ENERGEN
RESOURCES

November 19, 2001

Ms. Lori Wrotenberry
New Mexico Oil Conservation Division
1220 South Street Francis Drive
Santa Fe, New Mexico 87504

RE: Administrative Approval to Inject
Energen Resources Corporation
Carson SWD #1
895' FNL, 705' FWL, Sec. 26, T30N, R04W, N.M.P.M.
Rio Arriba County, New Mexico

Dear Ms. Wrotenberry:

Energen Resources Corporation requests administrative approval to inject produced water in its recently drill Salt Water Disposal Well. Attached is Form C-108 with the required data for application.

In accordance to New Mexico Oil Conservation Division Rules, the surface landowner and offset operators have been furnished a copy of this application by certified mail. Proof of legal notice has been requested for publication in both San Juan and Rio Arriba counties.

If additional information is needed, please contact me.

Sincerely,

Gary W. Brink
District Superintendent

GWB/vd

cc: NMOCD – Aztec✓
Offset Operators

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised 4-1-98

NOV 2001
RECEIVED
OIL CON. DIV.
DIST. 3

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance _____Disposal _____Storage
Application qualifies for administrative approval? ____X____Yes _____No

II. OPERATOR: __Energen Resources Corporation _____

ADDRESS: __2198 Bloomfield Highway – Farmington, NM 87401_____

CONTACT PARTY: _Gary Brink_____PHONE: _505-325-6800___

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? _____Yes ____X____No
If yes, give the Division order number authorizing the project: _____

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 geologic data on the injection zone including appropriate lithologic detail, geologic 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 sources 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 sources 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: Gary W. Brink, P.E. TITLE: _District Superintendent_____

SIGNATURE: _____ DATE: 11/19/01

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

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate 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 the 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, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, 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.

Side 1

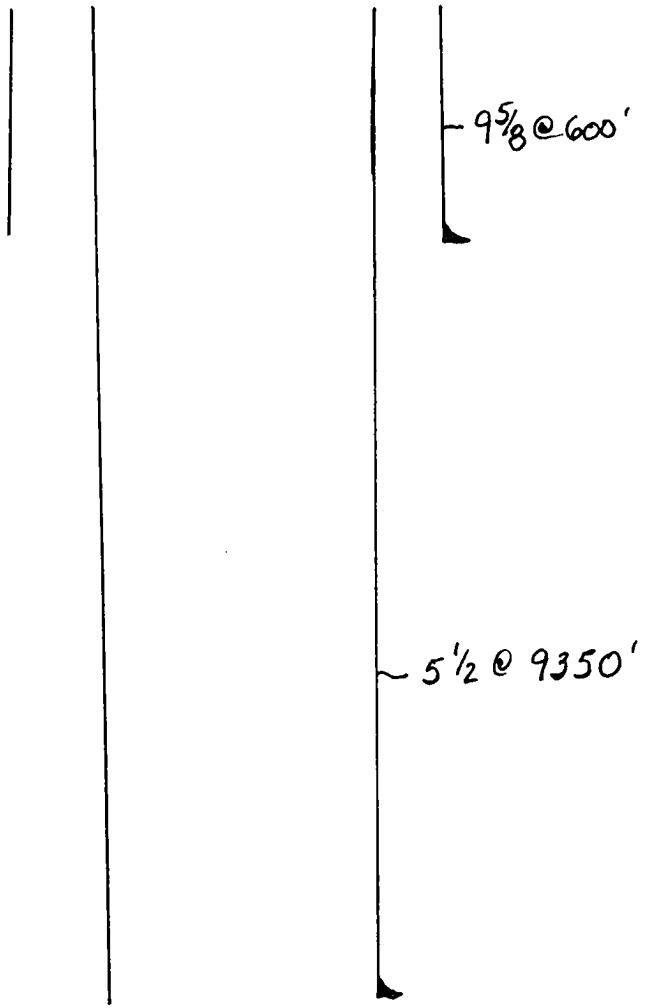
INJECTION WELL DATA SHEET

OPERATOR: ___Energen Resources Corporation_____

WELL NAME & NUMBER: ___Carson SWD #1_____

WELL LOCATION: _____895' FNL, 705' FWL_____D_____26_____30N_____04W____
FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: ____12-1/4"_____ Casing Size:_9-5/8", 36#, J-55_

