MCL

DIVISION OF WATER RESOURCES
WELL DRILLER'S REPORT

Log No. 108598
Permit No.
Basin 212

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

NOTICE OF INTENT NO. 32182

1. OWNER USA Washington DC
MAILING ADDRESS
ADDRESS AT WELL LOCATION Henderson 89015
Subdivision Name: County: CLARK

2. LOCATION Sw/4 SE ¼ Sec 30 T 21 N/S R 63 E
PERMIT/WAIVER No. H000688 1603000003
Issued by Water Resources Parcel No.
Latitude 36.04.973 Longitude 114.59.565
UTM E N
☐ NAD 27 ☒ NAD 83/WGS 84

3. WORKED PERFORMED
☒ New Well ☐ Replace ☐ Recondition ☐ Deepen ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC ☐ Air ☒ Other Sonic Dri

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
attached Log				

DCNR/DWR RECEIVED SEP 01 2009 LAS VEGAS OFFICE

Date started: 4 2 , 20 09
Date completed: 4 - 10 , 20 09

7. Water Level
Static water level: 0. feet below land surface
Artesian Flow: G.P.M. P.S.I.
Water Temperature: °F
Quality:

8. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

9. WELL CONSTRUCTION
Depth Drilled 188 Feet Depth Cased 188 Feet

HOLE DIAMETER (BIT SIZE)

		From		To	
8"	Inches	0	Feet	188	Feet
	Inches		Feet		Feet
	Inches		Feet		Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
4"	PVC	SCH 40	0	188

Perforations:
Type of perforation Slotted SLRech
Size of perforation 0.010
From 168 feet to 188 feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Annular Seal: ☐ Yes ☐ No
☐ Neat Cement to ☐ Pumped ☐ Poured
☐ Cement Grout to ☐ Pumped ☐ Poured
☒ Concrete Grout 0 to 151.3 ☒ Pumped ☐ Poured
☐ =30% Bentonite Grout to ☐ Pumped ☐ Poured

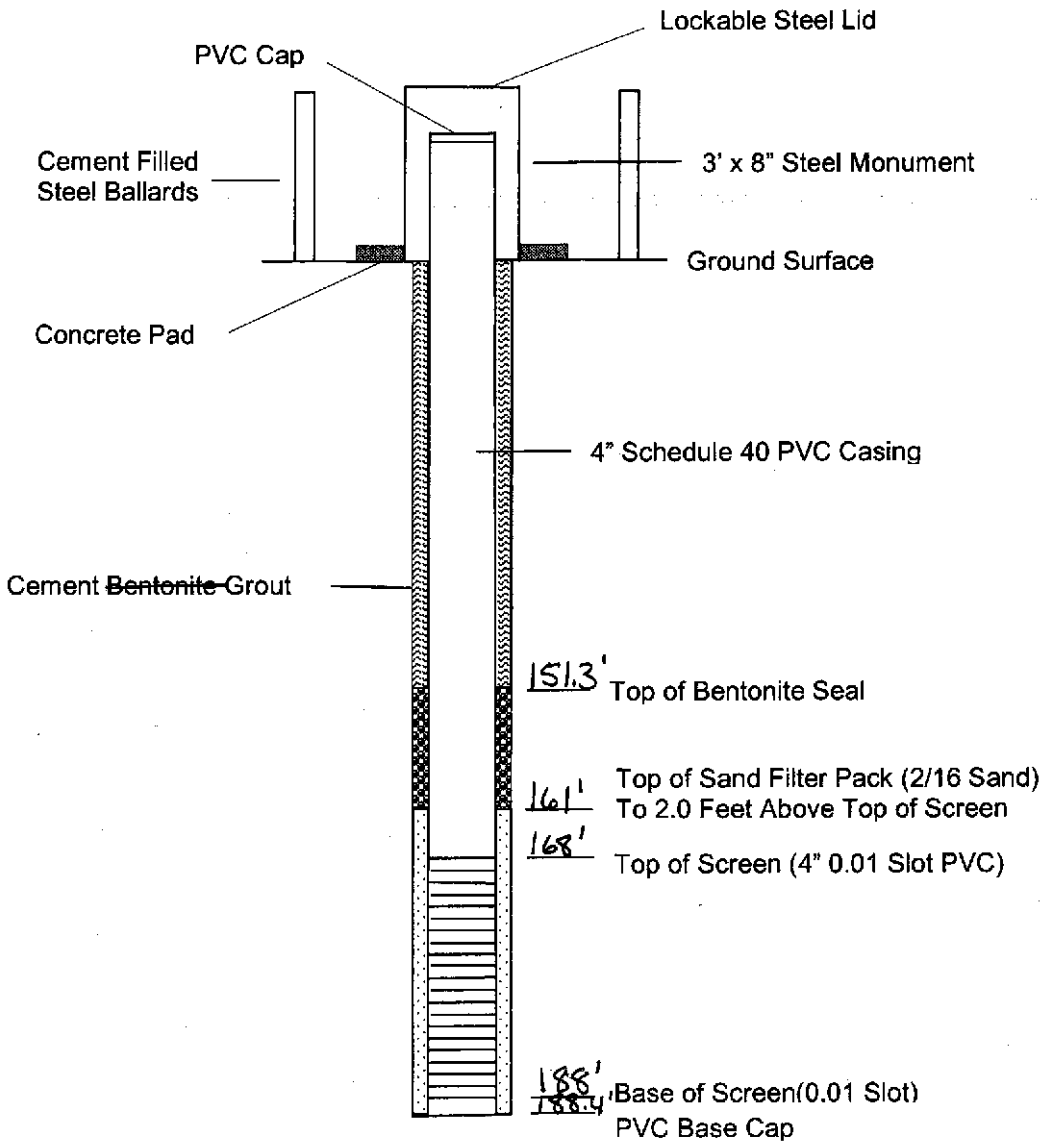
Gravel Pack: ☒ Yes ☐ No to ☐ Pumped ☒ Poured
Type: CEMEX Sand 2/16
Bentonite Chips: ☒ Yes ☒ No 161 to 151.3 ☐ Pumped ☒ Poured
Type:

