

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Print or Type Name

Signature

Title

Date

BRIAN WOOD (505) 466-8120 FAX 466-9682

721 /

CONSULTANT

6-2-07

e-mail Address

brian@permitswest.com

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 June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I.	PURPOSE: Secondary Recovery Application qualifies for administrative approval? XXX	Pressure Maintenance YesNo	YES Disposal Storage
II.	OPERATOR: ROSETTA RESOURCES OPERATING LP		
	ADDRESS: 1200 17 TH ST., SUITE 770, DENVER, CO 80	02	
	CONTACT PARTY: BRIAN WOOD (PERMITS WEST, I	NC.)	PHONE: (505) 466-8120
III.	WELL DATA: Complete the data required on the reverse s Additional sheets may be attached if necess		ell proposed for injection.
IV.	Is this an expansion of an existing project? XXX Yes If yes, give the Division order number authorizing the project.	No et: <u>SWD-1053</u>	
V.	Attach a map that identifies all wells and leases within two drawn around each proposed injection well. This circle ide		
VI.	Attach a tabulation of data on all wells of public record with Such data shall include a description of each well's type, conschematic of any plugged well illustrating all plugging details	struction, date drilled, loc	
VII.	Attach data on the proposed operation, including:		
	 Proposed average and maximum daily rate and volume Whether the system is open or closed; Proposed average and maximum injection pressure; Sources and an appropriate analysis of injection fluid an produced water; and, If injection is for disposal purposes into a zone not produced analysis of the disposal zone formation water wells, etc.). 	d compatibility with the re	thin one mile of the proposed well, attach a
*VIII.	Attach appropriate geologic data on the injection zone incl depth. Give the geologic name, and depth to bottom of all total dissolved solids concentrations of 10,000 mg/l or less known to be immediately underlying the injection interval.	inderground sources of dri	nking water (aquifers containing waters with
IX.	Describe the proposed stimulation program, if any.		
*X.	Attach appropriate logging and test data on the well. (If we	ll logs have been filed with	the Division, they need not be resubmitted).
*XI.	Attach a chemical analysis of fresh water from two or more injection or disposal well showing location of wells and date		ble and producing) within one mile of any
XII.	Applicants for disposal wells must make an affirmative star data and find no evidence of open faults or any other hydrosources of drinking water.		
XIII.	Applicants must complete the "Proof of Notice" section on	he reverse side of this form	1.
	Certification: I hereby certify that the information submitte and belief.	I with this application is tr	ue and correct to the best of my knowledge
	NAME: BRIAN WOOD		TITLE: CONSULTANT
	SIGNATURE:		DATE: <u>JUNE 2, 2007</u>
*	E-MAIL ADDRESS: <u>brian@permitswest.com</u> If the information required under Sections VI, VIII, X, and Please show the date and circumstances of the earlier submit		

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.

INJECTION WELL DATA SHEET

OPERATOR: ROSETTA RESOURCES OPERATING LP

WELL NAME & NUMBER: TSAH TAH SWD #36

WELL LOCATION:

1800' FNL & 1360' FWL FOOTAGE LOCATION

TOWNSHIP 25 N

SECTION

RANGE 10 W

UNIT LETTER

WELL CONSTRUCTION DATA

Surface Casing

WELLBORE SCHEMATIC

§ set @ 226, & cemented to the surface. Circulated out 3 bbl. 8-5/8" 24# J-55 ST&C

Cemented with: 200 sacks Hole Size: 12-1/4"

Top of Cement: SURFACE

Method Determine: VISUAL

or $\underline{236}$ ft³

Casing Size: 8-5/8" 24# J-55 ST&C

Intermediate Casing

Hole Size:

Cemented with:

or sacks

Casing Size:

ff,

Top of Cement:

Perforate (0.34") from ≈3,325° to ≈4,192°

with 2 shots/foot

Packer now @ 4,126'
Will move to 3,275'

Perforated (0.34")

4,193' - 4,381'

with 2 shots/foot

set @ 4,495' & cemented to the surface. Circulated out 25 bbl.

5-1/2" 15.5# J-55 LT&C

Method Determined:

Production Casing

Hole Size: 7-7/8"

Cemented with: 880 sacks

or 1.571 ft³

Casing Size: 5-1/2" 15.5# J-55 LT&C

Top of Cement: SURFACE

Method Determine: VISUAL

Total Depth: 4,495'

From ≈3,325 feet To ≈4,192 feet Injection Interval 438

(Perforated or Open Hole; indicate which)

130 P. S.

Side 2

INJECTION WELL DATA SHEET

	Tubing Size: 2-7/8" 6.5# J-55	Lining Material: <u>PLASTIC</u>
.>	Sype of Packer: 5-1/2" x 2-7/8" COMPRESSION SET WITH ON/OFF TOOL	ON/OFF TOOL
ă	acker Setting Depth: WITHIN 50' OF THE HIGHEST PERFORATION	FORATION
\equiv	Other Type of Tubing/Casing Seal (if applicable):	
	Additional Data	
	Is this a new well drilled for injection?	YesNo
	If no, for what purpose was the well originally drilled?	
_ :	Name of the Injection Formation: MENEFEE	
	Name of Field or Pool (if applicable): SWD; MESA VERDE	<u>UDE</u>
.•	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.	blug(s) used.
	PERFORATED @ 4,193' - 4,381' IN POINT LOOKOUT. PACKER SET @ 4,126'	T. PACKER SET @ 4,126'
•	Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:	ing or overlying the proposed
	OVER: FRUITLAND (1,650') & PICTURED CLIFFS (1,750')	1,750')
	UNDER: GALLUP (5,150') & DAKOTA (6,175')	