Cemented with: __250_____ sx. ***or*** ____295_____ ft^3

Top of Cement: __surface_____ Method Determined: _circulated__

Intermediate Casing

Hole Size: _____ Casing Size:_____

Cemented with: _____ sx. ***or*** _____ ft^3

Top of Cement: _____ Method Determined: _____

Production Casing

Hole Size: _8-3/4",__7-7/8"_____ Casing Size:5-1/2", 17#,J-55 & N-80

Cemented with: ___1985_____ sx. ***or*** _____2989_____ ft^3

Top of Cement: ___surface_____ Method Determined: circ. – 3rd stage

Total Depth: ___9350_____

Injection Interval

_____8710_____feet to_____9300 est._____

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: _3-1/2", 9.3#, N-80_____Lining Material: __IPC_____

Type of Packer: _____Baker Loc-set_____

Packer Setting Depth: ____8650'_____

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? ___X__Yes _____No

   If no, for what purpose was the well originally drilled? _____

   _____

2. Name of the Injection Formation: _Morrison & Bluff_____

3. Name of Field or Pool (if applicable): _____

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. ___No_____

   _____

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: __Pictured Cliffs 3745', Fruitland Coal 3670'_____

   _____

   _____

   _____

ENERGEN
RESOURCES

APPLICATION FOR AUTHORIZATION TO INJECT
ENERGEN RESOURCES CORPORATION
CARSON SWD #1

Attachment Data for C-108

V. See Attached Map

VI. No other wells in the area have penetrated the injection zone.

VII. Initially, it is anticipated to inject about 1000 barrels per day of produced water from the Fruitland Coal, Pictured Cliffs and Mesaverde with a maximum rate of 2500 barrels per day upon development of the Fruitland Coal formation. The system will be an open system with disposal fluid trucked to storage tanks from producing wells around the San Juan 30-4 Unit. The injection facility will have enough storage capacity to store two days of injection fluid. It is anticipated to inject at 1.5 bpm at 1300 psi with a maximum injection pressure of 1800 psi. If insufficient rate is established, a step rate test will be performed at time of completion. Attached are relative water samples of produced injection fluids and a representative water sample from the Bluff, Morrison and secondary Dakota intervals.

VIII. Bluff 9220' – 9370' Massive sandstone, white to off white to clear, moderately well sorted, fine to medium grained, moderately cemented with silica, most sub-angular grains. Porosity is 4-12%. Underlying unit is the Summerville formation and overlying unit is the Morrison formation.

Morrison 8710' – 9220' Massive sandstone, moderately sorted, fine to medium grained, poorly to well cemented, lenticular sandstone with fissile to platy shales deposited in a continental fluvial environment. Porosity is 4-10%. Underlying unit is the Bluff formation and overlying unit is the Dakota formation.

Burro Canyon 8475' – 8710' Lenticular sand stone, moderately sorted, fine grained quartzose sands, intermingled with shales and siltstones from overbank and swamp deposits from meandering streams and barrier bars. Porosity is 4-8%. Underlying unit is the Morrison formation and overlying unit is the Graneros Shale.

Overlying Aquifers are the Ojo Alamo, Naciemento and San Jose. The deepest in this wellbore is the Ojo Alamo from 3170' – 3400'.

IX. It is anticipated following perforating to acidize each zone with 50 gallons of 15% HCL per foot of pay. Based on treating pressures and other wells completed in this formation, a fracture stimulation will be performed.

