COUNTY OF SAN DIEGO DEPARTMENT OF HEALTH SERVICES

WELL PERMIT 6933

APN 6/4 100 20 Control # W 0 2683

TYPE OF WORK (Check)	,	USE (Check)	EQUIPMENT (Check)
New Well	Individual Domes	tic = dTEST _	Rotary MUD
Repair or Modification	Agricultural	Community	Cable Tool
Time Extension	Industrial	Other	Other
Destruction			
PROPOSED WELL DEPTH		PROPOSED CASING	
Max. 168 Min. 50 (Feet)	Type PVC D	epth <u>FULL</u> Diameter <u>6</u>	10 Wall or Gage 240
PROPOSED SEALING ZONE(S)		SEALING MATER	RIAL (Check)
From	Feet	Neat Cement Grout	Bentonite Clay
Fromto	Feet	Sand Cement Grout	Concrete
From to	Feet	Other-Specify:	
PROPOSED PERFORATIONS OR SCRE	EEN		
From <u>90</u> to <u>80770</u>	2 My Feet	DATE OF	WORK .
From to		Start MAY	70
From to	1	Completion MA	
From to	Feet		
NAME OF WELL OWNER		NAME OF WELL DRILLER	
WILLIAM KETCHEM		FRANK MURI	アトトング
LOCATION OF WELL Interstate 8		COMPANY	
SECMAP (JACUMA)	9)	MURPHY'S WELL A	PRILLING
DISPOSITION OF APPLICATION	N.	BUSINESS ADDRESS	
DISPOSITION OF APPLICATION (FOR MEALTH OFFICERS USE OF		PO 434 TACUM	180 92084
APPROVED	DENIED	LICENSE NUMBER	
APPROVED WITH CONDITIONS		00000	Cash Deposit Sond Posted
Report Reason(s) for Denial or Necessary	Conditions Here:	4150	
Well INSTALLATION TO	s be-	4/50 Fee paid on	
	7		
^ _	an Diego		
County AND STATE Cod	e Test hol	, ,	with all regulations of the
is to be dig within 30 da	45		ervices and with all ordi- County of San Diego and of
		the State of California	pertaining to well construc-
			on and destruction. Immedi- f work ! will furnish the ~
now	ب		rvices with a complete and
07		7/20	20. 1-
HEALTH OFFICER		Just G. VI	S SIGNATURE
5/17/90		1-17-90	
DATE			DATE

COUNTY OF SAN DIEGO
DEPARTMENT OF HEALTH SERVICES

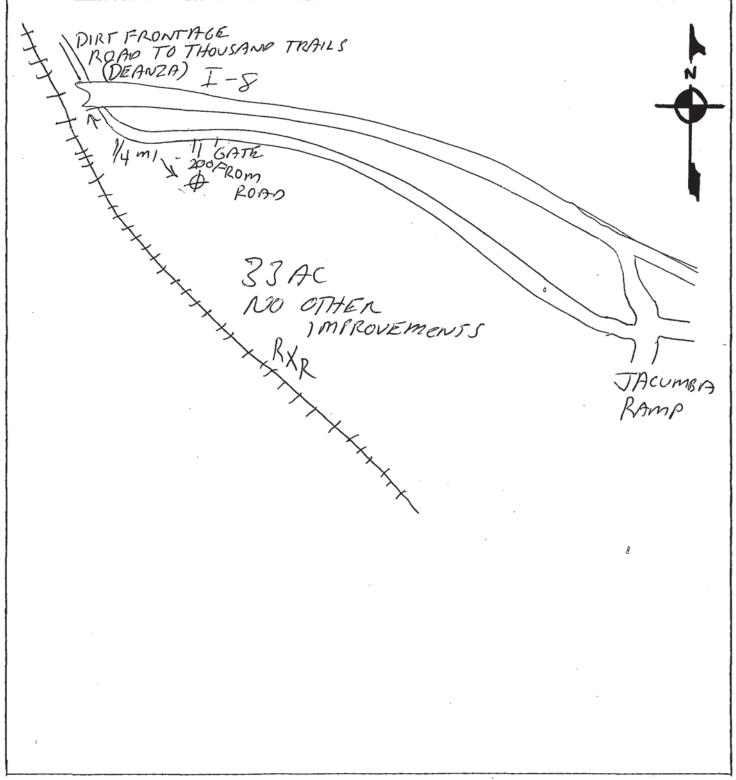
WELL PERMIT APPLICATION

Control # W02683

Assessor's Parcel No. 614-100-20

LOCATION

INDICATE BELOW THE VICINITY AND EXACT LOCATION OF WELL WITH RESPECT TO THE FOLLOWING ITEMS: PROPERTY LINES, WATER BODIES OR WATER COURSES, DRAINAGE PATTERN, ROADS, EXISTING WELLS, SEWERS AND PRIVATE SEWAGE DISPOSAL SYSTEMS AND OTHER POTENTIAL CONTAMINATION SOURCES, INCLUDING DIMENSIONS.



ORIGINAL File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

Do not fill in

No. 341230

Notice of Intent No.	State Well No.
Local Permit No. or Date W-02683	Other Well No.
he information in this grayed area has been blocked from public ewing pursuant to section 13752 of the Water Code and the	(12) WELL LOC: Total depth 8/ ft. Completed depth 7/5 ft.
iformation Practice Act of 1977, to protect personal information.	from ft. to ft. Formation (Describe by color, character, size or material)
, ,	0 - 241 Clay - Rust Brown
(0) LOCETION OF WELL (Continue)	- 1 (OLO/2
(2) LOCATION OF WELL (See instructions): County SPN DIECO Owner's Well Number	- 202-0/2
Well address if different from above TACUMBA VALLEY RANK	4 24-55 CORSE SAND
Township 17.5 Range 8 E Section 3.2	-
Distance from cities, roads, railroads, fences, etc. SEE MAP	
Plate that the state of the sta	55-65 BROKEN IGNAVEI
(3) TYPE OF WORK	65-75 BYACK SAND
New World Deepening	- \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Reconstruction Reconditioning Reconditioning Reconditioning Reconditioning Reconditioning Reconditioning Reconditioning Reconditioning Reconditioning Reconstruction Reconditioning Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Reconditioning Reconstruction Reconditioning Recond	25-18X VOLEDNICKOCK
Horizontal Well	~ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Destruction (Describe destruction materials and pro-	7- 10
cedures in Item 12)	
200' FROM RD (4) PROPOSED USE!	
Domestic	2 - 2 (Q) - 4 (Q)
Irrigation	4 // \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Industrial	W-//> (1/S)
Test Well	7/01
Municipal	- U// - V(C, V)
Other S	0) 0 - (6)
WELL LOCATION SKETCH (Describe)	
(5) EQUIPMENT: (6) CRAVEL PACK: SIL	<i>/</i> / ₂ − ⊗
Rotary R M P Reverse No No Size	
Cable Air Biameter bore	
Other Bucket Rucked from	(()) ~ -
(7) CASING INSTALLED: (8) PERPORATIONS: Steel Description or size of serious	
From To Dia Gage or Toom To Slot Size	
6 20 6' Scu 200 20 85 FXY	
	- good der
(9) WELL SEAL:	(- (-))
Was surface sanitary seal provided? Yes No I If yes, to depth 20 ft.	- Just
Were strata sealed against pollution? Yys No I Intervalft.	5/76/91
Method of sealing CLAY & CEMUST CROUT	Work started 5-10-1970 Completed 5-14-1990
(10) WATER LEVELS: ARRAY 241	WELD DRILLER'S STATEMENT:
Depth of first water, if knownft.	This well was drilled under my furisdiction and this report is true to the
Standing level after well completion PPROX. 4 ft.	best of my knowledge and belief.
(11) WELL TESTS:	Signed front a. May
Was well test made? Yes No I f yes, by whom? DRILLER Type of test Pump Bailer Air lift A	Mario Old Var (Well Driller)
Depth to water at start of testft. At end of testft.	NAME (Person, firm, or corporation) (Typed or printed)
Discharge 240 gal/min after 10 hours w Water temperature Colo	
Chemical analysis made? Yes No I If yes, by whom?	City 17 CVV1/3.7 C7 ZIP 920321
Was almotric low reads Yes No	Liversa No. 3/19 X 37 Duta of this report 1 = 23 = 90



DEH-LU-731a (Rev. 4/02) NCR

COUNTY OF SAN DIEGO DEPARTMENT OF ENVIRONMENTAL HEALTH WELL PERMIT APPLICATION

DEH USE ONLY PERMIT # W LW LL / 164	19
WELL COMPUTER #	
FEE:	
WATER DIST:	

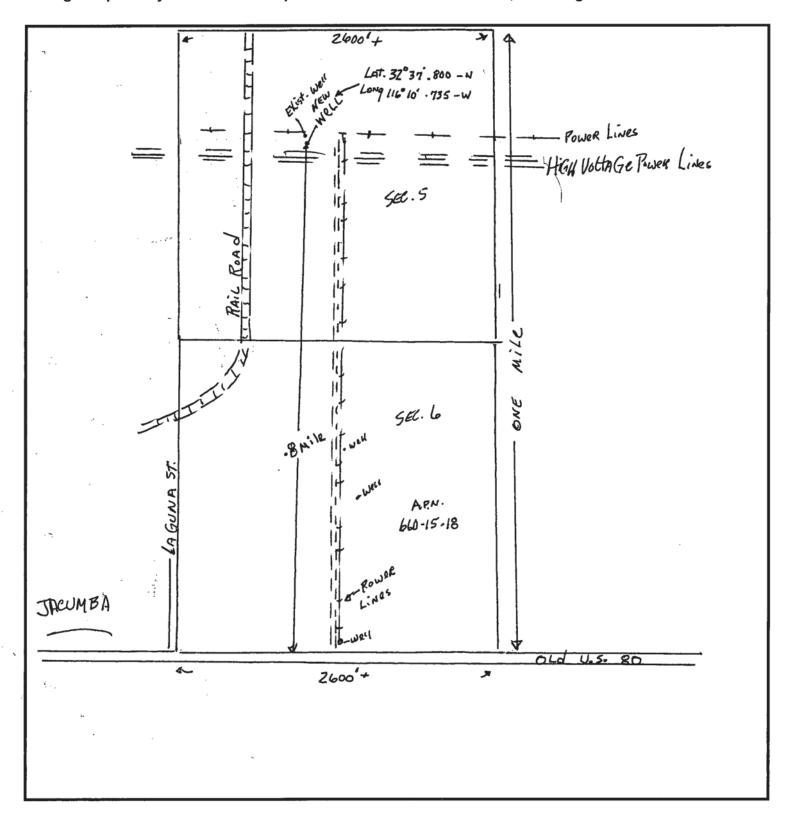
1.	Property Owner: (Lease) BORNT FARMS		Phone: 760 - 356 - 2233
	2307 EAST HWY 98	HOLTVILLE	92250
	Maumg Address	City	Zip
2.	Well Location - Assessors Parcel Number 660 - 6	10 -05	_
	OLd HWI/ 80 Site Address	JACUM B A	91934 Zip
	,	City	
3.	Well Contractor - Well Driller Joe Edwards	Company N	ame: FAIN DRILLING
	12029 OLD CASTIE RD	_ UAITEY CENTE	PE 92087
	Mailing Address	Gity	Zip
		C-57#: <i>3<u>28</u>287</i> _ □ Cash	\
	V	□ Cathodic □ Other	•
5.	Type of Work:	☐ Destruction Time Ext	ension: 🗆 1st 🗀 2nd
6.	Type of Equipment:		
7.	Depth of Well: Proposed: /OU'		Existing:
	Proposed:		<u> </u>
	Casing Conductor Casing Type: \$\frac{1\ell}{2\ell} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	From: <u>Zo</u> To: <u>/00</u> Type: <u>Pea gvave</u>	Perforations 5.5.304
9.	Annular Seal: Depth: Zo ft. Sealing Materia		
	Borehole diameter: 32 in. Conductor diar		
10	Date of Work: Start: /-21-05	Comple	ete: <u>/-24-05</u>
Cor	On sites served by public water, contact the local of the well. I accept responsibility for all work done as part of supervision.	ent of Environmental Health, and ving to well construction, repair, months artment of Environmental Health with this permit and all work will be perfectly the perfectly t	with all ordinances and laws of dification and destruction. ith a complete and accurate log
CC	DISPOSITION OF APPLICATION (Depart Approved Denied Special Conditions: Grad Instruction, maintenance or destruction of water wells an Diego and/or other agencies.	ing and clearing associated	with access to, or the
	1/2/4	/	/_ 1/ -
S	pecialist:	Date: <i>_/</i> /	7405

Page 1 of 2

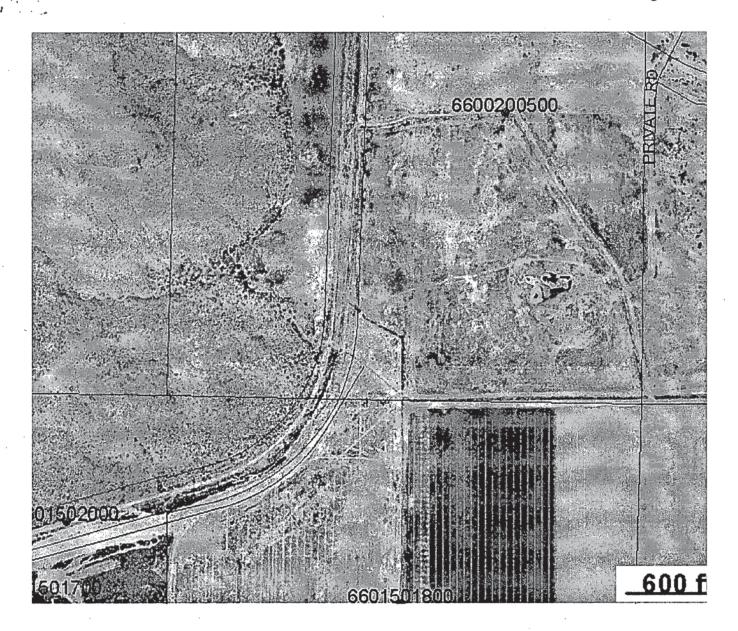
Control #: ಟಟ 16419 Assessor's Parcel Number: <u>៤७-೦೭೦- ೦5</u>

LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, water bodies or water courses, drainage pattern, easements, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.



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Page _=	of _1						. 1	Refer to In						S	TATE WI	ELL NO	./STATI	ON NO.
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Per	Permit Ag mit No	ency _		De 4-0	4		Permit I	Date 1	12510	· E	· ·	一 、「			AP	N/TRS/	OTHER	
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on	1 3 2	Calab		1	1.1	- in	1. rock			+	H		PACE	Più	ou Li	P 5		Other (Specify)
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<u> </u>	1	1	- :			1				ne ne	llustrate or Des ences, Rivers, e ecessary. PLE A	stc. and	i attach a map. E ACCURATE	& COMP	ional pap PLETE.	er if	_	OTHER (SPECIFY)
<u> </u>	!		·J							\vdash	WA	ATER	LEVEL &	YIELD	OF CO	OMPL	ETED	WELL
<u> </u>	-						,			DEPTH TO FIRST WATER 12 (Ft.) BELOW SURFACE								
	1	1			٠.					DEPTH OF STATIC WATER LEVEL (Ft.) & DATE MEASURED 1-16-05 ESTIMATED YIELD 2000 (GPM) & TEST TYPE A. 15 61 4.								
	1	ı						,] [STIMATED Y	FID .	<u> </u>	(GPM) &	TEST TV	PE .	A 115	li +.
TOTAL	DEPTH OF	BORING		12	·(I	Feet)	,			7	EST LENGTH		(Hrs.) TO1	AL DRAW	/DOWN_	90	(Ft.)	
	DEPTH OF					10	<u>&(Feet)</u>			*	May not be	repres	entative of a	well's lor	ng-term	yield.		
		<u> </u>	T	٠.			·	ASING (S))			7				ANN	HAR	MATERIAL
FROM	EPTH SURFACE	BORE- HOLE	T	YPE	(∠)	T-		13110 (3)	, T		T -		DEPT FROM SU	H RFACE		AITIT		PE PE
		DIA. (Inches)	¥	SCREEN	DUCTOR FILL PIPE	7	MATERIAL / GRADE	INTERNAL	GAUG OR WA		SLOT SIZ	Æ			CE-	BEN- TONITE	FILL	FILTER PACK
Ft.	to Ft.	(monos)	BLANK	SCRI			GHADE	(Inches)	THICKNE		(Inches)	-	Ft. to	Ft.	(∠)	(∠)	(∠)	(TYPE/SIZE)
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==	- ATTAC	HMENTS	(~) -		_							TION STAT					
	Geologic					}					report is con	nplete	and accura			mý kr	nowled	ge and belief.
	1	nstruction Di	iagra	m		ļ					Purap (
		sical Log(s)	_				(PERSO	ON, FIRM, OR (CORPORATION)	S C	PED OR PRINTED	yall	ley Cen	Cer,	Ca 9:	2082	:	
	Soil/Wat	diam.		lyses														
.	Other	Self prod	<u> </u>			1	ADDRESS	The state of the s	n. =	=).	~			CITY	1.20	. 4°3 120	STATE	ZIP RODE DEF
ATTACH	ADDITIONAL	INFORMATIO	ON, I	F IT	EXIST	S.	Signed C-57	LICENSED WAT	-	-	TOR			DA	TE SIGNED	03		327297 C-57 LICENSE NUMBER





DEH USE ONLY
PERMIT # W Word 17922
WELL COMPUTER #
FEE:
WATER DIST:

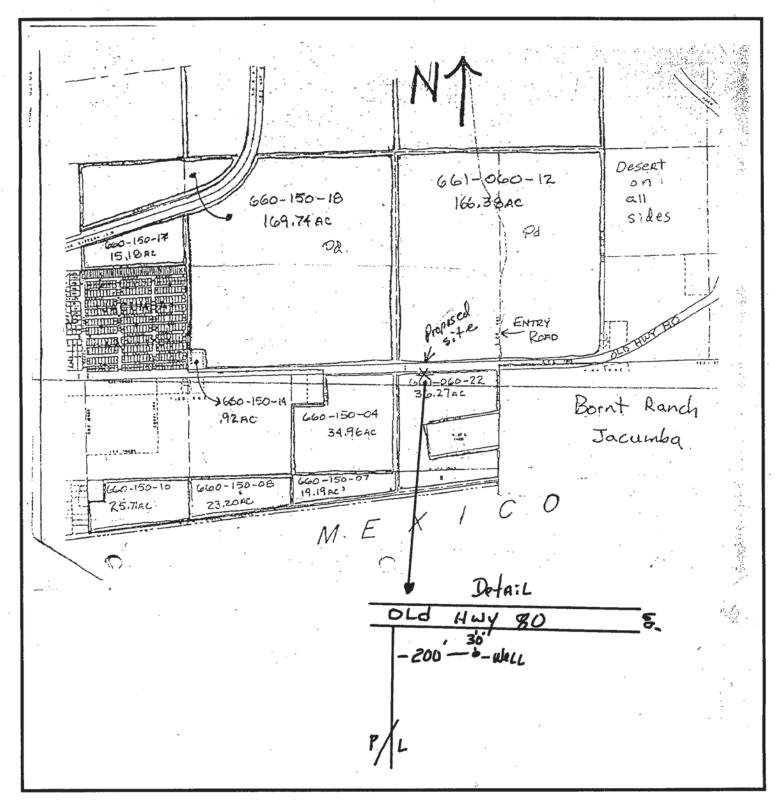
1	Property Owner:	BARNT	FORUS			Phone:	619-71	6-42
١.	2307 EAS			401	Tville	CA	9775	0
		Mailing Address		8	City		1205	Zip
2.	Well Location - Asses		per <u>667 * 06</u>	0.55		_		
	Old Hwy	Site Address		JAC	UMB	A		Zin
3	Well Contractor - Well		Edward	c	Company N	lame: A	Ain De	Pilling
0.	12029 01	. /			1 Cent			
		Mailing Address		. ,				
	Phone#: 766-	149-070	<u> </u>	_ C-57#: 3<u>2</u>828	7 □ Casl	n Deposit	Bond	Posted
	Use: Private		☐ Industrial	☐ Cathodic	□ Other			***
5.	Type of Work:			☐ Destruction	Time Ex	tension:	☐ 1st	☐ 2nd
6.	Type of Equipment:	Koto	IRY					
7.	Depth of Well:	Proposed: _	120'	0.000		Existir	ng.	
8.	Proposed:						181	
	Casing Type:	Depth: _ in. Diamete	ZO ft. rin.	Filter/Filler Yes □ No From: _2 Type: Wall/Gauge:	To: /20_	From: From:	60 To): <u>/20</u>):
9.	Annular Seal: Depth	22.2						
	Borehole diameter:							
10	. Date of Work: Start	: MAY	26-06		Compl	ete: M	14-31-	06
Coi	I hereby agree to co the County of San I Immediately upon co	mply with all regula Diego and the State Impletion of work, I	ntions of the Departm of California pertain will furnish the Department	water agency for nent of Environmenta ning to well constructi artment of Environme of this permit and all	I Health, and ion, repair, mo ental Health v work will be p	with all or odification vith a com performed	dinances an and destruc plete and ac	d laws of tion. curate log rect
						. 7		
		-107		50.	35-			
×	DISPOSITIO	N OF APPLIC	CATION (Depart	tment of Enviror	nmental H	ealth Us	se only)	
	Approved 🗅 De	nied Special	Conditions: Grad	ling and clearing	associated	with ac	cess to, or	the
17.5	onstruction, maintena	_	on of water wells	s, may require ad	ditional per	mits fror	m the Cou	nty of
S	an Diego and/or othe	encies	. 10 1 .	325-340-45-4				
S	pecialist:		- Klew Minte	ν. Da	ate:		5	19/06

Control #: 2 wel 17922

Assessor's Parcel Number: <u>661-060-22</u>

LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, water bodies or water courses, drainage pattern, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.



