 01/Mar ate : 01/Mar ate : 5a section - 15	0 () () E	Hole No.: <u>Sappa</u> Location: <u>Sappa</u> Hole Inclination (a):	Sappare
Country Site Dia of Hole: 7.6 m/m 90 degree Pocker Type: Machanical Machanical 90 degree Pocker Type: Machanical Machanical 133.37 Date : 0.1/March/1999 Date : 0.1/March/1999 err (pr) : I trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of trait of t	Pod degrees Pod degrees ter (pr): $1 \times 10^{-4} \times 0^{-0.111}$; fer (pr): $1 \times 10^{-4} \times 0^{-0.111}$; 513.37 m Groundwater level (L). 519.97 m Groundwater level (L). 9.80 m CL(L). 9.80 m CL(L). 9.80 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.93 m CL(L). 9.94 m CL(L). 9.92 m A0.023 9.92 m A0.026 9.93 m A0.026 9.93 m A0.026 9.93 m A0.036 9.93 m	ia. of Hole: 7 icker Type: Mech ate : 01/Man section section o(La)= 15 m 	0.35 (j.) E	Location: Hole Inclination	Sappare
90.0egre Pocker Type: Mechanical $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: $ter(p)$: t	90 degrees fer (p) : 1 x 10 ⁴ × 0 ⁴⁹¹¹ ; 513.37 m Groundwater level (L); 513.37 m Groundwater level (L); 9.80 m CL - (L) = Depth of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of to model of the model of to model of the model of the model of to model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of the model of t	icker Type: Mech ate : 01/Mar Nil 6- section 5- section 6- section	0.35 (LL).	Hole Inclination	
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w 1 Critical Pressure: 5.3 kgf/cm2					- V
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Kcmarks :	ü														
Note:	Injectio	n of wal	er should	be conti	nucd for	at least	10 minut	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute	s specified se minute	pressure,	after the	njechon r	ate per r	noute	
	Selling.	WILDIN X	01 01	10 14 1				Inspected by :	d bv : M	. Suea					
repat	Prepared by :		FOIDAL M. SHAIL	5											Ì

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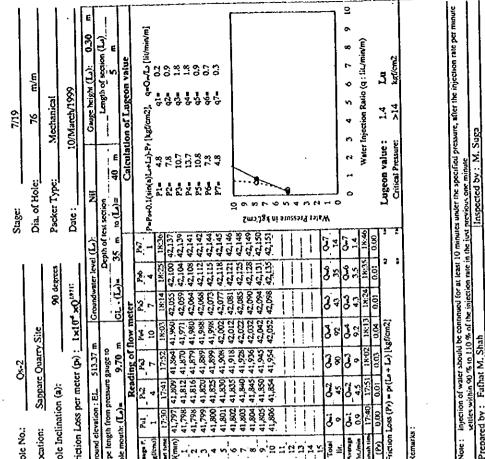
					Wa	ter J	res	Water Pressure Test					
19	Hole No.:	ľ	05-2 Q				0	Stage:		5/19			ļ
6 m/m	Location:	Sappar	Sappare Ouarry Site	Site			н	Dia. of Hole:		76	ш/ш		Ì
anical	Hole Inclination (a):	ation (a):			90 ¢	90 degrees	μ.	Packer Type:		Mechanical	-		
ch/1999	Friction Loss per meter (pt): 1×10 ⁴ ×Q ^{1,9,1} :	SS per me	i. (b) i	1×10	×O		-	Date :	S	04/March/1999	8		
oc height (La): 0.30 m	Ground elevation : EL	tion : EL	513.37 m		Groundwater level (La)	iter level	Ē	IEN		Giuge hei	Gauge height (La):	050	٤
Length of section (La)	Pipe length from pressure gauge to	om pressure	: gauge lo			2.	ih of le	Depth of test section		Icul	Length of section (Lu)	ן קייין	
Lugeon value	hole mouth: (Le)		9.65 m [GL- Beeding of flow meter				€ G		alculati	Calculation of Lugeon value	con value		
m2]. q=Q=/(1/min/m]	Gauge P. Pul	 	2	X,		2 -	P.1	P=PO !(cin(a)] +=] >-P- [kel/cm2].		tke(/cm2)	[m/mia/n] ←10=8	it/mim/m	
q1= 0.0	(AgGems)	14-41) 14:52		14	15.25	12:34	15:47	-1d	3.8	19	0.1		
q2= 1.1	_				41,004	41,051	41,090	8	80	G 3			<u> </u>
	1	40,805 40,817	40,857	40,924	41,010	41,054	41,091	54	2.8 12.8	98			
q5= 1.2				40,940	41,020	80	41,093	2	9.8	· 3			
