Boe, Erik

From: Bill Rickard <billrickard@geothermalresourcegroup.com>
Sent: Friday, May 13, 2022 10:01 AM
To: Boe, Erik
Cc: Thomas F. Neace - Idaho Department of Water Resources (thomas.neace@idwr.idaho.gov); H2OGUY@COPPER.NET
Subject: FW: Surface casing
Attachments: NDOM10percentargumentforchange.pdf; Idwr 10percent rule change.pdf; Rickard NAC534A260.pdf

Erik, I had your email wrong on the first try.

Bill Rickard PE, President, Geothermal Resource Group
77530 Enfield Lane, Building E, Palm Desert, CA 92211
Phone: 760-341-0186 / Cell: 760-413-2082 / Email: billrickard@geothermalresourcegroup.com

---

From: Bill Rickard
Sent: Friday, May 13, 2022 8:54 AM
To: Erik Boe (erik.boe.idwr.idaho.gov) <erik.boe.idwr.idaho.gov>
Cc: H2OGUY@COPPER.NET
Subject: FW: Surface casing

Erik,
I got your contact information from Roy Mink after I asked about the IDWR revising the geothermal drilling regulations. He said you were the contact at the agency receiving comments on the Idaho Geothermal drilling regulations. I think the BLM and several stares are working on the regulations, I have spoken to Charlene Wardlow of CalGEM and contacted the BLM, Nevada and Utah.
Attached are some documents I wrote over a decade ago regarding the 10% of TD for surface casing rule Idaho has such a rule in the drilling regs the last time I used them to prepare a drilling program in Idaho.
You can probably fix this by stating in the regulations that the last cemented casing (instead of surface casing) must be at least 10% of the vertical drilled depth in any geothermal wellbore.
My suggestion still has no engineering basis but does recognize that most geothermal wells have an intermediate casing installed. The current regulations make no allowance for the fact that the surface casing is irrelevant as soon as an intermediate casing has been installed. Many, if not most, O&G wells only have surface and production casing installed. If there is no intermediate casing, the surface casing is the BOPE anchor for the well and the surface casing shoe must withstand the pressure from a well kick without fracturing.
Please call me at your convenience. I will be happy to discuss with you in more detail.

Bill Rickard PE, President
Geothermal Resource Group
77530 Enfield Lane, Building E, Palm Desert, CA 92211
Phone: 760-341-0186 / Cell: 760-413-2082 / Email: billrickard@geothermalresourcegroup.com

---

From: Wardlow, Charlene@DOC <Charlene.Wardlow@conservation.ca.gov>
Sent: May 09 22 7:48 PM
To: Bill Rickard <billrickard@geothermalresourcegroup.com>
Cc: Mary Mann <mary@geothermalresourcegroup.com>
Subject: Re: Surface casing

Open until 10 am tomorrow and all Wednesday afternoon after 2. Thanks

Get Outlook for iOS

From: Bill Rickard <billrickard@geothermalresourcegroup.com>
Sent: Monday, May 9, 2022 5:50:22 PM
To: Wardlow, Charlene@DOC <Charlene.Wardlow@conservation.ca.gov>
Cc: Mary Mann <mary@geothermalresourcegroup.com>
Subject: RE: Surface casing

Maybe on Tuesday? I am hooked up with personal stuff right now. If I get a chance I will call.

Bill Rickard PE, President
Geothermal Resource Group
77530 Enfield Lane, Building E, Palm Desert, CA 92211
Phone: 760-341-0186 / Cell: 760-413-2082 / Email: billrickard@geothermalresourcegroup.com

---

From: Wardlow, Charlene@DOC <Charlene.Wardlow@conservation.ca.gov>
Sent: May 09 22 1:29 PM
To: Bill Rickard <billrickard@geothermalresourcegroup.com>
Cc: Mary Mann <mary@geothermalresourcegroup.com>
Subject: Surface casing

Hi Bill,

I would like to chat with you about your comments that the current surface casing requirements in our regulations came from 1978 RR Commission regulations and we should thrown them out.

Our regulations are about that vintage. I'd like to understand what your recommendation would be as the 10% doesn't apply to all cases. We would like to make each well's surface casing depth based on the geology and presence of a USDW if it exists but not always possible.

My phone number is 916-917-8898.

Thank you.

Charlene Wardlow
Geothermal Program Manager

California Department of Conservation
Geologic Energy Management Division
715 P Street 18th Floor, Sacramento, CA 95814
T: (916) 917-8898
E: Charlene.Wardlow@conservation.ca.gov
W: https://www.conservation.ca.gov/calgem

Geothermal Resource Group
TAPPING THE EARTH'S ENERGY

Bill Rickard, PE
P.O. Box 11898
Palm Desert, CA 92255

Bus: (760) 341-0186
Fax: (760) 341-9673
billrickard@grgi.org

October 31, 2008

Dear Chad,
Attached are samples of wells that have 7" casing cemented in 8-3/4" hole.
Here is a discussion of why I want to change the minimum of 10% of TD surface casing rule. The current rule came from an old rule of thumb for oil & gas well surface casing.
Whenever we drill we drill geothermal wells we have 10% of the hole cased at any given time. Surface casing is set to stabilize the unconsolidated formation and / or to provide a BOPE anchor, so well flow can be diverted or allow for well shut in for positive well control.
When the surface casing is set at 300 ft, if we consider the average fracture gradient to be 0.7 psi/ft, when the maximum shut in pressure at the shoe is 210 psi the corresponding saturated steam temperature is 385 deg F, from the saturation curve on a steam table. Therefore it is safe to assume that the well can be safely shut in on any steam or hot water zone up to a temperature of nearly 385 F.
We always monitor flow line temperature and usually have run MRT's to get a down hole temperature when we run surveys. We use some rules of thumb to make sure that we do not drill into a resource that cannot be controlled with the surface casing set at the depth less than 10% of TD.
In almost all geothermal wells we run an intermediate casing (this was not a standard practice in most oil and gas wells and still isn't wherever they can get away with it). The intermediate casing then becomes our BOPE anchor and is usually a lot more that 10% of TD.
In some areas it is a dangerous idea to try to set surface casing at 10% of TD. When there is a possibility of shallow high temperature zones a BOPE anchor should be cemented in the ground before it is this zone is encountered. The saturation pressure at 250 F is already up to 15 psig. So if you are drilling into any possible zone with temperatures over boiling, a surface casing should be installed before the static temperature exceeds boiling by very much. A conductor set to 30' below ground level could be used to divert flow as needed until it could be controlled at up to 15 psig with a good safety factor. Surface casing would have to be set to control any flow at a higher temperature. If you are near a hot spring, or any other shallow heat anomaly, or if you have no idea what the temperature is, it is prudent to set shallow surface casing and then an intermediate string of casing prior to drilling into the desired resource with sufficient temperature for a commercial project.
I've also attached a steam table and a letter I sent to NDOM. I am appearing before the NDOM board of directors meeting this November 7, to formally request a change in the Nevada rule.
Thanks for considering my request,