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	Owner's Well		TEST	17	E.I.	E.			_		140	. TA	0	505	0		\sqcup	LATITUDE		L.	LO	NGITUDE
	Date Work Beg	_	0/20	10	Ó		,	Ended	7	1610	16			* .* .		.		1	l I	1	1 1	1 1 1
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	i	- 1	• .				į		١,	<u> </u>	<u> </u>		4			MEX	(IC	<i>O</i>		- ;	VAF	OR EXTRACTION
		1.1				_	2	7.	101				L				י בידור					SPARGING
	, 1	· 1.					ب	,. 						llustrate or	Describe	Distanc	e of W	ell from Roa o. Use additi	ds, Build	ings,		REMEDIATION OTHER (SPECIFY)
;	51.04		:										- n	ecessary. I	PLEASE I	BE ACC	URAT	E & COMP	LETE.	er g	·	
							7						$-\Gamma$		WATE	R LEV	EL 8	YIELD	OF CO	OMPL	ETED	WELL /
٠,							-		.				، 🗠	DEPTH TO	FIRST V	VATER .		(Ft.) BE	ELOW SI	JRFACE	٠.	
	2.43.44	- ;												DEPTH OF		٠.						
**	1 179	1						٠.					- 1	WATER LE				(Ft.) & DATE				100
	TOTAL DEPTH	OF E	ORING		12	ß	_(Fee	et)		1								. (GPM) & TAL DRAW			/Et \	. :
	TOTAL DEPTH								_(Feet)									a well's lon			(Ft.)	·y
		$\overline{}$		_												1	<i>J</i>		I			
	DEPTH FROM SURFAC	_	BORE-	-	7/05	- / -/				CASIN	G (S)	·		T			DEF	TH URFACE		ANNI		MATERIAL
	, THOW SONI AC		HOLE DIA.	$\overline{}$	YPE			MATE	RIAL /	INTE	RNAL	GAUG		SLOT	SIZE		OW O	OI,II AOL	CE-	BEN-	. TY	
	. Ft. to Ft.	.	(Inches)	BLANK	SEE	CON- DUCTOR	IL P		ADE		METER ches)	OR W			ANY hes)	F	t. to	Ft.	1 1	TONITE		FILTER PACK (TYPE/SIZE)
	****				S	-	II.		:	-				-		II		20	(∠)	(エ)	(<u>~</u>)	-
		-		\vdash	Н	\forall	+			+-				 			$\overline{}$	120	X	H		,
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	ATT	ΓΑCḤ	MENTS	() -		Α	٦г.										FEMENT				
	Ged	ologic	Log					',	the und	dersign	ed, ce	ertify that	this	report is	complet	te and	accur	ate to the	best of	my kr	owled	ge and belief.
	Wel	II Cons	struction Di	agra	ım	;		~	AME T	30 1 m	Dyi	111100	× 8,	Puma	Co 3	Inc.	·					
	Geo	Well Construction Diagram Geophysical Log(s) 12029 Old Castle Rd. Valley Center, Ca 92082																				
			r Chemical		-			-	DRESS	-049	O J. C		-ve	MO.	ANTIE	-y (C	CII C	CITY CA	720	04 -	STATE	ZIP
	Oth	ier	<u> </u>	Al	1			-		~//		12	1.	4.1				****	2 -	41.		
	ATTACH ADDITIO	NAL IN	IFORMATIC	ON, I	F IT	EXIS	STS.	Si	gned / C-5	7 LICENS	ED WATE	R WELL CO	NTRAC					DAT	TE SIGNED	01-	<u> </u>	-57 LICENSE NUMBER
									1-	/												



DEH USE ONLY	
PERMIT # 4 WCI - 180	3)
WELL COMPUTER #	
FEE:	
WATER DIST:	

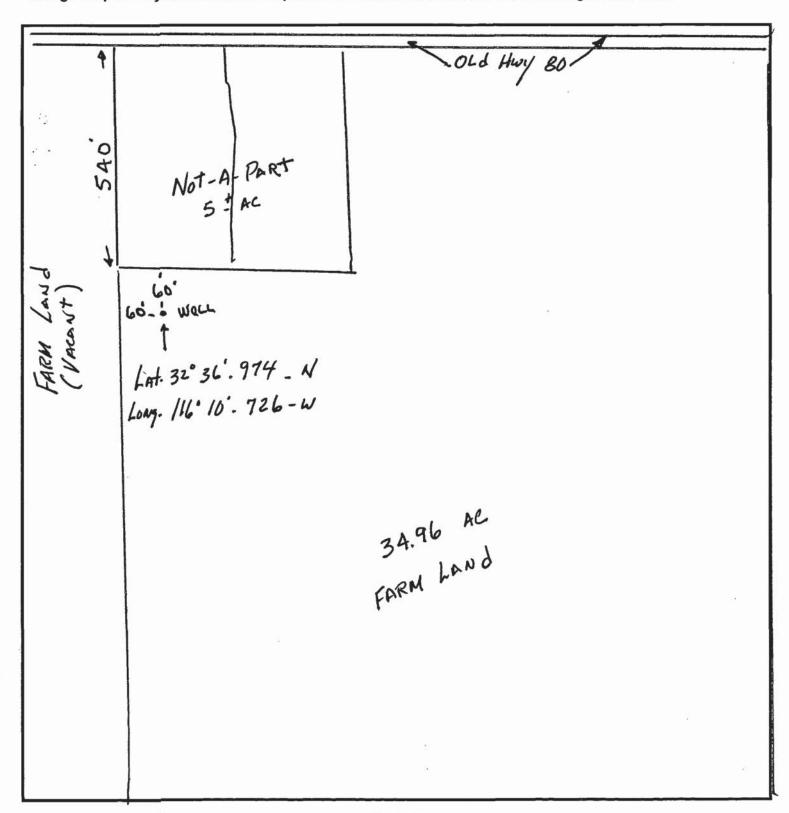
1.	Property Owner: BORNT	FARMS	9	Phon	019 766-4213
	2307 EAST HW	198	HOLTVILL	E CA	97.250
	Mailing Address	<i>'</i>	City		Zip
2.	Well Location - Assessors Parcel Nun	nber 660 - 15			
	OLD HWY 80 Site Address		_ JACU	u B A	Zip Zip
3	Well Contractor - Well Driller	JOB EdWA	RAS Com	nany Name: "	FAIN DRILLING
	12029 Old CAS-	10. (12. 11. 11. 11. 11. 11. 11. 11. 11. 11.	VAILEY		97082
	Mailing Address	4	£ ity		Zip
	Phone#: 760 -749 - 0701	<u> </u>	C-57#: <i>328287</i> (Cash Depo	sit Bond Posted
4.	Use: ☑ Public	□ Industrial	□ Cathodic □ O	ther <u>A6-u</u>	IEC
5.	Type of Work: New D	Reconstruction	☐ Destruction Tir	ne Extensior	n: 🗆 1st 🗆 2nd
6.	Type of Equipment: R. Ha	RU			
7.	Depth of Well: Proposed:	100'		Exis	ting:
8.	Proposed:				
9.	Type: Steel - A-129 Yes Depth: 100 ± Depth: Diameter 14" in. Diameter Wall/Gauge: -256 Wall/Gauge: Annular Seal: Depth: 26 ft	-	From: Zo To: / Type: Wall/Gauge:	66 From	Perforations 1: To: 1: To: 1: To:
	Borehole diameter: 32ir	n. Conductor dia	meter: 24 in.	Annular Th	ickness_4in.
10.	Date of Work: Start: _AUG -	2006		Complete: 🖊	146-2006
Con	On sites served by public water I hereby agree to comply with all regulation the County of San Diego and the Stall Immediately upon completion of work of the well. I accept responsibility for supervision. tractor's Signature:	lations of the Departn te of California pertain I will furnish the Dep	nent of Environmental Heal ning to well construction, re artment of Environmental F	th, and with all pair, modification dealth with a co will be performe	ordinances and laws of on and destruction. mplete and accurate log
	DISPOSITION OF APPL	CATION (Depar	tment of Environmen	ntal Health I	Jse only)
X		9785 L. (\$400 C.)	ding and clearing asso		
	nstruction, maintenance or destruc				to a contract of the state of t
	n Diego and/or other agencies		.,	P 5	and adming of
	ecialist:		Date:	8-4-	06

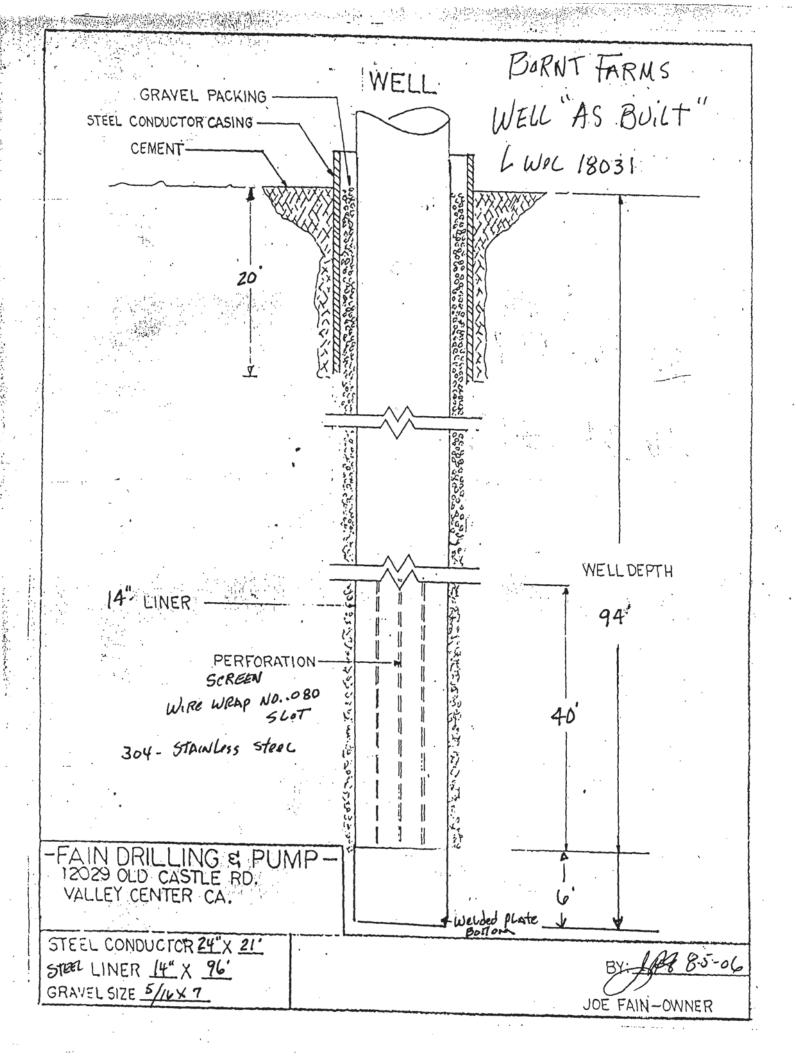
COUNTY OF SAN DIEGO DEPARTMENT OF ENVIRONMENTAL HEALTH

Control #: <u>LWel - 1803 /</u>
Assessor's Parcel Number: <u>660 - 150 - 0</u> 4

LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, water bodies or water courses, drainage pattern, easements, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.





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Page 1	of	;		0	11	8		Refer to In	struction	Pamp	hlet		^ <u>-</u>		STATE W	ELL NO	./STAT	ON NO.
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Date Wo	rk Began	7/27/	06			,	Ended 9/2/	05		:		:		LATITUE	DE		LC	DNGITUDE
	Permit Age	.*			40			.i		· .			. [└		AP	N/TRS/	OTHER	
Pern	nit No. 🔣				റെ	IC	LOG Permit I	Date	/4/06		•	12/1	-	WELL	OWNE	р		
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Official	11014 ()	DRILLING	,		ore													e and the information.
	H FROM RFACE					Ď	ESCRIPTION		110					, .				
	to Ft.						rial, grain size,	- (37	777	- C	\V \	` '	11/	WELL L	OCATIO	on—		
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	i ·	Consident	<u>x æ</u>	CI -	- 1	OD NE 4	orm color	5 5			unty S			<i>X</i> -7				
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		prove				1	21 4 114 - 2	$\langle \rangle \rangle$	1///					e 8E				
	<u>i</u>	· ·		~~~	2	ž	7///			La	32 DEG.		5 1 Q	7点 N SEC.	Long	116 DE		10 1.726 W
56	86	Coare	(A)	Bar	nd	()	(th grave)	1	13	(~-/)	, , ,	LOC	CATION	SKETCH			A(CTIVITY (\(\sigma\)
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7548	1 3/10	1		1	1 /	-	4/15			1			org H	wy 80	/			TICATION/REPAIR Deepen
96	105	Black	1377	28	3/	Ž,	unlcantes	\mathcal{D}_{\perp}			1-			•				Other (Specify)
	1	->//	_	<u> </u>						-	~ u	JOLL						DESTROY (Describe Procedures and Materials
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	-		عا	W	6	1.	776			ľ					- 1			S(<u></u>) R SUPPLY
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<u></u>	1 .	1					• • •			-) ;				CATHO	TEST WELL
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									:	1			1. 1.1	HAR				DIRECT PUSH
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	<u>; </u>										1-10	12 04	SOUT	-	- 1			SPARGING
	1.	<u> </u>												Well from Ro nap. Use addi				REMEDIATION OTHER (SPECIFY)
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		i]				& YIELD				WELL
		i I									PTH TO FI		ATER	(Ft.) I	BELOW S			
	i						,			W/	ATER LEVE	L		(Ft.) & DA				
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	DEPTH OF			WEI	LL	_,_								TOTAL DRAY of a well's l			. ,	
											,			J	1			
FROM S	PTH SURFACE	BORE- HOLE	Т	YPE	(<		C	ASING (S)	<u> </u>	Т		-	FROM	EPTH SURFACE		ANN		MATERIAL
-		DIA. (Inches)		Z.	- E	JIL	MATERIAL /	INTERNAL DIAMETER	GAUGI OR WA		SLOT SI				CE-	BEN-		FILTER PACK
Ft.	to Ft.	(miches)	BLANK	SCREEN	CON- DUCTOR	긢	GRADE	(Inches)	THICKNE		(Inches		Ft.	to Ft.	MENT (ビ)	TONITE	FILL (エ)	(TYPE/SIZE)
. 0	20	32	н	\vdash			Steal	23.5	.250				0	20	V			
0	50	22	X	1 1			Steel	13.5	.250				0	96				5/16=7
1 "	90	22	-	X		-	Steel-SS	13.5	.250	-		\dashv						1
90	¦ 96	22	K		\vdash	\dashv	Steel	13.5	.250		•	\dashv			+	· -		
	1						· · · · · · · · · · · · · · · · · · ·							1				
	- ATTAC	HMENTS	(<u>~</u>) -			I the unde	reigned	ortific that	hio				ATEMEN		f may be	2014	lan and belief
	Geologic	_					16'A	irsignea, ce IN DRI						urate to th	e nest o	i my ki	iowied	lge and belief.
ˈ[-	well col	nstruction Di		am	•		(PERSO	ON, FIRM, OR (CORPORATION)	. (TYPE	D OR PRINTE	ED)						
-		sical Log(s) er Chemical		alvse	s		12029	Old c	astle	P.d.	. val	ey .	Center	r, Ca S	2082			
	X Other _	site m	ap)			ADDRESS	la o	10	, -		:		CITY	12 1		STATE	
ATTACH A	ADDITIONAL	INFORMATIC	ON,	IF IT	EXI	STS.	Signed C-57	UCENSED WATE	ER WELL CON	TRACTO	R				ATE SIGNE			32 92 8 7 C-57 LICENSE NUMBER
DWR 188 R	EV. 05-03	,		IF	- AC	רוסכ	IONAL-SPACE IS					IVELY	NUMBER					