q6∎ 0.9 27∎ 01	4			40,949	41,024		41,094	-24 -24	8.9	-0-1- -0-1-	88 1		
	2 X	40,808 40,830	40,879	40,958	41,028	41.008	500,14 2005	-	¢.,	ñ			
							41,096	-بو م م					 [
			40,896	40,983	11,041		41,096	> 00 (W),					
	2 10 10	40,812 40,849		606'07	41,049		41,098						
	=:	!	l			Ì		i siu v o 					
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			;	ł		ļ		9 133 67 63					
	1-	55 1-0	3	Ş	3	ŝ	5						
5 6 7 8 9 10	- <u> </u>		ş[]	3			6			3 4 5	6 7	0 10	R
on Ratio (q : lit./mia/m)	Sit Jones 0	0.7 3.5	4.8	1		12	15.57		Water	Water Initesion Ratio (a : lit/min/m)	io (e : lit/m	in/m)	
	4		1		0.01	0.00	0.00			•		•	
1.6 Lu	Friction Los	Friction Loss (P+) = pr(L+ + L+) [kgt/cm2]	¥)(*1 + *	gt/cm2]		•	;		Lugeon value :		3		
						:	1		Critical Pressure:	ž	kgt/cm2		1
	Remarks :												
ifter the injection rate per minute	Nule: Inje	ction of wa	ter should	be contri	ned for a	it least 14) minuto	injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute contra minute aritimation of action rate per minute aritimation of action of the orthogonal state in the just receivers one minute.	ified pres	sure, after th	c injection 1	ate per fi	nuic
	Prenared by : Fathat M. Shah	d's Faft	at M. Sh	L L				Inspected by : M. Suga	: M. Su	ga Sa			
													ĺ

Note: Injection of water should be continued for at least 10 minutes under the specified pressure, after senter within 00 % to 110 % of the injection rate in the just previous one minute. Prepared by : Futhat M. Shah [Inspected by : M. Suga ۴ Mechai Gaug =Pu+0.1(sun(a)Lu+Lz)-Pv [kgf/cm] 4 04/Marc Water Injection Calculation of 6) 6) 4 1 Lugeon value : Critical Pressure: 25 m 2323232 ~ Water Pressure Test Dia. of Hole: Packer Type: ł 422222 0 Ī Staget m 10.(LA)= Date : Depth of test section 0 N 7 N N 0 2 00 r-. Water Pressure in kgt'em2 40,743 40,785 40,785 40,786 40,651 40,723 40,778 40,778 40,799 40,790 40.786 40,787 10,787 į Groundwater level (La): 40,738 40,784 40,716 40,770 40,78 40.78 2 į 6 δ 30 40,752 40,756 90 degrees 40,761 ļ 40,710 40.765 \$0,733 105 1 ł Şê Ĵ 3 (r) -Friction Loss per meter (pt) : 1x10* x01011 40,614 40,698 40,704 40,604 40,691 40,669 40,514 40,596 40,684 ; ટ્રક 40.678 1 3 3 1 Reading of flow meter 5 40,632 40,641 M - 24 i riction Loss (Pr) = p(Lo + Lo) [kg(/cm2] 40,498 40,579 1 28 Sappare Quarry Site 40,587 į 4057 (P-) 0.00 0.01 0.02 0.03 Ground clevation : EL 513.37 m Pipe length from pressure gauge to 9.20 m 40,558 11:01 40.529 : 40.506 40,551 -3× 3: 40.536 4 i 40 4 4 4 N Ö 40,469 40,475 40,481 40,430 30 40,458 40,436 35 nets turner 10:40 10:51 40,4421 40.452 Hole Inclination (a): 10,464 40,424 2 4,04 i į hole mouth: (La)= 130 40,421 40,421 40,421 40,421 40,421 40,421 40,421 40,421 40,423 40,421 3-40.451 2 5 Location: Hole No.: cmarks 10 4 N 0 1 Average 14./min Cines P. (uim)) 3333 Total œ ٥ 2

