JAMES A. GILLHAM

Petroleum Engineer

201 n washington, suite 3
p.o. box 1181
roswell, new mexico 88201
505-623-1933

April 17, 1987

Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87501

Attention: Mr. David R. Catanach

Gentlemen:

Enclosed is an original and three copies of an Application for Authorization to Inject, filed on behalf of Armstrong Energy Corporation.

We are requesting administrative approval at the earliest date possible.

Please return your approval to the above address. If there should be anything additional that you need, let me know, and I will furnish it promptly.

Sincerely,

James A. Gillham

James A. Gillham, Agent

Enclosures:
Original, 3 copies of
Application, 10 pages each

JAG:eam

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

East High Lonesome Unit

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: [X] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [ ] yes [ ] no

II. Operator: Armstrong Energy Corporation

Address: P. O. Box 1973, Roswell, NM 88201

Contact party: James A. Gillham Phone: 505-623-1933

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? [X] yes [ ] no
If yes, give the Division order number authorizing the project # R-2443.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: James A. Gillham Title Agent

Signature: James A. Gillham Date: April 17, 1987

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

ARMSTRONG ENERGY CORPORATION

APPLICATION FOR AUTHORIZATION TO INJECT

SUPPLEMENTAL DATA

The following data is presented as a supplement to Form C-108.

The East High Lonesome Unit was approved and became effective April 1, 1965, as a waterflood unit. The Oil Conservation Division authorized the injection of water into the Penrose Sand by Order R-2443 on March 6, 1963. Currently there are six active producing wells with one active injection well. This application proposes to convert the abandoned Unit Well No. 4, a former producing well, to an active water injection well. The increase in water injection with an improved flooding pattern will stimulate the recovery of additional oil.

The data now presented follows the format of C-108.

III. WELL DATA: Proposed Injection Well

A. (1) East High Lonesome Unit Well No. 4, 1980 feet from the North line, 660 feet from the East line, Section 14, Township 16 South, Range 29 East, N.M.P.M., Eddy County, New Mexico.

(2) Well was originally drilled and completed with cable tools at a total depth of 2,092 feet in January 1959. Casing was set as follows:

SIZE	WEIGHT, LBS	SETTING DEPTH	REMARKS
10-3/4"	32-3/4	352	pulled
8-5/8"	28	1881	pulled
7"	23	2074	cemented w/150 sks.

After setting the 7" casing, the 8-5/8" and 10-3/4" casing was pulled from hole and the 7" cemented with 150 sacks.

The Penrose Sand was abandoned in December 1980, by setting a cast-iron bridge plug in the 7" casing at 2,000 feet with 45 sacks of cement on top of plug. An acoustic log determined that the top of cement on the outside of the 7" casing was at 1,600 feet. The 7" casing was perforated with four holes at 1,577 feet and squeezed with 100 sacks, top of cement determined at 710 feet. The zone 1,370 to 1,385 feet was perforated with two shots per foot and sandfraced. The zone proved to be non-productive.

The well was plugged and abandoned in August 1982. A cast-iron bridge plug was set in the 7" casing at 1,350 feet with 10 sacks of cement on top. Four holes were perforated in the 7" casing at 460 feet, 25 feet above the Salado Salt, and squeezed with 55 sacks of cement.

Four holes were then perforated in the 7" casing at 350 feet and squeezed with 55 sacks of cement to protect the fresh water. A ten-sack plug at the top of the 7" casing capped the well.

The well was cleaned out in early April of 1987 with a reverse unit to the old total depth of 2,092 feet. The present casing in the hole is:

SIZE	WEIGHT, LBS.	SETTING DEPTH, FT.	REMARKS
7"	23	2074	cemented to surface
4-1/2"	10.5 to 13.5	2050	175 sks, circulated to surface
2-3/8" TBG	4.7	J-55 internally plastic coated with a Halliburton R-4 packer set at 2040 feet. 3000 pound working pressure tubing head.	