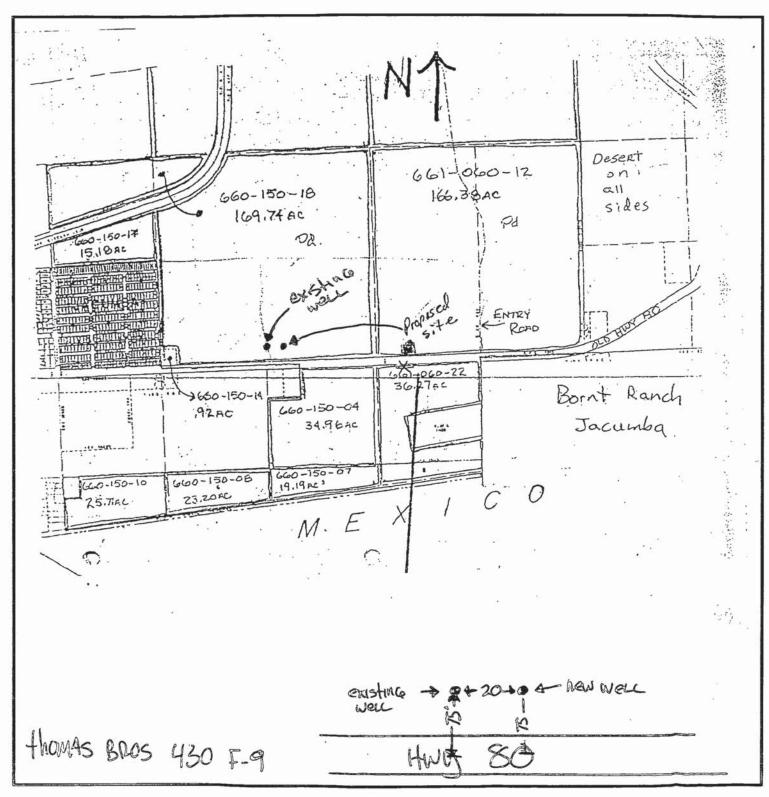


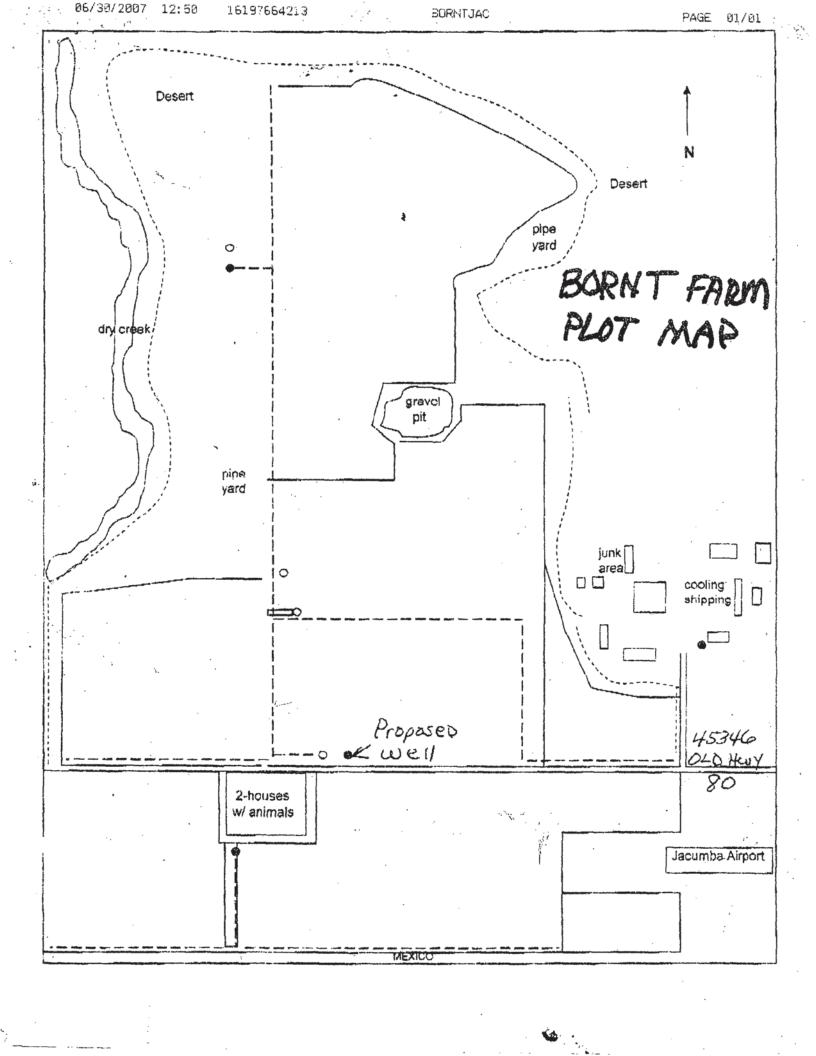
DEH USE ONLY BY	تحيم
WELL COMPUTER #	
FEE:	
WATER DIST:	

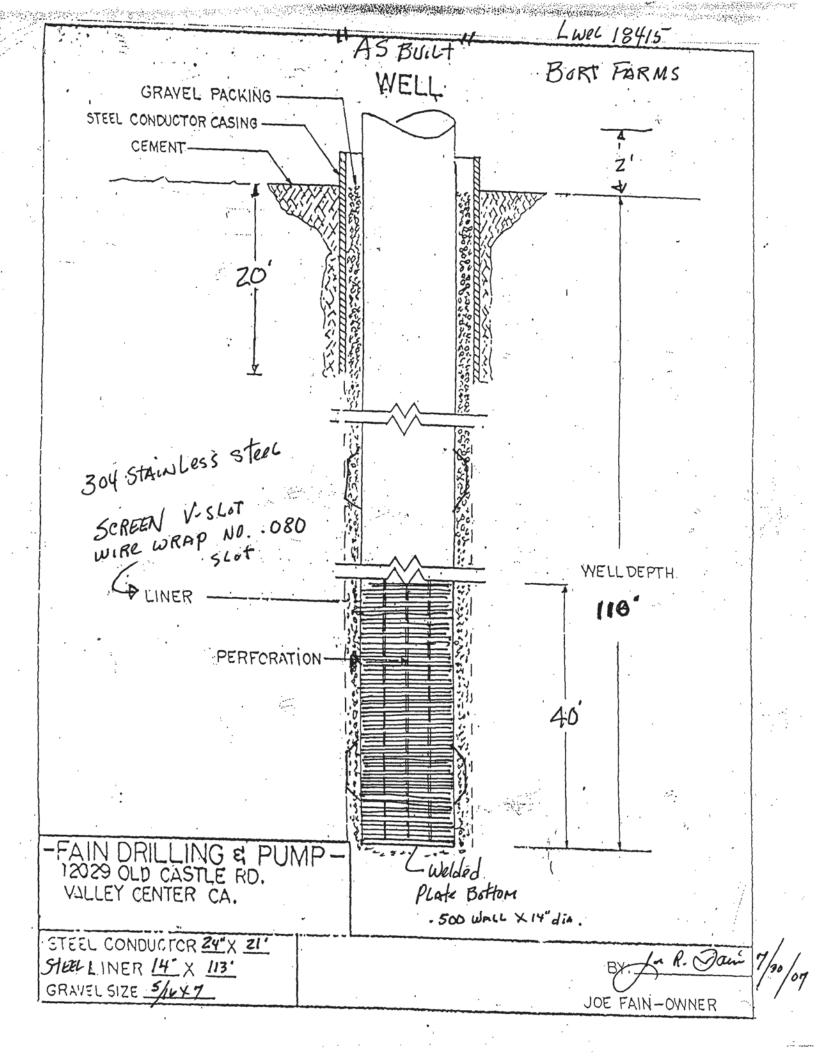
1	Property Owner: BORN FARMS	Phone: 649-766-4213
	2307 CAST HWU 98	HOLYVILLE, CA 92250
2	. Well Location - Assessors Parcel Number <u>CCO-15</u> <u>OUD HWY SO</u> Site Address	50-18 Sity Sity
3.	Well Contractor - Well Driller TOE ADWARD 12029 OLD CASHE RD Mailing Address	Company Name: FAM DULLING VALLEY CENTER 92082
	Phone#: (766) 749-0701	_ C-57#: 328287 □ Cash Deposit Bond Posted
4	. Use: 💆 Private 🗅 Public 🗅 Industrial	□ Cathodic □ Other
5	. Type of Work: New Reconstruction	☐ Destruction Time Extension: ☐ 1st ☐ 2nd
6	. Type of Equipment: ROTARU	
7	Depth of Well: Proposed:	Existing:
8	. Proposed:	
	Casing Conductor Casing Type: SteeL Yes No Depth: 110 Depth: \$20 ft. Diameter 14 in: Diameter 24" in. Wall/Gauge: ,250 Wall/Gauge: ,250	Filter/Filler Material Perforations Yes No From: 20 To: 120 From: 70 To: 110 Type: From: To: To: To: To: To: To: To: To: To: To
9	. Annular Seal: Depth: 20 ft. Sealing Materia Borehole diameter: 32" in. Conductor dia	meter: 24 in. Annular Thickness 4 in.
1	0. Date of Work: Start: 7- A -07	Complete: 7-24-67
С	the County of San Diego and the State of California pertain	nent of Environmental Health, and with all ordinances and laws of ing to well construction, repair, modification and destruction. Fartment of Environmental Health with a complete and accurate log
	DISPOSITION OF APPLICATION (Depart	tment of Environmental Health Use only)
(Approved Denied Special Conditions: Grade construction, maintenance or destruction of water wells San Diego and/or other agencies.	ling and clearing associated with access to, or the , may require additional permits from the County of
1	Specialist:	Date: 7-13-07

LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, water bodies or water courses, drainage pattern, easements, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.







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Page	of					٠.		Refer to In	struction P	amphl	let		S	TATE WI	ELL NO	/STATI	ON NO.	
Owner's Well No										1								
Date W	ork Began	7/18	10	7		,	Ended 7/2	23/07					LATITUDE	<u> </u>	1 .	LC	ONGITUDE	
Local	Permit Ag	ency _	- 1	DED	X				<u>·</u>					AP	N/TRS/	OTHER		لـــــــا
Per	rmit No. 📆	151 1	94 GI	ior.		IC	LOG Permit I	Date			- CA		(Derr	AUATE:	n		1.6	L. P
OBJENT	`ATION (∠)	X VE					RIZONTAL A	NGLE	(SPECIFY) V	l he ir ⁄iewir	nformation	in this gra t to section	ayed area on 13752	has be	een b Watei	locke Cod	d from pu e and the	iblic
	, , , , ,	DRILLING METHOD	G				FLI				nation Prac							
	TH FROM JRFACE					D	ESCRIPTION		110									
Ft.	to Ft.						rial, grain size, L AS FOLL	20" 20"5.	2 7 7 77 17	<u> </u>	/ OA 4	timber O	WELL LO	CATIO) N			
0	9						rained			Add City	ress Vita	unba 1	VO) V					
	; 	1				. 0		5,000		Con	nty San							
9	24	Cla	у .	- D	ar	k	color		No parties	APN	Book 660	Page	150	Parcel	18			
						(8	SUVA ($\langle j \rangle$		Tow	nship 118	S Rang	e 8 E	Sectio	n _8			
24	70	San	do	£	ae	ġ	rained \			Eat	DEG.	MIN. S	BEC. N	Long.	DE		MIN C	W SEC
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	<u>;</u>	<u> </u>										~ 9 €				. VAI	POR EXTRACT SPARG	
<u>.</u>	1	1					٠.			Illust	rate or Describe	Distance of	Well from Boo	ds Build	ings		REMEDIA	TION
	<u> </u>	1				į				Fence	es, Rivers, etc. as sary. PLEASE	nd attach a n	nap. Use addit	ional pap	er if		OTHER (SPEC	XIFY)
	<u>i</u> .	1									WATE	R LEVEL	& YIELD	OF CO	OMPL	ETED	WELL	
	<u> </u>	1			:					. DEP	TH TO FIRST V	VATER5	0 → (Ft.) B	ELOW SI	JRFACE			
	-	1					t		.	DEP.	TH OF STATIC	40				7/93	107	
	1 .	1					, * .				ER LEVEL	2000	(Ft.) & DAT	E MEASU	IRED _	irli	ft	
TOTAL	DEPTH OF	BORING	1	13		_(Fe	eet)				T LENGTH 6		TOTAL DRAW	DOWN_	60	(Ft.)		
TOTAL	DEPTH OF	COMPLET	TED	WE	ĹL	11	4 (Feet)				lay not be repr					(,		
_			$\overline{}$			_		ASING (S)						Т	ANN	İILAR	MATERIA	A.T.
	SURFACE	BORE-		TYPE	(~	_)		101110 (0)		\neg		FROM	EPTH SURFACE		78.11.1		/PE	
		DIA. (Inches)	BLANK	SCREEN	CON- DUCTOR	PIPE	MATERIAL / GRADE	INTERNAL	GAUGE OR WALL		SLOT SIZE IF ANY			CE- MENT	BEN- TONITE	FILL	FILTER	
Ft.	to Ft.	,,	A.	SCR	정	긢	UNADE	(Inches)	THICKNES		(inches)	Ft.	to Ft.	(∠)	(<u>∠</u>)	(∠)	(TYPE/	
0	20	32	X	_			Steel	23.5	.250			0	20	X				
0	73	24	X	+			Steel	13.5	.250		0.00	20	113	<u> </u>	pea	gra	vel 5/	16x7
73	113	24	+	H	\vdash	\dashv	Steel S.S	5.13.5	.250	,	.080	<u> </u>	+				-	
,	 	<u> </u>	+	\vdash		\dashv	304				•		; 		-		 	
	1		+	\vdash				-				l .	1		_			
	— ATTAC	HMENTS	(<u><</u>	.)			1 46	rolad		io re-	CERTIFICA				man le	novel and	an and bell	iof
	I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.								iet.									
7	Well Construction Diagram NAME FAIN DRILLING & PUMP CO INC (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)																	
	,	sical Log(s)					11				Rd. Val	ley Ce	nter, (Ca 92	082			
	Soil/Wai	ter Chemica	al Ana <i>M</i> (A		s		ADDRESS	"	<i>~</i> }				CITY	,		STATE	ZIP	,
ATTACH	ADDITIONAL			i		STS	Signed	for it.	Ja	-					0-0	<u> </u>	32728	37_
ļ ·		oranici						LICENSED WATE			NOTO: IT'S IT'S	/ NIII 155		ATE SIGNED)		C-57 LICENSE I	NUMBER
DWK 188	REV. 05-03			IF.	- AL	ווטכ	TONAL SPACE IS	o .NEEDED,	USE NEX	, COL	NOECOLINEL)	INOMBER	IED FORM.					



DEH USE ONLY
PERMIT # W 2041)
WELL COMPUTER #
FEE: 462.
WATER DIST:

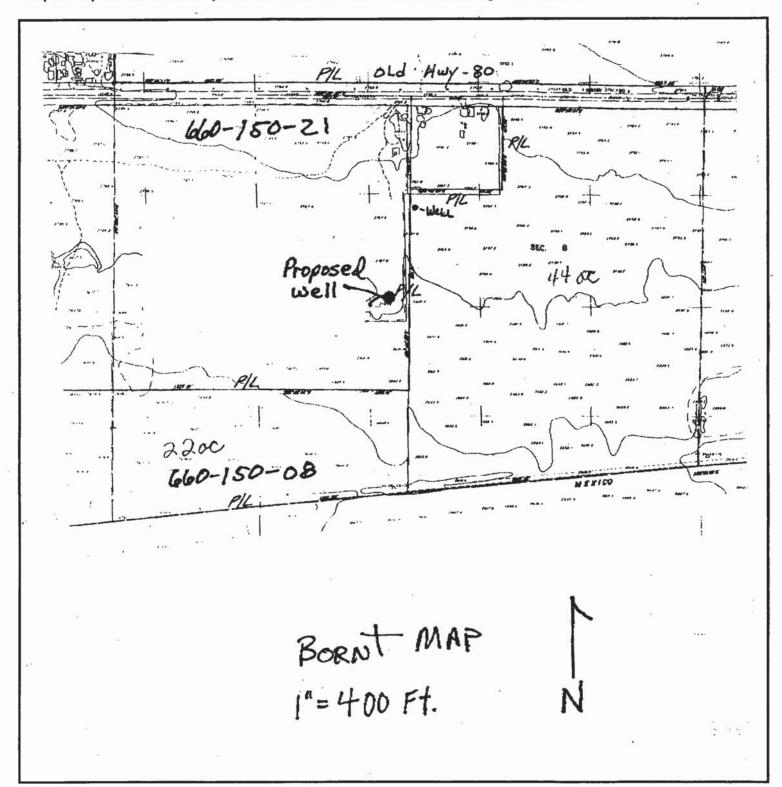
1	Property Owner: BORNT FARMS (Lea	see	Phone: 160-356-223
***	2307 E. HWY 98	Holtville	92250
•	Well Location - Assessors Parcel Number 660-75	City	Zip
2.			_
	Old Huy 30 Site Address		Zip
3.	Well Contractor - Well Driller Joe EDWAR 15	Company N	ame: FAIN DRIlling
	12029 Old CASTLE Rd	Valley CENTE	92082
	Phone#: 760-749-070/	C-57#: <i>3<u>2828</u>7</i> □ Cash	Deposit Bond Posted
4.	Use: Private Public Industrial	☐ Cathodic ☐ Other	
5.	Type of Work: ✓ New □ Reconstruction	☐ Destruction Time Ext	
6.	Type of Equipment: Rotaly		
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Sp	pecialist: Digus Araus	Date: _//-	2-09

Control #: LWEL - 2041)

Assessor's Parcel Number: 660-150-21

LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, easements, water bodies or water courses, drainage pattern, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.



*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0135671

Date Work Began 11/04/2009

Date Work Ended 11/6/2009

Latitude

Longitu

APN/TRS/Other

The information in this grayed area has been blocked viewing pursuant to section 13752 of the Water Code Drilling Method Direct Rotary

Drilling Fluid Bentonite mud

The information Practice Act of 1977 to protect personal information Practice Act of 1977 to protec

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DCCCLL DCCCLL

DEH USE ONLY LWELZOUSS PERMIT # W
WELL COMPUTER #
FEE: 460
WATER DIST:

(Leaser)	
1. Property Owner: BORN+ FARMS	Phone: 619-766-421
2307 E. Hwy 98 Holtvi	Ue 92250
2. Well Location - Assessors Parcel Number 660 - 150 - 04	y Zip
OLD HOW 80 JACK	JABA
Site Address City	
	ompany Name: Min Skilling
12029 Old CASHE Rd Valley Mailing Address City	CONTER 92082
	☐ Cash Deposit ☐ Bond Posted
	Other
5. Type of Work: New □ Reconstruction □ Destruction	1
6. Type of Equipment:	Time Extension. 4 1st 4 2nd
700 700	Existing:
7. Depth of Well: Proposed:	Existing.
Casing Conductor Casing Filter/Filler Ma Type:	From: To: From: To: n. Annular Thickness 4in.
On sites served by public water, contact the local water agency for m I hereby agree to comply with all regulations of the Department of Environmental H the County of San Diego and the State of California pertaining to well construction Immediately upon completion of work, I will furnish the Department of Environment of the well. I accept responsibility for all work done as part of this permit and all wo supervision.	dealth, and with all ordinances and laws of a, repair, modification and destruction. tal Health with a complete and accurate log
Contractor's Signature: R. Dawn	Date: 11-6-09
DISPOSITION OF APPLICATION (Department of Environm	nental Health Use only)
Approved Denied Special Conditions: Grading and clearing as construction, maintenance or destruction of water wells, may require addit San Diego and/or other agencies.	·
Specialist:Date	e: 11/10/09

COUNTY OF SAN DIEGO DEPARTMENT OF ENVIRONMENTAL HEALTH

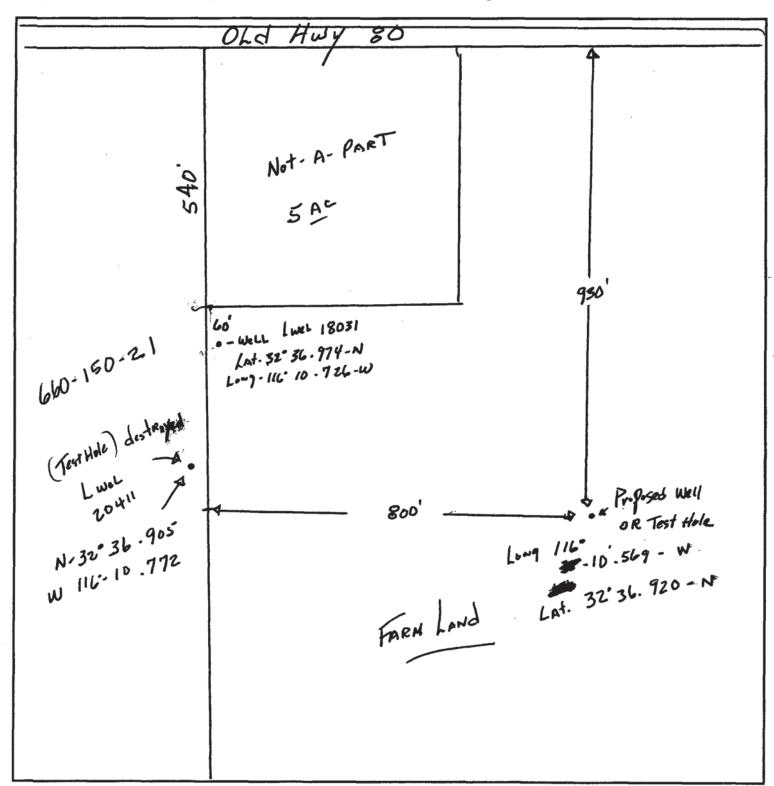
Control #: 20435

Assessor's Parcel Number: 660-150-04

LOCATION



Indicate below the vicinity and exact location of well with respect to the following items: Property lines, easements, water bodies or water courses, drainage pattern, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.