MENEFEE ZONE

I. Purpose is to add one more zone (Menefee) for additional water disposal capacity. Disposal has already been approved (SWD-1053) in this well and is underway into the Point Lookout.

II. Operator: Rosetta Resources Operating LP Operator phone number: (720) 359-9144 Operator address: 1200 17th St., Suite 770

Denver, CO 80202

Contact: Brian Wood (Permits West, Inc.)

Phone: (505) 466-8120

III. A. (1) Lease: State lease VO-6298-0000

Lease Size: 280.00 acres

Lease Area: NW4, SW4NE4, & S2SE4 Sec. 36, t. 25 N., R. 10 W.

Closest Lease Line: 840'

Well Name & Number: Tsah Tah SWD #36 (API # 30-045-33942)
Well Location: 1800' FNL and 1360' FWL Sec. 36, T. 25 N., R. 10 W. (see Exhibit A)

A. (2) Surface casing (8-5/8", 24#, J-55, S T & C) was set at 226' KB in a 12-1/4" hole. Cemented to the surface with 200 sacks (236 cubic feet) Class G + 1/4 pound per sack cello flake + 2% CaCl₂ + 1/4 pound per sack cello flake. Circulated out 3 barrels.

Production casing (5-1/2", 15.5#, J-55, L T & C) landed at \approx 4,490' KB in a 7-7/8" hole. Float collar is at 4,446' KB. Top of the marker joint is at 3,666' KB. Top of the stage tool is at 1,875' KB. Circulated 25 barrels to the surface.

Cemented first stage with 410 sacks (775 cubic feet) of Type 5 65:35 poz + 6% gel + 5 pounds per sack gilsonite + 1/8 pound per sack poly flake. Tailed with 100 sacks (132 cubic feet) of Type 5



MENEFEE ZONE

50:50 poz + 2% gel + 5 pounds per sack gilsonite + 1/8 pound per sack poly flake.

Cemented second stage 320 sacks (605 cubic feet) Type 5 65:35 poz + 6% gel + 5 pounds per sack gilsonite + 1/8 pound per sack poly flake. Tailed with 50 sacks (59 cubic feet) Type 5 50:50 poz + 2% CaCl₂ + 5 pounds per sack gilsonite + 1/8 pound per sack poly flake.

- A. (3) Tubing is 2-7/8" 6.5# J-55 EUE 8rd plastic lined injection string. It will be set at $\approx 3,325$ ' KB (disposal interval will be $\approx 3,325$ ' to $\approx 4,381$ ').
- A. (4) A 5-1/2" x 2-7/8" nickel coated packer with an on/off tool or its equivalent will be set within ≈ 50 ' of the highest perforation. Thus, packer will be set at $\approx 3,275$ ' which will be ≈ 50 ' above the top perforation of $\approx 3,325$ '.
- **B.** (1) Initial disposal zone was the Point Lookout sandstone. Rosetta plans to add the Menefee to the disposal interval. Both zones are in the Mesa Verde Formation (Pool 96160). Fracture gradient is expected to be a normal ≈0.433 psi per foot.
- B. (2) The Point Lookout has been perforated with two 0.34" shots per foot. Upon approval, additional similar perforations will be shot in the Menefee ($\approx 3,325$ ' to $\approx 4,192$ ') interval.
- **B.** (3) Well has been drilled. It will be for Rosetta's exclusive use and for the sole purpose of water disposal from present and future Rosetta wells. Water analyses from three Rosetta Basin Fruitland coal gas wells within a three mile radius are attached.
- **B.** (4) The Point Lookout has been perforated from 4,193' to 4,381' (2 shots per foot x 188' = total 376 shots). Upon approval, additional similar perforations will be shot in the Menefee (\approx 3,325' to \approx 4,192'). Currently there is a Weatherford nickel coated Arrow Set



MENEFEE ZONE

1-X packer at 4,126' KB. It was set with 16,000 pounds compression. That packer will be moved up hole to a point ≈ 50 ' above the highest Menefee perforation. There are no other perforations now in the well.

B. (5) Top of the Menefee is at 3,304'. Bottom of the closest overlying potentially productive zone (Pictured Cliffs) is at $\approx 1,950$ '. There will be a $\approx 1,375$ ' interval between the bottom of the Pictured Cliffs and the highest injection perforation.

