GTHT - 2

GENERAL CORRESPONDENCE

YEAR(S):

Los Alamos National Laboratory
Geophysics Group
MS D443
Los Alamos, NM 87545

Telephone: (505) 667-4318
FAX: (505) 667-8487

EES-11

EARTH & ENVIRONMENTAL SCIENCE

DATE: 4/17/02

NUMBER OF PAGES 3
(including cover)

FROM: Jim Thomson

FAX TRANSMISSION

TO:	FAX:
Roy Johnson - NMOCD	476-3462

Message

Casing schematics follow.

Jim

Jim Thompson
667-1924
needs to talk to you and also wants your fax form G-112
fax no: (505) 667-8487

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

Administrative Order No. GIW-[redacted] 16

THE APPLICATION OF LOS ALAMOS NATIONAL LABORATORIES FOR ONE GEOTHERMAL INJECTION WELL, SANDOVAL COUNTY, NEW MEXICO.

ADMINISTRATIVE ORDER OF THE OIL CONSERVATION DIVISION

Under the provisions of Rule 503 of the New Mexico Oil Conservation Division Rules and Regulations, Geothermal Resources, Los Alamos National Laboratories made application on July 8, 1991 for authority to complete for injection purposes into a geothermal reservoir its Fenton Hill Hot Dry Rock Geothermal Energy Test Site Well No. EE-~~3~~2A located in Unit G, Section 13, Township 19 North, Range 2 East, NMPM, Sandoval County, New Mexico.

THE DIRECTOR FINDS THAT:

(1) The application has been duly filed pursuant to the provisions of Rule 503 of the Geothermal Resources Rules and Regulations.

(2) There are no other owners of geothermal leases within a one-half mile radius of the proposed injection well.

(3) All the requirements of Rule 503 have been complied with.

(4) The proposed injection well is in the interest of conservation and will prevent waste and protect correlative rights, and that the subject well is cased and cemented and shall be equipped in such a manner as to prevent danger to natural resources including geothermal resources, useable underground water supplies and surface resources.

(5) The proposed geothermal injection well should be approved.

IT IS THEREFORE ORDERED THAT:

(1) The applicant herein, Los Alamos National Laboratory, is hereby authorized to complete its Fenton Hill Hot Dry Rock Geothermal Energy Test Site Well No. EE-~~3~~2A, located in Unit G, Section 13, Township 19 North, Range 2 East, NMPM, Sandoval County, New Mexico, in such a manner as to permit the injection of fluids into the altered PreCambrian Phase II reservoir through the open-hole interval located from ~~11,436~~ 10,770 feet to ~~12,107~~ 12020 feet.

(2) Injection shall be through the ~~4-1/2" and 5-1/2" tubing and~~ 7" casing surface injection pressure shall not exceed ~~4500~~ 3000 psi.

(3) Monthly injection for the above-described well shall be filed with the Division in accordance with Rule 210 of the Geothermal Resources Rules and Regulations.

(4) Surveillance of the above-described well shall be conducted as required by Rule 505 of the Geothermal Resources Rules and Regulations to ensure that all injected fluids are being confined to the intended zone of injection.

IT IS FURTHER ORDERED THAT:

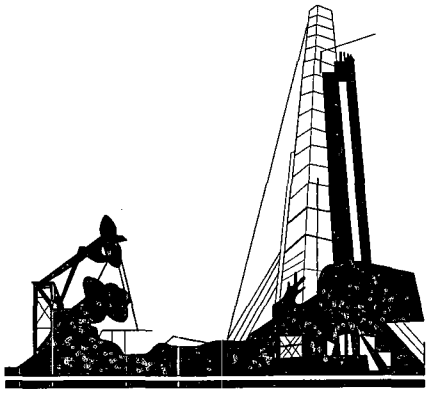
Jurisdiction of this cause is hereby retained by the Division for such further order or orders as may been deemed necessary or convenient for the prevention of waste and/or the protection of correlative rights, and for the protection of natural resources and the environment. Upon failure of the applicant to comply with any requirement of this order, the Division may terminate the authority hereby granted.

APPROVED at Santa Fe, New Mexico on this 2nd day of December, 1991.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LeMAY
Director

WJL/REJ/ag



TRANSMITTAL COVER SHEET

OIL CONSERVATION DIVISION
1220 S. ST. FRANCIS DRIVE
SANTA FE, NM 87505
(505) 476-3440
(505)476-3462 (Fax)
-3471 ENGR. FAX

PLEASE DELIVER THIS FAX:

TO: BOB BEERS

FROM: ROY JOHNSON

DATE: 7/19/02

PAGES: 3

SUBJECT: _____

IF YOU HAVE TROUBLE RECEIVING THIS FAX, PLEASE CALL THE OFFICE NUMBER ABOVE.

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: July 10, 2002
Refer to: RRES-WQH: 02-251

Mr. Roy E. Johnson
Senior Petroleum Geologist
Supervisor District IV
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, SUNDRY NOTICE FOR PLUGGING AND ABANDONMENT OF FENTON HILL GEOTHERMAL WELL, EE-2A

Dear Mr. Johnson:

As required under New Mexico Oil Conservation Division Rule 202, Form C-103, *Sundry Notices and Reports on Wells,* must be filed with your agency prior to the commencement of plugging operations. Enclosed are the original and two (2) copies of Form C-103 for the plugging and abandonment of Fenton Hill geothermal well EE-2A, the last remaining geothermal well at the Fenton Hill Hot Dry Rock (HDR) Geothermal Facility. Included with Form C-103 is a copy of Los Alamos National Laboratory's procedures for the plugging and abandonment of EE-2A.

Questions regarding the enclosed Sundry Notice and attachments should be addressed to Jim Thomson of the Laboratory's Geophysics Group (EES-11) at (505) 667-1924.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/am

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Printed on Recycled Paper

Enclosures: a/s

Cy: W. Price, NM OCD, Santa Fe, New Mexico, w/enc.
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
P. Weber, EES-DO, w/enc., MS D446
J. Hansen, EES-DO, w/enc., MS D446
M. Fehler, EES-11, w/enc., MS D443
J. Thomson, EES-11, w/enc., MS D443
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J978
S. Rae, RRES-WQH, w/enc., MS K497
D. Rogers, RRES-WQH, w/enc., MS K497
D. McInroy, RRES-R, w/enc., MS M992
W. Neff, RRES-R, w/enc., MS M992
T. Rust, RRES-R, w/enc., MS M992
P. Wardwell, LC, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised March 25, 1999

WELL API NO.
EE-2A (non-API)

5. Indicate Type of Lease
STATE ☐ FEE ☐

6. State Oil & Gas Lease No.
N/A

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name:
Fenton Hill Hot Dry Rock Geothermal Project

1. Type of Well:
Oil Well ☐ Gas Well ☐ Other – Experimental geothermal production well

2. Name of Operator
Los Alamos National Laboratory

8. Well No. – EE-2A

3. Address of Operator
P.O.Box 1663, Los Alamos, NM 87545

9. Pool name or Wildcat
N/A

10. Well Location

Unit Letter_____: well is located 1609 feet from the East line and 1405 feet from the North line

Section 13 Township 19N Range 2E NMPM Sandoval County

10. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
KB

11. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☒	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPLETION	☐	CASING TEST AND CEMENT JOB	☐		
OTHER:	☐			OTHER:			☐

12. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompilation.

Please find detailed procedure and well diagrams attached. It is currently estimated that the abandonment will occur in September, 2002. NMOCD will be notified by LANL of the exact time that the abandonment work will commence at least 48 hours in advance.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Paul G. Weber TITLE Division Leader DATE 9 July 02

Type or print name PAUL G. WEBER Telephone No. 505-667-5776

(This space for State use)

APPPROVED BY Roy E. Johnson TITLE DISTRICT SUPERVISOR DATE 7-19-02

Conditions of approval, if any:

PLUGGING AND ABANDONMENT PROCEDURES FOR GEOTHERMAL WELL EE-2A

Fenton Hill Hot Dry Rock Geothermal Project
Los Alamos National Laboratory

July 1, 2002

Geophysics Group – EES-11
Earth and Environmental Sciences Division

Water Quality and Hydrology Group – RRES-WQH
Risk Reduction and Environmental Stewardship Division

REGULATORY APPROVAL:

Mr. Roy Johnson, N.M. Oil Conservation Division Date

EXTERNAL REVIEWERS:

Mr. Fred Oneyear, U.S. Bureau of Land Management
Mr. John Peterson, U.S. Forest Service, Jemez Ranger District
Ms. Linda Gordan, N.M. Office of the State Engineer

Procedures for abandonment of HDR Well EE-2A
July 1, 2002

Current well configuration: EE-2 was drilled and completed in 1979-80. The original well was damaged following a wellhead failure that ended a massive hydraulic fracturing treatment. Following an extensive well reentry, repair, and plug back procedure, the well was sidetracked and redrilled in 1987-88. The well was completed as a geothermal production well with 7" casing and the annulus cemented to surface. 7-inch OD, 35 lb./ft, S-90, NSCC premium (internal flush) joint threaded and coupled casing was installed from just above the production interval at 10,770 ft to 9,500 ft. A 7-inch OD, 32 lb./ft, C-95, NSCC T&C tie-back string was then installed from 9,500 ft to the surface and cemented-in. The production interval, 10,770' to 12,360' total depth (TD) is uncased open hole. Casing schematics can be found in Attachments 1 and 2. Attachment 3 contains a wellhead diagram. Attachment 4 is a well trajectory survey for well EE-2A.

Although the well was used for geothermal production intermittently for several years, no steam flashing has ever occurred in the wellbore and it is unlikely that any significant scale deposits are present on the inner casing wall.

P&A procedures:

The minimum acceptable coiled tubing diameter for the required operations is 1-1/2" OD.

1) A bridge plug will be set in the 7" casing at 10,700 ft
   a) A casing scraper shall be run to the bridge plug setting depth on wireline or coiled tubing prior to running the bridge plug.
   b) The plug will be capable of maintaining a positive seal against a differential pressure of at least 5,000 psi at a temperature of 430° F
   c) The bridge plug may be deployed on wireline or coiled tubing.
   d) The bridge plug shall be tagged with 1000 lb. set down force using the end of the (cementing shoe on the) coiled tubing prior to pumping the first cement plug to assure proper set and depth.
   e) The initial cement plug shall be tagged to confirm proper location prior to proceeding with mud displacement. This is the only cement plug that will be tagged.
2) A plugging mud shall be displaced into the well from the bottom plug to the surface. The plugging mud shall:
   a) Have sufficient viscosity and density to prevent movement of the cement plugs
   b) Be compatible with the cement slurries proposed.
   c) Remain in the hole between the cement plugs
   d) Contain a sufficient quantity of corrosion inhibitor to provide long-term protection from casing degradation.
3) There is a remote possibility that Hydrogen Sulfide gas may be present in the fluid displaced from the well. Standard industry precautions, ie. H2S monitoring equipment, shall be present and operational during fluid displacement.