Fire Addise Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form. File Original with DWR State of California DWR Use Only - Do Not Fill In **Well Completion Report** Page one Refer to Instruction Pamphlet State Well Number/Site Number Owner's Well Number Test Hole No. e0135668 L N W Date Work Began 11/10/2009 Date Work Ended 11/12/2009 Local Permit Agency DEH APN/TRS/Other Permit Number <u>LWEL20435</u> Permit Date 11/10/09 Geologic Log Well Owner The information in this grayed area has been blocked from public Orientation

Vertical O Horizontal OAngle Specify viewing pursuant to section 13752 of the Water Code and the Drilling Method Direct Rotary Drilling Fluid Bentonite mud Information Practice Act of 1977, to protect personal information. Depth from Surface . Description Describe material, grain size, color, etc Feet to Feet Alluvial Fill As Follows: Well Location Address Old Hwy 80 Silty Sand City Jacumba County San Diego 68 Cemented Sand Latitude 32 N Longitude <u>116</u> <u>10</u> 68 Fine to Med Sand W/ Lenses of Clay Deg. 81. Decimal Lat. Decimal Long. 81 98 Cemented Sand & Gravel APN Book <u>660</u> Parcel 04 _ Page <u>150</u> 98 138 Sticky Brown Clay __ Range <u>8-e</u> Township 18-s Section 8 138 153 Grey Clay W/ Lenses of Small Aggregate 153 **Location Sketch** 180 Activity Grey Volcanics (Sketch must be drawn by hand after form is printed.) New Well North O Modification/Repair Test Hole Destroyed OLD HWY 80 O Deepen Other_ A ton PARtof O Destroy Describe procedures and materials under "GEOLOGIC LOG" S AC. Planned Uses 2 O Water Supply ☐ Domestic ☐ Public ☐ Irrigation ☐ Industrial O. Cathodic Protection O Dewatering Desteogeo O Heat Exchange O Injection O Monitoring O Remediation O Sparging Test Well O Vapor Extraction Illustrate or describe distance of well from roads, buildings, fences rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete. O Other Water Level and Yield of Completed Well Depth to first water ___ Depth to Static ___ (Feet) Date Measured Water Level Estimated Yield * ___ (GPM) Test Type Total Depth of Boring 180 Feet ____ (Hours) Total Drawdown Test Length ___ Total Depth of Completed Well 0 Feet *May not be representative of a well's long term yield.

Casings **Annular Material** Slot Size Depth from Outside Screen Depth from Borehole Wall Material Fill Thickness Diameter Description Surface Diameter Type if Any Surface Feet to Feet (Inches) (Inches) Feet to Feet (Inches) (Inches) 0 5 Fill 5 25 Cement 25 180 Fill NONE

Attachments	Certification Statement
☐ Geologic Log ☐ Well Construction Diagram	I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief Name Fain Drilling & Pump Co., Inc. Person, Firm or Corporation
☐ Geophysical Log(s) ☐ Soil/Water Chemical Analyses	12029 Old Castle Rd. Valley Center CA 92082 Valley Center CA State Zip
Other Site Map	Signed 12/16/2009 328287
Attach additional information, if it exists.	2-57 Licensed Water Well Contractor Date Signed C-57 License Number
DWR 188 REV. 1/2006	IF ANDITIONAL SPACE IS NEEDED LISE NEXT CONSECUTIVELY NUMBERED FORM



V 11 '
DEH USE ONLY
PERMIT EWEL 20450
WELL COMPUTER #
FEE:
WATER DIST:

	WATER DIST:
1. Property Owner: BORNT FARMS	619 Phone: 744-4213
	92250 Zip
2. Well Location - Assessors Parcel Number 660 - 150 - 18	
Nor old Hwy 86 Site Address City	. 91934 zip
	Name: Fain Deiling
12029 Old Castle Ad Valley CENTE	R 92087
Phone#: 760 - 749 - 070/ C-57#:328287 Case	
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On sites served by public water, contact the local water agency for meter pro I hereby agree to comply with all regulations of the Department of Environmental Health, and the County of San Diego and the State of California pertaining to well construction, repair, n Immediately upon completion of work, I will furnish the Department of Environmental Health of the well. I accept responsibility for all work done as part of this permit and all work will be supervision. Contractor's Signature:	d with all ordinances and laws of nodification and destruction. with a complete and accurate log
DISPOSITION OF APPLICATION (Department of Environmental F	lealth Use only)
Approved Denied Special Conditions: Grading and clearing associate construction, maintenance or destruction of water wells, may require additional personal Diego and/or other agencies.	
	// /2
Specialist: Date:	11-130.9

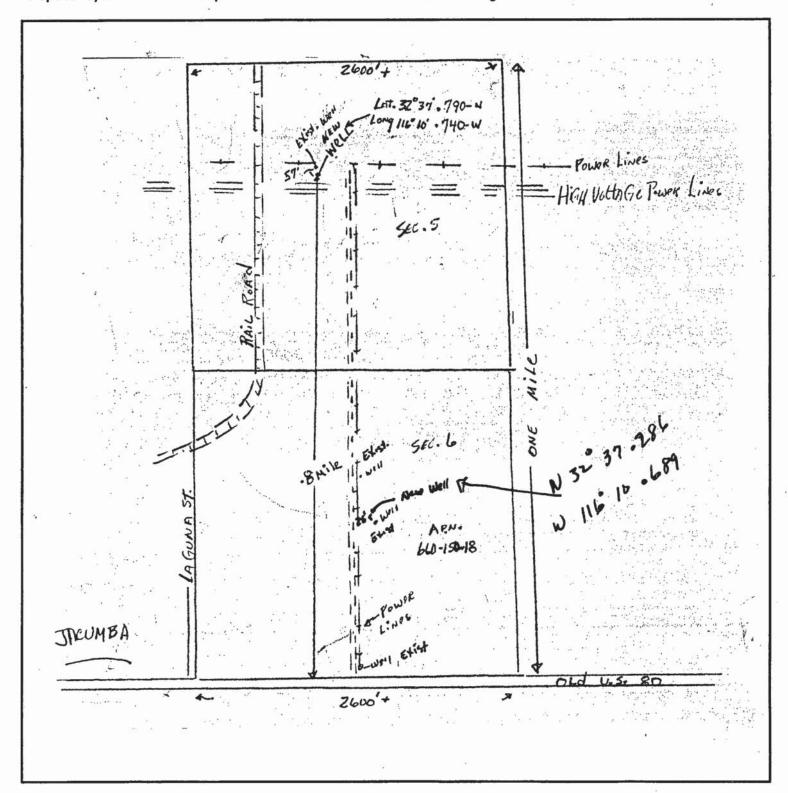
Control #:

20450

Assessor's Parcel Number: 660 - 150 - 18

LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, easements, water bodies or water courses, drainage pattern, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.



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LEIGHTON AND ASSOCIATES, INC.

Geotechnical and Environmental Engineering Consultants

LIMITED EVALUATION OF
LIQUEFACTION AND CONSOLIDATION
POTENTIAL, PHASE 1,
JACUMBA VALLEY RANCH
DEVELOPMENT, SAN DIEGO COUNTY,
CALIFORNIA

January 21, 1991

UPDATED EVALUATION OF CONSOLIDATION POTENTIAL, PHASE 1, JACUMBA VALLEY RANCH DEVELOPMENT, SAN DIEGO COUNTY, CALIFORNIA

February 27, 1991

Project No. 4900381-05

PREPARED FOR:

JACUMBA VALLEY PARTNERSHIP 2423 Camino Del Rio South, Suite 212 San Diego, California 92108



LEIGHTON AND ASSOCIATES, INC.

Geotechnical and Environmental Engineering Consultants

January 21, 1991

Project No. 4900381-05

To:

Jacumba Valley Ranch

2423 Camino Del Rio South, Suite 212

San Diego, California 92108

Attention:

Mr. Karl Turecek

Subject:

Limited Evaluation of Liquefaction and Consolidation Potential, Phase 1, Jacumba Valley Ranch Development, San Diego County,

California

<u>Introduction</u>

In accordance with your request, we have performed a limited geotechnical evaluation of the liquefaction and consolidation potential in the first phase of the proposed development. Plans for this phase include an 18-hole golf course, waste water treatment plant, hotel, school, congregate care center, and retail and commercial structures, along with associated streets, utilities, and drainage channels. We have concentrated our evaluation principally in areas underlain by alluvium (Qal and Qfn on Plate 1) as these are the areas thought most likely to be subject to liquefaction and consolidation. We understand that a maximum of 4 feet of fill is proposed in some areas. In addition, we have performed a limited evaluation of the soil in the drainage areas for use as structural fill and have evaluated drainage channel slope stability.

Accompanying Maps and Appendices

Figure 1 - Site Location Map - Page 2
Plate 1 - Geotechnical Map - In Pocket
Appendix A - References
Appendix B - Boring and Trench Logs
Appendix C - Laboratory Test Results

Scope of Services

Our scope of services to date has included:

- · Logging and sampling 13 small-diameter borings and 6 backhoe trenches.
- Field and laboratory testing to evaluate pertinent engineering properties of the soil samples.
- · Geotechnical evaluation of data obtained during our investigation.
- · Preparation of this report presenting the results of our evaluation.

Field Investigation

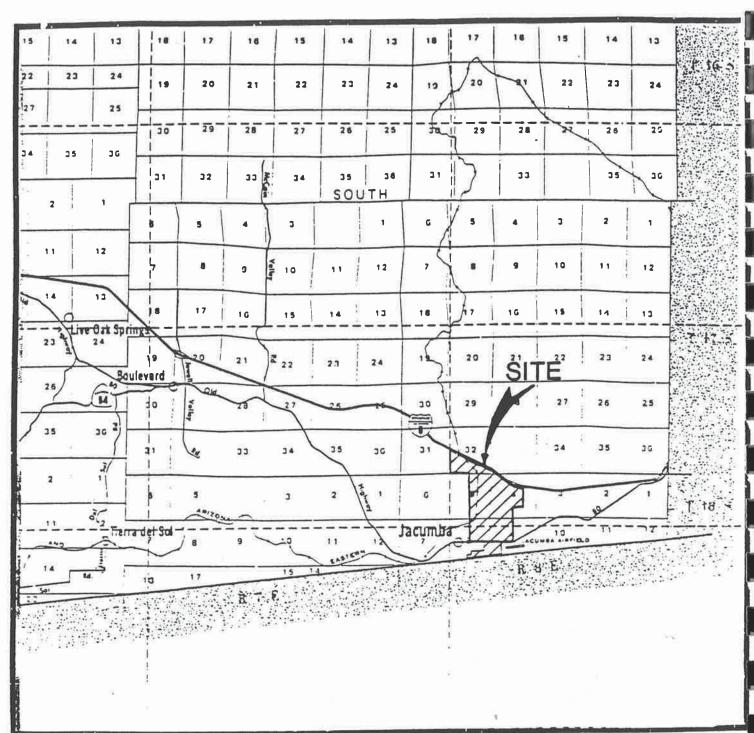
On December 11 through 14, 1990, 13 small-diameter borings were excavated on site. The borings were excavated to a maximum depth of approximately 50 feet or until bedrock was encountered (whichever was shallower) with a truck-mounted Mobil B-61 drill rig with 8-inch hollow stem augers. The borings were sampled and logged by a geologist from our firm. Borings were sampled with a Standard Penetration Test (SPT) split spoon sampler and a Modified California ring sampler. Bulk and relatively undisturbed ring samples were collected for visual classification and laboratory testing. Ground water levels at the time of drilling are recorded on the logs. On December 18, 1990, 6 backhoe trenches were excavated on site by Jacumba Valley Ranch. The trenches were logged and sampled by a geologist from our firm. The approximate locations and logs of the borings and trenches are presented on Plate 1 and in Appendix B, respectively.

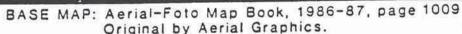
Seismicity

As discussed in our Land Use Feasibility Study (Appendix A, Reference 5), the seismic hazard thought most likely to impact the subject site is ground shaking produced by a large earthquake on one of the major active regional faults. A maximum probable event on the Elsinore fault (considered the design earthquake for this site) is expected to produce a peak horizontal bedrock acceleration of 0.30g and a repeatable ground acceleration of 0.20g. The effects of seismic shaking can be reduced by adhering to the Uniform Building Code or state-of-theart design parameters of the Structural Engineers Association of California.

Liquefaction Potential

During an earthquake, ground shaking may cause loss of soil strength (liquefaction) in loose saturated sandy soils, resulting in excessive settlement damage and/or possible failure of surface structures. The likelihood of liquefaction depends on the intensity and duration of the ground shaking, the



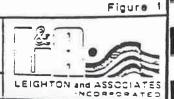


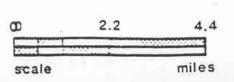


JACUMBA VALLEY RANCH

SITE LOCATION MAP

Project No. 4900381-05





soil characteristics, and the depth to ground water. A simplified analytical method, based on empirical correlations, relating the field occurrence of liquefaction to the earthquake magnitude and acceleration, cyclic shear resistance of the soils, and Standard Penetration Test (SPT) results (Appendix A, Reference 7) was used to evaluate the liquefaction potential of the recent alluvium (Qal) and older alluvium (Qfn). The formational materials (Tjl, Tja, Tmg) are not considered to have a significant liquefaction potential. The Geotechnical Map (Plate 1) shows the approximate extent of these units.

The ground water levels we encountered in our borings ranged from approximately 5 to 40 feet below the existing ground surface. We believe that these levels are likely to be significantly lower than historic high ground water conditions due to the ongoing drought. In our evaluation, we have assumed ground water levels 5 feet higher than those actually encountered.

The soils encountered in the upper portions of the alluvium were generally described as medium dense, silty fine to medium sand and stiff, sandy to clayey silt. Standard Penetration Test (SPT) blow count values (in the upper 30 feet) ranged from 19 to 49 with an average blow count of 31 blows per foot. Based on the results of our investigation, the calculated factor of safety against liquefaction is greater than 1.5, indicating a low potential for liquefaction at the site due to the design earthquake. Further, the addition of up to 4 feet of fill soils in selected areas across the site should reduce the potential for liquefaction in those areas receiving fill.

Dynamic Settlement

Dynamic settlement due to earthquake shaking was evaluated in the alluvial areas using the method described by Tokimatsu and Seed (Appendix A, Reference 9). The design earthquake (which has an estimated return period of 100 years) may induce a total settlement at the site on the order of 3/4 to 1 inch. Differential settlement of the alluvium due to earthquake-induced dynamic settlement is estimated to be on the order of 1/4 to 1/2 inch across 100 feet of ground surface. The addition of fill soils should reduce the potential for dynamic settlement.

Consolidation

Consolidation of soils is a relatively long-term process that may occur when pore pressures in soil of relatively low permeability (such as a silty or clayey soil) increase upon loading (due to additional fill placement, structures, etc.). Settlement of granular soils (sands and gravels) is the term used for the process of relatively short-term soil densification due to application of a load. Hydroconsolidation may also occur when a soil undergoes wetting or saturation after a load is applied. Consolidation, settlement, and hydroconsolidation may result in soil densification and ground subsidence.

The potential for long-term consolidation of the soils at the site is considered low due to the relatively high blow counts, the limited quantities of highly clayey materials encountered in our borings and trenches, and the relatively minor fill loads anticipated.

The potential for settlement of the existing granular alluvial soils was evaluated based on consolidation test results (Appendix C) and the assumption that no more than 4 feet of fill soils (above existing grades) will be added at the site. The building loads are assumed to be typical for this type of relatively light construction. Larger loads may be anticipated for the waste water treatment plant.

To reduce the potential for settlement, we recommend that portions of the alluvial soils under the proposed structures be removed and recompacted and that construction be delayed for a period of time after the addition of fill soils so that differential settlement may be reduced to tolerable limits. The following preliminary recommendations are based on a maximum total and differential settlement of 1 inch and 1/2 inch, respectively.

Type of Structure	Estimated Depth of Removal and Recompaction (feet below existing grade)
<pre>1- and 2-Story, School, Hotel Congregate Care, and Residential Structures</pre>	2 - 4
Waste Water Treatment Plant	3 - 5

The above values are preliminary and should be refined based on actual building loads and site-specific geotechnical investigations.

Thickness of Proposed Fill (above existing grade) in feet	Delay of Building Construction after Grading (months)
≤2	0
≤3	ž 1
<u>≤</u> 4	2

We do not believe these delays should pose significant constraints to construction provided that a phased construction approach can be accomplished.

To reduce the potential for hydroconsolidation of alluvial soils, the base of the removal area should be thoroughly wetted after removal of the existing soils and prior to recompaction. Specific grading recommendations will be provided in the geotechnical investigation reports.

Suitability of Material In Drainages for Use as Fill Soils

Based on our visual evaluation and laboratory testing of samples obtained from the five backhoe trenches located in the existing drainages, (one of the backhoe trenches was located outside of the drainage areas for purposes of evaluating rippability and other properties) this material should be generally suitable as structural fill. Visual evaluation generally indicates a very low expansion potential for the majority of this material. However, laboratory testing (Appendix C) indicates a medium expansion potential for the siltier portions. Soils with a medium expansion potential are generally not desirable within 3 feet of finish grade. The material generally varied from a fine sandy silt to a fine to coarse sand with gravels and cobbles. Scattered roots were noted in some of the near-surface soils. The clean, sandy portions may have a moderate to high erosion potential. This material is anticipated to have an adequate bearing capacity (for lighlty loaded structures) when compacted as fill soils.

Drainage Channel Slope Stability

We understand that unlined drainage channels are proposed to conduct storm water across the site. We further understand the proposed channel walls (up to 5 feet in height) are to be constructed at inclinations of approximately 5:1 (horizontal to vertical). Based on direct shear tests performed on remolded representative soil samples, these slopes should be grossly stable at the proposed inclinations. Channel erosion protection is generally under the purview of the civil engineer as evaluation of erosion and scour is based on water quantity and flow velocity. We have provided grain-size analyses of representative samples (Appendix C) for this evaluation. Clean, fine sand (without a significant portion of silt or clay to act as a binding agent) should be avoided in use as a channel liner unless adequately protected from erosion and scour.

Summary

Based on the results of our limited evaluation, it is our opinion that the proposed development is feasible from a geotechnical standpoint provided that the concerns presented herein are addressed into the project design.

We note that additional geotechnical investigation is recommended to provide site-specific foundation and grading recommendations.

If you have any questions regarding our report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEAGHTON AND ASSOCIATES, INC.

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Chief Engineer

DFR/GC/JGF/jss

Distribution: (6) Addressee

(6) Brian F. Mooney Associates Attention: Mr. Brian F. Mooney



APPENDIX A

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 Report 3.