Bottom of the Menefee is at 4,192'. Top of the closest underlying potentially productive zone (Gallup) is at $\approx 5,170$ '. There will be a ≈ 978 ' interval between the bottom of the Menefee and the top of the Gallup. Within this ≈ 978 ' interval is the Point Lookout zone which is currently being used for water disposal in this same well. Oil is being produced elsewhere in the San Juan Basin from the Menefee (≈ 39 miles south in 18-18n-10w at the Seven Lakes Menefee Field). Closest plugged Menefee well is ≈ 28 miles south in 30-20n-9w (wildcat with no production).

- IV. This is not an expansion of an existing injection project. It is an expansion (one more zone) of an existing water disposal project.
- V. A map (Exhibit B) showing the 3 existing wells (all Rosetta Tsah Tah gas wells) within a half mile radius is attached. A map (Exhibit C) showing all 54 wells (34 P & A + 17 oil or gas producers + 2 water + 1 disposal) within a two mile radius is attached. Details on the wells within a half mile are:

<u>WELL</u>	<u>API #</u>	<u>T. 25 N., R. 10 W.</u>	<u>zone</u>	<u>TD</u>	<u>DISTANCE</u>
Tsah Tah 36 #2	30-045 - 33753	SWNW Sec. 36	Fruitland coal	1905'	430'
Tsah Tah 36 #3	30-045-34239	NESW Sec. 36	Fruitland coal	1905'	1950'
Tsah Tah 35 #1	30-045-33766	SENE Sec. 35	Fruitland coal	1908'	2599'



TSAH TAH 36 #3 API# 30-045-34239

8-3/4" hole
136' of 7"
20# ST&C

Cemented w/
60 sx (71 cu. ft.)
Circulated 5 bbl
to surface

TD = 1905'

46 joints of

4-1/2" 10.5#

J-55 ST&C at

1870' KB



Cemented w/

to surface

225 sx (398 cu. ft.)

Circulated 18 bbl

TSAH TAH 36 #2 API# 30-045-33753

8-3/4" hole 120' of 7" 23# LS LT&C

> 6-1/4" hole 48 joints of 4-1/2" 10.5# J-55 ST&C at

1885' KB

Cemented w/ 55 sx (65 cu. ft.) Circulated 5 bbl to surface

Cemented w/ 225 sx (398 cu. ft.) Circulated 30 bbl to surface

TD = 1905'



TSAH TAH 35 #1 API# 30-045-33766

8-3/4" hole 116' of 7" 20# J-55 LS ST&C

> 6-1/4" hole 49 joints of 4-1/2" 10.5# J-55 ST&C at 1886' KB

Cemented w/
60 sx (72 cu. ft.)
Circulated 5 bbl
to surface

Cemented w/ 225 sx (398 cu. ft.) Circulated 28 bbl to surface

TD = 1908'



MENEFEE ZONE

Exhibit D shows all leases (all T. 25 N., R. 10 W.) within a half mile radius.

Details are:

<u>AREA</u>	LESSOR	LEASE #	LESSFE(S)
S2 Sec. 25	/ BLM	NMNM-98739	/ Yates
SE4 Sec. 26	avajo Allottees	NO-G-0503-1735	S XIOC
NE4 Sec. 35	BLM	NMNM-112957	Rosetta
SE4 Sec. 35	BLM /	NMNM-114377	Rosetta
NW4, SWNE, & S2SE4 Sec. 36	SLO /	VO-6298-0000	Rosetta & Yates
SENE, NWSE, & SESW Sec. 36	SLO		Rosetta & Kaiser-Francis
N2NE4, W2SW4, NESW, & NESE Sec.	36 SLO	EO-3148-0010	Rosetta & Speer

A map (Exhibit E) showing all lessors within a two mile radius is attached. Most leases are BLM. The remainder are Navajo allotted (FIMO) or NM State Land Office (SLO).

VI. None of the three wells which are within a 1/2 mile radius penetrate the proposed injection zone. The deepest (Rosetta's Tsah Tah 35 #1) of the three wells has a total depth of 1,908'. There will be a ≈1,417' interval between the bottom of that gas well and the highest proposed perforation ($\approx 3,325$ ').

- VII. 1. Average injection rate will be $\approx 2,000$ bwpd. Maximum injection rate will be ≈3,000 bwpd.
 - System is closed. (Rosetta laid water pipelines with its gas pipelines). Facilities include a tank battery with skimmer and settling tanks, filters, meter, and an injection pump.
 - Average injection pressure will be ≈650 psi Maximum injection pressure will be ≈ 665 psi (<0.2 psi x depth of top perforation)
 - Water source will be existing and future Rosetta wells in the San Juan Basin. Rosetta had 29 approved gas wells in Townships 24 and 25 North, Range 10 West as of June 2, 2007. All gas wells are or will be Fruitland coal gas with a maximum TD of ≈1,900'. The closest (430') is the Tsah Tah 36 #2.



MENEFEE ZONE

A water analysis from the Menefee (Exhibit F) is attached. The Menefee was sampled in Rosetta's Tsah Tah SWD 11 well which is $\approx 2-1/2$ miles southwest. Water analyses from the La Ventana (above the Menefee) and Point Lookout (below the Menefee) are also attached.