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name EAGLE DRILLING (Contractor)
Address 7150 Placid Street (Contractor)
Las Vegas NV 89119
Nevada contractor's license number issued by the State Contractor's Board 51266
Nevada driller's license number issued by the Division of ~~Water Resources, the on-site driller~~ 2097
Signed (By driller performing actual drilling on site or contractor)
Date 9-1-09

(Rev. 06-08)

USE ADDITIONAL SHEETS IF NECESSARY

MCF - SERIES MONITOR WELL CONSTRUCTION
~~**DIAGRAM**~~
MCF - 28B



GES	Job Name: BRC MONITOR WELLS	Boring No. MCF-28B

Job No. 20092509V1	Start:	Location: See fig. 2
	End:	
Total Depth:	Groundwater	Comments:
Elevation:	Depth: / Date: / Time:	
Equipment: Sonic Drill Rig	Type of Bit: 6.0" Sonic Core Barrel	
Hammer (lbs/inches): 140 #/30"	Driller: Tim Thompsen	Surface Dry Density (pcf): / Surface Moisture Content (%):
Surface Condition: Leveled Pond	Logger: Monty Mehlhorn	

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				SM	Brown (7.5 YR 5/4) silty SAND (~15% silt, ~85% sand (subrounded, poorly graded, ~10% cs, 20% ms, 70% fs), trace gravel (subangular, 100% fg) moist, med. dense, homogeneous, strong reaction to HCL sand is ~10% mafics, 90% felsics, gravel is ~100% basalt Abrupt contact w/ sequence below.		
1							1
2							2
3							3
4							4
5							5
6							6
7					...wet @ 7.0'		7
8						wet	8
				SM	Brown (7.5YR 5/4) silty SAND w/gravel (~20% silt, 60% sand (subround, ~10% cs, 20% ms, 70% fs), 20% gravel (subangular, poorly graded, 80% cg (as broken gravel), ~20% fg), wet, med dense, stratified (6" thick beds),		
9							9
10							10
11		MCF-28A-10,					11
12							12

GES	Job Name:	Boring No. MCF-28B
Job No. 20092509N	Start: / End:	Location: See fig. 2

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
					strong reaction to HCl, sand: ~10% mafics, ~90% felsics, gravel: ~30% basaltic andesite, 70% vesicular basalt.	Wet	
13							13
14					...from 12'-14': sand is ~100% c.s.		14
15							15
16							16
17					...same as above		17
18							18
19							19
20					...silt lense.		20
21							21
22							22
23							23
24					...same as above	wet	24
25							25
26							26
27							27
28							28