EXPLANATION OF GEOTECHNICAL TRENCH LOG

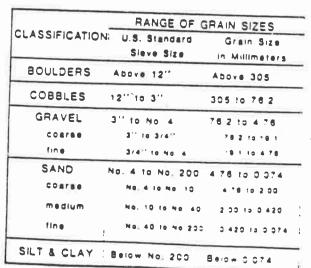
THENCH NO. TOWN BOTH THENCH NO. THEN	3
Kp K	12 0
Kp Kp Marking Seek Rackf	K
to 1/2-inch wide um dense, silty t chunks of lieht several wood and bbles dy siltstone/clay in lenses of ligh e, highly fractures tone, continuous (1) - o o o o	4 4
ELLL A few desiccation cracks at surface 3-4 light brown, slightly damp, line grained gray silty/very fine-grained gray silty/very fine-grained lin roots, porous, several s fone; with thick interlamina stone; with thick interlamina (2) Fight yellow-brown, silty fine-grai fractured and blocky, several fractured and blocky, several (3) Light yellowish brown fined g along wall (4) Light yellowish brown fined g along wall (5) Light joint system, spacing 4 along fractures	
Project Name: Project Name: Broject Name: Equipment: Equipment: GROLGG C ATTITIONS C: Sharp C: Sharp C: Sharp L-1 + + + + + + + + + + + + + + + + + + +	

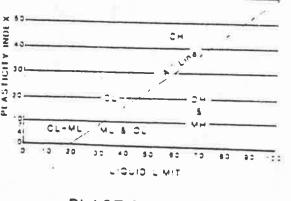
Date_			Dr	ill F	ole N	io		Job No.	
Proje	ct				-		9		
Drill	ing Co	•			Wai al			Type of Rigin.	
Hole	Diamet	er		IIVC	HerRi	Pof	OF D	afilm	
Eleva	tion	Top of Ho) I e			- 1			
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Fer Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by Sampled by Attitudes: Strike/Dip (b) = Bedding	
0-	10		T					Attitudes: Strike/Dip	
5—		j:N10W/ 20E b:Hori- zontal c:N80W/ 10N f:N-S/ 65W		14			ML	(c) = Contact (j) = Joint (f) = Fracture	
0			2	15		15.8	SP	Standard Peretration Test (Split-Spoor Sampler)	
20-		s: N50E/ 40W cs:N30W 20E F: N10E, 70W		18		Q <u>*</u>	CL/ CH	Sample not recovered Graphic Log:	
30	A (2/)	77)	_			<u></u> _	ighto	n & Associates	

500A (2/77)

1	ř v	1	TOTAL MANES						
-		GW	Well graded gravels or gravel-sand mixtures, little or no fines						
(e.zj	GRAVELS	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines						
M.S.	(More than 1/2 of coarse fraction >	GM	Silty gravels, gravel-sand-silt mixtures						
MED SC no. 200	no. 4 aleve size)	GC	Ciayey gravels, gravel-sand-clay mixtures						
GRAIP	-	sw	Well graded sends or gravelly sands, little or no fines						
(More than 1/2 of soil > no. 200 slave size)	SANDS	SP	Poorly graded sands or gravelly sands, little or no fines.						
ore the	(More than 1/2 of	SM	Slity sands, sand-slit mixtures						
4	no. 4 sleve size)	sc	Clayey sands, sand-clay mixtures						
slove stre)	SILTS & CLAYS	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity						
200 slev	LL < 50	CL	inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays						
- P		OL	Organic silts and organic silty clays of low plasticity						
2 of 904 C n	SILTS & CLAYS	МН	Inorganic silts, micaceous or distomaceous fine sandy or silty soils, elestic silts						
Mare than 1/2	LL > 50	СН	Inorganic clays of high plasticity, fat clays						
1More		ОН	Organic ciays of medium to high plasticity, organic silty clays, organic silts.						
OF	HIGHLY	Pt	Peat and other highly organic so is						

CLASSIFICATION CHART (Unified Soil Classification System)





PLASTICITY CHART

GRAIN SIZE CHART

METHOD OF SOIL CLASSIFICATION

LOG OF TRENCH NO: T-1 LOG OF TRENCH NO: I-2 Density Density PROPERTIES (pcf) (pcf) **PROPERTIES** Moisture Moisture (%) (%) ② @ 8'-10' () 0'-3' ENGINEERING 0,-3 Sample ENGINEERING 19-, 6 Sample 6 No. No. 0 N45W ML/SM TREND: N40W FiL/SH U.S.C.S U.S.C.S Ξ M S S SW S 뒫 TREND: GEOLOGIC UNIT GEOLOGIC (a) 0 TRENCH NO. TRENCH NO. SURFACE SLOPE SLOPE 06'-10'; Becomes fine sandy silt/silty tine sand lotal Depth - 10 feet Ground Water Seepage Encountered at 6 feet at time of trenchin Dark brown and olive-brown, moist, medium dense fine sandy silt/silty fine sand; sparse roots, slightly porous, micaceous Dark brown, moist, medium dense, silty, fine to medium sand; few coarse-grained constituents, micaceous, some pods and discontinuous lenses of very silty, fine to medium sand Dark brown, moist, medium dense, fine to medium it to roots, moist, medium dense, fine to coarse Light brown, moist, medium dense, silty fine sand Mottled olive-brown and orange-brown, moist wet, medium dense, fine sandy silt micaceous, slightly porous Becomes fine sandy silt/silty fine sand Mottled dark olive-brown and brown, moist wet, medium dense, fine sandy silt; few rabundant red-brown stringers (infilled borrows?), abundant caliche stringers coarse SURFACE to very c ly bedded Total Depth = 10 feet No Ground Water Encountered at Time of Trenching Backfilled: 12/18/90 See Plate 1 Gray-white, loose, dry, fine to sand; abundant pebbles, finely See Plate ±2,775¹ DE. (e) DESCRIPTION: DESCRIPTION: 9 0 9 0 (v) Logged By: Elevation: Θ Logged By: Elevation Location: Location: Dark brown, mois sand; micaceous GRAPHIC REPRESENTATION southwest wallSCALE: sandy silt wal BCALE: Name: Jacumba Valley Ranch Jacumba Valley Ranch Case 680C Backhoe Backline 12/18/90 southwest 01'-1.4': 12/18/90 01.4'-3' @n'-3': (d7'-1U' : , I ~ , 0e) (93,-6; 63,-C, 4900361-05 Project Number: 4900381-05 <u> 2089</u> ALLUVIUM ALLUVIUI GRAPHIC REPRESENTATION DATE: Case **a** 3 3 0 (3) Number: Name: GEOLOGIC ATTITUDES GEOLOGIC ATTITUDES Equipment: Equipment: Project Project 501-A -Leighton & Associates (3/77)501-A (3/77) Leighton & Associates

LOG OF TRENCH NO: T-3 LOG OF TRENCH NO: Density (pcf) Density PROPERTIES (pcf) PROPERTIES Moisture Moisture (%) (%) ENGINEERING ① @ 0'-3' Sample © @ 5'-7' ENGINEERING Sample () (a 1'-3' No. N25W N70W IL/SM U.S.C.S. Ħ $\frac{1}{2}$ SP-SSP U.S.C.S SE SE TREND: TREND: GEOLOGIC UNIT I-4 GEOLOG1C Qa] <u>I-3</u> Qal UNIT 00 TRENCH NO. TRENCH NO. SLOPE SLOPE Dark brown to olive-brown, saturated, medium dense, fine to medium sandy silt; micaceous Dark brown to black, moist to wet, medium dense, fine to medium sandy silt; porous, abundant roots and rootlets, micaceous Gray-brown, dry to damp, loose, fine to very coarse sand; few discontinuous silt layers approximately 1/2 inch thick, some discontinous sandy pebble lenses, rare clasts to 3 inch diameter to very Mottled dark olive-brown and brown, and orange brown, wet to saturated, dense, v silty fine sand/fine sandy silt; porous, few roots, some medium-coarse grained constituents coarse coarse SURFACE SURFACE of Trenching Total Depth : 7 feet Ground Water Seepage Encountered at 4 feet at Time of Trenching Backfilled: 12/18/90 Gray-brown, dry to damp, loose, fine coarse sand; few pebbles very Gray-white, dry, loose, fine to vo sand; some pebbles, finely bedded See Plate 1 Gray-brown, dry to damp, loose, sand; finely bedded -See Plate 12,755' Time . . . J . . . DIL 12,780 Total Depth = 7 feet No Ground Water Seepage Encountered at Backfilled: 12/18/90 DESCRIPTION: DESCRIPTION: Logged By: Elevation: Location: Elevation: Logged By: SCALE GRAPHIC REPRESENTATIONS OUT HWEST WAT ISCALE: Name: Jacumba_Yalley.Ranch 03.5'-5.5': Jacumba Valley Ranch Case 680C Backhoe (45.5'-7.0': G : PHIC REPRESENTATION LOTTH WAll Case 680C Backhoe DATE: 12/18/90 00,-3.5, 01'-3.5': 12/18/90 (03.5'-6' 66'-7': 4900381-05 @0'-1': Project Number: 4900381-05 ALLUVIUM ALLUVIUM DATE: 3 **(=)** 0 9 (2) 3 Project Number: Name: GEOLOGIC ATTITUDES Equipment: GEOLOGIC ATTITUDES Equipment: Project Project 501-A - (3/77) Leighton & Associates Leighton & Associates

501-A = (3/77)

LOG OF TRENCH NO: T-5 LOG OF TRENCH NO: I-6 Density Density (pcf) PROPERTIES (pcf) PROPERTIES Moisture Moisture (%) (%) ENGINEERING . 5 (2) (a) 5'-8' Sample .2 -Sample ENGINEERING No. ⊝ ~ No. N20W N80E SE ML & SM SM & SW U.S.C.S U.S.C.S. S 물 SP ₹ ∞ TREND: GEOLOGIC UNIT GEOLOGIC UNIT 1-6 Topsoil 0) **1-5** Qal Qfn Ljl 00 TRENCH NO. TRENCH NO. SURFACE SLOPE: 1010-4 S. um sand; amount Mottled pinkish white, dry, dense rhyolitic tuff bed; intermixed with volcanic clasts and zones and pods of alluvium; very weathered, slightly desiccated, slightly friable SURFACE SLOPE Gray, dry, loose, fine sand; finely laminated cross bedding, concoidal lenses of fine to coarse sand, manganese lamanae to coarse t layers Dark brown, wet to saturated, medium dense, fine to medium sandy silt, grades to silty, fine sand; slightly porous, minor roothairs . 8 feet Seepage Encountered at 7 feet dense, fine to clay, slightly to brown, damp, medium medium moderate a damp, medium dense, silty fine sand; grades to brown, damp, me fine to 40 dry, loose, f', loose silt; Brown, dry, loose, silty, fine abundant rootlets throughout, m of cobbles to 5-inch diameter, porous, desiccated See Plate Brown, dry, loose to medium medium sandy silt; trace of desiccated 12,820 (D) grades to brov to medium sand Ó Alternating gray, dry, losand and gray, dry, loose 1/4-inch to 1-inch thick DESCRIPTION: DESCRIPTIONS Logged By: Elevation Logged By: Location: Elevation: (0) Location: 0 dense, fine GRAPHIC REPRESENTATION outhwest wall SCALE: SCALE Brown, medium Link Belt LS 5800 Trackhoe Name: Jacumba Valley Ranch Jacumba Valley Ranch wall 12/18/90 OLDER ALLUVIUM (42.5'-5' 5 Depth = 01'-2': 00'-2': : , 8- , Sp 00'-1': JACUMBA LAVA 05.-2 680C Backhoe REPRESENTATION south 4900381-05 4900381-05 (921-2 ALLUVIUM TOPSOIL Total D Ground DATE DATE: 9 (< (3) 3 0 9 Case Project Number: Number: Name: C:Sharp, | horizontal GEOLOGIC ATTITUDES Equipment: GEOLOGIC Equipment: Project GRAPHIC Profeet Leighton & Associates 501-A - (3/77) 501-A - (3/77) Leighton & Associates

Date_	12/1	11/9	0		r	ill F	lole !	4o	B-1	And a second sec
	ct									
Drill	ling Co	•	Layn	e En	νi	ronm	ental		1	Type of Rig Mobile B-61
Hole	Diame	ter_	8"		Di	rive	Weig!	ht	140	0 lbs.
Eleva	tion '	Гор	of Ho	le	±2	2,760)'	Ref.	or D	Detum mean sea level
Bepth Feet	Graphic Log		Attitudes	Tube	Campto Inc.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
0-					T					ALLUVIUM
5				1		22	<i>a</i>)	23.8		ALLOVIUM
20-				3		28			SC	 @15': Dark brown, saturated, very stiff, clayey silt; some fine grains, rare pebbles @20': Dark brown, saturated, dense, clayey fine to coarse sand; numerous pebbles @25': Dark brown, saturated, dense, slightly clayey fine to very coase sand; numerous pebbles to 1" diameter
30_	1									

Date	12	/11/90	D	rill	Hole	No.	В-	Sheet 2 of 2 -
Proj	ect	Jacumba	Valle	y Rar	nch			Job No. 4000201 05
DT1]	lling (0	ayne E	nviro	nment	tal		Type of Rig Mobile P. 61
Hole	Diame	ter 8		Drive	Weig	ht	140	lbs. Drop 30 in.
Elev	ation	Top of H	ole	±2,7	60'	Ref.	OF	Detum mean sea level
Depth Feet	- Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
35 —			7	38 50/2"			SW SM/ GM	<pre>@30': Brown-gray, wet, dense, fine to coarse sand; numerous red, fine-grained volcanics</pre>
40			- H	34/2				Refusal at 36.5 feet due to bedrock Total depth = 36.5 feet Ground water encountered at 11 feet at time of drilling
-								Δ
				2.				

500A (2:77)

_			D:						
Proje	ct	Jacur	mba Val	ley R	anch			Job No. 4900381-05	
Drill	ling Co	oL	ayne En	viron	menta	1		Type of Rig Mobile B-61	
Hole	Diame	ter	8"	Drive	Weig	ht		140 lbs. Drop 30 in.	
Eleva	ation '	Top of	Hole	±2,77	8'	Ref.	or D	atum mean sea level	
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf		Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by Sampled by	
0 –	2.2							ALLUVIUM	
5_			1	17		₹	SM	05': Olive-brown, wet, medium dense, silty fine to medium sand; slightly micaceous	
10			2	24			ML	@10': Olive-brown to light orange-brown, wet, medium dense, fine sandy silt, micaceous	
15 -			3	28			ML/ SM	<pre>@15': Mottled brown, olive-tan and orange brown, wet, medium dense, silty very fine sand/very fine sandy silt; few root hairs, micaceous</pre>	
20 —			4	41			SM	@20': Mottled brown, olive-brown and orange-brown, wet, dense, silty fine sand; contact to brown, saturated, cense sandy gravel	, , ,
25 -	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	7	5	90/7	11			JACUMBA LAVA @25': Mottled pinkish white, wet, very dense volcanic rock Total depth = 27 feet (refusal on because)	
30 -	1 12/	-)				Lei	ghton	Ground water encountered at 6 feet at time of drilling & Associates	

GEOTECHNICAL BORING LOG

Date	12.	/11/90	D:	rill	Hole	No.	B-3	Sheet 1 of 2
Proj	ect	Jacumb	a Vall	ey R	anch			Job No. 4900381-05
Dril	ling C	o. La	yne En	viro	nment	al		Type of Rig Mobile B-61
Hole	Diame	ter	<u>8" [</u>	Drive	Weig	ht	14	0 lbs. Drop 30 in
Eleva	tion	Top of H	ole ±	2,790	0'	Ref.	or I	Datum mean sea level
Depth Feet	L Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, \$	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL ALLUVIUM
5_				*			SM	
10-			2	31	1024		311	@5': Brown, moist, dense, silty fine sance few rootlets@10': Mottled orange-brown and brown, wet dense, silty fine sand; few rootlets, slightly micaceous
15			3	35		₩ S	IL/ M	@15': Mottled orange-tan and brown, wet, dense, silty very fine sand/very fine sandy silt; some carbon-stained flecks
20-			4	51	98.3	31.5	ML	020': Mottled orange-brown and brown, wet to saturated, very dense, fine sandy silt
25			5 1 3	39			SM	025': Light brown, wet, dense, silty fine to medium sand; contact to dark brown, wet, dense, silty, fine sand; more silty than above contact
30	7							

Date_	12/1	11/9	0		Dri	.11 F	lole 1	۱o	В-	3			Sheet 2 of 2 -	
Proje	ct	Jacı	ı⊓ba	Vall	ev	Rang	ch						4900381-05	1
Drill	ing Co		Lay	ne E	nv	iron	nenta	1		Type of	Ri	g	Mobile B-61	
										lbs.			Drop 30 in.	
Eleva	tion T	op	of H	ole	_	±2,	790'	Ref.	or D	atum	me	an sea	level	47
Depth Feet	Graphic Log		Attitudes	Tube	Sample No.	Blows Per Foot	Density pcf	Moisture Content, %	1 Class. S.C.S.)	Logged Samples	ъу_		ECHNICAL DESCRIPTION	
-	T		AE		Sam	Pe	Dry	Mo	Soi (U.	Sample	i by		DLL	H
30 —	===					20		ν.		****			saturated, medium dense,	T
35				6		20	(N.R.)	SM	Si	i lty	fine s	sand; slightly micaceous	
40			*	7		70	^		ML/ SM	V 6	erv	dense,	ed brown and orange-brown, we silty fine sand/fine sandy tly micacous, carbon-stained	H T T
45 _													The state of the s	H
50 -					_	2.1	ÇN.	R.,	SM)': and	Brown,	, saturated, dense, silty fin	
55 -			767		8	84				Tot	tal ounc	deptn : i water of cri	= 51 feet encountered at 12 feet at illing	
500	1 (227	-,						Lei	ghtor	& Asso	ocia	tes		

5001 (24-1)

GEOTECHNICAL BORING LOG

Date	12	2/12/90	D	rill	Hole	No.	B-4	Sheet 1 of2 -
		Jacumb						Toh No. 4000201 05
Dril	ling C	o. Layn	e Env	iron	mental			Type of Rig Mobile R-61
Hole	Diame	ter8		Drive	Weig	ht	14	0 lbs. Drop 30 in
Eleva	ation	Top of H	ole	±2	,786'	Ref.	or [Datum mean sea level
bepth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
5_							Ch/	ALLUVIUM
			1	41	98.2	18.6	SM	<pre>@5': Brown, moist, dense, silty fine to coarse sand; micaceous @7': Becomes siltier</pre>
10			2	33			SM & SW	<pre>@10': Dark brown, wet, dense, slightly silty fine to medium sand and gray, wet, fine to cearse sand; micacecus</pre>
15			3	78	106.42	4.5	SM	015': Brown, saturated, very dense, silty, fine to medium sand
20			4	35				020': Gray, wet, dense, slightly silty fine to coarse sand; some interbecs of brown, clayey silt (up to 2" thick)
25			5	36			SW	<pre>@25': Red-brown, wet, very stiff, silty clay/clayey silt; gradational contactit gray, saturated, dense, fine to coarse sand</pre>
001 12	,,				1	b 4		

Leighton & Associates

_			נטני						
Proje	ct	Jacu	mba Val	ley F	lanch			Job No. 4900381-05	
Drill	ling Co	Lay	ne Envi	ironme	ental			Type of Rig Mobile B-61	
								0 lbs. Drop 30 in.	
Eleva	tion 7	Top of	Hole :	2,786	5'	Ref.	or D	etum mean sea level	Ŧ
Depth Feet	☐ Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL	
30-	골금님		6	36	N.R.	,			
35			7	82	IN.K.		SW	@40': Gray, saturated, very dense, fine to coarse sand	AMBLE CAMPLE STREET STREET, VALUE STREET,
45—			8	50			SM	@50': Light brown, saturated, dense to very dense, slightly silty, fine to medium sand	Month College (Min)
55_						5		Total depth = 51.5 feet Ground water encountered at 9 feet at time of drilling	
5001	(2/					Lei	ghton	& Associates	

GEOTECHNICAL BORING

Date	12/	12/90	D	rill	Hole	No.	B-	-5 Share 1 . 62					
Proje								Job No. 4900381-05					
DTILL	ing C	0la	yne E	nviro	nmeni	tal		Type of Rig Mobile D.C.					
HOTE	Diame	ter8"		Drive	Weig	tht	1	140 lbs. Drop 20 4-					
Eleva	tion '	Top of H	ole <u>+</u>	2,777		Ref	. or	Datum mean sea level					
of 16	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content.	Class.	GEOTECHNICAL DESCRIPTION					
5				*				ALLUVIUM					
			1	24		23.6	SM	<pre>@5': Mottled brown and red-brown, wet, medium dense, very silty fine sand; micaceous</pre>					
10-			2	26		\$	ML	<pre>@9': Becomes clayey @10': Mottled red-brown and brown, wet, very stiff, fine sandy silt; trace of clay, few carbonized flecks</pre>					
15			3 [41			CL- SM	<pre>@15': Mottled red-brown and brown, wet, dense interbedded silty clay/very silty fine sand; some carbonized thin (1/16" thick) beds, silty clay is finely laminated</pre>					
20-			4	49			SW	920': Brown, wet, dense fine to mecium sand; few coarse grains, micacecus					
25			5	28		1	5M/ 1L :W	025': Mottled red-brown, wet, medium dense, fine sandy silt/silty fine sand; trace of clay, some finely laminated clay layers. Sharp contact with brown, fine to medium sand with trace of silt (2 samples obtained					