Produced water analyses from three Basin Fruitland coal gas wells (Exhibit G) with a 3 mile radius are also attached.

A summary of the 6 analyses follows. All are Rosetta Tsah Tah wells.

Well:	2-4	33-2	34-4	SWD 11	SWD 11	SWD 11
Where:	2-24n-10w	33-25n-10w	34-25n-10w	11-24n-11w	11 - 24n-11w	11-24n-11w
What Zone:	Fruitland	Fruitland	Fruitland	La Ventana	Menefee	Pt. Lookout
<u>Parameter</u>						
Barium	2.44	3.19	2.26	No	Analysis	Run
Bicarbonate	518.5	786.9	549.0	486	725	483
Calcium	800	400	960	56	63	40
Chloride	19,000	18,000	16,000	9,552	14,653	13,465
Iron	27.62	46.22	21.77	0.10	0.16	0.46
Magnesium	344.04	245.22	149.33	48	77	77
рН	7.3	6.8	7.0	8.5	9.0	10.0
Sodium	10,906	10,980	9,166	6,240	9,586	8,752
Sulfate	zero	zero	2.0	23	32	97
TDS	31,599	30,462	26,851	16,443	25,149	22,953

5. The Menefee has not been found to be productive within two miles of the well. Oil is being produced elsewhere in the San Juan Basin from the Menefee (\approx 39 miles south in 18-18n-10w at the Seven Lakes Menefee Field). Closest plugged Menefee well is \approx 28 miles south in 30-20n-9w (wildcat with no production). Disposal of produced water into the Menefee has been approved \approx 2-1/2 miles southwest in SWD-1063-A.

Stone et al in <u>Hydrogeology and water resources of San Juan Basin, New Mexico</u> wrote that fluoride concentrations in Menefee wells near the Chaco River exceed safe drinking water limits.



MENEFEE ZONE

VIII. The Menefee Formation consists of Late Cretaceous claystone, coal, siltstone, shale, and sandstone. The Menefee Formation is ≈889' thick in this well. Top is at 3,304'. Bottom is at 4,193'.

Formation tops in this well are:

Nacimiento: 0'
Ojo Alamo Sandstone: 850'
Kirtland-Fruitland Formation: 1,430'
Pictured Cliffs Sandstone: 1,752'
La Ventana Tongue of Cliff House Sandstone: 2,614'
Menefee: 3,304'
Point Lookout Sandstone: 4,193'

Plugged Back Total Depth: 4,446'
Total Depth: 4,496'

There are two water wells within a two mile radius (see Exhibit C). Both are over 1-3/4 miles away. Well depths are 637' and 1,100'. Water depths, respectively, are 250' and 1,073'.

No existing underground drinking water sources are below the Menefee within a two mile radius. There will be $\approx 1,874$ ' of vertical separation between the bottom of the lowest existing underground water source (Ojo Alamo) and the top of the Menefee Formation.

- IX. The Menefee Formation will be stimulated with a sand-water fracture.
- X. Gas spectrum and cased hole neutron- gamma ray logs were run. Copies were provided to the NMOCD by Blue Jet.
- XI. There are no water wells within a one mile radius.



MENEFEE ZONE

XII. Rosetta is not aware of any geologic or engineering data which may indicate the Menefee is in hydrologic connection with any underground sources of water. There will be $\approx 2,204$ ' of vertical separation between the top ($\approx 3,304$ ') of the Menefee and the bottom (1,100') of the deepest water well within $\approx 1-3/4$ miles. This interval includes at least three shale zones (Kirtland, Lewis, and the Menefee).

XIII. Notice (this application) has been sent (Exhibit H) to the surface owner (NM State Land Office), operators of all wells (only Rosetta), and lessees or lease operating right holders (Kaiser-Francis, Rosetta, Speer, XTO, Yates), and lessors (BLM, Navajo allottees (c/o FIMO), NM State Land Office) within a half mile. A legal ad (see Exhibit I) was published on April 18, 2007.



DISTRICT I 1625 N. French Dr., Hobbs, N.M. 88240

State of New Mexico Energy, Minerals & Natural Resources Department

Form C-102 Revised August 15, 2000

DISTRICT II 811 South First, Artesia, N.M. 88210

DISTRICT III 1000 Rio Brazos Rd., Aztec, N.M. 87410 OIL CONSERVATION DIVISION 2040 South Pacheco Santa Fe, NM 87505

Submit to Appropriate District Office State Lease — 4 Copies Fee Lease — 3 Copies

☐ AMENDED REPORT

DISTRICT IV 2040 South Pacheco, Santa Fe, NM 87505

WELL LOCATION AND ACREAGE DEDICATION PLAT

30-045-33942	*Pool Code 96160	swd; Mesa Verde
Property Code 35715		roperty Name
OGRID No.	90	perator Name Delevation
239235	ROSETTA RES	OURCES OPERATING LP 6745'