4) Every effort shall be made by the vendor to minimize the amount of waste water, mud and materials produced by the operations.
5) Cement plugs may be placed sequentially up the hole. It will not be necessary to tag any cement plugs other than the bottom plug.
6) Required cement plug placement depths, as specified by NMOCD, shall be located in the intervals shown on Table 1. The temperature at the bottom of each interval is included. Cement formulations shall be designed accordingly.
7) After Plug #6 is placed, wash the top of the plug out to 5-ft below the bottom of the wellhead and rig down BOPE and the CTU.
8) Demobilize equipment.

TABLE 1 – NMOCD Plugging Intervals and Estimated Temperature

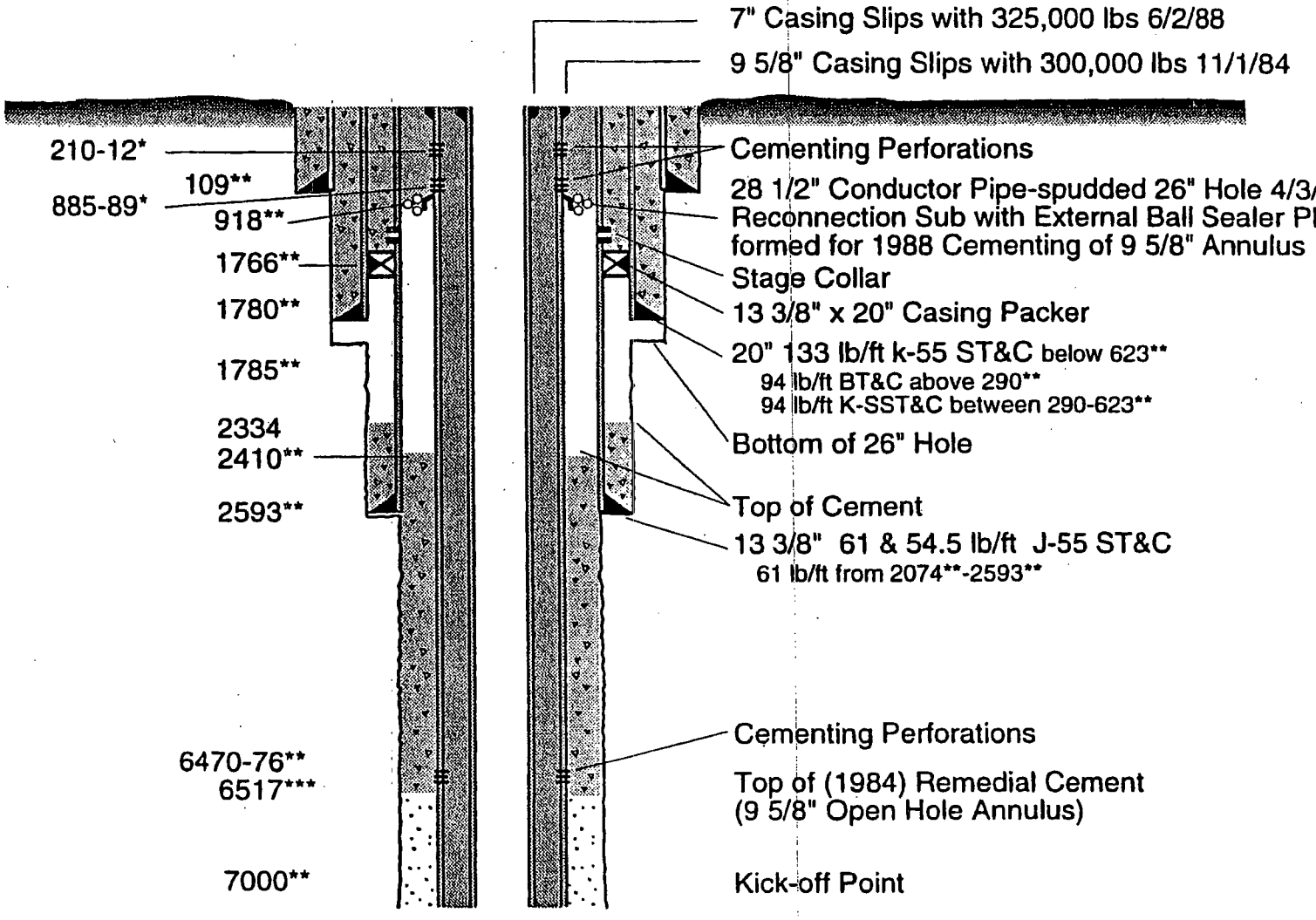
Plug #	Interval (ft)	Length (linear feet)	Temp.°F *
1	10,700 – 10,500	200	423
2	9,600 – 9,400	200	386
3	6,550 – 6,450	100	285
4	3,550 – 3,450	100	212
5	2,693 – 2,493	200	169
6	75 – surface**	75	53
*	Estimated temperature of the hole prior to circulation.		
**	Circulate out cement to 5-ft below the well head after placing cement.		

ATTACHMENT 1

Present Configuration of EE 2-A

As completed June 17, 1988

(Drawing revised 7/15/91, all depths in ft)



* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A

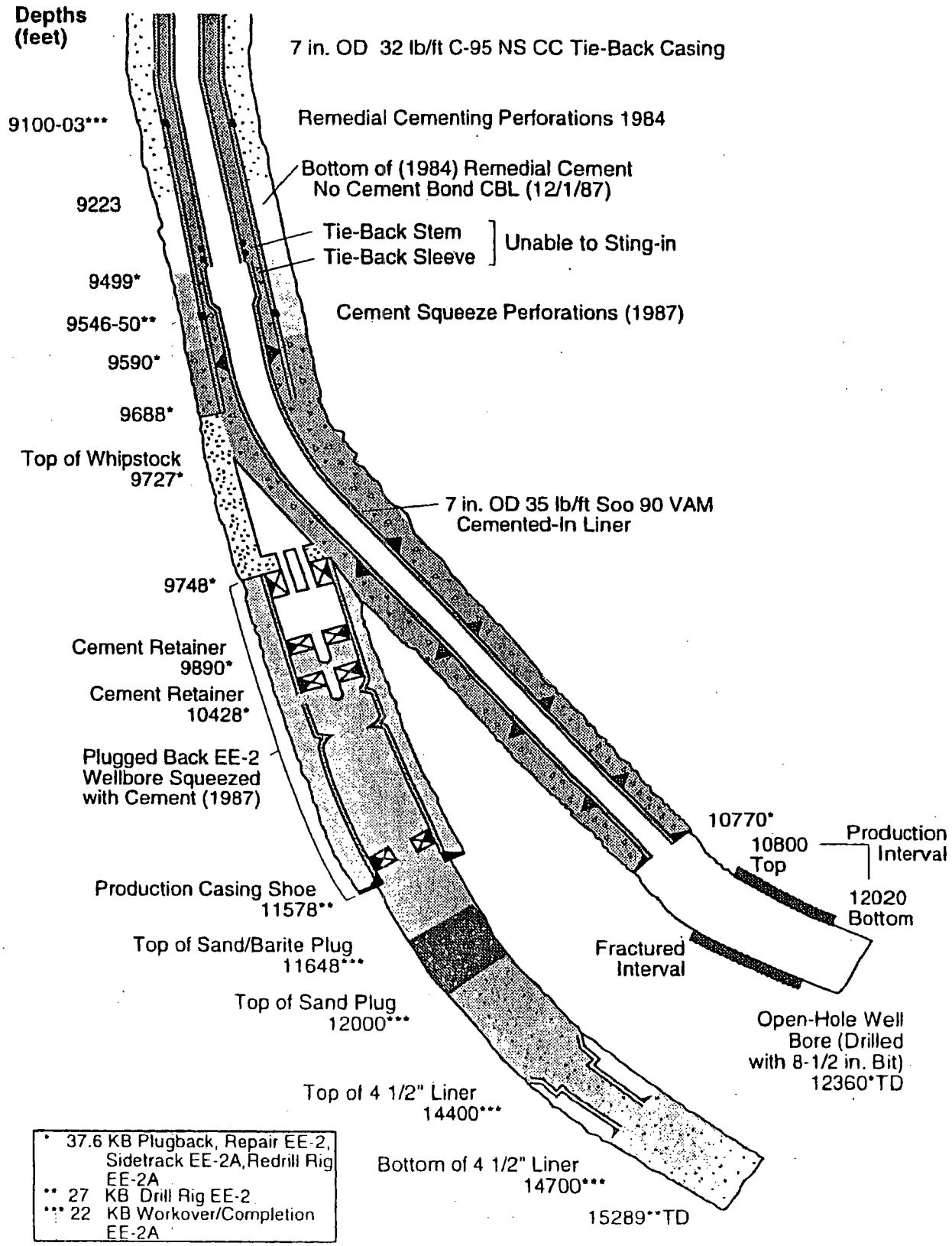
** 27 KB Drill Rig EE-2

*** 22 KB Workover/Completion EE-2A

ATTACHMENT 2

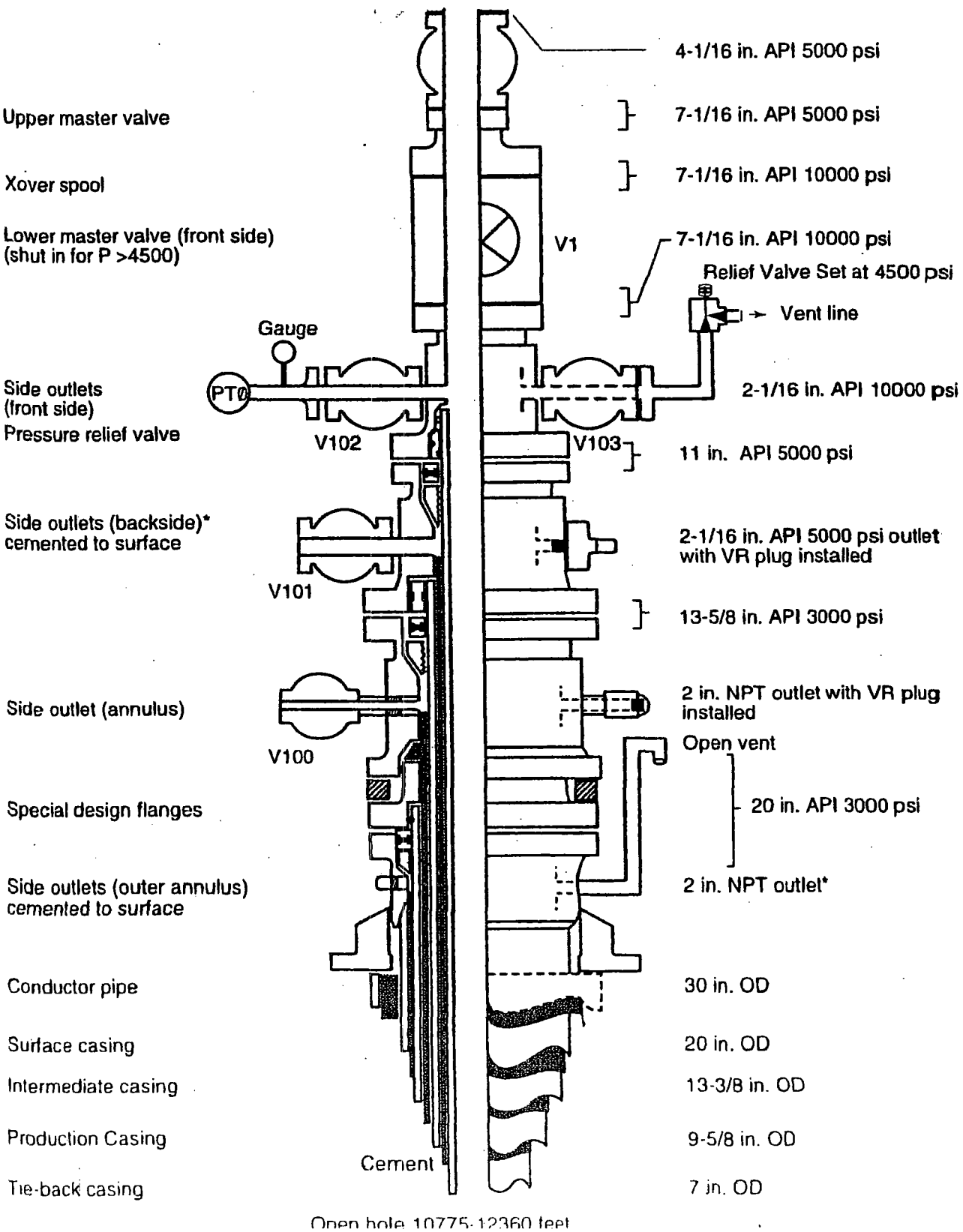
Present Configuration of EE-2A. Completed June 17, 1988