		12/90							
Proje	ect	Jacum	ba Va	111	ey Ra	inch			Job No. 4900381-05
Dril	ling Co	oL	ayne	En	viror	nmenta	a l		Type of Rig Mobile B-61
Hole	Diame	cer	8"	D	rive	Weig	ht	14	0 lbs. Drop 30 in.
Eleva	ation	Top of	Hole	±	2,777	7 1	Ref.	or D	Detum mean sea level
Depth Feet	Graphic Log	Attitudes	Tube	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL @30': Mottled red-brown and brown, wet,
30 —	!÷.			T					@30': Mottled red-brown and brown, wet,
35 —			6		38			SM	
40			7		38	^		SW	@40': Brown, saturated, dense, fine to medium sand; trace of silt
50 —									@50': Brown, saturated, very dense, fine
		-	8		67				to coarse sand; trace of silt
55 -			3						Total depth = 51.5 feet Ground water encountered at 9 feet at time of drilling
5001	(2/7	1		_			Leic	hton	& Associates

GEOTECHNICAL BORING LOG

Date	12/	12/90	D	rill	Hole	No.	B	Sheet 1 of2 -
Proj	ect	Jacumba	Vall	ey Ra	nch			Job No. 4900381-05
Dril	ling C	o. Layn	e Env	ironm	ental		106	Type of Rig Mobile B-61
Hole	Diame	ter8	"	Drive	Weig	ht	140	bs. Drop 30 in.
Eleva	ation '	Top of H	ole	±2,7	88'	Ref.	l ro	Detum mean sea level
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	/ Density pcf	Moisture Content, \$	11 Class. S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
		~	Sau	4	Dry	¥ 5	.8 E.	Sampled by DLL
0 -								ALLUVIUM
5 _	-:-		1	19		8.5	SM	<pre>@5': Light brown, moist, medium dense, silty fine sand; micaceous</pre>
10 —			2	42	105.7	10.8		
15 _			3	48			SW	@15': Brown, wet, dense, fine to coarse sand; micaceous, trace of silt
20 =			4	76 (1	N.R.,			
25 -			5	20		C M	L/	<pre>@25': Mottled red-brown and brown, wet, ver stiff, silty clay/clayey silt; trace of fine sand</pre>
30 1			Н					
5001								

Data	12/	12/9	0	D	rill H	iole l	lo	8-6	Sheet 20f 2-	
		Jacu	mba	Vall.	ev Ran	ch			Job No. 4900381-05	
	: C		1 a	vne	Enviro	nment	al		Type of Rig Mobile 8-61	
11-1-	Diamet		8"		Drive	Weig	nt	140	1bs. <u>Drop 30 211.</u>	
Eleva	tion 1	Top o	of Ho	le	±2,788	,	Ref.	or D	Detume mean sea level	1 1
Depth Feet	Graphic		Attitudes	Tube Cample No.		Dry Density pcf	Moisture Content, \$: _		
30-									@30': Same as at 25'	
35-				7		93.7 Part reco	ial very)	ì	@30': Same as at 25	
45-								CL/	@50': Mottled olive-brown, wet, hard	
30		7		8	4	7		ML	clayey silt/silty clay	
55									Total depth = 51.5 feet Ground water encountered at 11.5 feet at time of drilling	11 11 11

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5004 (2/77)

GEOTECHNICAL BORING LOG

Date	1	2/13/90	D	rill	Hole	No.	B-1	7 Sheet 1 of2 - Job No. 4900381-05
Proj	ect_J	acumba V	alley	Ranc	h			Job No. 4900381-05
DTIL	ling C	oLa	yne E	nviro	nment	al		Type of Rig Mobile R-61
Hole	Diame	ter_3"		Drive	Weig	ht	140	lbs. Drop 30 in.
Eleva	tion	Top of H	ole	±2,	792'	Ref.	or l	Detum mean sea level
bepth Feet	L Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
10 - 20 - 25 - 25 - 25			2 3	26 22 43 1	97.5	11.8	SM SC/SM	ALLUVIUM 05': Brown, damp to moist, medium dense, very silty, fine to medium sand; micaceous trace of clay, rare pebbles 010': Light reddish brown, moist, medium dense, very silty fine to medium sand; slightly micaceous; trace of clay, mocerate volcanic pebbles 015': Light reddish brown, moist, medium dense, clayey to silty, fine to coarse sand JACUMBA LAVA 020': Mottled red, white and black, saturated, very dense, very weathered volcanic rock
30 1	524		H					

Date	roject Jacumba Valley Ranch Job No. 4900381-05													
Proje	ct	Jacun	nba V	/all	ey	Rane	ch			Job No. 4900381-05				
Drill	ling Co	•	Lay	yne	Er	viro	nment	al		Type of Rig Mobile B-61				
										140 lbs. Drop 30 in.				
Eleva	tion '	Top o	£ Ho	le	±2	1,792		Ker.	or L	Datum mean sea level				
bepth Feet	Graphic Log	Attitudes		Tube	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL				
30 -	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7			5		50/2	" (N.	R.)		@30': Black, slightly weathered basaltic volcanic rock				
35 —							0			Total depth = 33 feet Ground water encountered at 9 feet at time of drilling				
-					-									
-														
	1 1 1 1							X						
5001	12	- - _i		•	_			Lei	ahton	& Associates				

GEOTECHNICAL RAPING LAC

		/13/90						Sheet 1 of 2-
_	-	acumba V						Job No. 4900381-05
Dril	ling C	oLa	yne E	nviro	nment	al		Type of Rig Mobile B-61
								bs. Drop 30 in.
Elev	ation	Top of H	ole	±2,7	81'	Ref.	OF	Datum mean sea level
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
5			1	28	93.8	27.3	SM	@5': Olive-brown and orange-brown, wet, medium dense, silty fine sand; few rootle
10-			2	50		<u> </u>	ML/ SM	<pre>@10': Mottled orange-brown and olive-brow saturated, dense, silty fine sand/fine sandy silt; some carbonized thin (1/16" thick) layers</pre>
15—			3	28	95.4	30.7	11-/-	@15': Mottled orange-brown and olive- brown, saturated, clayey silt/silty clay; some carbonized flecks and staining, few medium-sized grains
20—			4	48			SM	020': Light brown and olive-brown, wet, dense, silty fine sand; micacecus, some brown, silty/clayey layers up to 1,4" this.
25-			5	34 1	13.9	8.8		@25': Light brown, wet, dense, signtly silty, fine to coarse sand
30 F								

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	12/													
Proje	oject Jacumba Vallev Ranch Job No. 4900381-05 illing Co. Lavne Environmental Type of Rig Mobile B-61													
					_					0 lbs. Drop 30 in.				
Eleva	ation	Гор	of Ho	le		2,78	31'	Ref.	or D	Detum mean sea level				
Depth Feet	I—Graphic Log		Attitudes	Tube	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL				
35 - 40 - 45 -				7		20 (:	.R.)		ML/ MH	@30': Mottled olive, olive-brown, and orange-brown, wet, nard clayey silt, trace of fine sand, micaceous, some thin clay layers				
50				8		100			SH	@50': Brown, wet, very dense, very silty, fine to medium sand; approximately 5 per-				
55 _										Total depth = 51.5 feet Ground water encountered at 8.5 feet at time of drilling				
5001	() see	· a	W			77-77		Lei	ghton	& Associates				

5001 (2 ***)

GEOTECHNICAL BORING LOG

,	Date 12/13/90 Drill Hole No. B-9 Sheet 1 of 2 -													
-	Project Jacumba Valley Ranch Job No. 4900381-05													
Dril	Drilling Co. Layne Environmental Type of Rig Mobile B-61 Hole Diameter 8" Drive Weight 140 lbs. Drop 30 in.													
		-			_	ht		140 lbs. Drop 30 in.						
Elev	ation '	Top of H	ole	±2,77	4'	Ref.	or [Datum mean sea level						
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL						
				31			CL/ ML	ALLUVIUM @O': Dark brown, moist to wet, very stiff, silty clay/clayey silt						
5_			1	20		<u> </u>	CL/ ML	<pre>@5': Mottled dark olive-brown and orange- brown, wet, very stiff, clayey silt/silty clay; trace of fine sand</pre>						
10-			2	24	N.R.	ń.								
15			3	72	74.0	36.9	CL	@15': Mottled orange-brown and brown, saturated, very dense, fine sandy clay						
20 —			4	32	-		SM CL/ ML	@22': Brown, wet, dense, very silty fine sand; micaceous, sharp contact to rec-brown and brown, silty clay/clayey silt						
25			5	21 (N.R.)									

	12/1						No	B-9					
		Jacum					Job No. 4900381-05						
									Type of Rig Mobile B-61				
		ter											
Eleva	tion '	Top of	Ho1		±2,77	4'	Ref.	OF D	atum mean sea level				
Depth Feet	-Graphic Log	Attitudes	1. 4.4.	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	CEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL 030': Brown, wet, dense, silty very fine				
30 —				6 II	46			ML/	1 330 1 310111, 1121, 1121, 1131				
-	_:-							SM	sand/very fine sandy silt; micaceous, grades to:				
-	<u></u>				1			CL/	orange-brown and brown, silty clay/clayey				
-								ML	silt				
35 —			i										
35-	-:												
									17				
									1-				
40—									@40': Mottled olive-brown and orange-brown				
		-		7	52	80.1	20.6	100	wet, hard, silty clay/clayey silt				
	- :=:			-	-			CL					
-	=:=:-			-					1				
	E-:-			+	-								
45 —				ŀ	-			1					
-	==:				-								
	-:-:	1		ŀ				ĺ					
-		_		Ì	i								
-	E-1-) •			7				950': Mottled orange-brown and brown, wet,				
50 -				8	1 44			CL/	dense, fine to medium sandy clay, clayey sand				
	= 000,=		-		<u> </u>	-	-	SC					
									Total depth = 51.5 feet Ground water encountered at 7 feet at time				
							1		of drilling				
55 -					-		İ						
	-		1		Ц		1						
	-	1			Н	Ì							
	-	i			H		1	i					
	1	Ì			Н		i		24				

GEOTECHNICAL BORING LOG

Date	12/1	3/90	D	rill	Hole	No.	B-10	Sheet 1 of 2-
		Jacumba						Tob No. 4000201 05
Dril	ling C	oLa	yne Ei	nviro	nment.	al		Type of Rig Mohile R-61
Hole	Diame	ter_ o		Drive	Weig	ht	140	1bs. Drop 30 4m
Elevi	ation	Top of H	ole	±2,7		Ref.	or	Detum mean sea level
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
-	11:11:11			٠				ALLUVIUM
5			1	23		곡	CL/ ML	<pre>@5': Mottled olive-brown and orange-brown, wet, very stiff silty clay/clayey silt; micaceous trace of fine sand</pre>
10-	1-1-		2	29 8	8.7 3	4.2		
			H				ML/	<pre>@12': Mottled olive-brown and orange-brown saturated, medium dense, fine sandy silt/ silty fine sand; micaceous</pre>
15			3	37			SM	@15': Mottled olive-brown and orange-brown wet, dense, silty fine sand; sample nad one 3" thick layer of olive-brown and brown, laminated clay and silt
20			4	38 87	7.8 34		SC/	<pre>@20': Light brown, saturated, cerse. silty and clayey fine to medium sand; micaceous</pre>
25			5 7 4	3		CI	L/	@25: Mottled olive-brown and rec-brown wet, dense, fine sandy clay to silty clayey sand

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Date	12/1	13/90	D:	rill !	Hole	No.	B-1	O Sheet 2 of 2-
			Valley					
								Type of Rig Mobile B-61
								140 lbs. Drop 30 in.
Elev	ation	Top of	Hole	±2,77	0'	Ref.	or [Datum mean sea level
Depth Feet	Graphic Log	Attitudes	Tube.	Blows Per Foot	Density pcf	ture nt, t	Class.	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
F. F.	Gr	Itti	Tu	Bl	Dry D	dois onte	J.S.	Logged by DLL
30 -	<u> </u>		S.		ā	- 3	3 2	Sampled by DLL
30 -			6	50/2'	(N.	₹.)		*
35 —								
								*
40 —			7	68	,		ML/ SM	@40': Brown, wet, very dense, very fine sandy silt/silty very fine sand
-								Total depth = 41.5 feet Ground water encountered at 6 feet at time of drilling
45 —								
-								
_								
-								

GEOTECHNICAL BORING LOG

Date	1	2/14/90	0	rill	Hole	No.	B-	11 Sheet 1 of 2-
Proj	ect	Jacumba	Vall	ey Ra	nch			Job No. 4000201 05
DT11	ling C	o. Lay	ne En	Viror	menta			Type of Rig Mobile R-61
Hole	plame	Top of H	010	Drive	Weig	ht		140 lbs. Drop 30 in.
		lop of h	T	12,7		Ker.	OF	Datum mean sea level
t t	Graphic Log	Attitudes	ु	Foot	sity	o de	ass. S.)	GEOTECHNICAL DESCRIPTION
Depth Feet	Gra	tit	Tube	Blows r Foot	Dens	istu	20.0	Logged by DLL
	I	At	Sam	B]	Dry	Moisture Content,	Soi.	Sampled by DLL
0-								ALLUVIUM
	-:-:-				i			
_								
		b	_					
5-			ŀ			프		@5': Mottled olive-brown and orange-brown,
-			1	22		-	ML	wet, medium dense, fine sandy silt; micaceous, trace of clay
			F					a, saccording, and
1	7:		Н			1		
10-	-:-::		Н					*
	 		2	36	12.1	19.1	SM& CL	@10': Brown, saturated, dense, silty fine to coarse sand and brown, saturated stiff, slightly sandy clay
].			П			1		originally cray
1.	<u> </u>	İ	× [7		
15_		į					CL	015': Mottled olive-brown and orange-brown,
-			3	30				wet, very stiff to hard, fine sancy clay; micaceous
+			Н			1		
-			Н		1	1		
20-	(a (b))		4	55 (1	i.R.			
1.	-:			55 VI	1.K.			
]:			Н					
			П					
25								@25': Mottled red-brown and olive brown
4-			5	32			i	saturated, hard, slightly silty class
1.			Ħ		1			numerous carbonized flecks, micaceous, some caliche stringers and pods
1 - 1			H		i			32.2 2.14 pous
30			П					
5001 "	8 VET							

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Date	12/	14/90	D;	rill	dole	No	B - 1	1	_	Sheet 2		
Proje	ct	Jacumb	a Val	ley R	anch		-		J	ob No. 4900381-0)5	100
Drill	ling C	o. Layr	ne Env	ironm	ental			Type of	Rig_	Mobile B-61		
Hole	Diame	ter_8"		Drive	Weig	ht	140	lbs.		Drop 30	in.	
Eleva	tion	Top of H	ole	±2,76	6'	Ref.	or D	etun	mean	sea level		
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, 1	Soil Class. (U.S.C.S.)	Logged Sampled	by	DLL DLL wn, saturated, ha	RIPTION	
30 —			6	70 (N.R.)	27	CL	@30':	Brow	wn, saturated, ha	rd, clay	
35—			7	50/4	2.		SW	@40 ':	Bro	whish gray, wet,		ne
45 —			8	50/	3 117	.6 14.	SC.D	@50': cer	Lig nse, c	nt recaish brown, clayey, fine to c	saturated, ve parse sand	iry .
55 —								Groun	dept d wat drill	h = 51 feet er encountered at ling	5 feet at tir	e

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500A (2/--)

GEOTECHNICAL BORING LOG

Date	12/	14/90	D:	rill	Hole	No	B-1	Sheet 1 of 1 -
		Jacumba						
Drill	ling C	Lay	ne En	viron	menta	1		Type of Rig Mobile B-61
								0 lbs. Drop 30 in.
Eleva	tion	Top of H	ole		1		or D	Metum mean sea level
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, \$	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
5 —			1	20	Λ	8.4	SM/ SW/	ALLUVIUM @0': Brown, damp, medium dense, silty fine to coarse sand @5': Brown, damp, medium dense, trace to slightly silty, fine to medium sanc; few gravels, approximately 5 to 10 percent coarse grains
10-			2	21	<			@10': Same as at 5" but fine to very coars grained and wet
15 —			3	26		Ž	SW	015: Gray-brown, wet, medium dense, fine to coarse sand
20 —	3,7,7,7	-	4	50/5				JACUMBA LAVA @20': Red and black, very dense, meathered volcanic rock
25 —								Total depth = 22 feet (Refusal on Becrooks Ground water encountered at 13.5 feet at time of drilling
30								

101 1 1 1 1 -- ;

		/90						
Proje	ct	Jacum	ba Val	lev P	Ranch			Job No. 4900381-05
								Type of Rig Mobile B-61
								40 lbs. <u>Drop</u> 30 in.
Eleva	tion T	op of H	ole	±2,79	91'	Ref.	or D	etum mean sea level
Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, \$	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION Logged by DLL Sampled by DLL
0 -								ALLUVIUM
5 -			1	23		7.0	ML/ SM	@5': Brown, damp, medium dense, fine sandy silty/silty fine sand; few pebbles
10 -	, o		2	41		4.3	SW	010': Brown, damp, dense, fine to medium sand; few thin (1/4" thick) silt layers, some pebbles More pebbles with depth
15 -	8 ° 5		3	75		2.2		@15': Brown, camp, very cense, fine to coarse sand; some pebbles@18': Abundant pebbles to 2" diameter
20 -			4		п	2.3		
25 -	6 6		5	30/	6)'	5.2	331	026': Becomes silty sand
500	12/=-	1	1			Lei	ghton	& Associates

GEOTECHNICAL BORING LOG

Dat	e 12/	14/90	D:	rill	Hole	No.	B-13	Sheet 2 of 2 -
Pro	ject	Jacumb	a Vall	ev Ra	ınch			Job No. 4900381 05
Dri	lling C	o. Lay	ne Env	ironm	ental			Type of Rig Mobile B-61
Ho1	Diame	ter8		Drive	Weig	ht	140	lbs. Drop 30 in
Elev	ation	Top of H	lole	±2,7	91'	Ref.	or	Datum mean sea level
Depth Feet	Graphic	Attitudes		Blows Per Foot	Dry Density pcf	Moisture Content, 1		GEOTECHNICAL DESCRIPTION
35 - 40 - 45 - 1			6	38		7=	SM	@30": Brown, damp, dense, silty fine to medium sand; rare pebbles, one 1/2" thick clay layer @40': Brown, wet, very dense, fine to mediu sand; few pebbles, approximatley 5 to 10 percent coarse grains
50 —			3 3	4				050': Same as at 40' but dense
55								Total depth = 51.5 feet Ground water encountered at 40 feet at time of drilling
5:003			$\perp \perp$					

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APPENDIX C

LABORATORY TESTING PROCEDURES

Moisture and Density Tests: Moisture content and dry density determinations were performed on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring and/or trench logs. Where applicable, only moisture content was determined from "undisturbed" or disturbed samples.

<u>Classification Tests</u>: Typical materials were subjected to mechanical grain-size analysis by wet sieving from U.S. Standard brass screens (ASTM D422-65). Hydrometer analyses were performed where appreciable quantities of fines were encountered. The data was evaluated in determining the classification of the materials. The grain-size distribution curves are presented in the test data and the Unified Soil Classification is presented in both the test data and the boring and/or trench logs.

Direct Shear Tests: Direct shear tests were performed on selected remolded and/or undisturbed samples which were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transfer of the sample to the shear box, and reloading the sample, pore pressures set up in the sample due to the transfer were allowed to dissipate for a period f approximately 1 hour prior to application of shearing force. The samples were tested under various normal loads, a different specimen being used for each normal load. The samples were sheared in a motor-driven, strain-controlled. direct-shear testing apparatus at a strain rate of 0.05 inch per minute. After a travel of 0.300 inch of the direct shear machine, the motor was stopped and the sample was allowed to "relax" for approximately 15 minutes. The "relaxed" and "peak" shear values were recorded. It is anticipated that, in a majority of samples tested, the 15 minutes relaxing of the sample is sufficient to allow dissipation of pore pressures set up in the samples due to application of shearing force. The relaxed values are therefore judged to be a good estimation of effective strength parameters. The test results were plotted on the "Direct Shear Summary".