10 Surface Location

UL or lot no.	Section 36	Township 25N	Range 1 OW	Lot Idn	Feet from the 1800'	North/South line NORTH	Feet from the 1360'	East/West line WEST	County SAN JUAN
•			11 Bott	om Hole	Location I	Different Fr	om Surface		
UL or lot no.	Section	Township	Range	Lot ldn	Feet from the	North/South line	Feet from the	East/West line	County
¹⁸ Dedicated Acre	<u>l </u>	<u> </u>	18 Joint or	Infill	¹⁶ Consolidation C	ode	15 Order No.		
		•	•						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION 16

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OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and

Signature BRIAN WOOD

Printed Name CONSULTANT

Title JUNE 2, 2007

Date

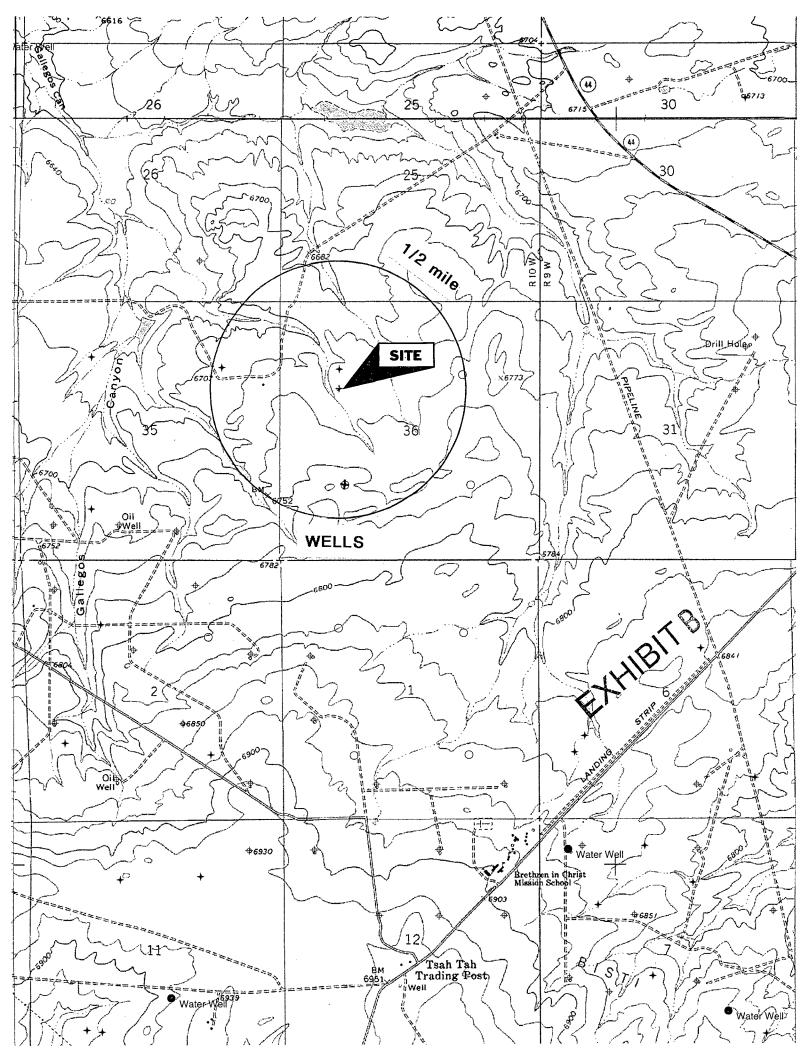
SURVEYOR CERTIFICATION

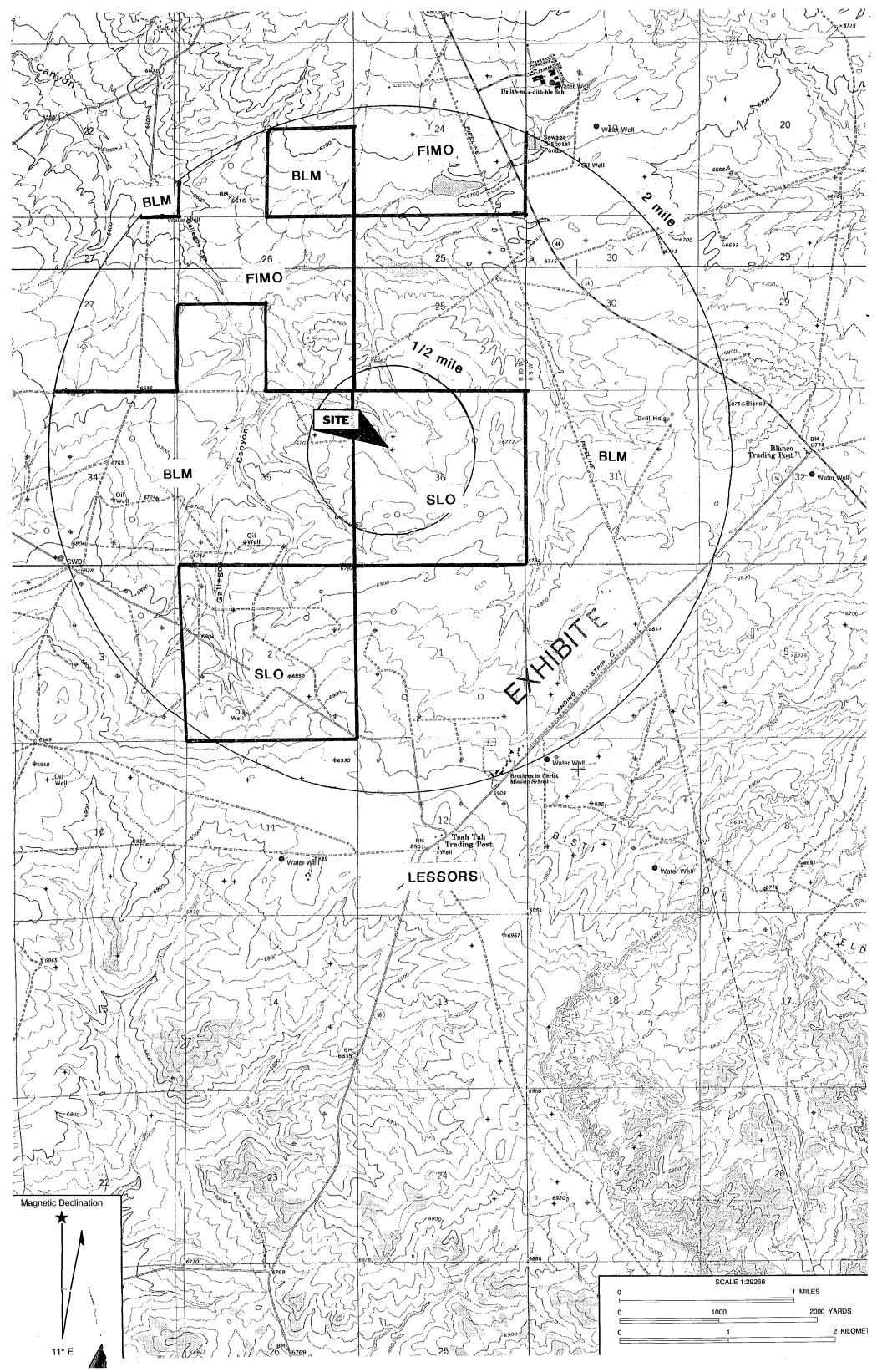
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