X. Well logs will be submitted when the well is drilled.

ENERGEN
RESOURCES

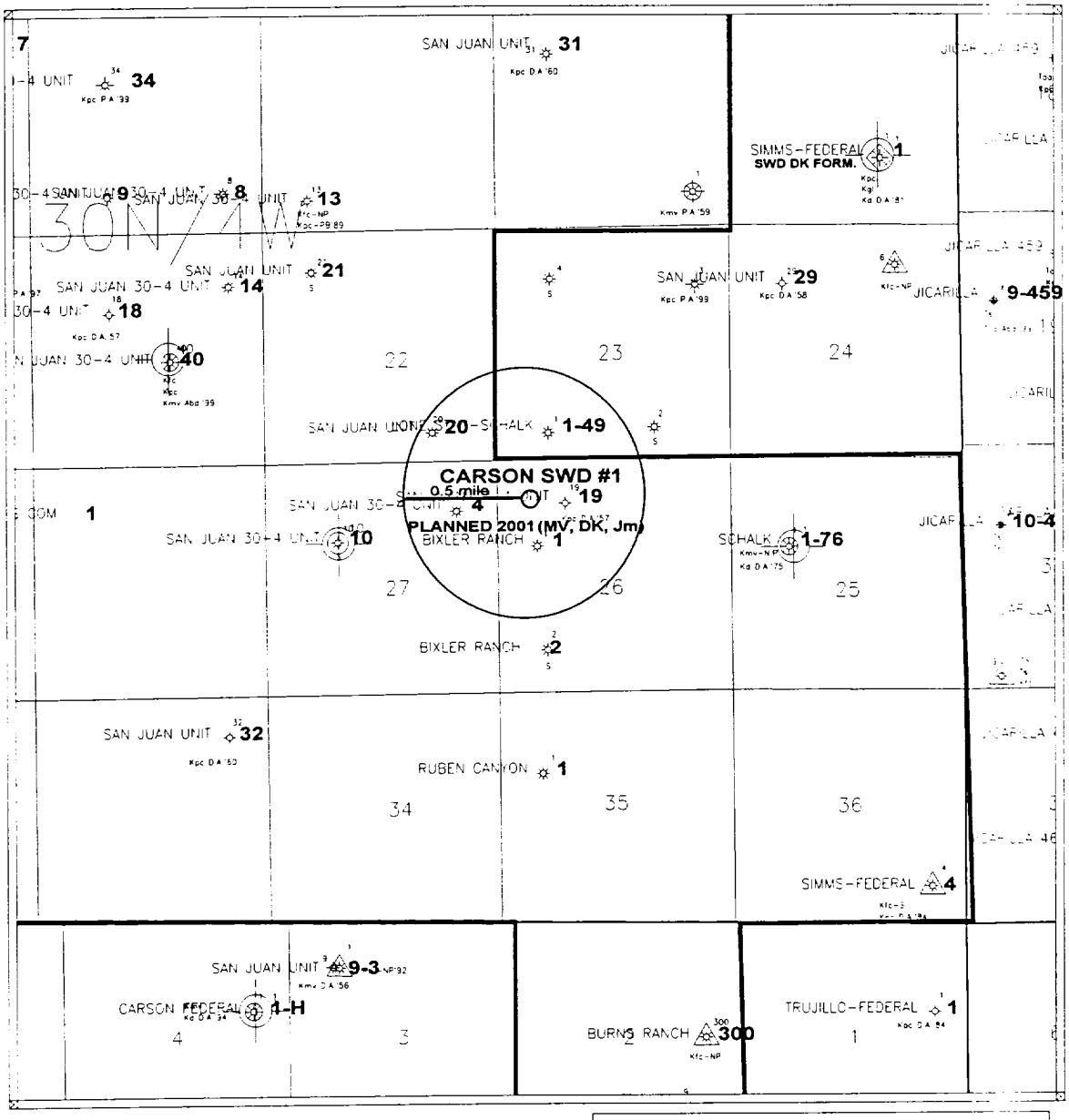
XI. No fresh water wells exist within one mile of this well. See attached report from New Mexico State Engineer Office.

XII. I, Gary W. Brink P.E., have examined all available geological and engineering data and find no evidence of open faults or any other hydrologic connection between the anticipated disposal zones and any underground sources of drinking water.

XIII. Proof of legal notice has been sent to the Rio Grande Sun, Espanola, NM and the Farmington Daily Times, Farmington, NM for advertisement. In addition, Energen Resources is the surface owner of this well site and all offset operators have been notified of this application by certified mail.

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

Gary W. Brink, P.E.
District Superintendent



LEGEND

- FRUITLAND COAL WELL
- PICTURED CLIFFS WELL
- MESAVERDE WELL
- GALLUP WELL

ENERGEN RESOURCES

SAN JUAN BASIN
30-4 UNIT
CARSON SWD #1 LOCATION

SJB\2001book\30-4\m		7/27/01

...ccf	ATTEN ILL CLARK	DATE SAMPLED: 8/1/89
... 2605	PO BOX 1237	WELL NAME: NEBU UNIT 501
DURANGO, CO 81302	DURANGO, CO 81302	LOCATION: 10-32N-7W
(303) 247-4220	(303) 247-0728	FORMATION: ENTRADA WATER
		SAMPLED FROM:
CDS ID #: 1119		WELL ON/OFF:

Item 2A
SWD-339

CONSTITUENT		ppm	epm
Sodium	Na +	4760	207.1
Potassium	K +	169	4.3
Calcium	Ca ++	1310	65.4
Magnesium	Mg ++	29.4	2.4
Iron Total	Fe++ & Fe+++	164	8.8
POSITIVE SUB-TOTAL		6432.4	287.9779
Chloride	Cl -	8280	233.5
Carbonate	CO3 =	0	0.0
Bicarbonate	HCO3-	152	2.5
Hydroxide	OH -	0	0.0
Sulfate	SO4 =	2100	43.7
NEGATIVE SUB-TOTAL		10532	279.70728

Total Dissolved Solids	19000 ppm
pH	5.07 units
Specific Gravity	1.01 @ 73 F.
Resistivity	.45 ohm-m

APPROVED BY: Joe Bowden
DR. JOE BOWDEN, DIRECTOR

Results are based on analysis made at the time samples are received at the laboratory.

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W718

FARMINGTON LAB

GENERAL INFORMATION

OPERATOR:	MALLON OIL	DEPTH:	
WELL:	SIMMS FED. #1	DATE SAMPLED:	11/15/99
FIELD:		DATE RECEIVED:	11/15/99
SUBMITTED BY:	J. ZELLITTI	COUNTY:	STATE: NM
WORKED BY	D. SHEPHERD	FORMATION:	Morrison
PHONE NUMBER:			

SAMPLE DESCRIPTION

SAMPLE #1

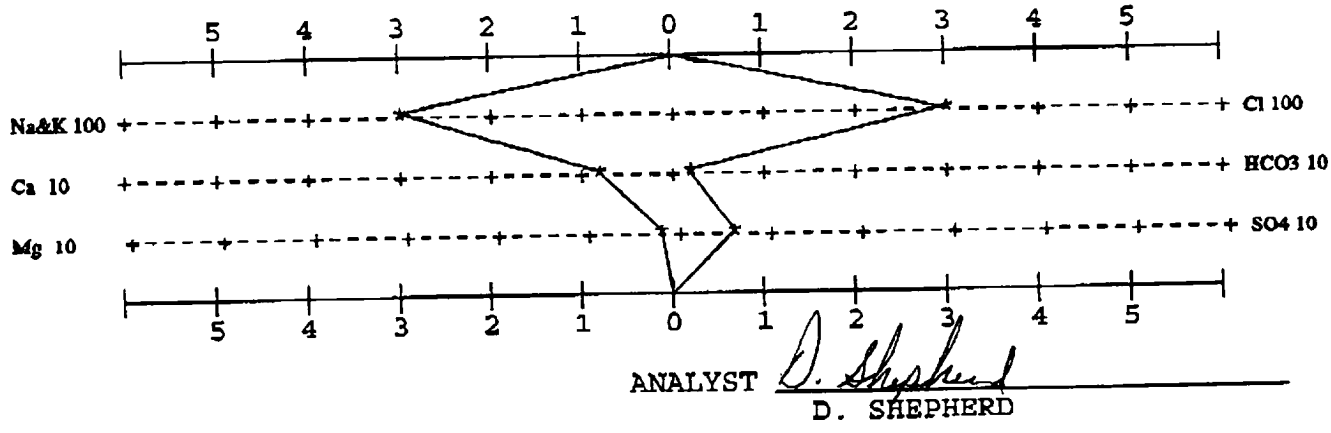
PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY: 1.015 @ 72°F PH: 7.10
RESISTIVITY (MEASURED): 0.340 ohms @ 71°F

IRON (FE++) :	0 ppm	SULFATE:	256 ppm
CALCIUM:	150 ppm	TOTAL HARDNESS	473 ppm
MAGNESIUM:	24 ppm	BICARBONATE:	180 ppm
CHLORIDE:	10,479 ppm	SODIUM CHLORIDE(Calc)	17,237 ppm
SODIUM+POTASS:	11,485 ppm	TOT. DISSOLVED SOLIDS:	22,873 ppm
H2S: NO TRACE		POTASSIUM (PPM):	15,600

REMARKS

STIFF TYPE PLOT (IN MEQ/L)



ANALYST D. Shepherd
D. SHEPHERD

HALLIBURTON

Water Analysis Report

To:	Energen	Date:	7/20/99
Submitted by:	Halliburton Energy Services	Date Rec:	7/20/99
Attention:	Dell Gunn	Report #:	WF-990-0168
Well Name:	Carson #4M 19-30-4	Formation:	Flow back - Dakota