GES	Job Name: BRC Monitor Wells	Boring No. MCF-28B
Job No. 20092509V1	Start: / End:	Location: See fig. 2

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				SM	...same as above.	Wet	
29						↓	29
30					...grades into:		30
31	Run #7			SW-SM	Dark brown (7.5YR 3/3) well-graded SAND w/silt and gravel (~10% silt, ~70% sand (subround, ~40% cs, 30% ms, 30% fs), ~20% gravel (sub-angular to sub-round poorly graded, ~100% fg)), wet, dense, stratified (0.5' to 1.0' thick beds), no reaction to HCl, sand: ~30% matics (basalt, andesite), gravel: ~30% latite, ~40% basalt, 30% andesite.		31
32							32
33							33
34							34
35		MCF-28B-34' 10' above TMCF					35
36	Run #8						36
37							37
38							38
39							39
40							40
41	Run #9						41
42							42
43							43
44					...abrupt contact with:		44

GES	Job Name: BRC Monitor Wells	Boring No. MCF-28B
Job No. 20092509V1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
45	Run #9			ML	Tertiary Muddy Creek Formation: Pale olive (5Y 6/4) mottled lt. olive brown (2.5Y 5/4) SILT (~95% silt, trace sand, gypsum as fs-sized crystals), moist, very stiff, weak reaction to HCl, laminated.		45
46							46
47							47
48	Run #10						48
49		MCF-28A-48 (wet)		ML wet	Pale olive (2.5Y 6/4) SILT w/ sand (~80% silt, ~20% sand (subround, poorly graded, 100% fs), trace gypsum), wet, few 0.25" wide weakly cemented gypsum nodules, weak reaction w/HCl, laminated.	wet	49
50				ML	49': Lt. greenish gray (Gley 1, 8/1) SILT (~95% silt, trace sand, ~5% gypsum), moist, very stiff, laminated.		50
51							51
52							52
53	Run #11						53
54 / 54.5'		MCF-28A-55 (wet, 10' below contact)		wet ML	...50': same as above, except: lt. yellowish brown (10YR 6/4), weakly cemented in layers, abrupt contact with:		54
55				CL	53'-54.5': Light bluish gray (Gley 2, 7/5B) sandy SILT (~70% silt, 25% sand (subround, poorly graded, 100% fs)), wet, weakly to moderately cemented in 0.5" thick layers, no reaction to HCl, laminated, abrupt contact with:	5% gypsum as cement	55
56							56
57							57
58	Run #12						58
59							59
60							60

GES	Job Name:	Boring No. MCF-28B
Job No. 20092509V1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
61	Run #13 - Lost			CH	54.5': Lt. brown (7.5YR 6/4) lean CLAY (~90% lean clay, trace sand, ~10% gypsum as cemented layers), moist, weakly cemented in 0.5" thick layers, very stiff, strong reaction to HCl, laminated, w/nodules of Fe OX, exact position of contact unknown due to core loss.	lean	61
62							62
63							63
64							64
65							65
66	Run #14 - Lost				~60': Bluish gray (Gley 2, 5/0B) fat. CLAY (~80% lean clay, 20% gypsum (as fibrous X-stals, 0.5" long, euhedral crystals), trace organic matter)), moist, very stiff, no reaction to HCl, laminated to stratified (1mm to 0.5' thick beds), moderate sulfur odor.		66
67							67
68							68
69							69
70					...becomes mottled H. greenish gray (Gley 1 8/1).		70
71	Run #15	MCF-28A-71 (moved 2' due to core loss)					71
72					...abrupt contact with:		72
73				CL	Pale brown (10YR 6/3) lean CLAY (~85% lean clay, trace sand, ~15% gypsum as cs-fs-sized crystals), moist, very stiff, weak reaction to HCl, laminated.		73
74							74
75							75
76	Run #16				...2" thick granular gypsum		76