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	Hole No.: Os-2	Location: Sappare Quarry Site	Hole Inclination (a):	Friction Loss per meter (p): 1×10	Ground elevation : EL. 513.37 m C	Pipe length from pressure gauge to	ding of	Gauge P. Pul, Pul, Pul , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post , Post	17:30 17:41 17:52	O(min) 41,797 41,809 41,864 41,960	41,816 41,879	41,820	5 41,800 41,830 41,800 42,002	41,835 41,918	7 41,803 41,840 41,928 42,022 0 41,804 41,845 41,936 42,032	41,805 41,850 41,945	10 41,806 41,854 41,954 42,052				Total Qa1 Qa2 Qa3 Qa4 III 9 45 90 92	Average Om _ Om2 Om3 Oud	17:40 17:51 1K-02	(P) 0.00 0.01 0.03 0.04	Friction Loss (Pr) = pr(La + La) [kgf/cm2]	Kemarks :	Note : Injection of water should be conti-	Prepared by : Fuffhat M. Shah
sure Test	Stage: 6/19	Dia. of Hole: 76 m/m	Packer Type: Mechanical	Date : 06/March/1999	NH Cauge height (La): 0.30 m	of test section Length of section (La)	Š	P=P++0.1(sin(a)L+L-)-P+ [kgf/cm2], q=QfL- [lit/min/m]	.	P2+ 7.3 q2+ P3- 10.2 g3+	P4= 13.2 q4=	10.2			r			• • • • • • • • • • • • • • • • • • •	2 Fres	2 64		0 1 2 3 4 5 6 7 8 9 10	Water Injection Ratio (q : lit./min/m)	t	Lugeon value : 2.7 Lu Critical Pressure: >13 kg/cm2		Injection of water should be continued for at least 10 minutes under the specified pressure, after the unjection rate per minute	Inspected by : M. Suga
Water Pressure Test	Hole No:: 05-2	Suppare Quarry Site	nation (a): 90 depres	ter (pt): 1×10 ⁴⁴ ×0 ¹⁴⁷¹⁵	Contraction of S11.37 m Groundwater level (Lo):	re gauge to Depth	5	Lad ond sad and cad cad the	1 4 1 / 10 12-01 17-18 17-17 17-48	41,135 41,222 41,344 41,560	1 41,103 41,143 41,236 41,413 41,570 41,678 41,750	41,161 41,260 41,448 41,590 41,686	41,111 41,170 41,281 41,466 41,600 41,693 41,755	41,499 41,620 41,710	41,323 41,512	41,121 41,203 41,336 41,527 41,040 41,740	41,127 41,219 41,364 41,555				Total Out Out Out Out Out Out Out		17.47	0.00 0.03 0.07	a Lous (Pr)	Romarks :	Note : Injection of water should be continued for at least 10 minut	entires within 90 % to 110 % of the infection rate in the loss precision within 40 % of the infection by the Prepared by : Faihat M. Shah



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Holc No.: Location:		Os-2 Sappare Quarry Site	05-2 e Quarry	Sile	M	ater	Pres	Sure Tes Stage: Dia. of Hole:	Water Pressure Test Stage: Dia. of Hole:		9/19 76	u/u	E		11
Hole Inclination (a):	inati.	n (a):		, ,		90 degrees		Packer Type <u>:</u> Packer Type:	Type:		Mechanical Mechanical	100			l
Friction	Loss	Friction Loss per meter (pt) ;	<u>ک</u>	ΞĮ	Q X			υĒ						540	16
Ground elevation : EL	clevation	: 61	S13.37 m	£	Groundw	Groundwater level (Lu): UL-	1		E C7'N	Ī					<u> </u>
Pipe Icn	th from	Pipe length from pressure gauge to	gauge to	,		1	Depth of lest section 45 m to (La)=	to (La)=	1	a 201	s,	Licingin of section (Au)	S Strom	i Ì,	;
NCIG MONING (TO)			Reading of flow meter	É ×ou	l L					alculati	Calculation of Lugeon value	Incon V	aine		
Genge P.	Pe4	Po2	P.3	4		86	Pu7		N-1-1-11	9	(0		a-O-a - Uit/min/mi	in/mi	
(kgl/cm))	1	4.76	71.11	14-45	14.54	• IO	15-21		n(e)me)v.	1.1	Ple 2.1		18		
	42.576	42.5KI	42.213	42.662	42,712	42.746	42,768		8	5.1			0.6		
Ĩ	42,576			42,667	42,716	42,748			23	8.1			6 0 0		
2	42.576			42,672	42,719	42,750	42,768		ž	111			200		
	42.577	42,590	42.228	42.681	272	42.754			9	51.5			5		
	42.57	42.596		42,685	42,728	42,756		-	2	5			0.0		
	12.3			42,690	10.4	42,758		01						ţ	