Wm M Rickard

Bore Hole Schematic Report

CONFIDENTIAL - G R G Inc

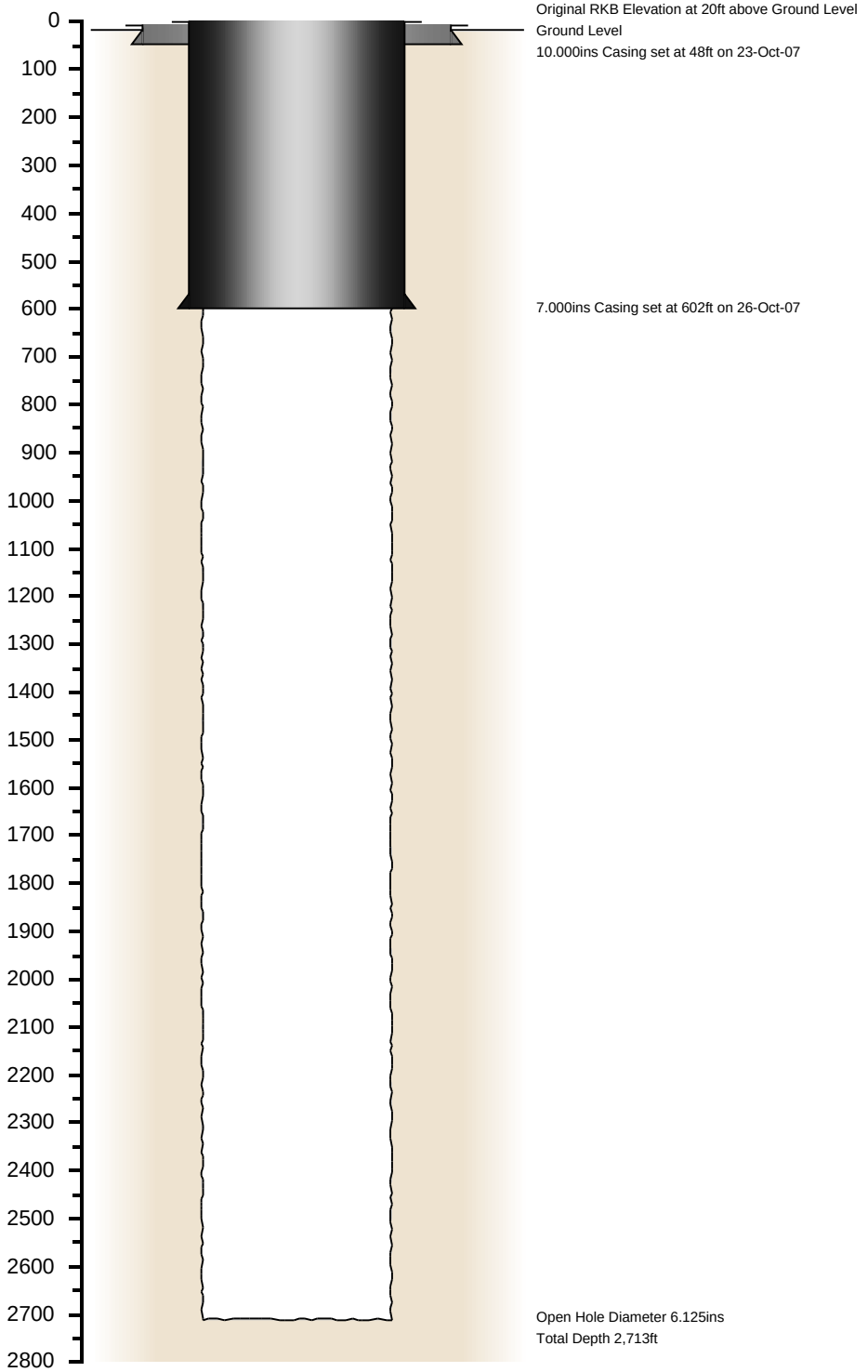
Well ID: RRP-13-4

Well Name: Reese River 13-4

Field: Reese River

Sect: 4 Town: 23N Rng: 43E County: Lander State: NV

Actual Data



Bore Hole Schematic Report

CONFIDENTIAL - G R G Inc

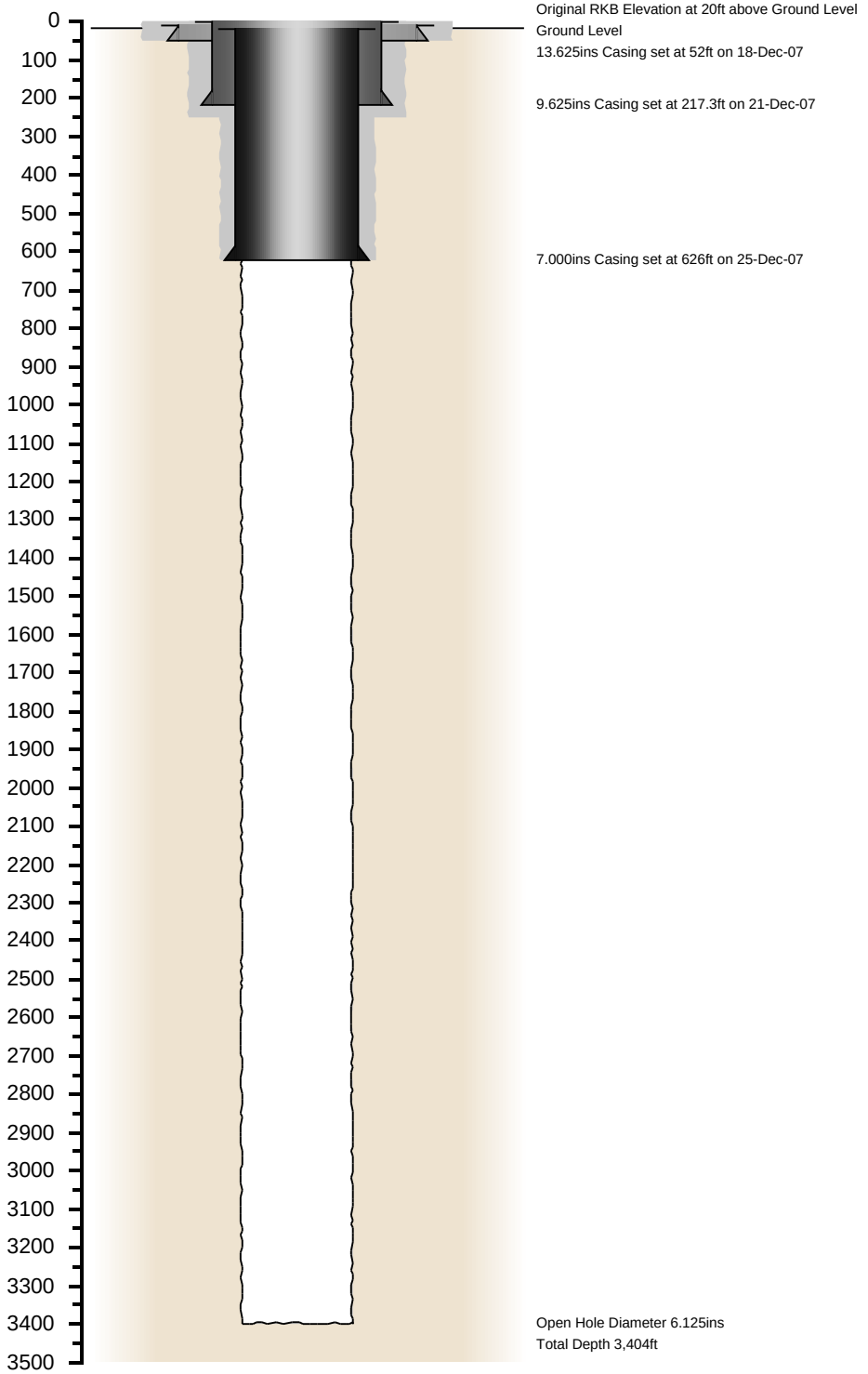
Well ID: WSP M-1

Well Name: Marshall 1

Field: Exploratory

Sect: 22 Town: 23N Rng: 20E County: Washoe State: NV

Actual Data



Bore Hole Schematic Report

CONFIDENTIAL - G R G Inc

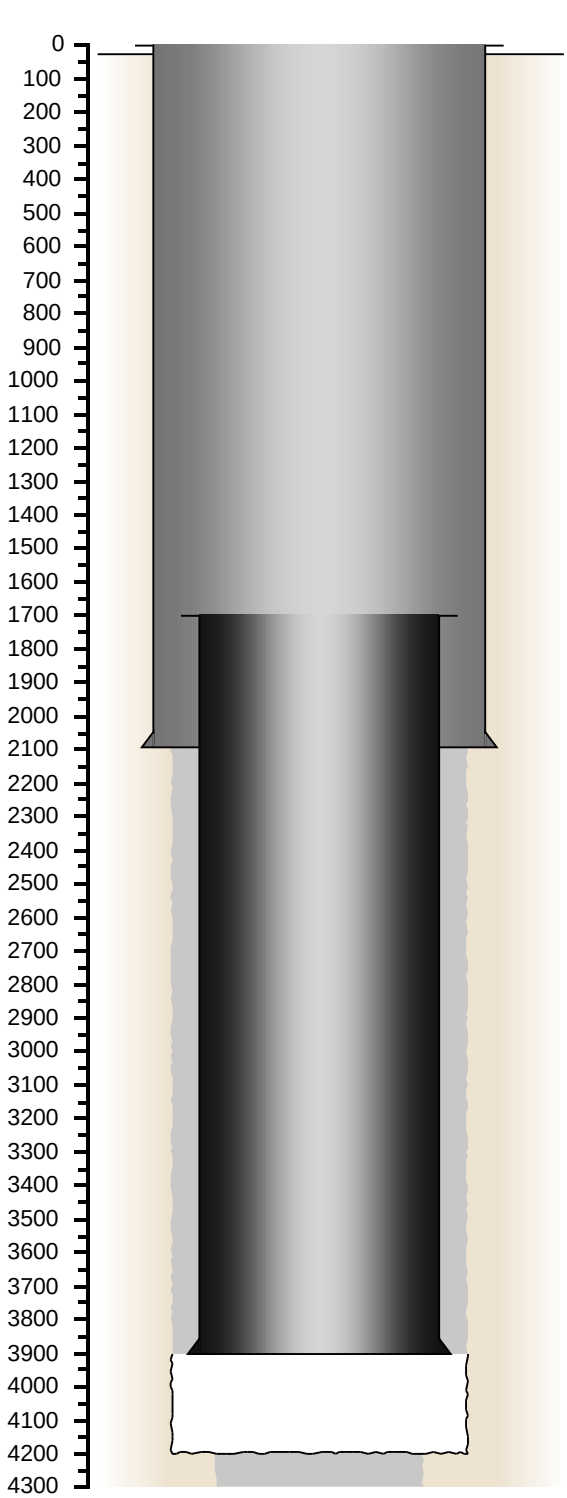
Well ID: KS-4 RD

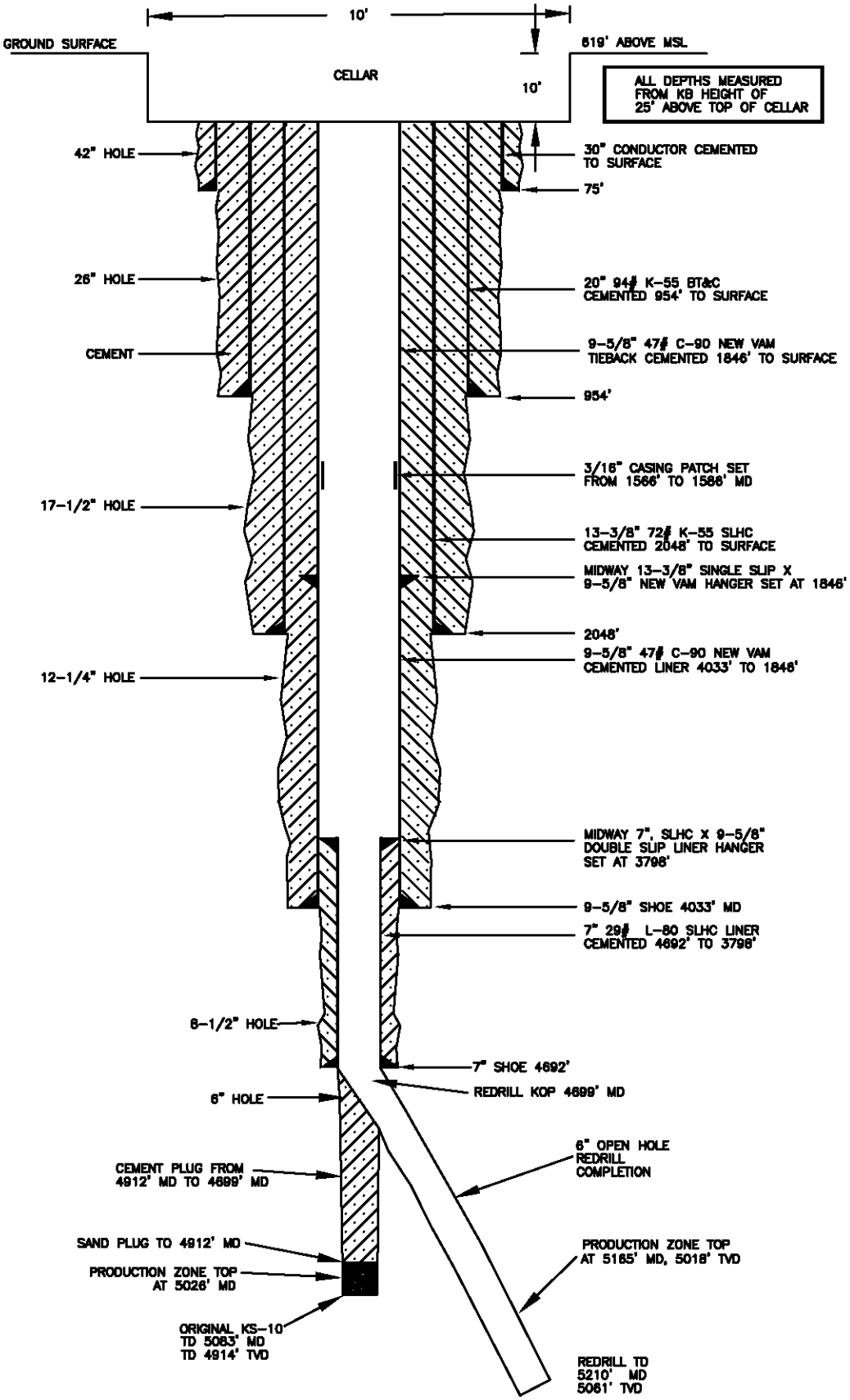
Well Name: Kapaho State 4 Re-Drill

Field: Kilauea East Rift Zone

County: Hawaii State: HI Country: United States

Actual Data (Original Well)





PUNA GEOTHERMAL VENTURE	GEOTHERMAL WELL KS-10 REDRILL COMPLETION SCHEMATIC			
		DATE: 6/19/2006	BY: WM. TEPLOW	FIGURE 1

Form 3160-2
(Formerly 9-1957)