GES	Job Name: BRC Monitor Wells	Boring No. MCF-28B
Job No. 20092509V1	Start: End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	layer, also at 77.0'		
77							77
78	Run #16				...randomly-oriented euhedral		78
					0.5" long gypsum crystals.		
79					...weak cross-bedding.		79
80							80
81	Run #17				...~6.0" thick layer of granulose		81
					gypsum; at ~81': 1.0"-0.5" long,		
82					clear, doubly terminated clear		82
				ML	gypsum crystals.		
83					82': Light brownish gray (10YR		83
					6/2) sandy SILT (~65% silt,		
84					25% sand (subround, poorly		84
				CL	graded, ~10%ms, 90%fs), 10%		
85					gypsum as ms-sized grains),		85
					moist, very stiff, weak reaction		
86					to HCl, laminated.		86
					84': Lt. brown (7.5YR 6/3) lean		
87					CLAY (~90% clay, trace sand,		87
	Run #18				10% gypsum as fs-sized		
88					crystals), moist, very stiff,		88
					weak reaction to HCl,		
89					laminated.		89
					...at ~87': mottled lt. greenish		
90					gray (Gley 1, 7/5Gy), has		90
					~1.5" long, doubly terminated		
91	Run #19				euhedral gypsum crystals (~		91
					30%, randomly-oriented.)		
92							92

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Job No. 20092509V1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	...cs-ms-sized gypsum crystals.		
93							93
94		MCF-28A-94 (regular Sample, 50' below TMCF			...thin, contorted laminae (cross-bedding		94
95					...¼" thick sandy SILT laminae.		95
96	Run #19				...clear, randomly oriented, 1.5"/long gypsum crystals to ~40%.		96
97							97
98							98
99					...clear gypsum crystals cross core, appear to be randomly-oriented.		99
100							100
101							101
102							102
103					...gypsum content and crystal size decreases, only ~10% as cs to ms-sized grains.		103
104							104
105					...light greenish gray (Gley1, 7/5Gy), weak reaction to HCl, weakly-cemented in 0.5" thick layers.		105
106	Run #20						106
107					...becomes mottled reddish yellow (7.5YR 6/6).		107
108					...at ~107.5': lt. brown (7.5YR 6/3).		108

GES	Job Name: BRC Monitor Wells	Boring No. MCF-28B
Job No. 20092509V1	Start: End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
109	Run #20			CL	gypsum occurs as 0.5"-1.0" thick granulose layers with chicken wire texture.		109
110							110
111	Run #21				...~5" thick banded gypsum layer.		111
112					...abrupt contact with:		112
113				ML	Reddish yellow (7.5YR 6/6) SILT (~80% silt, trace sand, 20% gypsum as cs-ms sized grains), moist, weakly cemented, v.stiff, weak reaction to HCl, laminated, abrupt contact w/:		113
114							114
115							115
116		Sample # MCF-28A-115 (wet)		wet ML	Mottled light greenish gray (Gley 1 7/5Gy) and reddish yellow (7.5YR 6/6) SILT w/sand (~80mm 70% silt, 20% sand (subround, poorly graded, 100% fs), 10% gypsum as cs-ms	wet	116
117							117
118							118
119	Run #22			CL	sized grains), wet, very stiff, weak reaction to HCl, laminated 118': Brown (10YR 5/3) lean		119
120				ML	CLAY (~90% lean clay, trace sand, ~10% gypsum as fs-sized grains), moist, v.stiff, no reaction to HCl, laminated		120
121							121
122					...119': light brownish gray (10YR 6/2), abrupt contact with:		122
123				CL	119.5': Brown (7.5YR 5/4) SILT (~80% silt, trace sand, ~20% gypsum as cs-		123
124							124

GES	Job Name: BRC Monitor Wells	Boring No. MCF-28B
Job No. 20092509V1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
125	Run #22			CL	-fs sized grains)), moist, v. stiff, weakly cemented, weak reaction w/HCl, laminated.		125
126					122': Brown (7.5YR 5/4) lean CLAY (~80% lean clay, trace sand, 20% gypsum as cs-sized grains and euhedral crystals 0.5"-2.0" long (clear, randomly-oriented)), moist, v. stiff, weak reaction to HCl, laminated.		126
127							127
128							128
129							129
130					...123': reddish brown (5YR 4/4).		130
131					...from 126' on: gypsum occurs as cs-ms-sized crystals, contact at 133' marked by a ~0.5" thick granulose gypsum layer.		131
132							132
133	Run #23						133
134		MCF-28A-133, wet, pH= 7.90		Sm wet	Gray (10YR 5/1) silty SAND (~20% silt, 80% sand (sub-rounded, poorly graded, ~20% ms, 80% fs)), wet, dense, weak reaction with HCl, laminated, water content decreases near contact w/: 134.5': 8mm Reddish brown (5YR 4/4) lean CLAY (~80% lean clay, trace sand, 20% gypsum as cs-sized grains to 0.5" euhedral, clear gypsum crystals)), moist, v. stiff, weak reaction to HCl, laminated.	wet	134
135				CL			135
136							136
137							137
138	Run #24						138
139							139
140				ML			140