A schematic Diagram is attached as Exhibit A.

B. (1) The injection formation is the Penrose Sand of the Queen Formation of the Guadalupe Series in the Permian System.

(2) The injection interval is 2074 to 2092 feet in open hole.

(3) The well was originally drilled as a producing well and subsequently plugged and abandoned.

(4) Perforating and cementing record is detailed in item (2) above and Exhibit A.

(5) There are no known oil or gas zones above the Penrose in this area.

V. A map marked Exhibit B identifies the leases and wells within two miles of the proposed injection well. The East High Lonesome Unit area is highlighted with a heavy line. A one-half mile radius circle is shown circumscribed around the proposed injection well. All wells encompassed by this one-half mile radius circle, the area of review, are in the East High Lonesome Unit. The surface is federal.

VI. Exhibit C is a tabulation of the pertinent data for each well within the one-half mile radius area of review, with representative diagrams of a typical producing well and a plugged and abandoned well.

VII. After receiving approval for injection, a step rate injection test shall be conducted to determine optimum operating conditions for injection. It is anticipated that conditions will be in the order of 450 barrels per day and will not exceed 550 barrels per day as a maximum. Injection pressures will be in the order of 350 psig average with 400 psig as a maximum. The water injection uses produced water in a closed water system.

VIII. There have been 20 wells previously approved for injection into the Penrose Sand over the life of this waterflood unit. Appropriate data describing the lithologic detail of the waterflood zone is of record.

IX. No stimulation program is proposed.

X. Well logs and test data have previously been filed with the Oil Conservation Division.

XI. Chemical analyses of fresh water in the area (containing less than 10,000 MG/L) are also of record.

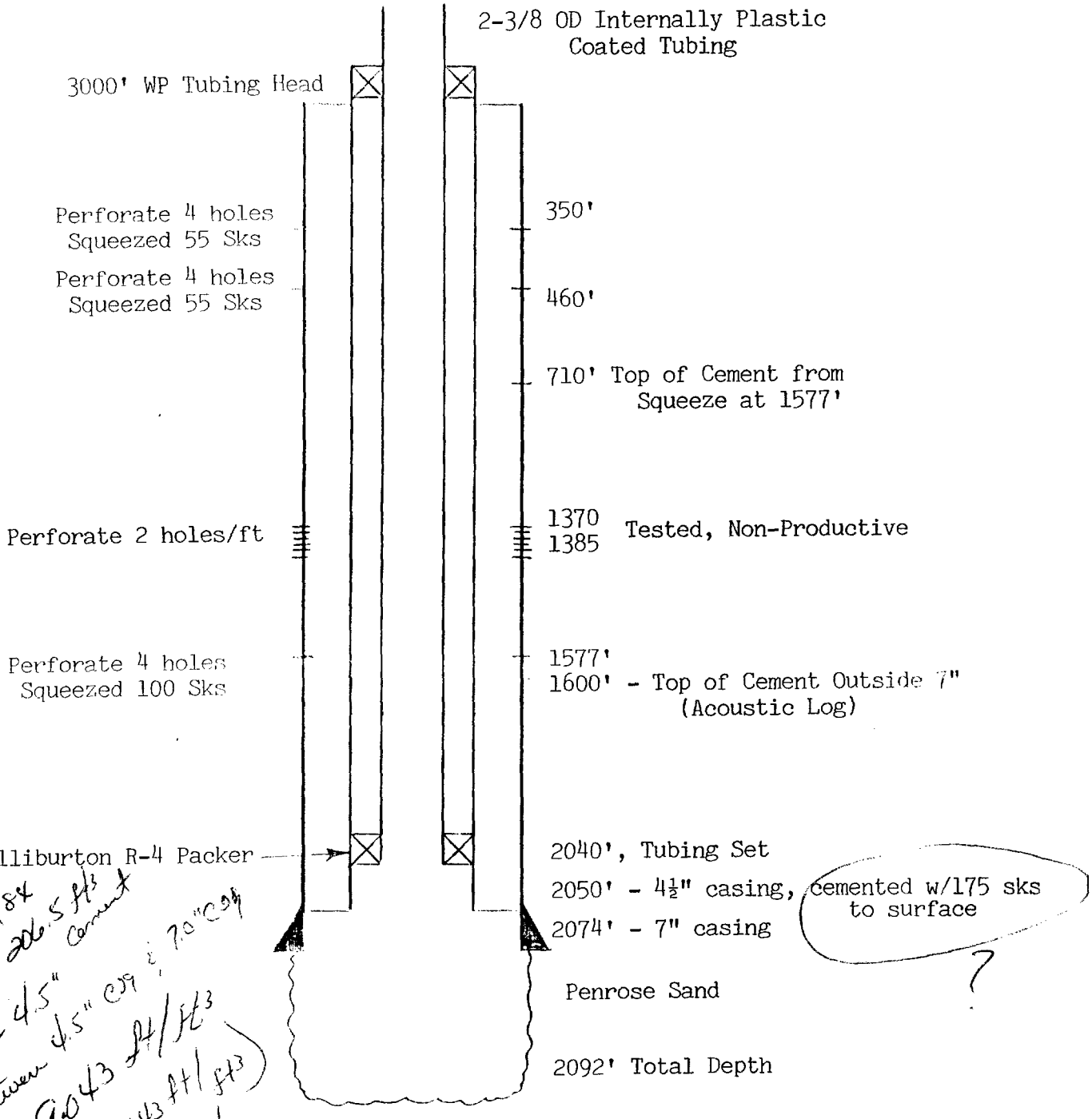
XII. Examination of the geologic and engineering data available does not present any evidence that there are open faults or any other hydrologic connection between the Penrose Sand injection and any source of underground drinking water.