(June 1988)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
GEOTHERMAL DRILLING PERMIT

FORM APPROVED
OMB NO. 1004-0132
Expires: September 30, 1990

7. Lease Serial No. OR-48203

The Bureau of Land Management (BLM) requires this form or other BLM approved forms to be prepared and filed in triplicate with requisite attachments with the authorized officer. The authorized officer must approve this permit prior to any lease operation.

8. Surface Manager: ☒BLM ☐FS ☐Other

a. Type of Work: ☒Drill New Well ☐Redrill ☐Deepen ☐Plug Back ☐Directionally Drill ☐Other

9. Unit Agreement Name

b. Well Type: ☐Production ☐Injection ☐Heat Exchange ☐Observation ☐Water Supply ☒Other Exploration

10. Well No. ESI-A-S-ALT

11. Permit No.

c. Well Status: New Well

12. Field or Area Vale

Name of Lessee/Operator Trans-Pacific Geothermal Corp.

13. Sec., T., R., B. & M.

Address of Lessee/Operator 1901 Harrison, Ste 1590, Oakland, CA 94612-3501

Sec. 33 T18S R45E

Location of Well
At surface NW 1/4, NE 1/4, Sec. 33 T18S R45E

14. County Malheur

At proposed prod. zone Same

15. State Oregon

Distance from Proposed Location to Nearest Property or Lease Line
Approx. 3,350 Ft. East, 100 Ft. South from NW Corner Sec 33

16. Approx. Starting Date Sept. 1993

Distance from Proposed Location to Nearest Well, or Previously Applied for Well Location on this Lease

17. Acres Assigned (Well Spacing)

18. Drilling Media and Characteristics: ☐Air ☐Water ☒Mud ☐Foam ☐Other

19. Proposed Depth
Measured: 5,000 ft.
True Vertical: 5,000 ft.

20. Elevations: ☒Estimated ☐Final
2,510
Reference Datum: ☒GR ☐MAT ☐DF ☐KB ☐RT ☐Casinghead Flange ☐Other

21. Existing and/or Proposed Casing and Cementing Program: (Use existing program first, followed by proposed program, and separate by a sufficient space to clearly distinguish the two programs).