-	42.578		42.246	42,694		42,700	27.78	Zu					•		
1	8/078	42,608						62))				0		١	
2	42,578						42, 68			•					
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ıٰם									4	;)					
11	ł	1	ļ	ł			! 			/	-				
Total	٥̈́,	3	3:	۶.s	S:	3 .8	۶.°		~ 0	-		-			
Average	-ī	6	3	8	3.	Ş	5.	-	0	5	0.3 0.4 0	0.5 0.6	0.7	0.8 0.9	P 1
HI/MID		14.16		14:5X		1-	Ľ			Water 7	Water Injection Ratio (q : lit/min/m)	: p) oite	lit/min/	Ê	
(a)		—		0.01		1.1	8 0								
Friction	Loss (P	Friction Loss (Pr) = pr(La + La) [kgf/cm2]	× 1 1	g(/cm2)		3 3			Critical	Lugeon value : Critical Pressure:	8 2 7		Lu kęt/cm2		
Remarks	 19														
Note :	Injectio	on of walt	cr should	be conti	nued for	al least	10 minut	es under	the spec	ified pres	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute	the inject	tion rate		١×
Den De		settles within 90 % to 110 % of the injection rate in the just previous one minute of hue. Earthar M. Shah	Fathar M Shah	2 10 % CI		5 BIC 1	242 243	Inspe	cted by	Inspected by : Azim Gill	Gill				Ī
ric pa	Frepared oy :	Lähud	17 I.N. 1												Ì

tiole No .	;				W.	ater	Pres	Water Pressure Test Stage:	ſest	8/19	0			
rioic ro.	-	Cucose	Success Quarty Site	Site		•		Dia, of Hole:	 ;; ;	76		m/m		
Hole Inclination (a):	inati	(a)			8	90 degrees	-	Packer Type:	÷	Mechanical	a ca			
Friction	Loss J	ver mete	Friction Loss per meter (pt) :		1×10 ⁻⁴ ×0 ^{1,871:}			Date:		12/March/1999	M/1999			
Ground elevation : EL	levation.		513.37 m	Γ	Groundwater level (Li):	ater leve	Ë	ΞN	1	Gaug	Gauge height (La):	(Lu): 0.30	н 30-	
Pice Jenn	th from	Įξ	Pipe length from pressure gauge to				pth of le	Depth of test section	1	1	Length	Length of section (Lu)	(r	
hole mouth: (Le)	<u>ال</u> پر		9.00 m		с- С)-		٤ ج	=(ما) ها	ş	E .		۲۵.	Ī	
		Read	Reading of flow meter	now m	cter					Calculation of Lugeon value	Lugeon	value		
Campo P.	Fal -	2 -	5	10	5 r	3 4	2 -	P=Pu+0.1(hin(a)l+L	P=P++0.1(sin(a)L+L2)-Pr [kgl/cm2],		q=0/Lı [JiVmin/m]	(w/u	
	14-07	4: 4	14:29	14:40	14:51	15:02	15:13		Pl= 5.3	~	а¦р	0.1		
(mun)	42,102		42,213		42,347	42,400	42,443	,			8-	80		
-	42,262		42,218		42,352	42,404	42,446 47,446		P4= 14.3	.	3	1.6		
~	101.14	021.04		42,289	22,362	42.412	42,452			ה יח	3	1.0		
്ഷ	42.262			42,297	42.267	42,615	42,455			n	8	0.5		
5	42,163			42,205	42.372	42,419	42,458		P7= 5.	~	47	0.6		
\$	12,163			42,313			41.461	202					Ĺ	
r.j	3	101	42,240	92.24	12 187	42,423	42,467							
*	2 2 2		_	123		42,436	42,470	ος (μο/)β				 -		
2	42,165			42,343	196,24	42,440	42,472	r v Ruj						
: : :	ļ	1		ļ	į	İ	:		ľ	Ľ	ò			
12	I	ļ		;	1		. 1							
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Total lif.	3	3,4	34	۶,۴	ડેક	\$ [,] 4	25							
Awe for	ō	3:	3:	3.0	ິ ດ.ັ	ð.▼	95		0 0.1 0	0.2 0.3 0.4	0.5 0.6	6 0.7 0.8	1 6.0	
Parish terr	14:17					15:12	15:23		3	Water Injection Ratio (q : lit./min/m)	Ratio (q	: lit./min/m)	_	
(Pe)	0.00				10.0	10.0	0.0	1	-					
Friction	Loss (P	7) = b([Friction Loss (P+) = pr(Lo + Lo) [kgf/cm2]	g(/cm2]	·	2 1	2 3		Lugeon value : Critical Pressure:			L.U kgf/cm2		
Remarks :														
														-1