GES	Job Name: BRC Monitor Wells	Boring No. MCF-28B
Job No. 20092509U1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
	Run #24			ML	139': ML: Brown (7.5YR 5/3) SILT w/sand (~80% silt, ~15% sand (subrounded, poorly graded, ~100% fs), ~5% gypsum as 0.25" thick layers and ms-sized grains), moist, v. stiff, weakly cemented, weak reaction to HCl, laminated w/randomly-spaced SM lenses (2-5 mm thick).		
141							141
142							142
143							143
144		MCF-28A-144, (100' below Gat pH=6.74 TMCF).		CL			144
145							145
	Run #25				144': CL: Brown (7.5YR 5/4) lean CLAY (~80% lean clay, trace sand, ~20% gypsum as euhedral, randomly-oriented and clear 1.0" X-tals and grains), moist, v. stiff, weakly cemented, weak reaction to HCl, laminated.		
146							146
147							147
148				ML	147': ML: Brown (7.5YR 5/4) SILT (~75% silt, trace sand, ~25% gypsum as ms-fs sized grains), moist, weakly cemented, v. stiff, weak reaction to HCl, laminated.		148
149							149
150				CL	149.5': CL: Brown (7.5YR 5/4) lean CLAY (~80% lean clay, trace sand, ~20% gypsum granules), moist, weakly cemented, very stiff, weak reaction to HCl, laminated.		150
151	Run #26						151
152							152
153							153
154		pH = 7.71		ML			154
155				CL	...@ 150'-153.5': 0.5" thick SILT laminae, randomly-oriented, clear, doubly-terminated		155
156							156

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Job No. 20092509V1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	gypsum crystals, abrupt contact w/:		
157					153.5': ML: Light brownish		157
158	Run #26				gray (10YR 6/2) SILT with sand (~80% silt, 20% sand		158
159					(subround, poorly graded, ~100% fs), trace gypsum), moist,		159
160					v. stiff, weak reaction to HCl, laminated, abrupt contact w/:		160
161					154.5': CL: Reddish brown		161
162					(5YR 5/4) lean CLAY (~65% lean clay, trace sand, ~35%		162
163					gypsum as twinned, doubly terminated, randomly oriented		163
164					euhedral crystals and fs-sized grains), moist, very		164
165					stiff, weak reaction to HCl, laminated w/0.25" thick silt beds.		165
166					... 161': yellowish brown (10YR 5/4); gypsum as ~~cs~~ mm cs-sized crystals.		166
167	Run #27				... stratified w/ lt. reddish		167
168					brown (5YR 5/4) layers (~0.5" thick).		168
169					... @166': 0.25" silt stringers.		169
170					... 168.5': @20% gypsum as cs-sized crystals; brown (10YR 5/3).		170
171	Run #28						171
172					... same as above.		172

GES	Job Name: BRC Monitor Wells	Boring No. MCF-28B
Job No. 20092509V1	Start: End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	...same as above		
173							173
174							174
175					...contact marked by increasing percentage and thickness of silt beds.		175
176				Wet ML, mm	175': ML: Light brownish gray (10YR 6/2) sandy SILT (~60% silt, 35% sand (subround, poorly graded, 100% fs), 5% gypsum as cement), wet, weakly cemented, v. stiff, no rxn to HCl, laminated.	Wet	176
177	Run #28			SM			177
178		MCF-28A-178 (wet)					178
179		pH = 7.81			176.5': SM: Lt. gray (10YR 7/1) silty SAND (~20% silt, 80% sand (poor mm subround, poorly graded, ~100% fs), trace gypsum), wet, weakly cemented in ~0.5" wide nodules, very dense, no reaction to HCl, laminated.		179
180				CL			180
181							181
182							182
183							183
184					179': CL: Reddish brown (5YR 5/4) lean CLAY (~75% lean clay, trace sand, ~25% gypsum as 2" long randomly-oriented, clear euhedral crystals), moist, very stiff, no reaction to HCl, laminated, with 0.25" silt stringers ~0.25' below contact.		184
185							185
186	Run #29						186
187					182.0 thin silt beds > 0.25", strong rxn to HCL		187
188					...185.0: CL: Light Reddish		188

End of Boring @ 188