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	COUPLING (Collars & Threads)	GRADE	SETTING DEPTH Top	SETTING DEPTH Bottom	QUANTITY OF CEMENT
17-1/2"	13-3/8"	Steel conductor	—	K-55	0	± 30 ft.	Sufficient to circulate
12-1/4"	9-5/8"	36 lb ft	Buttress	K-55	0	± 400 ft.	250 cubic ft. (100% excess)
8-3/4"	7"	23 lb ft	Buttress	K-55	0	± 2,000 ft.	614 cubic ft. (100% excess)
6-1/4"	5"	15 lb ft	Hydril FJ	K-55	± 2,000	± 5,000 ft.	None hung liner

22. Proposed Work Summary

Drilling at the Vale Geothermal Prospect will be undertaken with the objective of completing exploratory wells with diameters specifically designed to allow the wells to flow with minimum restriction, for purposes of testing and gathering of reservoir data. The target zones are expected at depths between 4,500 and 5,000 feet (maximum drilled depth would be 5,000 feet).

The wells to be drilled are exploratory wells, aimed principally to assess the geologic and reservoir characteristics of the Vale Geothermal Prospect, Oregon.

Temperatures in the order of 350°F are expected to occur at depths below 3,000 feet. The drilling plan and well design criteria are based on data obtained from geophysical and geologic data, as well as from several shallow and deep holes drilled in the same general area.

It may be necessary to use bottomhole and BOP assemblies different from those specified in order to accommodate specific rig sizes and layouts. Any such modifications, however, must be approved by the project drilling engineer.

Signed _____ Title Vice President Date 7-23-93

(This space for Federal use)

Approved by Patrick H. Geehan Title Deputy State Director for Mineral Resources Date 11-10-93

Conditions of Approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(See Instructions on reverse side)

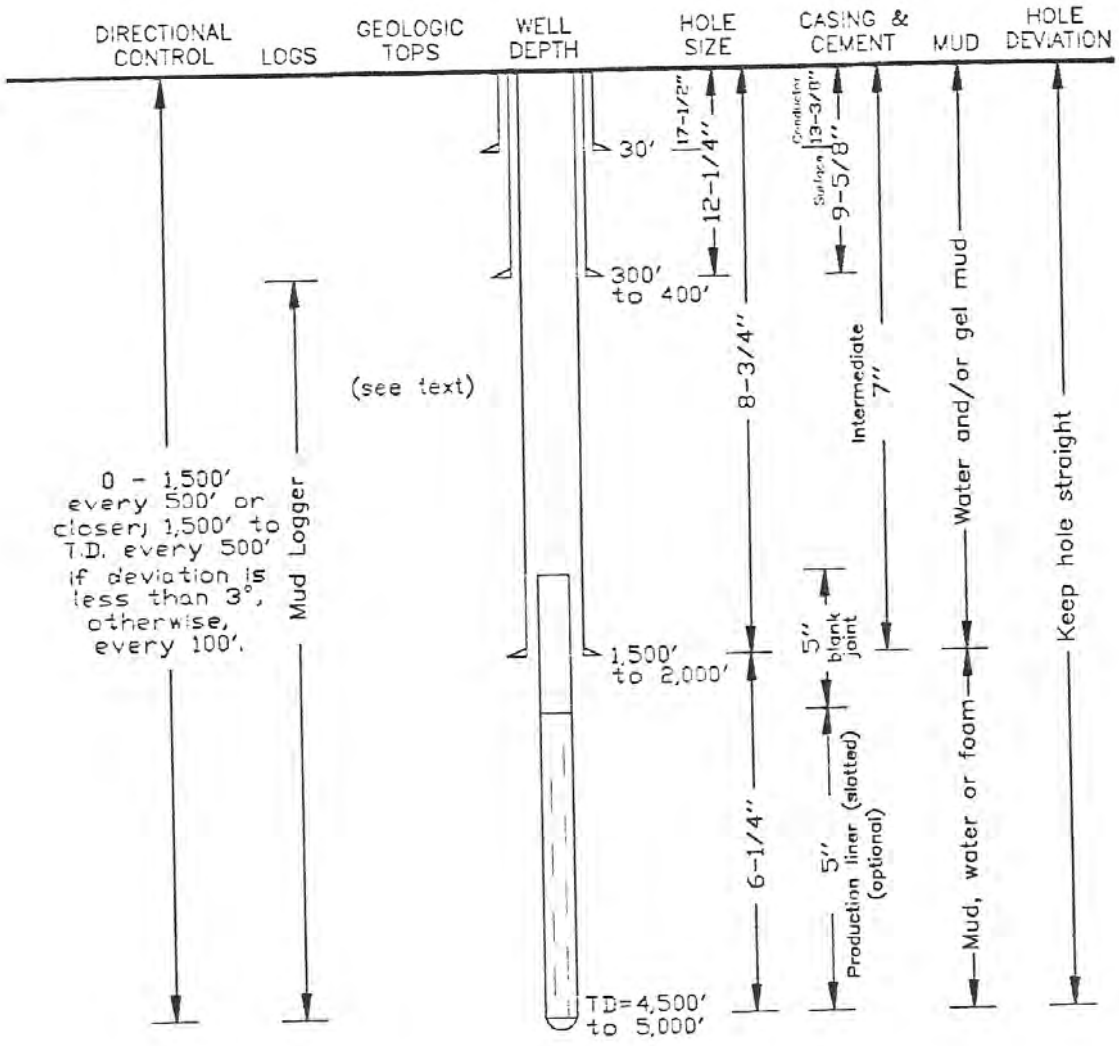
E.S. # 2-1

Figure 5. DRILLING WORKSHEET

TITLE: VALE GEOTHERMAL PROSPECT

LOCATION: Vale, Oregon

OBJECTIVE: Drill an exploratory well to depths between 4,000' and 5,000' (maximum depth)



pervasive calcite-chlorite veining, druzy quartz veins, stibnite, pyrite, and other sulfide mineral deposits, xenoliths, and possible plant fossils within the siliceous sinter.