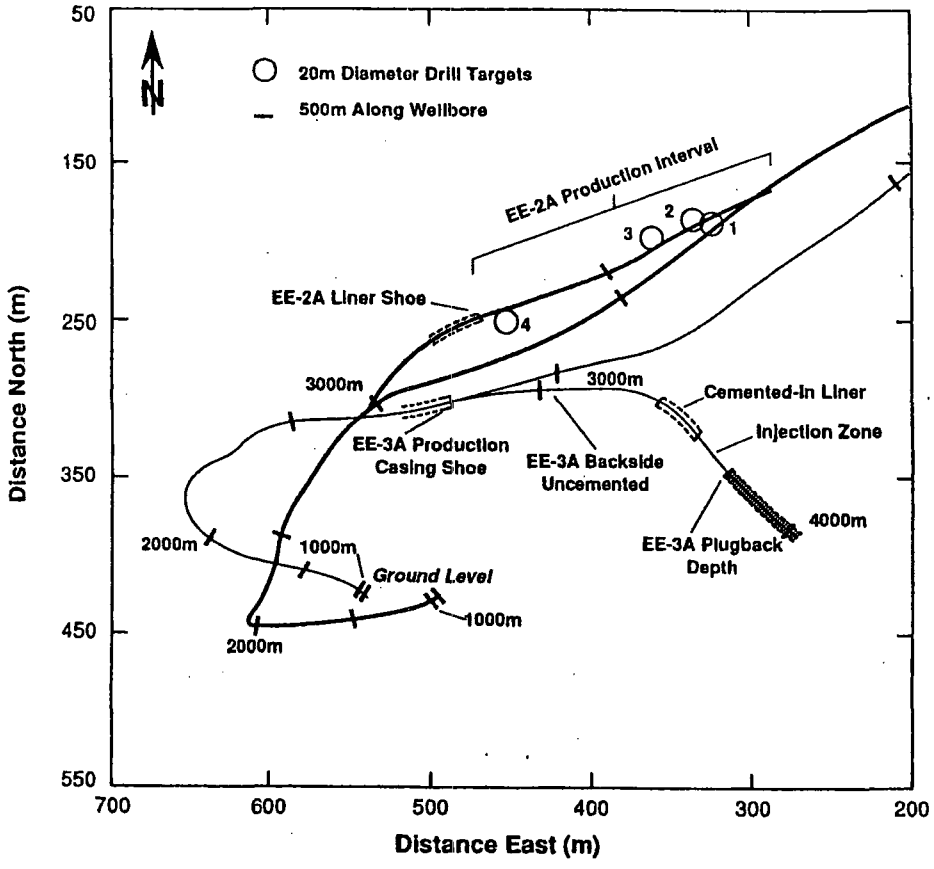
(Drawing revised 7/15/91, all depths in ft)

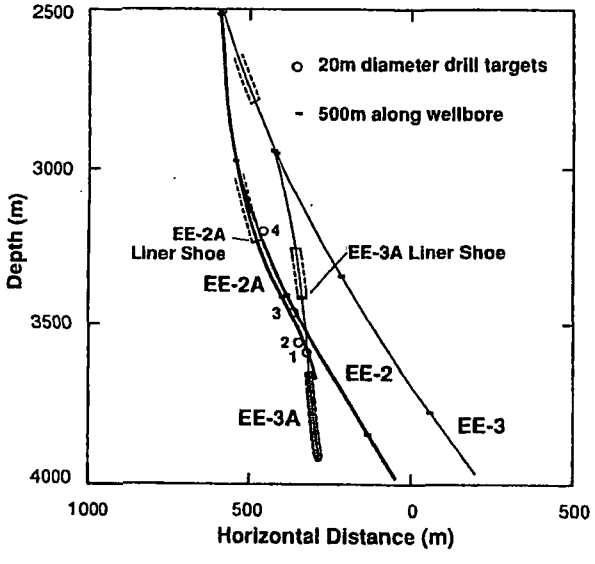


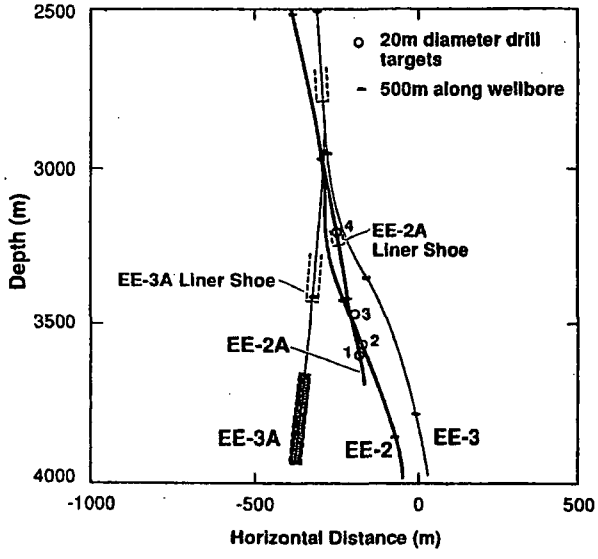
ATTACHMENT 3

EE-2A Production Wellhead









EE-2A targets and drilled trajectory.

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
BETTY RIVERA
Cabinet Secretary

Administrative Order No. GIW-16

Lori Wrotenbery
Director
Oil Conservation Division

THE APPLICATION OF LOS ALAMOS NATIONAL LABORATORIES FOR ONE GEOTHERMAL INJECTION WELL, SANDOVAL COUNTY, NEW MEXICO

ADMINISTRATIVE ORDER OF THE OIL CONSERVATION DIVISION

Under the provisions of Rule 503 of the New Mexico Oil Conservation Division Rules and Regulations, Geothermal Resources, Los Alamos National Laboratories made application on July 10, 2002 for authority to complete for injection purposes into a geothermal reservoir its Fenton Hill Hot Dry Rock Geothermal Energy Test Site Well No. EE-2A located in Unit G, Section 13, Township 19 North, Range 2 East, NMPM, Sandoval County, New Mexico.

THE DIRECTOR FINDS THAT:

(1) The application has been duly filed pursuant to the provisions of Rule 503 of the Geothermal Resources Rules and Regulations.

(2) There are no other owners of geothermal leases within a one-half mile radius of the proposed injection well.

(3) All the requirements of Rule 503 have been complied with.

(4) The proposed injection well is in the interest of conservation and will prevent waste and protect correlative rights and that the subject well is cased and cemented and shall be equipped in such a manner as to prevent danger to natural resources including geothermal resources, useable underground water supplies and surface resources.

(5) The proposed geothermal injection well should be approved.

IT IS THEREFORE ORDERED THAT:

(1) The applicant herein, Los Alamos National Laboratory, is hereby authorized to complete its Fenton Hill Hot Dry Rock Geothermal Energy Test Site Well No. EE-2A, located in Unit G, Section 13, Township 19 North, Range 2 East, NMPM, Sandoval County, New Mexico, in such a manner as to permit the injection of fluids into the altered PreCambrian Phase II reservoir through the open-hole interval located from 10,770 feet to 12,020 feet.

(2) Injection shall be through 7" casing and surface injection pressure shall not exceed 3000 psi.

(3) Monthly injection for the above-described well shall be filed with the Division in accordance with Rule 210 of the Geothermal Resources Rules and Regulations.

(4) Surveillance of the above-described well shall be conducted as required by Rule 505 of the Geothermal Rules and Regulations to ensure that all injected fluids are being confined to the intended zone of injection.

IT IS FURTHER ORDERED THAT:

Jurisdiction of this cause is hereby retained by the Division for such further order or orders as may been deemed necessary or convenient for the prevention of waste and/or the protection of correlative rights, and for the protection of natural resources and the environment. Upon failure of the applicant to comply with any requirement of this order, the Division may terminate the authority hereby granted.

APPROVED AT Santa Fe, New Mexico on this 10th day of July, 2002.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

Lori Wrotenbery REJ

LORI WROTENBERY
Director

LW/REJ

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: June 24, 2002
Refer to: RRES-WQH: 02-249

Mr. Roy E. Johnson
Senior Petroleum Geologist
District IV Supervisor
New Mexico Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

SUBJECT: INJECTION PERMIT APPLICATION FOR LOS ALAMOS NATIONAL LABORATORY'S FENTON HILL GEOTHERMAL WELL EE-2A

Dear Mr. Johnson:

As required by New Mexico Oil Conservation Division Rule 701, enclosed is Form G-112, Application to Place Well on Injection, for Los Alamos National Laboratory's Fenton Hill Geothermal Well EE-2A. The proposed use of this injection permit is for the permanent disposal of approximately 80,000 gallons geothermal fluid currently being stored in the lined 1 million-gallon service pond at the Fenton Hill site. Chemical analysis of the geothermal fluid has been enclosed. The Laboratory proposes to inject into well EE-2A with permanent disposal in the Phase II Hot Dry Rock (HDR) geothermal reservoir. Following injection, EE-2A will be plugged and abandoned in accordance with NM OCD regulations.

The Phase II HDR reservoir was artificially created by hydraulic fracturing and is located in granite at a depth of approximately 11,000 feet. An impermeable barrier of approximately 8,500 feet exists between the reservoir and the formation top at 2,500 feet. The proposed injection well, EE-2A, was originally completed as a production well with 7-inch casing from surface to just above the injection interval. The 7-inch string is cemented from the casing shoe to surface. All other geothermal production and injection wells in the area have been abandoned.