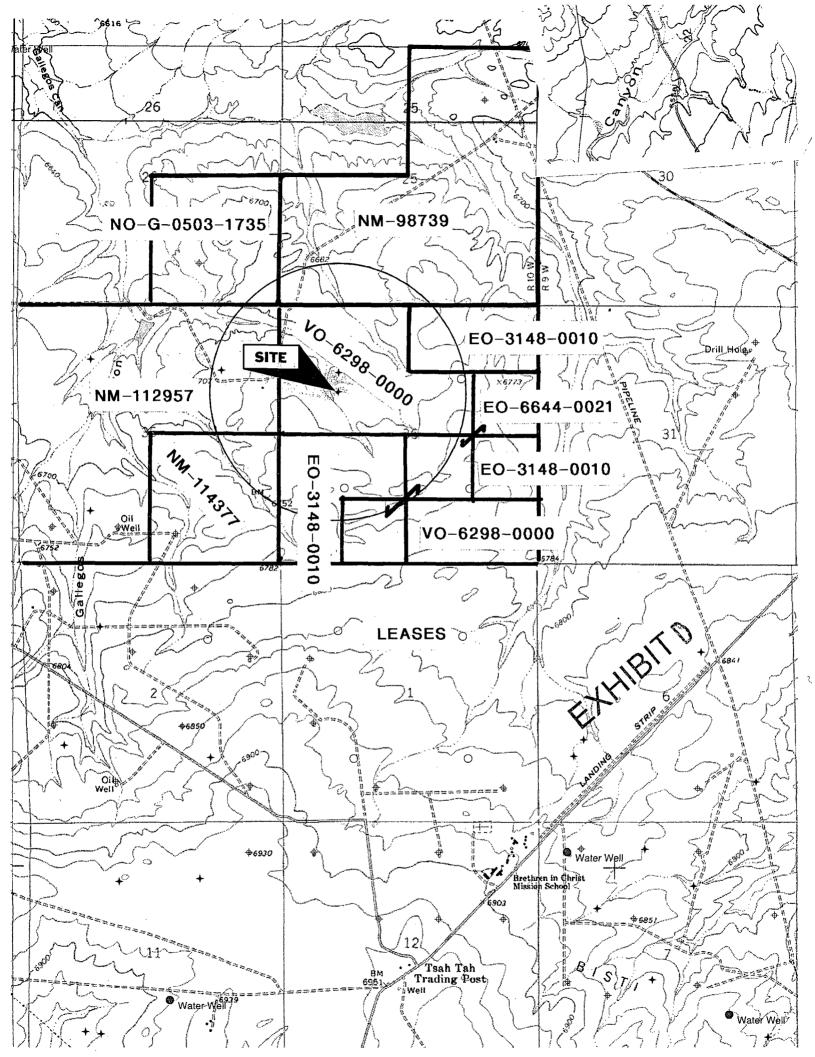
Date of Survey THESELT David

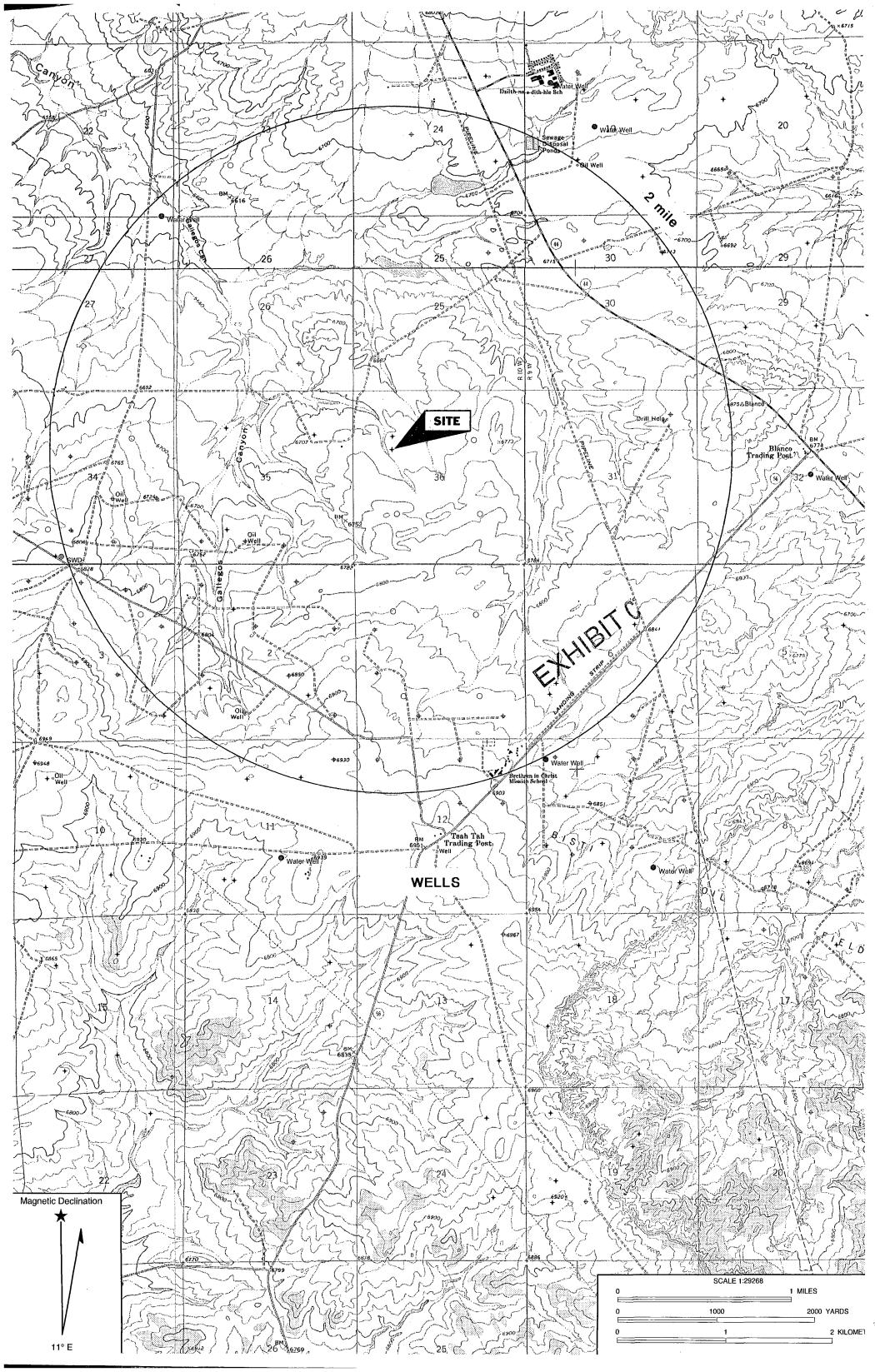
Certificate Number

10201













Operator:

Rosetta Resources

Sample Date: Analysis Date: March 15, 2007

Well

Tsah Tah SWD # 11

District:

March 17, 2007

Farmington

Formation:

SULFATES:

CLIFFHOUSE

Requested By:

RUSS McQUITTY

16443 ppm

TDS:

County:

SAN JUAN N.M.

Technician:

BEN BARELA

Depth:

2469

Source:

Swab Run #1

PHYSICAL AND CHEMICAL DETERMINATION

SPECIFIC GRAVITY: S.G. (Corrected): 1.005 1.005 (°F) MAGNESIUM: 8.50 48 ppm RESISTIVITY: 0.70 ohm/meter CALCIUM: 56 ppm 486 ppm IRON: 0.10 **BICARBONATES:** ppm CHLORIDES: 9552 ppm H2S: 0 ppm POTASSIUM: SODIUM: 6240 ppm 38 ppm

CaCO3 Scale Tendency =

Remote Remote

ppm

23

CaSO4 Scale Tendency = Stiff Plot 30 20 10 00 10 20 30 CI HCO3

Data contained in this document is based on the best information & most current test procedures and materials available. No liability is expressed or implied.