Structurally, the pre-Cenozoic metamorphic rocks are intensely folded and faulted. Dips range from 45 to 90 degrees, while bedding strikes range from northeast to northwest. At least three systems of normal faults have been recognized in the Steamboat Hills. One set, which is still active, strikes northeast, parallel to the axis of the Hills. Another set strikes northwest, almost perpendicular to the first set. The third set of faults strikes nearly north and is prominent on the main terrace of hot springs. The Steamboat Hills hydrothermal system has been active, possibly intermittently, for approximately the last 2.5 million years, and faulting appears to be the principal structural control for fluid flow.

III-b. Vale, Oregon[3]

b.1 Introduction and Background

In April-May 1995, Sandia drilled a cost-shared exploratory slimhole with Trans-Pacific Geothermal Corporation (TGC), which owns leases in the Vale KGRA. In addition to possible discovery of a new geothermal resource, this situation offered an opportunity for direct cost comparison between an exploration slimhole drilled with "hybrid" techniques on a diamond-coring rig and a previous exploration well, which was conventionally drilled but would be considered a slimhole in that technology. TGC drilled this previous well, approximately two miles away, in early 1994, and completed it to roughly the same depth as that planned for this project.

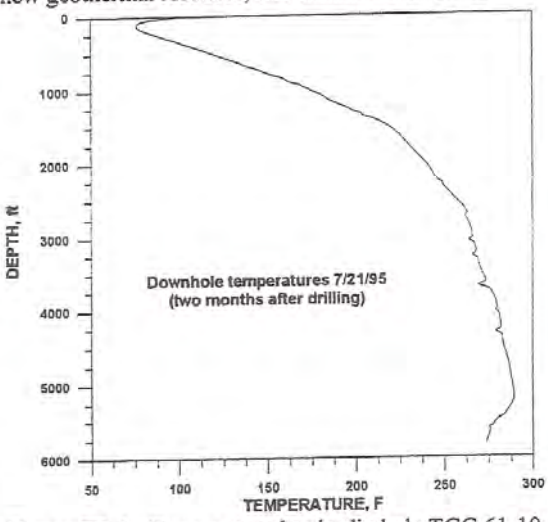


Figure III-4 - Temperature log in slimhole TGC 61-10

The exploratory slimhole (number TGC 61-10) was specifically designed to evaluate the geothermal potential at this location, and to provide additional data on drilling practices, costs, and testing in slimholes. This report describes the drilling and testing operations, gives a preliminary summary and interpretation of the data, and makes a few recommendations for future projects.

The principal objectives for this project were the following: development of slimhole drilling and testing methods, cost comparison with a recent, near-by, conventionally-drilled exploratory well, comparison of reservoir and performance data from this well with that from subsequent production-size wells, and evaluation of commercial geothermal potential at this location. Although formation temperatures were lower than expected (see

Figure III-4), and it is unlikely that commercial development will take place in this location, the drilling and testing here successfully demonstrated slimhole technology and the principal objectives have been met.

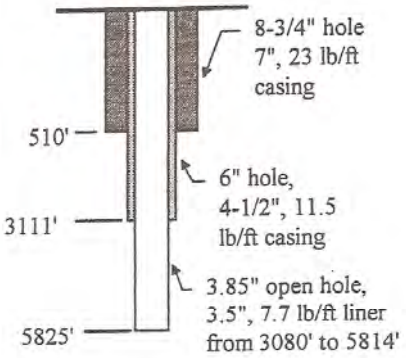


Figure III-5 - Design for slimhole TGC 61-10

b.2 Summary of Operations

To meet our testing and data collection goals for this slimhole, it was designed to satisfy the following criteria:

- Drill to TD at minimum cost consistent with necessary testing.
- Obtain a competent cement job on all casing, to allow extended production testing.
- Maintain HQ hole diameter (3.85") as deep as possible, to allow setting packers for isolation of possible production/injection zones.

The well design (Figure III-5) has 7" casing to 510' and 4-1/2" casing to 3111 feet. The drilling program used a core rig with conventional rotary tools to drill the top 3112 feet of hole and to then core the interval of interest from casing shoe to TD. This approach combined the cost savings of a slimhole drill rig, doing fast rotary drilling in the upper part of the hole, with the scientific and reservoir data obtained from core in the potential production zone.

Drilling was relatively continuous, with all testing (other than temperature logs) reserved until hole TD at 5825 feet. The following tests were then performed: wireline logs before casing; post-casing injection tests into the complete open hole section, with pressure shut-in data; bailing from the bottom 500' of the hole, which was isolated with an inflatable packer, and then measuring temperature change in that section; repeated temperature logs in the hole, following well completion with a 3-1/2" liner from 3080' to 5814'.