Questions regarding the enclosed application and enclosures should be addressed to Jim Thomson of the Laboratory's Geophysics Group (EES-11) at (505) 667-1924.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

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Printed on Recycled Paper

BB/tml

Enclosures: a/s

Cy: W. Price, NM OCD, Santa Fe, New Mexico, w/enc.
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
P. Weber, EES-DO, w/enc., MS D446
J. Hansen, EES-DO, w/enc., MS D446
M. Fehler, EES-11, w/enc., MS D443
J. Thomson, EES-11, w/enc., MS D443
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J978
S. Rae, RRES-WQH, w/enc., MS K497
D. Rogers, RRES-WQH, w/enc., MS K497
D. McInroy, RRES-R, w/enc., MS M992
W. Neff, RRES-R, w/enc., MS M992
T. Rust, RRES-R, w/enc., MS M992
P. Wardwell, LC, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

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STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

Oil Conservation Div.
2040 Pacheco St.
Santa Fe, NM 87505

Form G-112
Adopted 10-1-74
Revised 10-1-78

APPLICATION TO PLACE WELL ON INJECTION-GEOTHERMAL RESOURCES AREA

Operator		Address	
Los Alamos National Laboratory		P.O.Box 1663, Los Alamos, NM 87545	
Lease Name	**Well No.**	**Field**	**County**
Federal Interagency Agreement	EE-2A	Fenton Hill	Sandoval

Location: Unit Letter _____ ; Well is Located 1609 Feet From The East Line And 1405 Feet From The North Line, Section 13 Township 19N Range 2E NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
Conductor Pipe	28-1/2"	109'		Surface	Visual
	20"	1,780'		~~Surface~~	~~Visual~~
Surface Casing	13-3/8"	2,593'		2,334'	CBL
	9-5/8"	9,688'		2,410'	CBL
Long String	7"	10,700'		Surface	CBL
Tubing			Name, Model and Depth of Tubing Packer		

Name of Proposed Injection Formation	Top of Formation	Bottom of Formation
Granite	2,500'	Unknown

Is Injection Through Tubing, Casing, or Annulus?	Perforations or Open Hole?	Proposed Interval(s) of Injection
7" casing	open hole	10,800' - 12,020

Is This a New Well Drilled For Injection?	If Answer is No, For What Purpose was Well Originally Drilled?	Has Well Ever Been Perforated in Any Zone Other Than the Proposed Injection Zone?
No	Geothermal experimental production	No

List All Such Perforated Intervals and Sacks of Cement used to Seal Off or Squeeze Each

Depth of Bottom of Deepest Fresh Water Zone in This Area	Is This Injection for Purpose of Pressure Maintenance or Water Disposal? (See Rules 501 and 502)
400'	Water disposal

Anticipated Daily Injection Volume	Minimum	Maximum	Open or Closed Type System	Is Injection to be by Gravity or Pressure?	Approx. Pressure (psi)
	75,000 gal	54,000 gal 81,000 gal	open	pressure	3,000

Answer Yes or No Whether the Following Waters are Mineralized to such a Degree as to be Unfit for Domestic, Stock, Irrigation, or Other General Use—	Water to be Injected	Natural Water in Injection Zone	Are Water Analyses Attached?
	yes	N/A	yes

Name and Address of Surface Owner (or Lessee, if State or Federal Land)
U.S. Forest Service

List Names and Addresses of all Operators Within One-Half (½) Mile of This Injection Well
None

Have Copies of this Application Been Sent to Each Operator Within One-Half Mile of this Well? Yes ☐ No ☐ N/A

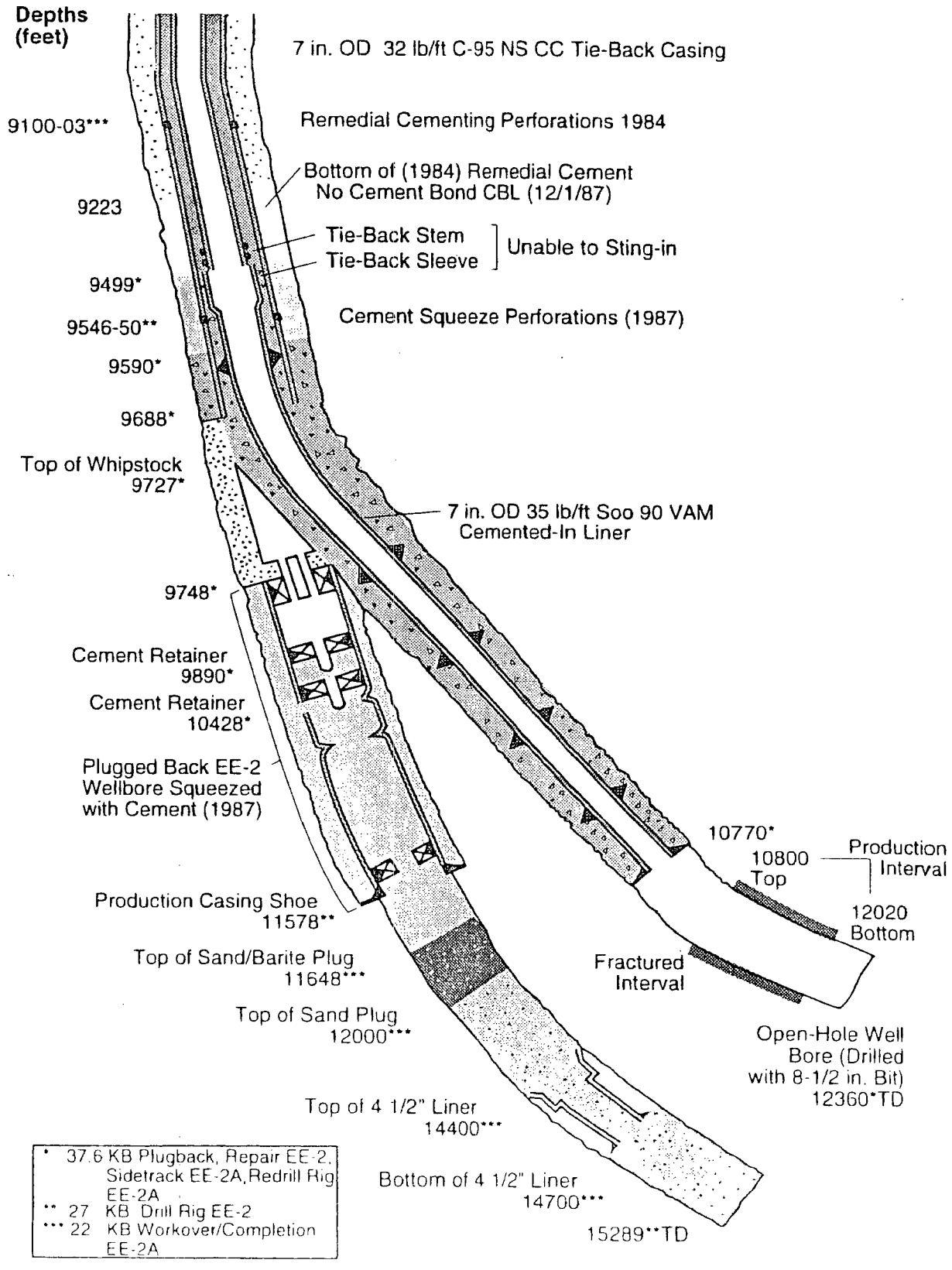
Are the Following Items Attached to this Application (see Rule 503)? Plat of Area Yes ☐ No ☒ | Electrical Log Yes ☐ No ☒ | Diagrammatic Sketch of Well Yes ☒ No ☐

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

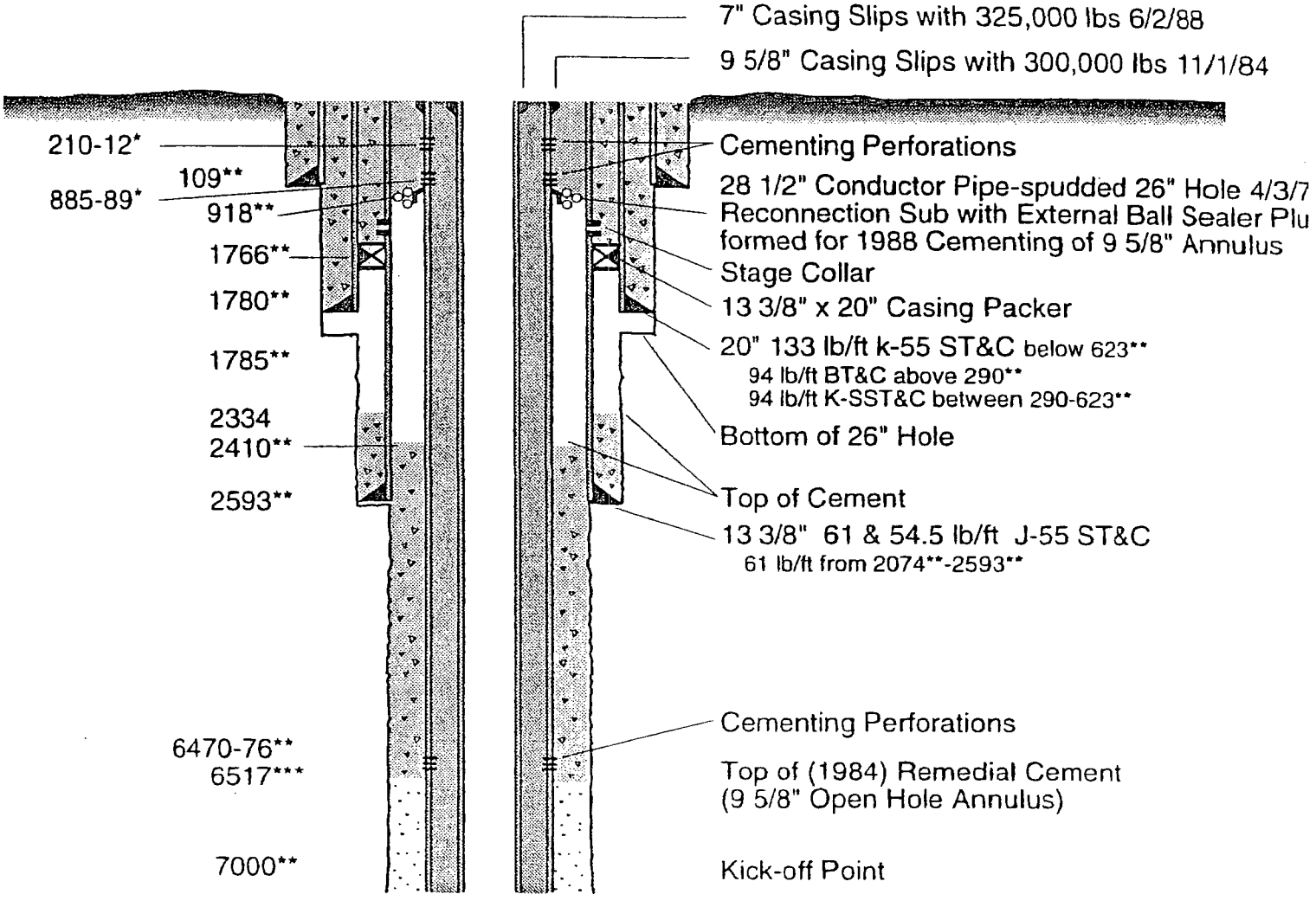
D. Craig Pearson — (Signature) | Acting Division Leader — (Title) | 6/24/02 — (Date)

NOTE: Should waivers from all operators within one-half mile of the proposed injection well not accompany this application, the New Mexico Oil Conservation Division will hold the application for a period of 20 days from the date of receipt by the Division's Santa Fe office. If at the end of the 20-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 503.