XIII. The surface of the land is public land administered by the Bureau of Land Management, (BLM). BLM, having approved the application for re-entry and completion for injection of the East High Lonesome Unit Well No. 4 on April 3, 1987, signifies that they are in accord with this request for authorization to inject. A copy of the Notice as published in the Artesia Daily Press, Artesia, New Mexico is also made a part of this application.

We respectfully request administrative approval of this application at the earliest date possible.

ARMSTRONG ENERGY CORPORATION
EAST HIGH LONESOME UNIT WELL NO. 4
SE¼NE¼, Sc. 14, T. 16 S., R. 29 E.,
EDDY COUNTY, NM

PROPOSED INJECTION WELL



Slurry - 1.18 ft³/sk
= 1.18 x 175 = 206.5 ft³ cement
D - 4½" csg = 4.5"
volume between 4.5" csg & 7.0" csg
= 9.043 ft/ft³
(206.5 ft³)(9.043 ft/ft³)
= 1867 ft.
ok

EXHIBIT A

R 29 E

R 30 E

T 16 S

Armstrong Energy Corporation

EAST HIGH LONESOME UNIT

EDDY COUNTY, NEW MEXICO

Scale: 2 inches = 1 mile

EXHIBIT B

CURRENT

WELL DATA IN AREA OF REVIEW

WELL	CURRENT STATUS	COMPLETION DATE	CASING	SET AT	SKS CEMENT	TOTAL DEPTH,FT
1	Prod.	9-1-58	7"-23#	2061'	150	2084
3	P&A Inj.	12-1-58	7"-23#	2055'	150	2084
	Converted to Injection May 29, 1964, SI August 1973. Plugged August 1982. 100' cement plug 2084' - 1984' Perf. 4 holes at 1070', Top of Yates, squeezed w/55 sacks cement. Perf. 4 holes at 440', 25' above Salt, squeezed w/55 sacks cement. Perf. 4 holes at 350', water zone, squeezed w/55 sacks cement. 10 sack cement plug in top of 7" casing					
5	P&A Inj.	2-13-59	7"-23#	2052'	150	2078
	Converted to Injection May 1966, NMOCC Order WFX 235 Plugged August 1982. 100' cement plug 2078' - 1978' Perf. 4 holes at 1060', Top of Yates, squeezed w/55 sacks cement. Perf. 4 holes at 425', 25' above Salt, squeezed w/55 sacks cement. Perf. 4 holes at 350', water zone, squeezed w/55 sacks cement. 10 sack cement plug in top of 7" casing					
6	Prod.	3-20-59	7"-23#	2048	150	2078
10	P&A Inj.	6-21-59	7"-23#	2106	150	2140
	Converted to Injection August 2, 1968, NMOCC Order WFX 287 Plugged October 24, 1985 Washed out to TD, set 30 sk cement plug 2140' - 2000' Tagged plug at 2103', spotted 25 sks cement 2103' 1926' Perf. 4 holes at 900' and 4 holes at 470' Set packer at 860', pumped through both set of perfs. Set retainer at 860', pumped 25 sks cement at 860' left one barrel on top of retainer Pumped 425 sacks cement through 470' perfs. and left 7" casing filled with cement					
1 (Bosworth)	P&A Inj.	5-31-59	7"-24#	2064'	150	2101