Maximum Density Tests: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557-78 (five layers). The results of these tests are presented in the test data.

APPENDIX C (Cont'd.)

Expansion Index Tests: The expansion potential of selected materials was evaluated by the Expansion Index Test, U.B.C. Standard No. 29-2. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch thick by 4-inch diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached. The results of these tests are presented in the test data.

<u>Consolidation Tests</u>: Consolidation tests were performed on selected, relatively undisturbed samples recovered from the sampler. Samples were placed in a consolidomter and loads were applied in geometric progression. The percent consolidation for each load cycle was recorded as the ratio of the amount of vertical compression to the original 1-inch height. The consolidation pressure curves are presented in the test data. Where applicable, time-rates of consolidation were also recorded. A plot of these rates can be used to estimate time of consolidation.

U.S. Standard Mesh Opening - Inches U.S. Standard Sleve Sizes Hydrometer Analysis PERCENT RETAINED BY WEIGHT 1.0 0.5 0.1 0.05 0.01 0.005 GRAIN SIZE IN MILLIMETERS

SAND

Coarse Medium

GRAVEL

Coarse Fine

SYMBOL	SAMPLE LOCATION		LL*	PL* PI*	SOIL	ı
0	T-1 1 0 0 - 3'	į	- 1		I SW	_
9	T-1 20 8' - 10'	T			! 100	87
Δ	T-2 0 0 0 - 3'	i		Į.	- MI	_
						_
Ü		4				_
- 19		1	1			_
1	-	İ			1	-
		1	20°		4	-

*LL Liquid Limit

*PL Plastic Limit

*Pl Plasticity Index

Based on ASTM D422-72

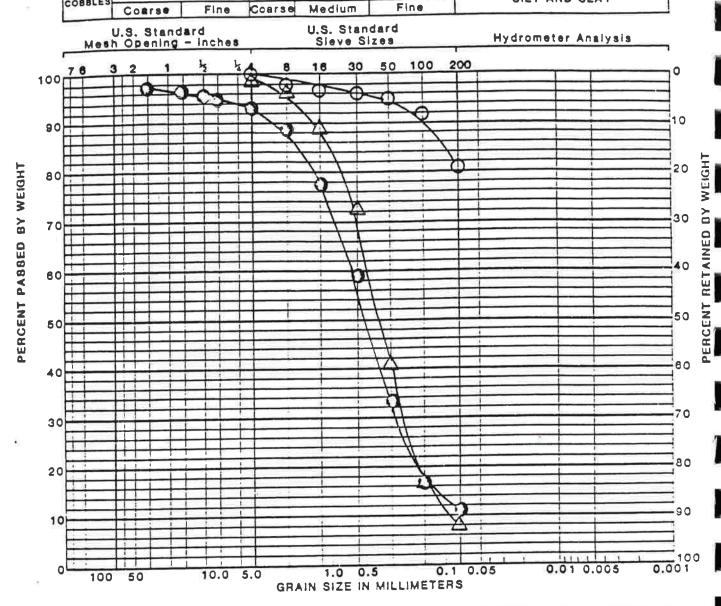


Project No. 4900381-35

SILT AND CLAY

JACUMBA VALLEY RANCH

GRAIN SIZE ANALYSIS



SAND

SYMBOL	SAMPLE LOCATION		LL*	İ	PL*		PI*	1	SOIL
0	T-2(2)@ 4' - 6'			1				2	۳L
•	T-3(1)@ 1' - 3'			1		×			SM-SW
$\overline{\wedge}$	T-3(2)@ 5' - 7'	į						07 9	SM-SW
		i			1				11-12
1						11			
1								5	
		i		. 12				ău	
		1		- 6		30		ĕ	

*LL Liquid Limit

*PL Plastic Limit

*PI Plasticity Index

Based on ASTM D422-72

GRAVEL

COBBLES



Project No. 4900381-05

SILT AND CLAY

JACUMBA VALLEY RANCH

GRAIN SIZE ANALYSIS

COBBLES	GRAV			SAND				
<u> </u>	Coarse		Coarse Me	dium	Fine	21L	T AND CLAY	
Mes	U.S. Standa h Opening -	Inches	U.S	. Standard eve Sizes		Hydror	meter Analys	ls
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SYMBOL	SAMPLE LOCATION		LE*	ĺ	PL*	1	PI*	i	SOIL
0 13-2	② @ 10'-11.5'	i						1881	TYPE
● B-3	4 @ 20'-21.5'						-	- 1	ML MI
△ 1 B-7	③ @ 15'-16'			7		1		'c	1112
▲ : B-8	(5) @ 25'-26'			-				3	C/SM
1	1								311
d		7						51	
					-			-	

GRAIN SIZE IN MILLIMETERS

*LL Liquid Limit

*PL Plastic Limit

*PI Plasticity Index

10.0 5.0

Based on ASTM D422-72

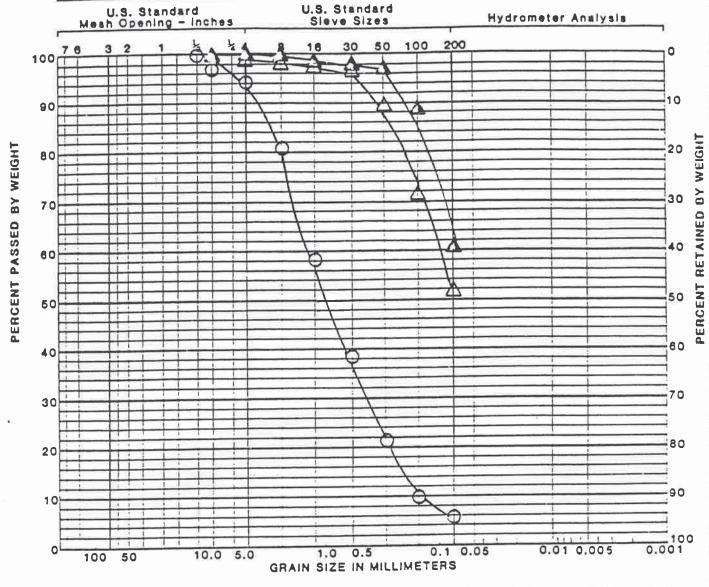


Project No. 4900381-05

0.01 0.005

JACUMBA VALLEY RANCH

GRAIN SIZE ANALYSIS



SAND

Coarse Medium

SYMBOL	SAMPLE LOCATION	İ	LL*		PL*	İ	PI*		SOIL TYPE
^ 1	B-9 (4) @ 20'- 21.5'	1				-		#	CL
A	B-11(1) @ 5'-6.5'	1		ě)		Y		i	111
0	8-12 ③ @ 15'-16.5'	30		H.		i		0.	SW
	V AC XXXXX			10	5				
1									
		((
i		į		i((6)	
		1				1			

*LL Liquid Limit

*PL Plastic Limit

*PI Plasticity Index

Based on ASTM D422-72

GRAVEL

Coarse

Fine

COBBLES

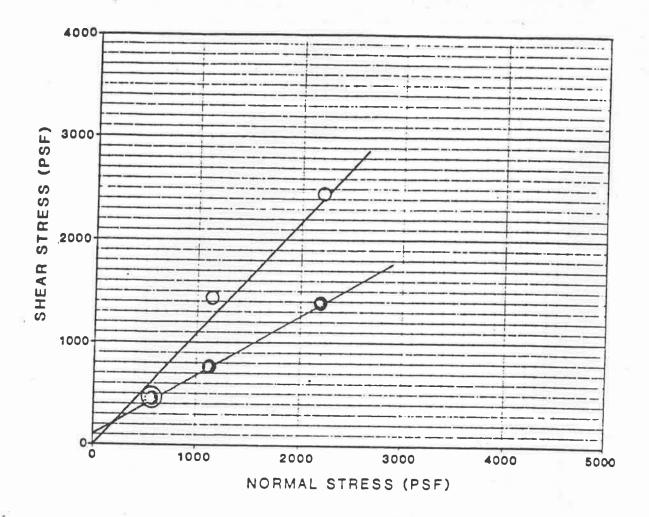


Project No.4900381-05

JACUMBA VALLEY RANCH

SILT AND CLAY

GRAIN SIZE ANALYSIS



DESCRIPTION	SYMBOL	BORING NUMBER	SAMPLE NUMBER	DEPTH (FEET)	COHESION (PSF)	FRICTION	SOIL
Remolded to 90% of Maximum Dry	0	T-1	1	0 - 3'	0	48°	SW
Density at Opt Moisture Content	0	T-2	1	0 - 3'	130	30°	SM-ME

Based on ASTM D3080-79



Project No. 4900381-05

JACUMBA VALLEY RANCH

DIRECT SHEAR TEST RESULTS

EXPANSION INDEX TEST RESULTS

SAMPL NO.	E SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE POTENTIAL
			(PCF) 96.6	31.3	6.6	66	Medium
2	T-2 @ 4'-6'	14.0	90.0	31.3			
1	T-4 @ 0'-3'	11.5	104.6	24.0	5.1	51	Medium
		F				8	
1							
1							5
1							
L						I	

MAXIMUM DENSITY TEST RESULTS

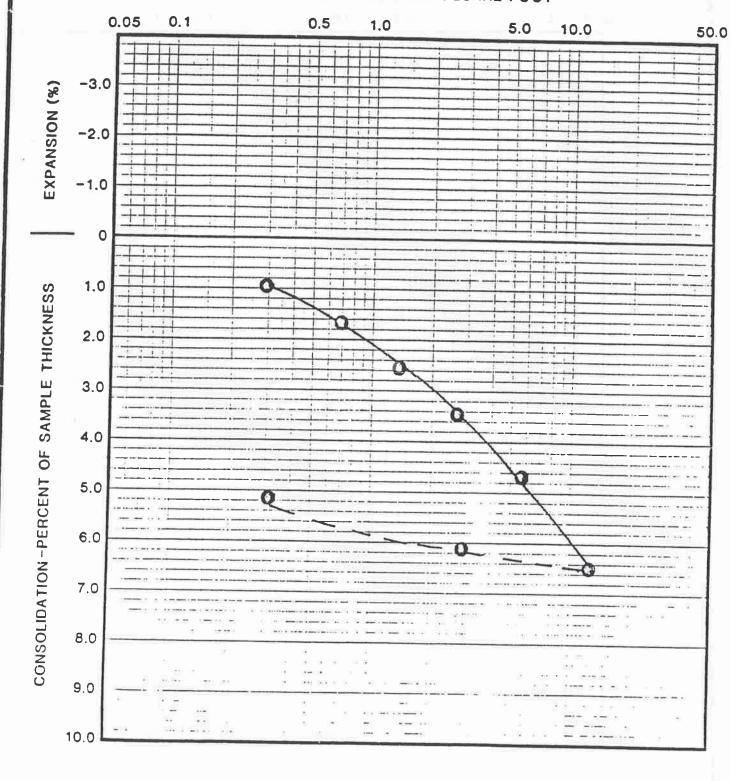
SAMPLE NO.	LOCATION	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
0	T-1 @ 0'-3'	115.5	14.5
Õ	T-2 @ 0'-3'	107.0	20.0
2	T-2 @ 4'-6'	110.0	14.0
		*	



Project Nc.4900381-05 JACUMBA VALLEY RANCH

EXPANSION INDEX AND MAXIMUM DENSITY TEST RESULTS

STRESS IN KIPS PER SQUARE FOOT



O FIELD MOISTURE BORING NO.: 3-3

SATURATED SAMPLE NO.: 2

LOADING DEPTH (FT): 10-11

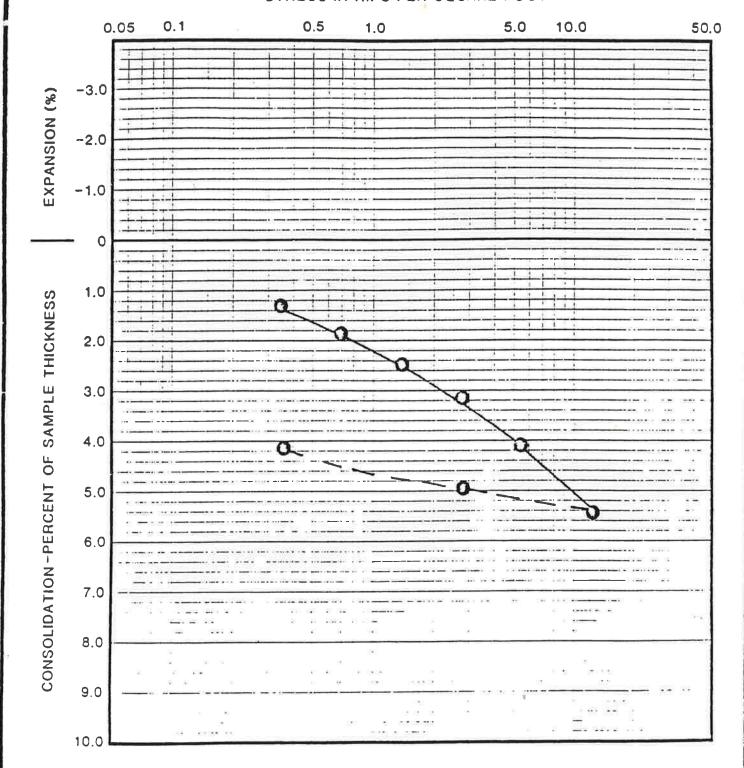
REBOUND SOIL TYPE: 5M



Project No. 4900361-05 JACUMBA VALLEY RANCH

CONSOLIDATION TEST RESULTS

STRESS IN KIPS PER SQUARE FOOT

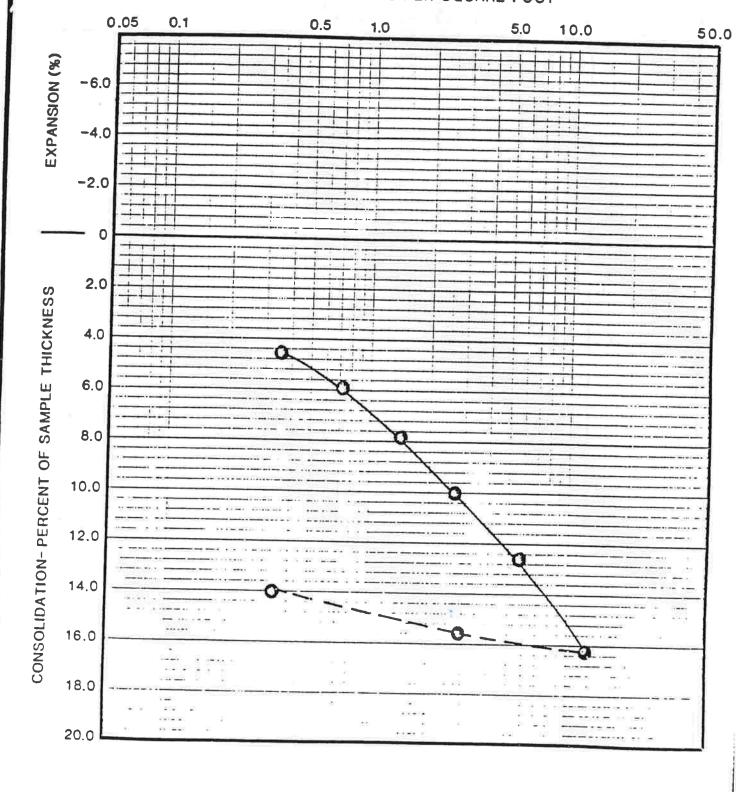




Project No. 4900381-05 JACUMBA VALLEY RANCH

CONSOLIDATION TEST RESULTS

STRESS IN KIPS PER SQUARE FOOT



O FIELD MOISTURE

BORING NO.: 3-10

SATURATED SAMPLE NO.: 2

LOADING DEPTH (FT): 10-11"

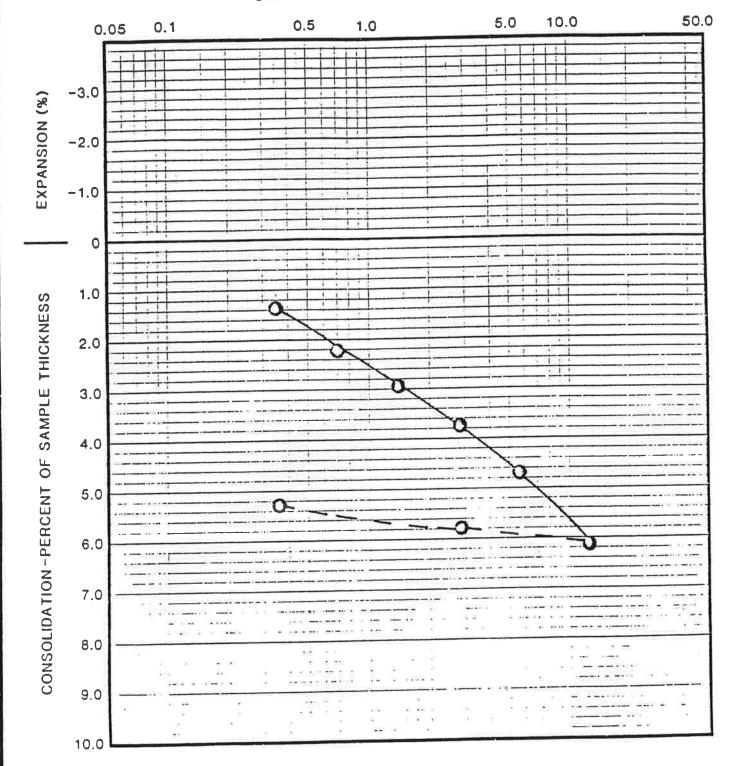
THE REBOUND SOIL TYPE: CLIME



Project No. 4900381-08 JACUMBA VALLEY RANCH

CONSOLIDATION TEST RESULTS

STRESS IN KIPS PER SQUARE FOOT



O FIELD MOISTURE BORING NO.: 3-11

SAMPLE NO.: 2

LOADING DEPTH (FT): 10-11

--- REBOUND SOIL TYPE: SM



Project No.4900381-05

JACUMBA VALLEY RANCH

CONSOLIDATION TEST RESULTS



LEIGHTON AND ASSOCIATES, INC.