Note :	Injoctio cettles	n of wate vithin 90	cr should	be contu	nucu for e injectio	at least 1 on rate in	0 minut	Injection of water should be continued for at least 10 minutes under the specified etitles within 90 % to 110 % of the injection rate in the just previous one minute	e specified	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute certies within 90 % to 110 % of the injection rate in the just previous one minute	e og u	cction raie p		
Prepar	Prepared by :		Fafhat M. Shah	f			Ì	Inspect	Inspected by : M. Suga	1. Suga				٦

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Hole Inclination (a): Friction Loss per meter (p) : 1×10^{4} Ground elevation : EL 513.37 M C Pipe length from pressure gauge to hole mouth: $(L_a) = \frac{513.37}{200} = \frac{6}{200}$ hole mouth: $(L_a) = \frac{7}{200} = \frac{7}{200} = \frac{13001}{2001}$ Cuerger Pai + $\frac{7}{200} = \frac{13001}{2001} = \frac{2300}{2000}$ (articm) = 2,300 43,351 43,401 43,4770 i = 2,324 43,361 43,411 43,4770	n (a): cr mete ressure j Poz Poz Poz 43,359 43,359	Sappare Quarry Sile on (a): per meter (p) : <u>1x1</u> presure gauge to presure gauge to presure gauge to presure gauge to presure gauge to presure gauge to presure gauge to the presure gauge to the presure gauge to the presure gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the preserve gauge to the 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OS Signature (C) OS Signature (C) Signature (C)	Water Pressure Test	Os-2 Stage: 14/19	Sappare Quarry Site Dia. of Hole: 76 m/m	90 degrees Packet Type: Mechanical	er (bb) : 1×10 ⁴ ×0 ^{1,011} : Date : 24/March/1999		Depth of test section Length of section	m <u>ci(L.)= 70 m (c.(L.)=</u>	meter	P.3 P.4 P.5 P.6 P.6 P.6 P.9. P.0. [10] P.2 P.0.0.1(5in(3)L.1.).P.7 [xgf(cm2], 9=0.46.1 [ik/min/m]	16:41 16:51 17:01 P1-	45,5%2 46,463 47,373 4%,131 48,872 74 74 74 74 75 73	45,655 40,259 44,445 45,154 46,057 46,057 46,546 47,5261 48,894 48,894 48,894	45,803 46,735 47,590 48,270 48,92M P5=	45,847] 46,812] 47,654 48,335 48,961 Por 2.0 40"	45,956 46,907 47,783 48,466 49,031	46,075 47,072 47,847 48,533 49,065	46,178 47,168 47,912 48,597 49,098 E	46 325 47 333 48.041 48,726 49,167					-1	Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual Qual <th< th=""><th>1 16:41 16:51 17:01</th><th>5.31 3.15 2.51 0.26</th><th>Friction Loss (Pr) = pr(Lo + L) [kg(rcm2)</th><th></th><th></th><th>injection of water should be continued for at least 10 minutes under the specified pressure, wher the injection rate per minute</th><th>vertiles within 90 % to 110 % of the injection rate in the just previous one minute</th><th></th></th<>	1 16:41 16:51 17:01	5.31 3.15 2.51 0.26	Friction Loss (Pr) = pr(Lo + L) [kg(rcm2)			injection of water should be continued for at least 10 minutes under the specified pressure, wher the injection rate per minute	vertiles within 90 % to 110 % of the injection rate in the just previous one minute	
	•	-2	Juarry Site	-		$\left \right $		E	ig of flow meter	<u>7</u> .0	16:01	46,463	40.059	46.735	46,812	26.94	47,072	47,168	47.333			<u> </u>		32	j.	116:41	5.31	L) [kg(/cm2]			thould be continued I	to 110 % of the inje-	