Since neither the tests performed just after drilling nor repeated temperature logs over the following four months indicated that this hole was in a promising geothermal resource, the hole was plugged and abandoned during

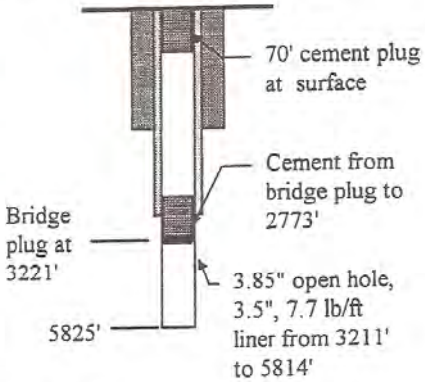


Figure III-6 - Abandonment design

[metric units][imperial units][superheated][general info]

steam tables - imperial units

Pressure	Temp	Sensible Heat (hf)	Latent Heat (hfg)	Total Heat (hg)	Volume Dry Sat
	deg F	Btu/lb	Btu/lb	Btu/lb	cu.ft/lb
absolute					
15	179	147	991	1138	51.41
10	192	160	983	1143	39.40
5	203	171	976	1147	31.80
psig					
0	212	180	971	1151	26.80
1	215	183	969	1152	25.20
3	221	190	964	1154	22.50
5	227	196	961	1156	20.10
7	232	201	958	1158	18.40
9	237	206	954	1160	17.00
11	241	210	951	1162	15.90
13	246	214	949	1163	15.10
15	250	218	946	1164	13.90
17	253	222	943	1165	13.00
19	257	226	941	1167	12.30
21	260	229	939	1168	11.70
23	264	233	937	1169	11.10
25	267	236	935	1170	10.60
27	270	239	932	1171	10.30
29	273	242	931	1172	9.70
31	275	244	929	1173	9.30
33	278	247	927	1174	8.90
35	281	250	925	1175	8.60
37	283	252	923	1175	8.25

Related pages
" Home page
" Info on SI Units
" SI Unit Descriptions
" SI Derived Units
" SI Prefixes (mega, giga)
" Imperial/UK Units
" Scientific Notation (i.e. what is 1.00E+09)
Detail pages
" Feet to metres calculator
" Metres to feet calculator
" British Thermal Units Btu
" Density of bulk materials
" Density of liquids
" Specific Gravity of water
" Density of metals
" Density of woods
" Kitchen metric
" Medical metric
" Parts per million - ppm
" Clothing metric
" Yarn metric
" Time
" cc to hp
" Paper & Envelopes
" Gross to Nett price
" Nett to Gross price
" Add on Commission
" Sheet metal swg - mm
" Wire & rod swg - awg
" Electrical wire swg - awg
" Steam tables (4 pages)
" Watts, amps, volts, ohms
" M Threads & spanners
" Self tapping screws
" M tap & pilot drill sizes

39	286	255	921	1176	7.95
41	288	257	920	1177	7.70
43	290	260	918	1177	7.44
45	292	262	916	1178	7.21
47	295	264	915	1179	6.99
49	297	266	913	1179	6.78
51	299	268	912	1180	6.60
53	300	270	910	1181	6.40
55	303	272	909	1181	6.23
60	308	278	905	1183	5.84
65	312	282	902	1184	5.50
70	316	287	898	1185	5.19
75	320	290	896	1186	4.91
80	324	295	892	1187	4.67
85	327	298	890	1188	4.45
90	331	302	887	1189	4.24
95	335	305	884	1189	4.06
100	338	309	882	1190	3.89
105	341	312	879	1191	3.74
110	344	316	876	1192	3.59
115	347	319	874	1193	3.46
120	350	322	872	1193	3.34
125	353	325	869	1194	3.23
130	356	328	867	1195	3.12
135	358	330	865	1195	3.02
140	361	333	862	1196	2.93
145	363	336	860	1196	2.84
150	366	339	858	1197	2.76
155	368	341	856	1197	2.68
160	371	344	854	1198	2.61
165	373	346	852	1198	2.54
170	375	348	850	1198	2.47
175	377	351	848	1199	2.41
180	380	353	846	1199	2.35
185	382	355	844	1199	2.29
190	384	358	842	1200	2.24
195	386	360	840	1200	2.19

200	388	362	838	1200	2.14
205	390	364	837	1201	2.09
210	392	366	835	1201	2.04
215	394	368	833	1201	2.00
220	395	370	831	1201	1.96
225	397	372	830	1202	1.92
230	399	374	828	1202	1.88
235	401	376	826	1202	1.85
245	404	380	822	1202	1.78
255	408	383	819	1203	1.71
265	411	387	816	1203	1.65
275	414	391	813	1204	1.60
285	417	394	810	1204	1.54
295	420	397	807	1204	1.49
305	423	400	804	1204	1.45
315	426	404	801	1204	1.41
325	429	407	798	1205	1.36
335	432	410	795	1205	1.33
345	434	41	792	1205	1.29
355	437	416	790	1205	1.26
365	440	419	787	1205	1.22
375	442	421	784	1205	1.19
385	445	424	781	1205	1.16
395	447	427	779	1205	1.13

last modified : 27th. October 2003

-------- Original Message --------
Subject: NAC 534A.260, Requirements for Casing
Date: Wed, 13 Aug 2008 11:54:20 -0700
From: Bill Rickard <billrickard@grgi.org>
To: Alan Coyner <aconyer@govmail.state.nv.us>
CC: John Snow <John.Snow@northamerica.enel.it>, wthgeo@aol.com, Sam Abraham <samabraham@grgi.org>

Alan,
In item #3 of the above rule, there is a requirement that "Surface casing must not be set less than 10% of the proposed TD or..."

I would like to make a formal request that this rule be changed.

I believe the intent is to make sure that there is no more than 90% of the well bore uncased at any one time. However, that is not what the rule states and I have been told that repeatedly when submitted drilling plans have not conformed to the rule.

The intent could be better served by some wording like, "at no time should the hole be advanced beyond any point where the at least 10% of the hole has been securely cased". Or, "open hole will not be advanced more than ten times the depth of surface casing".

Alternatively more detail could be included, such as, "Surface casing shall provide for control of formation fluids, for protection of shallow usable ground water and for adequate anchorage for blowout-prevention equipment and be set at least....".

Or in more detail, (which I feel is overkill) "All surface casing shall be cemented solid to the surface. A minimum of surface casing shall be set through a sufficient series of low permeability, competent lithologic units to ensure a solid anchor for blowout-prevention equipment and to protect usable ground water and surface water from contamination. A second string or intermediate casing may be required if the first string has not been cemented to at least 10% of the Total Depth.