Present Configuration of EE-2A. Completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



Present Configuration of EE 2-A
As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

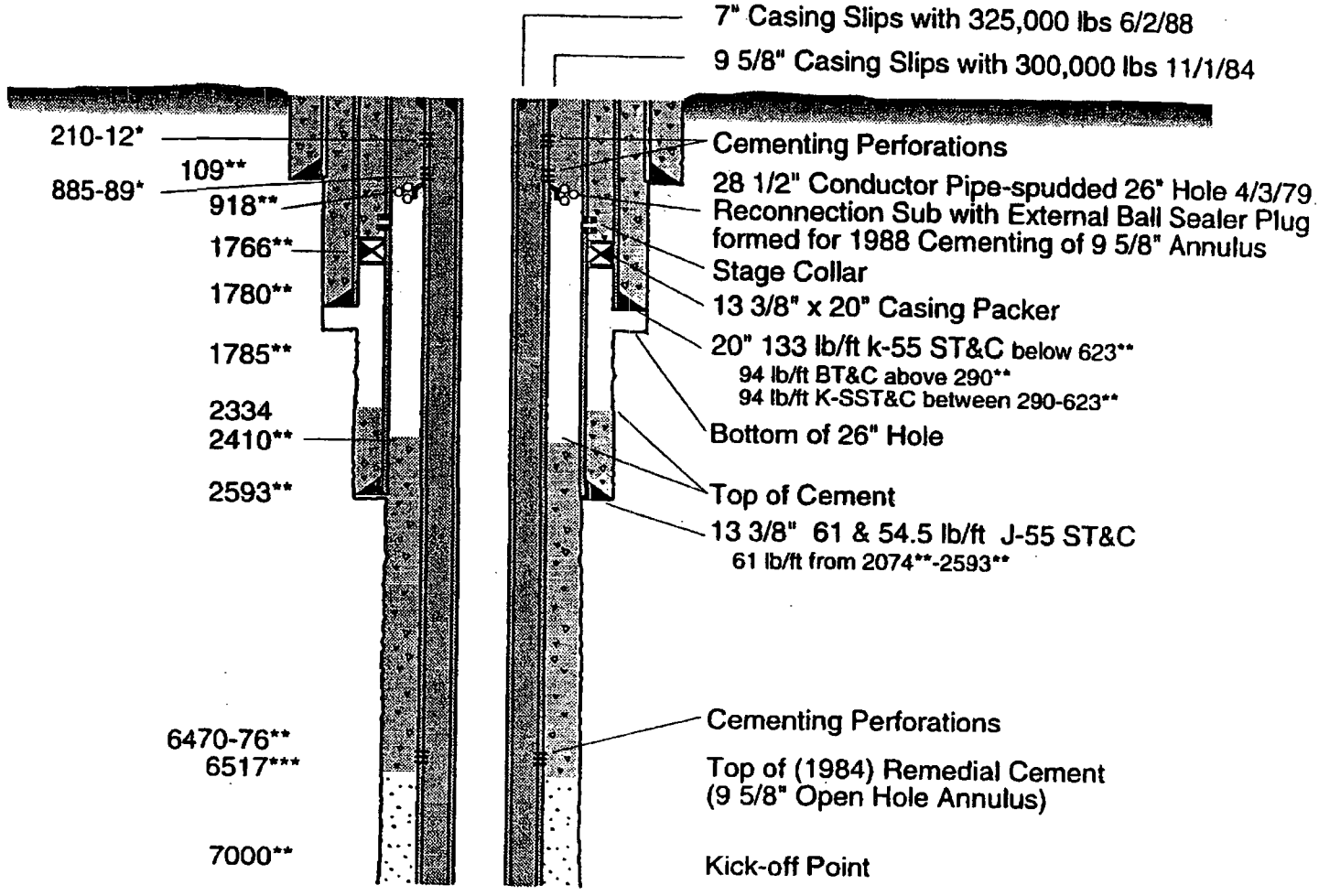
1 Million Gallon Pond Water, Fenton Hill

Sample ID #	Sample Date			Sample Type
1MGP 041802	04/18/02			totals, nonfiltered
Analyte	**Result**	**Units**	**Std.D. (+/-)**	**TCLP Concentration Limits (40CFR 261)**
Ag	<0.01	ppm		5.0
Al	<0.02	ppm		
As	3.56	ppm	0.05	5.0
B	22.2	ppm	0.1	
Ba	1.30	ppm	0.01	100.0
Be	<0.002	ppm		
Cd	<0.01	ppm		1.0
Cl	7612	ppm		
Co	<0.01	ppm		
Cr	<0.01	ppm		5.0
Cu	<0.01	ppm		
F	1.26	ppm		
Fe	0.03	ppm	0.01	
Hg	0.0003	ppm		0.2
Li	10.7	ppm	0.1	
Mg	134	ppm	1	
Mn	0.039	ppm	0.001	
Mo	0.02	ppm	0.01	
Na	3220	ppm	5	
Ni	<0.01	ppm		
Pb	<0.01	ppm		5.0
pH	7.91	su		
Se	<0.0002	ppm		1.0
Sb	<0.1	ppm		
SO4	179	ppm		
Sr	5.08	ppm	0.01	
Ti	<0.002	ppm		
V	<0.002	ppm		
Zn	<0.01	ppm		

ATTACHMENT 1

Present Configuration of EE 2-A

As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



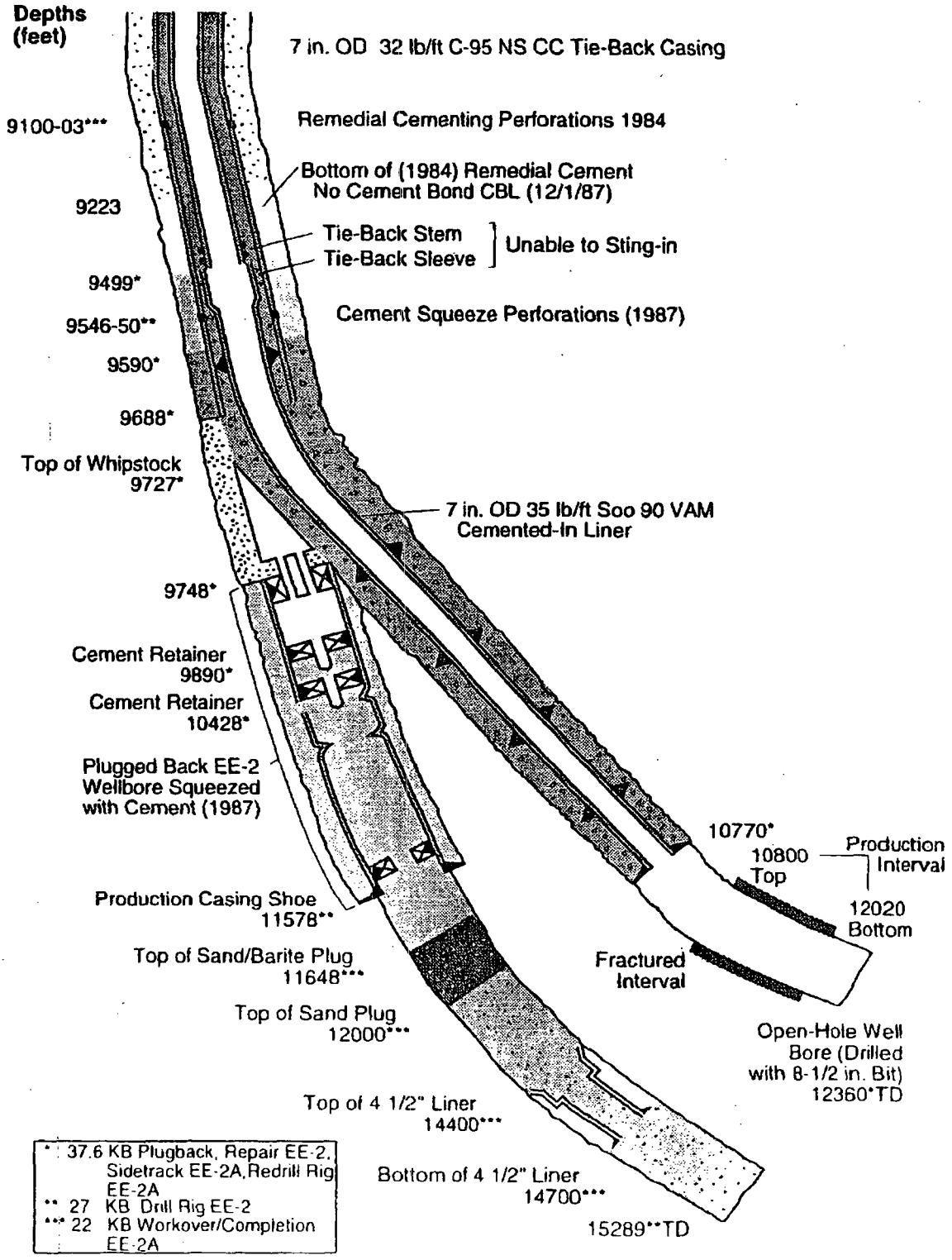
* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

Effective 4/30/92

ATTACHMENT 2

Present Configuration of EE-2A. Completed June 17, 1988

(Drawing revised 7/15/91, all depths in ft)



Purchase Request _____ Bidders List

American Energy Services
Attn: Loren Diede
708 South Tucker Avenue
Farmington, NM 87401
Phone: (505) 325-4192
Fax: (505) 564-3524

BJ Services
Attn: Cliff Anderson
3250 Southside River Road
Farmington, NM 87401
Phone: (505) 327-6222
Fax: (505) 327-5766

Cudd Pressure Control
Attn: Jack Armstrong
P.O. Box 2970
Farmington, NM 87499
Phone: (505) 326-5326
Fax: (505) 326-5469

DS Services
Attn: Bill Redman
P.O. Box 1650
Farmington, NM 87499
Phone: (505) 325-5096
Fax: (505)327-0317

Halliburton Energy Services
Attn: Clyde Lasster
4109 E Main
Farmington, New Mexico 87499
Phone: (505) 324-3553
Fax: (505) 327-2534

New Force Energy Services
Attn: Tom Gipson
P.O. Box 1519
Eastland, TX 76448
Phone: (254) 629-2220
Fax: (254) 629-3173

Specification _____
Abandonment of HDR Well EE-2A
April 30, 2001

Objective: Plug and abandon (P&A) Hot Dry Rock (HDR) production well EE-2A at Los Alamos National Laboratory's (LANL) Fenton Hill HDR site in compliance with New Mexico Oil Conservation Division (NMOCD) regulations. Due to the fact that the well was completed with a 7" tie-back liner cemented to surface and that no casing will be removed from the well, cement placement and abandonment can be accomplished through coiled tubing.

Location: The Fenton Hill HDR site is located at an elevation of 8,700 feet in the Jemez Mountains in Sandoval County, NM, Section 13, Township 19N, Range 2E and all-weather paved access is provided by State Road 126. The driving distance from Farmington, NM to the site is 175 miles by way of US 550, State Road 4 and State Road 126.