Geotechnical and Environmental Engineering Consultants

MAR 0 7 1991

February 27, 1991

Project No. 4900381-05

To:

Jacumba Valley Ranch

2423 Camino del Rio South, Suite 212

San Diego, California 92108

Attention:

Mr. Karl Turecek

Subject:

Updated Evaluation of Consolidation Potential, Phase 1, Jacumba

Valley Ranch Development, San Diego County, California

Reference:

Leighton and Associates, Inc., 1991, Limited Evaluation of Liquefaction and Consolidation Potential, Phase I, Jacumba Valley Ranch Development, San Diego County, California, Project

No. 4900381-05, dated January 21

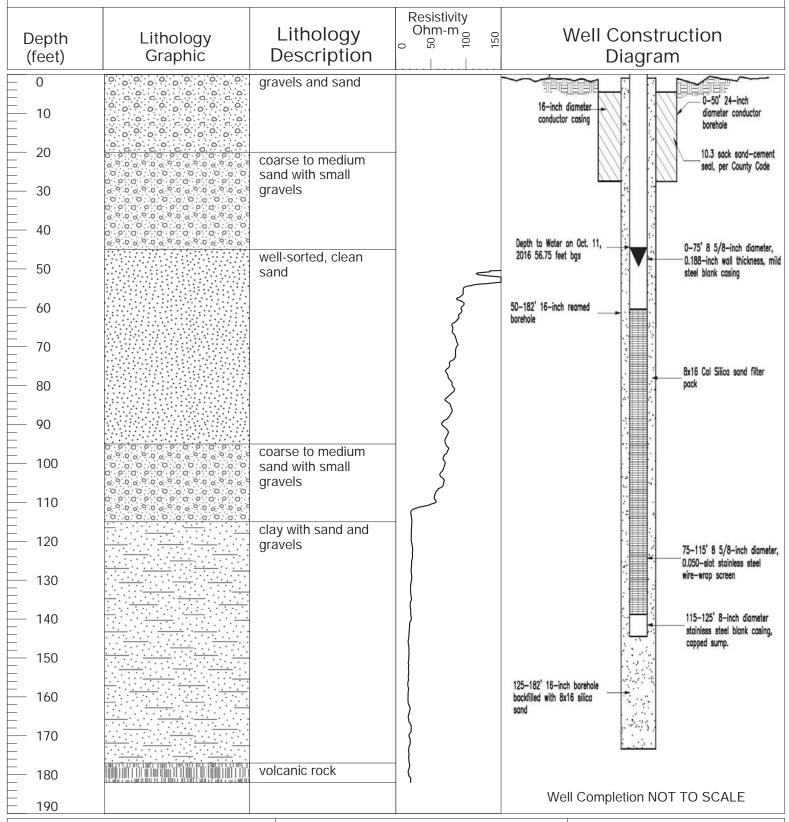
In accordance with your request, we performed an updated evaluation of the consolidation potential at the subject development. We understand that fills in Residential Area A are proposed to be up to approximately 20 feet thick (above existing grades). Our referenced report provided recommendations based on your previous assumption that the thickness of additional fill would be approximately 4 feet. In order to evaluate the consolidation potential due to the weight of the proposed fill soils (up to 20 feet thick), we have performed laboratory time-rate consolidation tests on ring samples collected as part of our previous study. We chose representative samples near the areas of proposed fills as shown on the computer printout prepared by F.J. Willert Contracting Company, Inc. Based on our laboratory data (attached), we recommend the following delays after the completion of grading until the construction of settlement-sensitive structures in order to reduce the total and differential settlement to approximately 1 inch and 1/2 inch, respectively.

Thickness of Proposed Fill Above Existing Grade (feet)	Delay of Construction after <u>Grading (months)</u>
<pre>< 2 < 3 < 4</pre>	0 1
≤ 5 ≤10	2 3 4
<u>≤</u> 15 ≤20	6 8

Maximum settlement of the existing soils below the areas of thickest proposed fill soils (approximately 20 feet thick) is estimated to range from 4 to 6 inches.



LOG OF JCSD HIGHLAND CENTER WELL



Project Name: Highland Center Well

Project Number: 9286

Drilling Company: Fain Drilling

and Pump Company

Drilling Method: Mud Rotary

Drilling Start Date: September 28, 2016 Drilling Finish Date: September 29, 2016 Pilot Borehole Diameter: 15.75-inch Total Borehole Depth: 182 feet Boring Location: Jacumba Hot Springs, CA

Latitude: 32°37'2.94"N

Longitude: 116°11'4.19"W

Surface Elevation (ft msl): 2,805'

Additional Information:

prepared October 2016

Logs from wells that penetrate the alluvium in the center of the valley are presented in Table 3. See Figure 8 (page 28) for the location of the wells.

The alternating layers of clay and gravelly sand in the well logs appear to be lacustrine deposits. Similar deposits, of rhythmic layers of silty-clay and fine to medium sand, occur in the stream cut banks at the north end of Jacumba Valley. There are abundant small gastrapod shells in these deposits. Above the lacustrine sediments the well records generally show a fining upward trend.

The wells on the western edge of Jacumba penetrate the alluvium to a depth of 18 meters (County of San Diego, Department of Public Health, personal communication, 1980).

	Well J3A	Well J4					
Depth (Meters)	Lithology	Depth (Meters)	Lithology				
- 9.1	Clay and silt	-12.2	Layers of clay and gravel				
-15.2	Coarse sand and gravel	-18.3	Gravel and boulders				

In general, the lithology of the Quaternary alluvium varies both with depth and laterally, as would be expected in an alluviated valley in the arid southwest.

Table 3 $\label{eq:Logs} \mbox{Logs for Wells Jl and J2}^{\mbox{a}} \mbox{ and Wells Kl and K2}^{\mbox{b}}$

Depth (Meters)	Lithology	Depth (Meters)	Lithology						
	Well Jl	Well J2							
0-3.0	Soil and clay	0-3.0	Soil and clay						
-11.6	Clay	-11.6	Clay						
-12.2	Fine sand	-12.2	Fine sand						
-15.2	Medium sand	-15.2	Medium sand						
-26.8	Coarse sand and small gravel	-26.8	Coarse sand and small gravel						
-30.5	Coarse sand and coarse gravel	-30.5	Coarse sand and small gravel						
-36.6	Layers clay and coarse sand	-36.6	Layers clay and coarse sand						
-37.8	Volcanic formation	-42.7	Layers clay and coarse sand						
	Well Kl	<u>W</u>	ell K2						
0-1.5	Clay and topsoil	0-6.1	Clay and silt						
-9.1	Silt and fine sand	-6.4	Cobbles						
-12.2	Fine sand	-12.2	Fine sand						
-13.7	Sand	-13.7	Sand						
-15.2	Boulders and sand	-15.2	Rocks and sand						
-19.2	Sand and gravel	-21.3	Sand and gravel						
-19.5	Black silt and clay	-28.0	Rocks and sand						
-20.7	Sand and gravel	-31.4	Large rocks and sand						
-21.3	Black silt and clay								
-29.9	Sand and gravel								

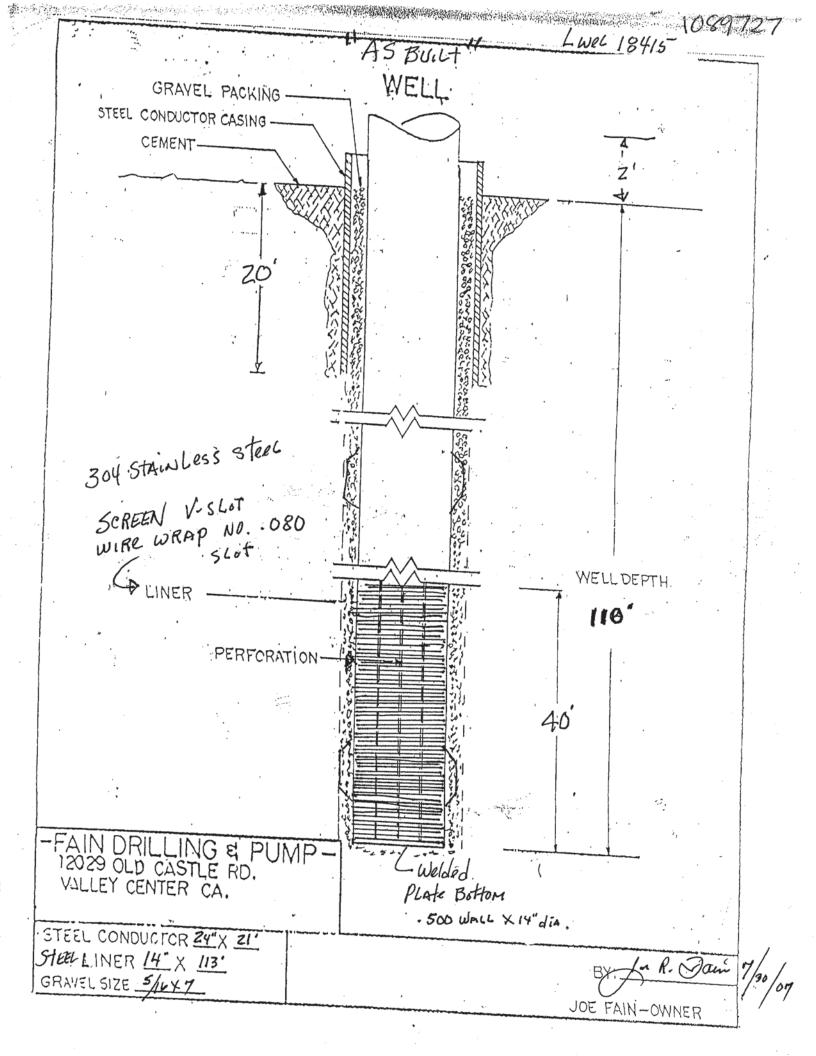
Table 3 (Continued)

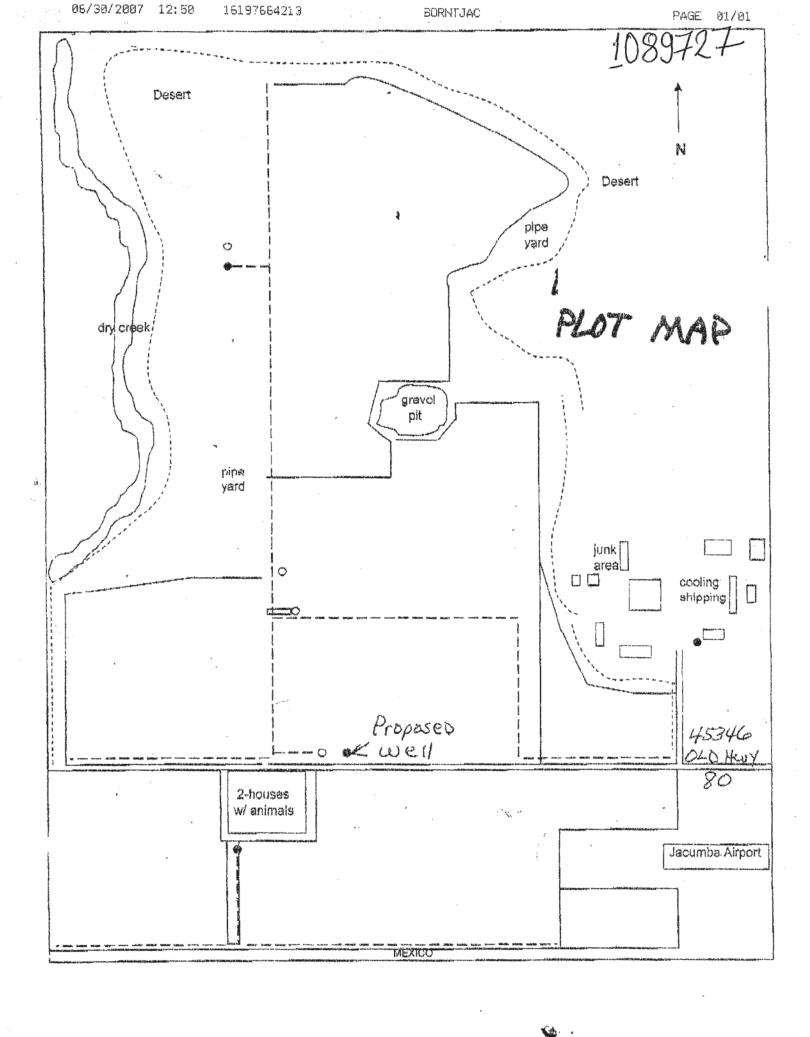
Depth (Meters)	Lithology	Depth (Meters)	Lithology				
	Well Kl	Well K2					
-31.4	Boulders and cobbles						
-32.3	Sand and gravel						
-33.5	Red clay						

Taken from County of San Diego, Department of Public Health, personal communication, 1980.

 $^{$^{\}rm b}$$ Taken from William Ketchum, personal communication, 1980.

ORIGINAL STATE OF CALIFORNIA File with DWR WELL COMPLETION REPORT Refer to Instruction Pamphlet Page _1__ of __1_ No. 1089727 Owner's Well No. _ One - 2007 LONGITUDE Date Work Began __7/18/07_ Local Permit Agency ____DEH_ APN/TRS/OTHER Permit No. LWEL 18415 GEOLOGIC LOG -WELL OWNER X VERTICAL ____ HORIZONTAL ____ ANGLE ____ (SPECIFY) ORIENTATION (ビ) DRILLING METHOD Rotary FLUID ____ DEPTH FROM DESCRIPTION SURFACE Describe material, grain size, color, etc. to Old Hwy 80 WELL LOCATION ALLUVIAL FILL AS FOLLOWS: Address _ 0 9 Sand, fine grained - brown color Jacumba City _ San Diego County _ APN Book 660 Page 150 9 24 Clay - Dark color Parcel 18 Township 18 S Range 8 E Section 8 24 70 Sand, fine grained Long_ DEG. MIN. MIN. SEC. LOCATION SKETCH ACTIVITY (∠) 70 Sand, medium to coarse grained X NEW WELL - NORTH with some boulders MODIFICATION/REPAIR See Attached ___ Deepen _ Other (Specify) MAP FOR detail DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG", 169.74 AC USES (∠) WATER SUPPLY _ Domestic ____ Public __ Irrigation ____ Industria MONITORING . TEST WELL CATHODIC PROTECTION HEAT EXCHANGE DIRECT PUSH NEW Well INJECTION Illustrate or Discribe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE. REMEDIATION OTHER (SPECIFY) WATER LEVEL & YIELD OF COMPLETED WELL DEPTH TO FIRST WATER __50+_ (Ft.) BELOW SURFACE DEPTH OF STATIC 40 _(Ft.) & DATE MEASURED 7/23/07 WATER LEVEL ___ ESTIMATED YIELD . 2000 (GPM) & TEST TYPE airlift TOTAL DEPTH OF BORING 113 TEST LENGTH 6 (Hrs.) TOTAL DRAWDOWN 60 TOTAL DEPTH OF COMPLETED WELL 114 * May not be representative of a well's long-term yield. CASING (S) ANNULAR MATERIAL DEPTH BORE-FROM SURFACE FROM SURFACE TYPE (∠) TYPE HOLE CON-DUCTOR FILL PIPE INTERNAL GAUGE SLOT SIZE MATERIAL / SCREEN OR WALL DIAMETER IF ANY FILTER PACK MENT TONITE FILL GRADE to to Ft. (Inches) (inches) (TYPE/SIZE) (~) (~) (\simeq) 20 32 20 Stee1 23.5 250 X 73 24 Stee1 13.5 .250 113 pea gravel 5/16x7 Steel S.S.13.5 250 080 ATTACHMENTS (≤) CERTIFICATION STATEMENT I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief. _ Geologic Log X Well Construction Diagram NAME FAIN DRILLING & PUMP CO INC __ Geophysical Log(s) 12029 Old Castle Rd. Valley Center, Ca 92082 Soil/Water Chemical Analyses STATE Other Site ATTACH ADDITIONAL INFORMATION, IF IT EXISTS. 57 LICENSE NUMBE IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM OSP 03 78836 DWR 188 REV. 05-03





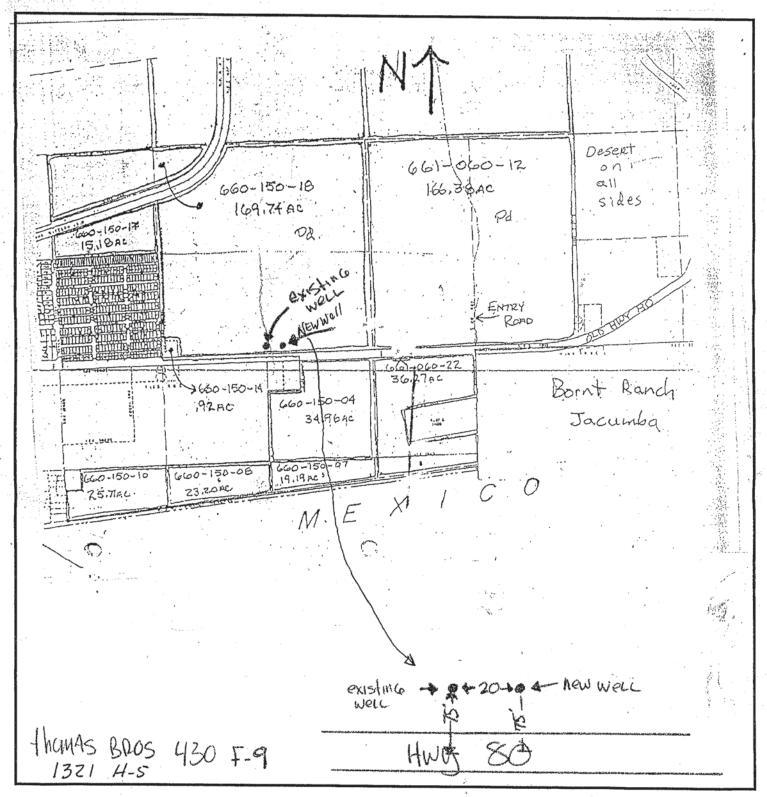
COUNTY OF SAN DIEGO DEPARTMENT OF ENVIRONMENTAL HEALTH

Control #: LWEL- 18415
Assessor's Parcel Number: 660 -150-78

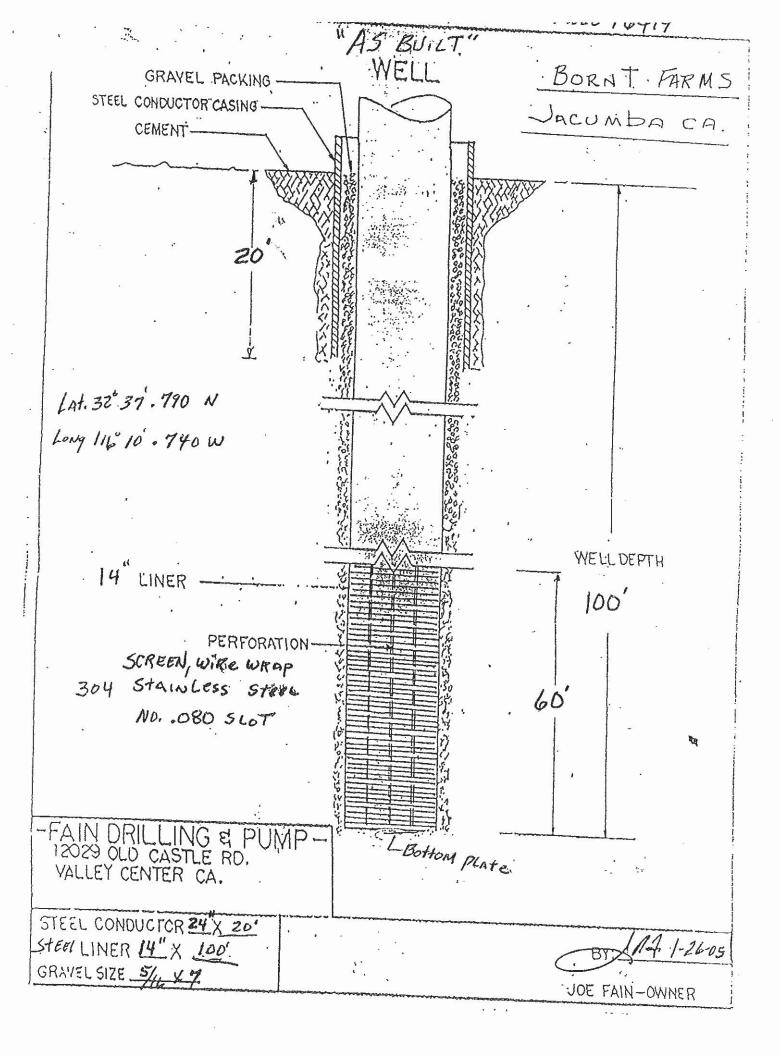
1089727

LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, water bodies or water courses, drainage pattern, easements, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.



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	TTACH ADDITIONAL INFORMATION, IF IT EXISTS. SIGNED C-57 LICENSED WATER WELL CONTRACTOR DATE SIGNED C-57 LICENSE NUMBER R 188 REV. 05-03 IF ADDITIONAL SPACE IS DIFFERED LICENSE NUMBER R 188 REV. 05-03																					



LOCATION

Indicate below the vicinity and exact location of well with respect to the following items: Property lines, water bodies or water courses, drainage pattern, easements, roads, existing wells, sewers and private sewage disposal systems and other potential contamination sources, including dimensions.