This is both an economic and safety issue. We usually run an intermediate casing string back to surface and/or an intermediate liner cemented back into the surface casing. Running surface casing to 10% of TD is an unnecessary additional expense when an intermediate casing or liner is going to be run anyway. In some cases it is unsafe to drill to 10% of TD without having a BOPE anchor (surface casing) set and cemented at a lesser depth.

Where do I go or what should do now to have the rules changed? I plan to make the same request in Idaho and Oregon as their regulation reads like the Nevada regulation.

Thanks and Regards,

--
Bill Rickard, President
Geothermal Resource Group, Inc.

Phone: 760-341-0186
Fax: 760-341-9673
Cell: 760-413-2082
Email: billrickard@grgi.org

Geothermal Resource Group
TAPPING THE EARTH'S ENERGY

Bill Rickard, PE
P.O. Box 11898
Palm Desert, CA 92255

Bus: (760) 341-0186
Fax: (760) 341-9673
billrickard@grgi.org

November 7, 2008

Commission on Mineral Resources
Nevada Division of Minerals
Board of Commissioners

Re: NAC 534A.260, Requirements for Casing, Item # 3

Dear Sirs:

This is a formal request that the rule be changed and the following is a discussion of why the portion of the rule stating "Surface casing may not be set less than 10 percent of the proposed total depth of the well.." should be changed

First, following this rule will result in blowouts when drilling into shallow geothermal systems. A shallow BOPE anchor is advisable in a lot of geothermal exploration and development drilling to allow for safe shut in if a shallow geothermal resource is encountered. Even a relatively cool resource can present problems if circulation is lost in the zone and then it flows back. The saturation pressure at 250 F is already up to 15 psig (from the saturation curve on a steam table). So if you are drilling into any possible zone with temperatures over boiling, a surface casing should be installed before the temperature significantly exceeds boiling. For example, if surface casing is set at 250' and we use a very conservative estimated fracture gradient to be 0.5 psi/ft, then the maximum shut in pressure at the shoe is 125 psi. The corresponding saturated steam temperature is 353 deg F. Therefore it is safe to assume that the well can be safely shut in on any steam or hot water zone up to a temperature of 353 F with saturated steam at the surface. This is more than sufficient for almost any known geothermal field, even If you are near a hot spring, any other shallow heat anomaly, or if you have no idea what the temperature is.

The current rule came from an old rule of thumb for oil & gas well surface casing. When drilling geothermal wells we almost invariably have 10% of the hole cased at any given time. Surface casing is set to stabilize the unconsolidated formation and / or to provide a BOPE anchor (so well flow can be diverted or allow for well shut in and positive well control). In almost all geothermal wells we run an intermediate casing (this was not a standard practice in most oil and gas wells and still isn't wherever they can get away with it). The intermediate casing then becomes our BOPE anchor and is usually a lot more that 10% of TD.

I feel the blowout risk alone is enough to get the rule changed to something like, "At no time should the hole be advanced beyond any point where the at least 10% of the hole has been securely cased". Or, "Open hole will not be advanced more than ten times the depth of last cemented casing".

The well completion issues are just as compelling. Sometimes it is not feasible to set surface casing at depth due to unstable shallow formations. And casing must be run so that drilling may continue without the hazard of well bore collapse and subsequent loss of the well. This is one very good reason for surface ***and*** intermediate casing.

I believe the intent is to make sure that there is no more than 90% of the well bore uncased at any one time. However, that is not what the rule states. Another alternative wording could be "Surface casing shall provide for control of formation fluids, for protection of shallow usable ground water and for adequate anchorage for blowout-prevention equipment and be set at least....". If changing the rule is not appropriate, possible or is very unrealistic at this point, a formal directive from the Board to the Division of Minerals stating that the intent rather the letter of this rule needs to be followed would clear the matter up and minimize a real permitting hurdle. It will also make my job easier as I am petitioning Idaho, Oregon and the BLM for a similar change.

Thanks for your time and consideration,

Wm. M. Rickard, PE

-------- Original Message --------
Subject: NAC 534A.260, Requirements for Casing
Date: Wed, 13 Aug 2008 11:54:20 -0700
From: Bill Rickard <billrickard@grgi.org>
To: Alan Coyner <aconyer@govmail.state.nv.us>
CC: John Snow <John.Snow@northamerica.enel.it>, wthgeo@aol.com, Sam Abraham <samabraham@grgi.org>

Alan,
In item #3 of the above rule, there is a requirement that "Surface casing must not be set less than 10% of the proposed TD or..."

I would like to make a formal request that this rule be changed.

I believe the intent is to make sure that there is no more than 90% of the well bore uncased at any one time. However, that is not what the rule states and I have been told that repeatedly when submitted drilling plans have not conformed to the rule.

The intent could be better served by some wording like, "at no time should the hole be advanced beyond any point where the at least 10% of the hole has been securely cased". Or, "open hole will not be advanced more than ten times the depth of surface casing".

Alternatively more detail could be included, such as, "Surface casing shall provide for control of formation fluids, for protection of shallow usable ground water and for adequate anchorage for blowout-prevention equipment and be set at least....".

Or in more detail, (which I feel is overkill) "All surface casing shall be cemented solid to the surface. A minimum of surface casing shall be set through a sufficient series of low permeability, competent lithologic units to ensure a solid anchor for blowout-prevention equipment and to protect usable ground water and surface water from contamination. A second string or intermediate casing may be required if the first string has not been cemented to at least 10% of the Total Depth.

This is both an economic and safety issue. We usually run an intermediate casing string back to surface and/or an intermediate liner cemented back into the surface casing. Running surface casing to 10% of TD is an unnecessary additional expense when an intermediate casing or liner is going to be run anyway. In some cases it is unsafe to drill to 10% of TD without having a BOPE anchor (surface casing) set and cemented at a lesser depth.

Where do I go or what should do now to have the rules changed? I plan to make the same request in Idaho and Oregon as their regulation reads like the Nevada regulation.

Thanks and Regards,

--
Bill Rickard, President
Geothermal Resource Group, Inc.

Phone: 760-341-0186
Fax: 760-341-9673
Cell: 760-413-2082
Email: billrickard@grgi.org