There is a fresh water source on location that is capable of producing 90 gpm and will be available for the supply of water requirements.

Scope of work: The extent of the required work will be limited to mobilization of the required equipment, personnel and materials to the site, rig up, run casing scraper and bridge plug, displacement of in-situ water with weighted fluid (plugging mud), installation of specified cement plugs as coiled tubing is pulled from the hole, rig-down and demobilization. All hazardous materials will be removed from the site by the vendor following job completion. The vendor will not be responsible for removal of the wellhead.

Current well configuration: EE-2 was drilled and completed in 1979-80. The original well was damaged following a wellhead failure that ended a massive hydraulic fracturing treatment. Following an extensive well reentry, repair, and plug back procedure, the well was sidetracked and redrilled in 1987-88. The well was completed as a geothermal production well with 7" casing and the annulus cemented to surface. 7-inch OD, 35 lb./ft, S-90, NSCC premium (internal flush) joint threaded and coupled casing was installed from just above the production interval at 10,770 ft to 9,500 ft. A 7-inch OD, 32 lb./ft, C-95, NSCC T&C tie-back string was then installed from 9,500 ft to the surface and cemented-in. The production interval, 10,770' to 12,360' total depth (TD) is uncased open hole. Casing schematics can be found in Attachments 1 and 2. Attachment 3 contains a wellhead diagram. Attachment 4 is a well trajectory survey for well EE-2A.

The height of the wellhead, from ground level to the top flange of the 7-1/16" 10M master valve is 86 inches.

Although the well was used for geothermal production intermittently for several years, no steam flashing has ever occurred in the wellbore and it is unlikely that any significant scale deposits are present on the inner casing wall.

The hole is currently full of water to near surface with 120-psi on the wellhead. Current plans call for the possible injection of up to 100,000 gallons of water from a nearby lined storage pond scheduled for removal to be injected into EE-2A for disposal prior to commencement of P&A operations. It's estimated that the wellhead pressure following any injection operations could be as high as 1,000 psi.

P&A requirements: The vendor shall provide all materials, equipment and personnel required to accomplish the following:

1) The minimum acceptable coiled tubing diameter for the required operations is 1-1/2" OD.
2) A bridge plug will be set in the 7" casing at 10,700 ft
   a) A casing scraper shall be run to the bridge plug setting depth on wireline or coiled tubing prior to running the bridge plug.
   b) The plug will be capable of maintaining a positive seal against a differential pressure of at least 5,000 psi at a temperature of 430° F
   c) The bridge plug may be deployed on wireline or coiled tubing.
   d) The bridge plug shall be tagged with 1000 lb. set down force using the end of the (cementing shoe on the) coiled tubing prior to pumping the first cement plug to assure proper set and depth.
   e) The initial cement plug shall be tagged to confirm proper location prior to proceeding with mud displacement. This is the only cement plug that will be tagged.
3) A plugging mud shall be displaced into the well from the bottom plug to the surface. The plugging mud shall:
   a) Have sufficient viscosity and density to prevent movement of the cement plugs
   b) Be compatible with the cement slurries proposed.
   c) Remain in the hole between the cement plugs
   d) Contain a sufficient quantity of corrosion inhibitor to provide long-term protection from casing degradation.
4) There is a remote possibility that Hydrogen Sulfide gas may be present in the fluid displaced from the well. Standard industry precautions, ie. H2S monitoring equipment, shall be present and operational during fluid displacement.
5) Every effort shall be made by the vendor to minimize the amount of waste water, mud and materials produced by the operations.
6) Cement plugs may be placed sequentially up the hole. It will not be necessary to tag any cement plugs other than the bottom plug.
7) Required cement plug placement depths, as specified by NMOCD, shall be located in the intervals shown on Table 1. The temperature at the bottom of each interval is included. Cement formulations shall be designed accordingly.
8) After Plug #6 is placed, wash the top of the plug out to 5-ft below the bottom of the well head and rig down BOPE and the CTU.

9) Demobilize equipment.
10) The vendor will not be responsible for removal of the wellhead.

TABLE 1 – NMOCD Plugging Intervals and Estimated Temperature			
Plug #	Interval	Length (linear feet)	Temp.°F *
1	10,700 – 10,500***	200	423
2	9,600 – 9,400	200	386
3	6,550 – 6,450	100	285
4	3,550 – 3,450	100	212
5	2,693 – 2,493	200	169
6	75 – surface**	75	53
*	Estimated temperature of the hole prior to circulation.		
**	Circulate out cement to 5-ft below the well head after placing cement.		

*** Mechanical bridge plug could be set at casing shoe at 10,700' prior to setting initial cement plug.

Note. Why is the cement plug at 3550' to 3450' being set, no perforations or laps at this depth.

Note. Cement plug may be required across perforations located at 885-889' and 210-212'.

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised March 25, 1999

WELL API NO.
EE-2A (non-API)

5. Indicate Type of Lease
STATE ☐ FEE ☐

6. State Oil & Gas Lease No.
N/A

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name:
Fenton Hill Hot Dry Rock Geothermal Project

1. Type of Well:
Oil Well ☐ Gas Well ☐ Other – Experimental geothermal production well

2. Name of Operator
Los Alamos National Laboratory

8. Well No. – EE-2A

3. Address of Operator
P.O.Box 1663, Los Alamos, NM 87545

9. Pool name or Wildcat
N/A

10. Well Location

Unit Letter_____: well is located 1609 feet from the East line and 1405 feet from the North line

Section 13 Township 19N Range 2E NMPM Sandoval County

10. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
KB

11. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	☒
PULL OR ALTER CASING	☐	MULTIPLE COMPLETION	☐	CASING TEST AND CEMENT JOB	☐		
OTHER:			☐	OTHER:			☐

12. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompilation.

Set 16.5 ppg Class H cement plug at 10,870' to 9,300' and allowed it to set overnight. Tagged cement top at 9,650'. Set 2nd cement plug at 9,650' – 9,400'. Filled hole with corrosion inhibitor treated fresh water to 6,550' and set 3rd cement plug from 6,550' to 6,450'. Filled hole with corrosion inhibitor treated fresh water to 3,550' and set 4th cement plug from 3,550' to 3,450'. Filled hole with corrosion inhibitor treated fresh water to 2,693' and set 5th cement plug from 2,693' to 2,493'. Filled hole with corrosion inhibitor treated water and set 6th cement plug from 89' to surface.

Please find BJ Services treatment report, cement lab report and well diagrams attached. Work was performed 9/10 – 9/13/02.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Paul Weber TITLE DIVISION LEADER DATE 10/17/02

Type or print name Paul Weber Telephone No. 505-667-3644

(This space for State use)

APPPROVED BY R E Johnson TITLE DISTRICT SUPERVISOR DATE 10/17/02

Conditions of approval, if any:

CEMENT JOB REPORT

CUSTOMER	DATE	F.R. #	SERV. SUPV.
Los Alamos National Laborator	10-SEP-02	216425049	Richard H Kovacs

LEASE & WELL NAME	LOCATION	COUNTY-PARISH-BLOCK
Fenton Hill Well EE #2a	Sec13 , T19N , R2E	Sandoval New Mexico

DISTRICT	DRILLING CONTRACTOR RIG #	TYPE OF JOB
Farmington		Plug & Abandon

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE
	NA-P&A

MATERIALS FURNISHED BY BJ	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT^3	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
Fresh Water		8.34				60	
Class H Cement	260	16.5	1.45	5.17	08:15	66.93	31.99
Fresh Water		8.34			23:00	60	
Class H Cement	25	16.5	1.45	5.17	06:00	6.44	3.08
Fresh Water		8.34			29400	50	
Class H Cement	25	16.5	1.06	4.17	21600	4.70	2.48
Fresh Water		8.34				38	
Available Mix Water 800 Bbl. Available Displ. Fluid 800 Bbl.				TOTAL		286.07	37.55

HOLE			TBG-CSG-D.P.					COLLAR DEPTHS		
SIZE	% EXCESS	DEPTH	SIZE	WGT.	TYPE	DEPTH	GRADE	SHOE	FLOAT	STAGE
8.5		12360	7	32	CSG	10770				

LAST CASING				PKR-CMT RET-BR PL-LINER		PERF. DEPTH		TOP CONN		WELL FLUID	
SIZE	WGT	TYPE	DEPTH	BRAND & TYPE	DEPTH	TOP	BTM	SIZE	THREAD	TYPE	WGT.
								1.75	EVE	FRESH WATER	8.34

DISPL. VOLUME		DISPL. FLUID		CAL. PSI	CAL. MAX PSI	OP. MAX	MAX TBG PSI		MAX CSG PSI		MIX WATER
VOLUME	UOM	TYPE	WGT.	BUMP PLUG	TO REV.	SQ. PSI	RATED	Operator	RATED	Operator	
35	BBLS	Fresh Water	8.34	0	0	0	5000	5000	0	0	Frac Tank
		Fresh Water	8.4								

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

PRESSURE/RATE DETAIL						EXPLANATION
TIME HR:MIN.	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 6000 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
						9/10/02
16:20						ST RIG UP
18:00	2000				N2	ST N2 PUMP FOR PRESSURE TEST 2000 PSI
18:38	0				0	SHUT DOWN
						9/11/02 1ST PLUG 10,870' TO 9,400'
08:04	6000		1		H20	ST PRESSURE TEST 6000 PSI
08:20	480		1.5	.9	H20	ST FILL TUBING 35 BBLS
08:59	0		0	35	H20	SHUT DOWN
09:00	5000		1	0	H20	ST PRESSURE TEST ONTHE TUBING 5000PSI
09:25	2000		.6	.5	H20	ST TO CIRCULATE TUBING DOWN
12:02	4760		1.9	65	H20	PUMP WITH ACID FRAC 102 BBLS
12:50	0		0	102	0	SHUT DOWN
12:54	2300		1	0	CMT	ST 67.1BBLS CEMENT @ 16.5 ppg
01:30	1438		1.2	38	CMT	ST TUBING OUT OF THE HOLE
02:21	2600		1.2	23	H20	ST DISPLACEMENT 35 BBLS
02:51	1670		1.2	35	H20	ST TO CIRCULATE TUBING OUT OF THE HOLE
03:09	0		0	50	0	SHUT DOWN
						ST 2ND PLUG 9-12-02 9,650' TO 9,400'
07:27	70		1	0	H20	ST FILL TUBING 18 BBLS
07:50	1330		1	18	H20	ST LOAD HOLE 7 BBLS
07:57	0		0	7	0	SHUT DOWN
~~08:00~~	~~257~~		~~4~~	~~0~~	~~H20~~	~~ST PRESSURE TEST CASING TO 250 PSI~~

SUPPLEMENTAL CEMENT JOB REPORT

Field Receipt # 216425049

CUSTOMER	DATE	F.R. #	SERV. SUPV.
Los Alamos National Laboratory	10-SEP-02	216425049	Richard H Kovacs
LEASE & WELL NAME - OCSG	**LOCATION**		**COUNTY-PARISH-BLOCK**
Fenton Hill Well EE #2a	Farmington		Sandoval New Mexico
DISTRICT	**DRILLING CONTRACTOR RIG #**		**TYPE OF JOB**
Farmington			Plug & Abandon