Specific Gravity	1.010	
pH	7.28	
Resistivity	0.66	@ 70° F
Iron (Fe)	50	Mg / L
Potassium (K)	500	Mg / L
Sodium (Na)	6227	Mg / L
Calcium (Ca)	337	Mg / L
Magnesium (Mg)	63	Mg / L
Chlorides (Cl)	9300	Mg / L
Sulfates (SO_4)	2000	Mg / L
Carbonates (CO_3)	0.0	Mg / L
Bicarbonates (HCO_3)	285	Mg / L
Total Dissolved Solids	18763	Mg / L

Respectfully: Bill Loughridge

Title: Field Chemist II

Location: Farmington, NM

HALLIBURTON

Water Analysis Report

To: Energen

Date: 11/14/2001

Submitted by: Halliburton Energy Services

Date Rec: 11/14/2001

Attention: Gary Brink 326-6112

Report #: FLMM1695

Well Name: SJ 30-4 Carson #4

Formation: Mesa Verde

Anthrone Test for Broken Gel = NEGATIVE

Specific Gravity	1.010	
pH	6.65	
Resistivity	4.48	@ 70° F
Iron (Fe)	25	Mg / L
Potassium (K)	0	Mg / L
Sodium (Na)	2854	Mg / L
Calcium (Ca)	32	Mg / L
Magnesium (Mg)	0	Mg / L
Chlorides (Cl)	2678	Mg / L
Sulfates (SO_4)	2000	Mg / L
Carbonates (CO_3)	0.0	Mg / L
Bicarbonates (HCO_3)	610	Mg / L
Total Dissolved Solids	8199	Mg / L

Respectfully: Bill Loughridge

Title: Senior Scientist

Location: Farmington, NM

HALLIBURTON

Water Analysis Report

To: Energen

Submitted by: Halliburton Energy Services

Attention: Gary Brink 326-6112

Well Name: SJ 30-4 #8

Date: 11/14/2001

Date Rec: 11/14/2001

Report #: FLMM1696

Formation: PC

Anthrone Test for Broken Gel = NEGATIVE

Specific Gravity	1.020	
pH	8.48	
Resistivity	1.35	@ 70° F
Iron (Fe)	0	Mg / L
Potassium (K)	0	Mg / L
Sodium (Na)	4324	Mg / L
Calcium (Ca)	40	Mg / L
Magnesium (Mg)	20	Mg / L
Chlorides (Cl)	4166	Mg / L
Sulfates (SO_4)	2000	Mg / L
Carbonates (CO_3)	160.0	Mg / L
Bicarbonates (HCO_3)	1830	Mg / L
Total Dissolved Solids	12540	Mg / L

Respectfully: Bill Loughridge

Title: Senior Scientist

Location: Farmington, NM

HALLIBURTON

Water Analysis Report

To: Energen

Submitted by: Halliburton Energy Services

Attention: Gary Brink 326-6112

Well Name: Chicosa Canyon #1

Date: 11/14/2001

Date Rec: 11/14/2001

Report #: FLMM1697

Formation: Fruitland Coal

Anthrone Test for Broken Gel = NEGATIVE

Specific Gravity	10.150	
pH	8.14	
Resistivity	0.98	@ 70° F
Iron (Fe)	0	Mg / L
Potassium (K)	450	Mg / L
Sodium (Na)	4045	Mg / L
Calcium (Ca)	48	Mg / L
Magnesium (Mg)	10	Mg / L
Chlorides (Cl)	5357	Mg / L
Sulfates (SO_4)	400	Mg / L
Carbonates (CO_3)	120.0	Mg / L
Bicarbonates (HCO_3)	1789	Mg / L
Total Dissolved Solids	12219	Mg / L

Respectfully: Bill Loughridge

Title: Senior Scientist

Location: Farmington, NM

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 30N Range: 04W Sections: 22,23,24,25,26,27,34,35,36,

NAD27 X: Y: Zone: Search Radius:

County: RA Basin: SJ Number: Suffix:

Owner Name: (First) (Last) Non-Domestic Domestic All

Well Data Report | Avg Depth to Water Report | Water Column Report
Clear Form | WATERS Menu | Help

WELL DATA REPORT 07/30/2001

DB File Nbr	Use	(acre ft per annum) Diversion	Owner	(quarters are Well Number (quarters are

No Records found, try again