11: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1:		Hole No.:	Location:	Hole Inclination (a):	Friction Loss per meter (pc) :		Proc length from pressure gauge to	hole mouth: (La)		Cange P.	View 1 Lines	O(min) 44,561	1 44,5%	3 44,666	4 44,701	~ `	2		> 9	: 1	ਕ ਵ 	1 1	ž	i de	Average Out		i te	Friction 1	1	. venues	Note :		

ဠ Note: Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute settles within 90 % to 110 % of the injection rate in the just previous one minute ٩ >=P0+0.1(sin(a)L1+L2)-P+ [kgf/cm2], q=Q-/L2 [lit/min/m] 0.40 Length of section (Lu) Water Injection Ratio (q : lit./min/m) 80 Lu kg2/cm2 Calculation of Lugeon value 5 Gauge height (Lu): <u>m/m</u> ø 2S/May/1999 ****** Mechanical 4 v 15/19 25 22 5 5 Lugeon value : Critical Pressure: ٤ 12855851 Depth of test section £ Packer Type: Dia. of Hole: Inspected by undwater level (Li): GL- 10.25 0 Date: Smolgt ni sin ken ta sin Water Presentation and the single second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s Stage: ្អ a ¢,
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 đ 9 0.0 Pu7 ļ 6 8 3'r 90 degrees រីះ 2 Friction Loss per meter (pv) : 1×10⁻⁴ ×0^{1,841} 33 З 0.10 3 १ँ≣ 0.17 2,≝ iction Loss (Pr) = pr(Lo + L) [kgt/cm2 Suppare Quarry Site Å 8.45 m Ground elevation : EL 513.37 m Pipe length from pressure gauge to Reading of 14:03 Së 39 Pu2 Pu3 N Ö Hole Inclination (a): ર્યુક્ર 1 12 ļ hole mouth: (La)= 13:40 į 3 ļ 1 อี Z Hole No.: Locution: Crmarks : . . ~~~ SISII 8 Cauge P. (united) A LEVEN

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Prepared by : Azim Gill

	Hole No.:	-	Q2					Stage:	I		17/19			
Location:		Sappart	Sappare Quarry Site	y Site				Dia. of Hole:	Hole:		76	m/m		
Hole Inclination (a):	inatio	n (a)			8	90 degrees		Packer	Packer Type:	Mc	Mechanical	-		
riction J	d ssor	er met	Friction Loss per meter (p) : 1x10° x01011	1×10	ž XOL	Ä	•	Date:		28/1	28/May/1999	8		
Ground elevation : El.	vation		513.37 m		Groundy	vater lev	Groundwater level (L1): GL-	0L- 1	10.25 m	-	Gauge he	Gauge height (Lu):	0.37	E
Pipe length from pressure gauge to	u non	Messure	Cauge to				Depth of test section	CN SCIN			LCn.	(cul) Length of section (Lo)	(LJ) noi	
hole mouth: (L)	ີ 2	_	7.60 m	E	ст. С	ļ	85 a	to (L)=	- 00	ε		5	٤	
		Read	Reading of flow meter	flow m	eter				ບຶ	Calculation of Lugeon value	of Lug	eon valu	2	
	Pol.	Pu2	2.	ž	Pes-	Puć.	2 ⁿ d				10-07			
	-	4	\ \	- 10			1.24		-10	THE REPAIR (NUMBER OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT	ivenue,	2		-
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		50.942		51.178					2	7.9	- 6			
,		50,948		51,200					P4=	10.7	۰Ş.			
ي ي	50,913	50,954		51,222			50,786		PS=	7.9	6			
	50,915	50,960		51,244					₽6 .	5.0	ě	q6= I.6		
		50,966		51,266		50,714	50,794		ż	20	÷	q7= 0.8		
	20,20	50.978	10115		51,470			-						Γ
1		50,984		51.232		_		Zar						
	50.925	50,990		51,354						<i>.</i>				
• •	50,927		721,147	2/212	טוקוט	Si A	20,814			Ň				
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	រីន	g a	3,3	វិន	33	g'e	9.4	• ~ ¢ ₩					1	
L.	5	8	6	Į:	8	ູ່ໃ	ઠે		н 0	0 10	4 2	67	8 8	01
inter the	12:25	12:37	12:50	13:02			r			Water Injection Ralio (g : lit./min/m)	tion Rali	o (a : lit./n	nin/m)	
1	000	0.0	0.15	0.41	Ľ	ĩ		.						