PRESSURE/RATE DETAIL

TIME HR:MIN	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
08:21	1370		1	.6	H20	ST TUBING TO TAG PLUG, TAG CEMENT @ 9,650 FT.
11:04	1370		1	18	CMT	ST 7.1 BBLS CEMENT PLUG @ 16.5 ppg
11:10	1910		1	7.1	H20	ST 102 BBLS DISPLACEMENT WITH C/I
12:41	0		0	102	0	SHUT DOWN
						3RD PLUG 6,550' TO 6,450'
12:53	1350		1	0	CMT	ST 6.45 BBLS CEMENT @ 16.5 ppg
12:57	4000		1.5	6.45	H20 C/I	ST 104.6 BBLS DISPLACEMENT WITH C/ I
13:46	0		0	104	0	SHUT DOWN
						4TH PLUG 3,550' TO 3,450'
13:46	1080		1	0	CMT	ST 7 BBLS CEMENT @ 16.5 ppg
13:50	3650		1.5	7	H20 C/I	ST 27.3BBLS DISPLACEMENT C/I
14:11	2830		1.5	27.3	H20	ST 35 BBLS H20 DISPLACEMENT
14:19	0		0	35	0	SHUT DOWN
						5TH PLUG 2,693' TO 2,493'
14:23	3195		1.5	0	CMT	ST 12.8 BBLS CEMENT @16.5 ppg
14:28	4123		1.5	12.8	H20 C/I	ST 87.2 BBLS DISPLACEMENT C/I
15:37	0		0	87.2	0	SHUT DOWN
15:47	2000		0	0	N2	ST N2 CLEAR OUT OF COILTUBING UNIT
						6TH PLUG 75' TO 0' 9-13-02
08:36	65		2	0	CMT	ST 6.2BBLS CEMENT @ 16.5
09:04	0		0	6	0	SHUT DOWN ST CLEAN UP OF B.O.P.

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERV. SUPV.
Y [N]		Y [N]	2	764	0	Y [N]	Richard Kovacs

CEMENTING LABORATORY REPORT
TOMBALL LAB # 02-07-0556

COMPANY :	Los Alamos National Lab	DATE:	8/20/02
WELL NAME:	HDR EE2A	LOCATION:	Sec 13/T19N/R2E,Sandoval Co.
DISTRICT:	Farmington, NM	TYPE JOB:	Coil Tubing Plug
DEPTH MD(ft):	10800	MUD WT(ppg):	
TVD(ft):	10800	BHST(°F):	430
CASING SIZE("):	1.75 CT	BHCT(°F):	
HOLE SIZE("):		BHSqT(°F):	430
TOC(md):		TOL (°F):	Static / Circ.

SLURRY DATA

#1	Southdown H + 40% Silica Flour + 1.3% R-8 + 1.3% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#2	Southdown H + 40% Silica Flour + 1.5% R-8 + 1.5% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#3	Southdown H + 40% Silica Flour + 1.5% R-8 + 1.5% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32 (Field Blend)

SLURRY PROPERTIES			#1		#2		#3	
Density : ppg			16.5		16.5		16.5	
Yield :cu.ft./sk.			1.446		1.448		1.448	
Mixing Water: gal/sk.			5.219		5.2		5.2	
Water Type:			Tap		Tap		Location	
Testing Temperature :			430 °F	°F	430 °F	°F	430 °F	°F
Thickening Time: hrs.			8:45		11:15		8:10	
Fluid Loss:ml/30min					80		50	
Compressive Strength : psi			°F	°F	°F	°F	°F	°F
	50psi	hrs.						
	500psi	hrs.						
		hrs.						
		hrs.						
		hrs.						
Rheologies		RPM	°F	°F	rt °F	°F	rt °F	200 °F
		300			432		328	128
		200			306		216	82
		100			166		112	40
		6			12		6	2
		3			8		4	2
		600			600+		550	270
		PV	0	0	#VALUE!	0	222	142
		YP	0	0	#VALUE!	0	106	-14
Gel Strength : #/100sq.ft.		10 sec.						
		10 min.						
Free Water : mls	@45°	@90°						

REMARKS :

COMMENTS : The above data is supplied solely for informational purposes and BJ makes no guarantees or warranties, either express or implied, with respect to the accuracy or use of this data. All product warranties and guarantees shall be governed by the standard contract terms at the time of sale.

CEMENTING LABORATORY REPORT
TOMBALL LAB # 02-07-0556

COMPANY :	Los Alamos National Lab	DATE:	8/20/02
WELL NAME:	HDR EE2A	LOCATION:	Sec 13/T19N/R2E,Sandoval Co.
DISTRICT:	Farmington, NM	TYPE JOB:	Coil Tubing Plug
DEPTH MD(ft):	10800	MUD WT(ppg):	
TVD(ft):	10800	BHST(°F):	430
CASING SIZE("):	1.75 CT	BHCT(°F):	
HOLE SIZE("):		BHSqT(°F):	430
TOC(md):		TOL (°F):	Static / Circ.

SLURRY DATA

#1	Southdown H + 40% Silica Flour + 1.3% R-8 + 1.3% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#2	Southdown H + 40% Silica Flour + 1.5% R-8 + 1.5% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#3	

SLURRY PROPERTIES			#1		#2		#3	
Density : ppg			16.5		16.5			
Yield :cu.ft./sk.			1.446		1.448			
Mixing Water: gal/sk.			5.219		5.2			
Water Type:			Tap		Tap			
Testing Temperature :			430 °F	°F	430 °F	°F	°F	°F
Thickening Time: hrs.			8:45		11:15			
Fluid Loss:ml/30min								
Compressive Strength : psi			°F	°F	°F	°F	°F	°F
	50psi	hrs.						
	500psi	hrs.						
		hrs.						
		hrs.						
		hrs.						
Rheologies		RPM	°F	°F	°F	°F	°F	°F
		300						
		200						
		100						
		6						
		3						
		600						
		PV	0	0	0	0	0	0
		YP	0	0	0	0	0	0
Gel Strength : #/100sq.ft.		10 sec.						
		10 min.						
Free Water : mls	@45°	@90°						

REMARKS :

COMMENTS : The above data is supplied solely for informational purposes and BJ makes no guarantees or warranties, either express or implied, with respect to the accuracy or use of this data. All product warranties and guarantees shall be governed by the standard contract terms at the time of sale.

BJ Services Farmington Laboratory Report

Report #: 131900612FB

Customer/Well Information

Company:	Los Alamos Nat'l Laboratory	Depth MD:	3,450 ft	Date:	August 22, 2002
Well Name:	Fenton Hill #EE-2A	Depth TVD:	3,450 ft	Prepared for:	Customer
API #		TOC(md):		Submitted by:	Cliff Anderson
Location:	Sandoval Co, NM	Casing Size:		Prepared by:	Dave Shepherd
District:	Farmington	Tubing Size:		Water Type:	Tap
Type Job:	3 rd Plug Slurry	Hole size:			

BHST: 215 °F BHCT: 156 °F BHSqT: 178 °F

Slurry Design Data

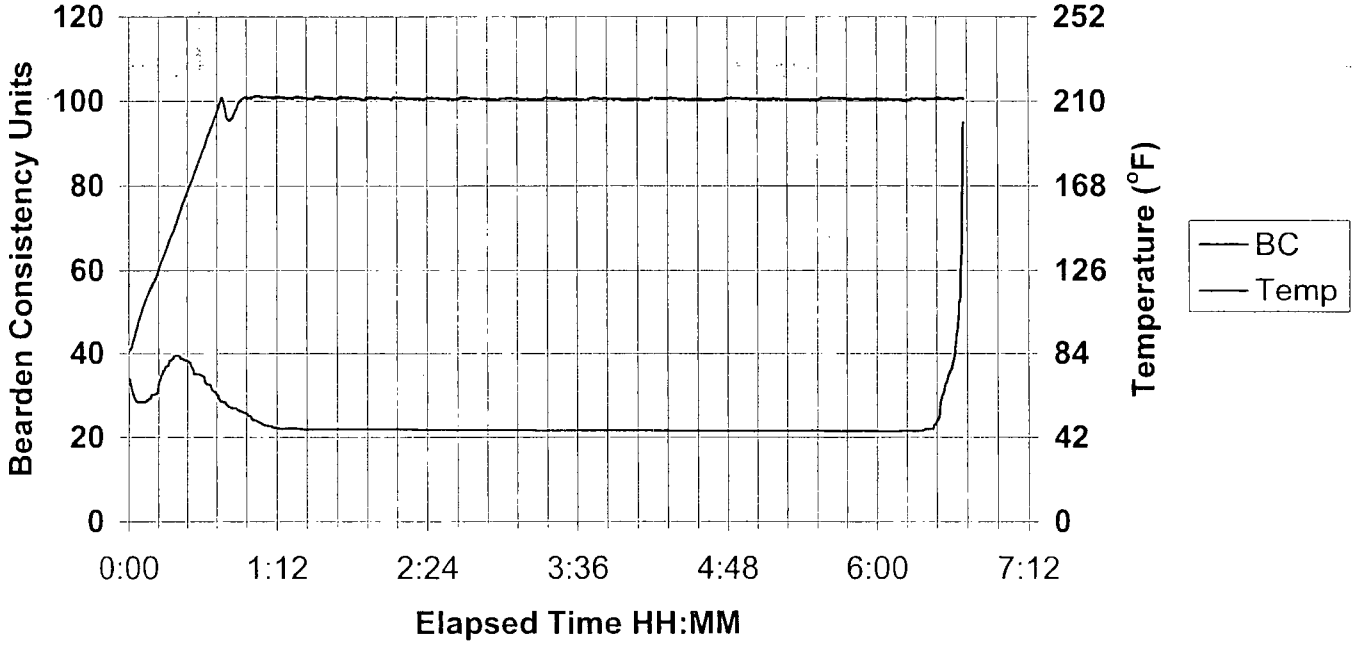
Class H + .5% FL-25 + 1.0% R-3 + .2% CD-32 (Field Blend 3rd retest)

Slurry Properties

Density:	16.5 ppg	Fluid Loss:		Test Temp:	211 °F
Yield:	1.06 cf/sack	Free Water:		Time to 70bc:	6:40 hrs:min
Mix Water:	4.16 gps	Total Fluid:	4.16 gps	Time to 100 bc:	

Rheology:	600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	PV	YP	Gel Strength	
									10 sec	10 min
@80 °F										
@200 °F										

Consistometer Recording of Bearden Consistency:



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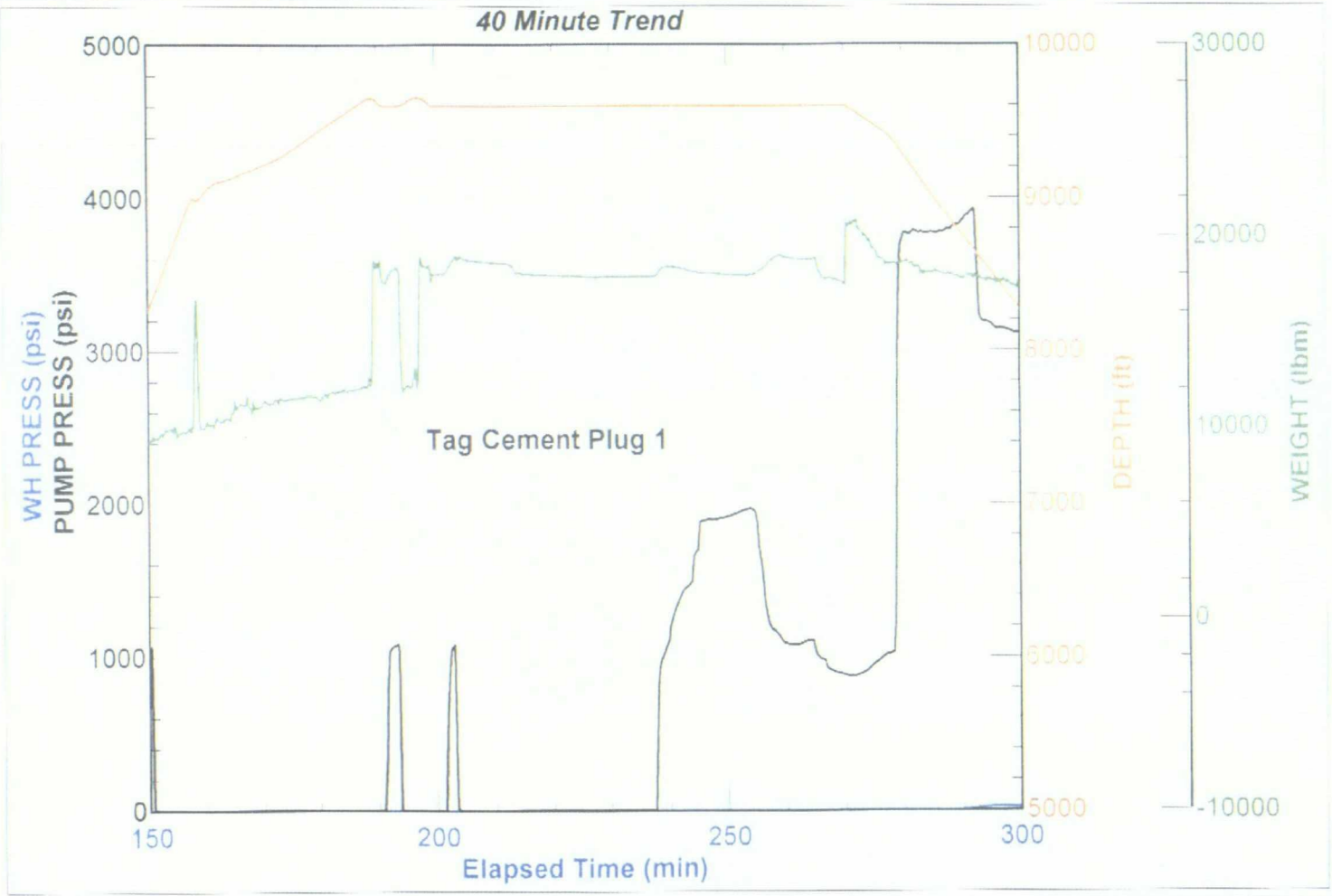
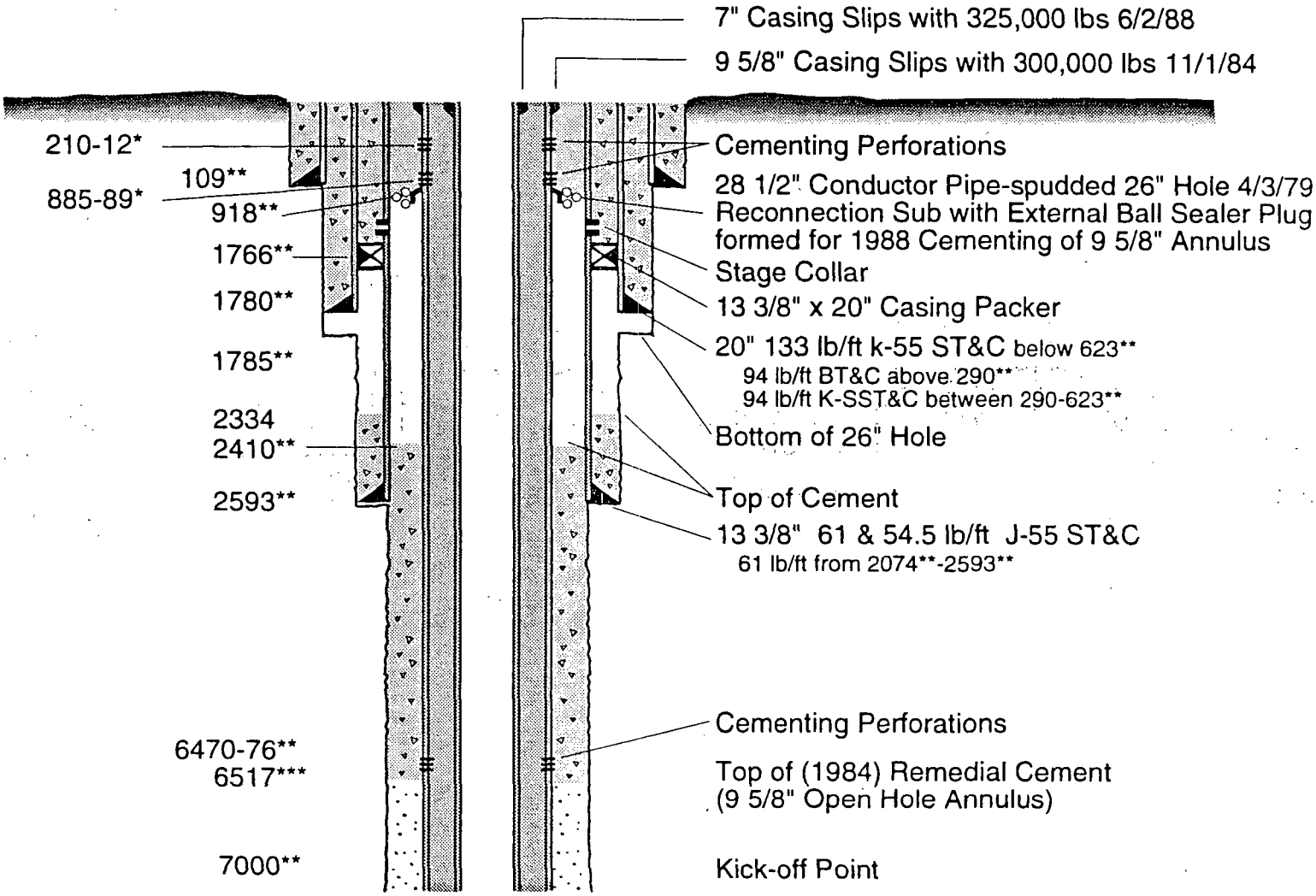
BJ Services JobMaster Program Version 2.61
Job Number: 494091002
Customer: Los Alamos National Labs
Well Name: Fenton Hill EE 2A



Job Start: Thursday, September 12, 2002

Present Configuration of EE 2-A

As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)

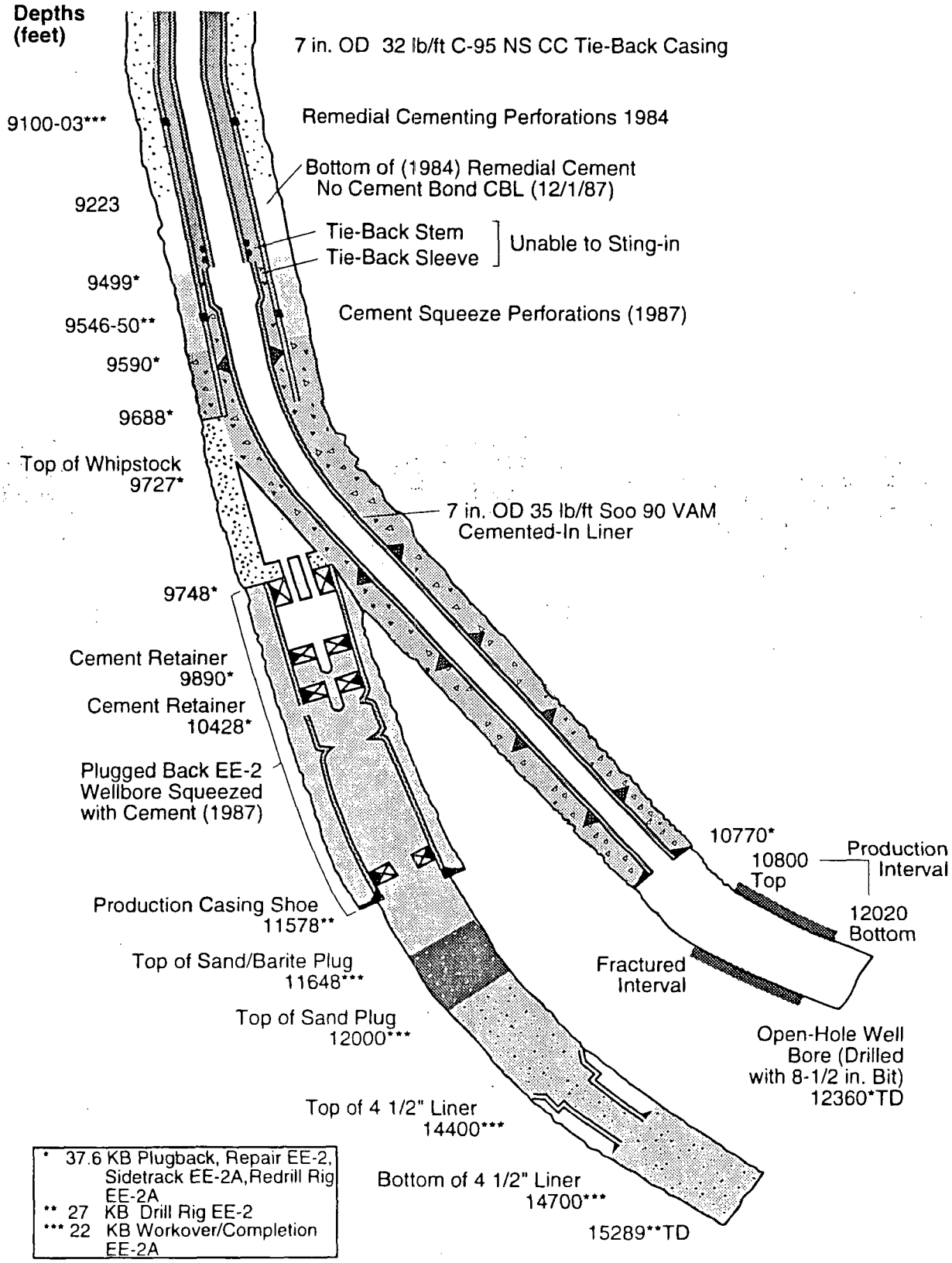


* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

Effective 4/30/92

Present Configuration of EE-2A. Completed June 17, 1988

(Drawing revised 7/15/91, all depths in ft)



Effective 4/30/92