	Converted to Injection May 1966, NMOCC Order WFX 235 Plugged April 16, 1981 50 sack cement plug 2101' - 1985' Perf. 4 holes at 892', base of Salt, squeezed 55 sks cement, cement left inside 7" casing, 942' - 800' Perf. 4 holes at 480', Top of Salt below water zone, squeezed 100 sks of cement, cement inside 7" casing 530' - 300' 10 sack cement plug in top of 7" casing					

EXHIBIT C

STAGE III

TOWNSHIP 16 SOUTH, RANGE 29 EAST, NMPM

Brewer Well No. 3, located 660 feet from the North line and 1980 feet from the East line of Section 14;

Brewer Well No. 8, located 660 feet from the South line and 660 feet from the East line of Section 11;

Brewer Well No. 12, located 1980 feet from the South line and 660 feet from the West line of Section 13;

Brewer Well No. 15, located 660 feet from the South line and 1980 feet from the West line of Section 12;

Brewer Well No. 21, located 660 feet from the North line and 660 feet from the West line of Section 14;

Brewer Well No. 23, located 660 feet from the South line and 1980 feet from the West line of Section 14;

Brewer Well No. 26, located 660 feet from the South line and 990 feet from the East line of Section 12;

Bosworth Well No. 4, located 990 feet from the South line and 990 feet from the East line of Section 14.

(2) That in lieu of Stage III above, the applicant is hereby authorized to convert the waterflood project to a pattern-type flood utilizing the following-described injection wells:

PATTERN

TOWNSHIP 16 SOUTH, RANGE 29 EAST, NMPM

Bosworth Well No. 1, located 1980 feet from the South line and 660 feet from the East line of Section 14;

Brewer Well No. 1, located 660 feet from the North line and 660 feet from the East line of Section 14;

Brewer Well No. 5, located 1980 feet from the North line and 1980 feet from the East line of Section 14;

Brewer Well No. 7, located 1980 feet from the North line and 660 feet from the West line of Section 13;

Brewer Well No. 9, located 660 feet from the North line and 1980 feet from the West line of Section 13;

Brewer Well No. 13, located 1980 feet from the North line and 660 feet from the West line of Section 14;

Brewer Well No. 18, located 1980 feet from the South line and 1980 feet from the West line of Section 14.

(3) That all water injection shall be accomplished through tubing below a packer set in the lower part of the casing in all injection wells.

(4) That the waterflood project shall be governed by the provisions of Rule 701, including the allowable provisions thereof, and including the provisions with respect to expansion of the project.

(5) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1119 of the Commission Rules and Regulations.

(6) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JACK M. CAMPBELL, Chairman

E. S. WALKER, Member

A. L. PORTER, Jr., Member & Secretary

S E A L

esr/