Friction Loss (Pr) = pr(Lo + Lo) [kgf/cm2]	(14) 54	n) A	101	g(/cm2]		4		ы г.–	Lugcon value :	alue :	4.0	ŋ		
						\$	Ĩ		Critical Pressure:	Cosure:	ŗ	k gl/cm2		
Remarks ;														
Note : In	jection	of walc	r should	be contin	nued for	at least 1	(0 minut	cs under	the specifi	Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection tate per minute	, after the	: injection	rate per m	Ĭ
	ž	settise within 20 % to 1 (0 % of the injection rate in the just previous the month settise		10 X.1		A Talc II			CHART STILLER					

2 Note: Injection of water should be continued for at least 10 minutes under the specified pressure, after the injection rate per minute settles within 90 % to 110 % of the injection rate in the just previous one minute Received by : Azim Gill \$ 4-0-1 (Ivmin/m) 637 Length of section (Lu) 2 3 4 5 6 7 8 E Water Injection Ratio (q : lit./min/m) Lu kal/cm2 Calculation of Lugeon value Gauge height (La): m/m 28/May/1999 Mechanical 16/19 *=Pu+0.1(sin(a)Lu+L2)-Px [kgf/cm2]. 4.5 >11 36 Lugeon value : Critical Pressure: ٤ 20.0 % % 0 0 2 0 0 % % 0 0 2 0 0 % % 0 0 2 ---Water Pressure Test Dia. of Hole: Packer Type: 2852585 Groundwater level (L.); GL- 10.25 0 Depth of test section **30** = 5 (**1**) Date: o 8 × 1 × 1 × 1 × 1 õ Slage: Smo'JgA ai stuccord rota'M 4 50,293 50,534 50,694 50,774 4 50,317 50,550 50,702 50,782 1 50,344 50,566 50,710 50,786 5 50,565 50,565 50,716 50,746 5 50,348 50,578 50,716 50,746 50,757 50,806 50,765 50,810 50,773 50,814 50,794 50,798 50,802 17:47 6 2 90 Ş 9 50,614 50,734 5 50,630 50,741 5 17:45 50,749 90 degrees 0.0 20 Į? រះ ; ł : 1 2 or . C.). Friction Loss per meter (ps) : 1×10⁴ ×0^{1,911} 50,661 50,677 50,693 50,645 3≩ Sš i 3 i 5 Reading of flow meter 50,413 50,437 50,461 50,661 50,500 50,500 50,500 ¥ 9 ł 5837 0.46 I I riction Loss (Pr) = pr(Lo + Lo) [kgf/cm2] Sappure Quarry Site Ground elevation : EL 513.37 m 7.70 m Pipe length from pressure gauge to 50,118 50,134 50,151 50,168 50,249 50,249 50,281 50,201 50,217 33 0.06 0.22 17:05 ő 6.55 + 33 3 ł ł 50,107 99,107 50,025 50,033 50,049 50,059 10:52 50,041 50.067 . 32 Hole Inclination (a): 50,083 \$0.075 20,00 3z ļ 2 i . nole mouth: (La)= 50,008 50,012 50,012 49,974 49,987 49,987 49,991 49,991 50,000 0.01 50.00 16-40 į ā 34 ļ 9 19 ļ Location: Hole No.: (cmarks Garge '. Average NN4'N0 - 0 Found Tit. ٩. 0 min

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Hole No.:	:0	-	<u>0</u> 2			1	÷,	Stage:		61/81				
1 octation		Sannan	Sannare Ouarry Site	v Sile			-	Dia. of Hole:	ole:	76	8/E	ε		
Holo I	100	(e) er			Ř	90 degrees		Packer Type:	į	Mechanical	Ū			1
Friction	n Loss	Friction Loss per meter (p): $1 \times 10^4 \times 0^{13715}$	ີ (ຊີ ຍ	1×10	то×	5	-1	Date :		31/May/1999	6661			
Control	Conund elevation : EL	19.	513.37 m	ε	Groundwater level (Li); GL-	ater leve	1 (L.): C	iL- 10.25	E	Gauge	Gauge heizht (Lu):		5	E
Pine len	sth from	Pine length from pressure gauge to	gauge to				anh of te	Depth of test section			(سل) hollow Jo digna	section (3	:
bole mo	ole mouth: (L_)=		8,00 m	E	ol (L.)-		ء 8	=(v]) oi	е К			-	E	Τ
			Reading of flow meter	flow m	eter				Calcu	Calculation of Lugeon value	<u>ugeon</u>	Value		
Cauge P.	ā.	2 -	2+	V C	5. 2	8 4 8	P"7	P=Pu+0.1(>	(בוו+יש(ב)מו	P=Pu+0.1(\.in(a)Li+Li)-Pi [kg(/cm2].		{m/mim/n} {/	min/m}	
	17.15	17:27	17:40	12:21	14:05	14.10			P1- 2.1		-6	сц 0		
(mm))								,	22 		ġ ;	0 C		
,,(51,834	51,955	52-080 52-080	52,120	~ ~	P4= 10.9		- 4 0	10.		
N .F	20012	0/0/10	51 750			52,090					-5-	2.0		
. 4	\$1,657					52,095		-	P6= 5.0		- 96	23		
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æ	51,661						201.20	ءە رڊس	*					
<u>م</u>	51,662	51,712	51,810	140,15	50.02	5.125)31	_					
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e wie	<u>+</u>	3	2	2	10.1	4.9	-	>	4	r 7	> \			•
Planeth 11m	17:25	17-37	17:50	10:61	18:15				Wat	Water Injection Ratio (q : htt/min/m)	(atio (d.	/שיש/	Ê	
હે	0.00	0.02	0.09	0.20	80.0	0.02	80		•					
Friction	() seon i	Friction Loss (Pr) = pr(Lo + Lo) [kgl/cm2]	1)(1+•	g[/cm2]		2	1	3	Lugeon value :					
						*	1	Ö	Critical Pressure:	2		K pt/cm2	ļ	
Remarks :														
Note :	Injectio settles v	in of wait within 90	er should % to 1 [be contr 0 % of th	nued for e injectio	at least l	O minute the just	Injection of water should be continued for at least 10 minutes under the specified cettles within 90 % to 110 % of the injection rate in the just previous one minute	specified p reminute	Injection of water should be continued for at least 10 minutes under the specifical pressure, after the injection raie per minute cetter within 90 % to 110 % of the injection rate in the just previous one minute	Che injec		E Z	ų l
Prenai	Prenared by :	Azim Gill	Ē					Inspected by	d by :					
								ĺ						

Water Pressure Test

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Hole No.:		-	04-2			1	.,	Stage:			19/19			1	I
Location:	-	Sappari	Suppare Quarry Site	y Site				Dia. of Hole:	lole:		76	۳/H			
Hole In	inati	(a) (a)			8	90 degrees		Packer Type:	, Š	ž	Mcchanicol				1
Friction	i ssol n	ocr met	Friction Loss per meter (p.) : 1×10* ×0'111;	1×10	",0×,	÷	-	Date :		/90	06/June/1999	8			I
Ground	Ground elevation : El-	-EL	513.37 m	ε	Croundwater level (La): GL-	mer kve	1	1	10.25 m	Η	Gauge h	(u.) (u.);	0.37	E	٦
Pipe len	wh from	Dressure	Pipe length from pressure gauge to			Å	pth of te	Depth of test section	1	! 	5	Length of section (La)	רי ייי	:	i
hole mo	hole mouth: (La)-		8.90	F	CL - (L)-	1	E Sc	to (La)=	Е 801	E		5	E		T
		1	Reading of flow		meter				Set	ulation	Sur Jo	Calculation of Lugeon value	g		T
Gauge P.	1nd	P.2	2 End	P.4	54 24	3. 4	. Pu7.	P=Po+0.1(P=Po+0.1(sin(a)L+L2)-Pr {k5f/cm2}.	یا) ۲۹۰≺د.	f/cm2).	[hivaia/m] ماسكمهم]	(livmia	[w]	
ALC: N	11 55	12-07	12:20	12:32	12-45	11:00			PI- 1.	1.7	σ.				
(uim)(24.450			2 	4.1	σř.	음 25			
	52,191				54,039	54,478	C 82.95			35	σč	90			
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						54.57				. .	ŏ	q6= 5.8			
	5222								P7. 1.	1.8	G.				
. 0	52,295		_					5							 1
7	52,316														
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م ! !		52,720	53,295	518.55		22.22				•					
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Average	آ	200	6	۲ 0	5-0	ŝ	3		- -	10 15	20 25	30 35	4	\$	8
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Finish Line	-					I.	Г		F				, , , , , , , , , , , , , , , , , , ,		
2		5						-			100				
Friction	d) scort	-1) (-	Friction Loss (Pr) = pr(Lo + Lo) [kgl/cm2.	g[/cm2]		; ;			Lugeon value : Critical Pressure:	sure:	>8.5 >8.5	kat/cm2	ş		
Remarks :								1							-
	Incortor	n of wate	er should	be contr	nued for	t least	0 minute	a under (h	Innerion of water should be continued for it least 10 minutes under the specified pressure, after the injection rate per minute	I pressure	c, after th	e injection	rate pe	עיטר עיטר	ų
- 2004	settles w	vithin 90	% 10 11(0 % of th	e mjectic	n rate in	the just	previous (services within 90 % to 110 % of the injection rate in the just previous one minute						Ī
Prepar	Prepared by :	Azim Gill	Gill					Inspected by :	cd by :						٦

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