EXHIBITE

Key Pressure Pumping Services Water Analysis Result Form Farmington,, NM. 708 S. Tucker Phone:(505)325-4192 Fax:(505)564-3524 Zip:87401



Operator:

Resources Rosetta

Sample Date:

March 15, 2007

Analysis Date:

March 17, 2007

Well

Tsah Tah SWD # 11

District:

Farmington

Formation:

SAN JUAN N.M.

Requested By:

RUSS McQUITTY

County:

Menefee

Technician:

BEN BARELA

Depth:

3645

Source:

Swab Run #1

PHY	SICAL	AND	<u> </u>	<i>.</i> A L	DEIE	<u> </u>	AIIUN
SPECIFIC	GRAVITY:	1.010	52 (°F)	S.G.	(Corrected):	1.010	•

- 9.00

0.80 ohm/meter

MAGNESIUM: CALCIUM: 77 ppm 63 ppm

RESISTIVITY: IRON: H2\$:

0.16 ppm 0

BICARBONATES:

725 ppm

POTASSIUM:

ppm11 ppm **CHLORIDES:** SODIUM:

14653 ppm 9586 ppm

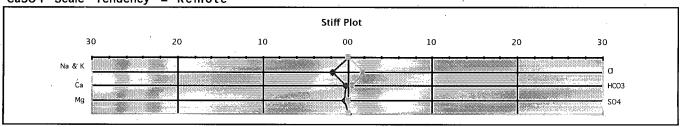
SULFATES:

32 ppm

TDS:

25149 ppm

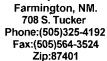
CaCO3 Scale Tendency = Remote CaSO4 Scale Tendency = Remote



Data contained in this document is based on the best information & most current test procedures and materials available. No liability is expressed or implied.



Key Pressure Pumping Services Water Analysis Result Form





Operator: Rosetta Resources

Sample Date:

March 15, 2007

Analysis Date:

March 17, 2007

Well

Tsah Tah SWD # 11

District:

Farmington

Formation:

POINT LOOKOUT

Requested By:

RUSS McQUITTY

County:

SAN JUAN N.M.

Technician:

BEN BARELA

Depth:

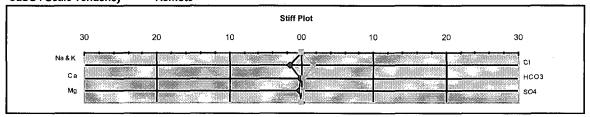
4181

Source:

Swab Run #6

<u> </u>	CHEM	<u>ICAL</u>	<u> DE</u>	<u>TERMINATION</u>	· · · · · · · · · · · · · · · · · · ·
	1.010	47	(°F)	S.G. (Corrected):	1.010
10.00				MAGNESIUM:	77 ppm
0.40	ohm/meter			CALCIUM:	40 ppm
0.46	ppm			BICARBONATES:	483 ppm
0	ppm			CHLORIDES:	13465 ppm
38	ppm			SODIUM :	8752 ppm
97	ppm			TDS:	22953 ppm
	10.00 0.40 0.46 0 38	1.010 10.00 0.40 ohm/meter 0.46 ppm 0 ppm 38 ppm	10.00 0.40 ohm/meter 0.46 ppm 0 ppm 38 ppm	1.010 47 (°F) 10.00 0.40 ohm/meter 0.46 ppm 0 ppm 38 ppm	1.010 47 (°F) S.G. (Corrected): 10.00 MAGNESIUM: 0.40 ohm/meter CALCIUM: 0.46 ppm BICARBONATES: 0 ppm CHLORIDES: 38 ppm SODIUM:

CaCO3 Scale Tendency = Remote CaSO4 Scale Tendency = Remote



Data contained in this document is based on the best information & most current test procedures and materials available. No liability is expressed or implied.



Water Analysis #: 1058

Company: Rosetta Resources

Lease:

Lease.

Location: Farmington, New Mexico

Date: January 16, 2007

Attention: Bryan Enns

Description:

Well: Tsah Tah 2 #4

Sulfide, S

Sample Point: 2 #4

PRODUCTION CHEMICALS*

DISSOLVED SOLIDS

CATIONS	mg/l	meq/l
Sodium, Na (calc)	10,906.14	474.18
Calcium, Ca	800.00	39.80
Magnesium, Mg	344.04	28.20
Barium, Ba	2.44	0.04
Iron, Fe	27.62	1.48

ANIONS	mg/l	meq/l
Hydroxyl, OH		
Carbonate, CO3		
Bicarbonate, HCO3	518.50	8.49
Sulfate, SO4	0.00	0.00
Chlorida Cl	19,000.00	535.21

OTHER PROPERTIES

pH	7.30
Specific Gravity	1.014
Dissolved Oxygen, (Mg/I)	
Dissolved Carbon Dioxide	19.80
Sulfide as H2S, (ppm)	0.00
Sample Temp	F. 72 C. 22
CO2 in Gas Phase (Mg/I)	• • •
H2S in Gas Phase (Mg/l)	
Total Hardness (Me/I)	68.00

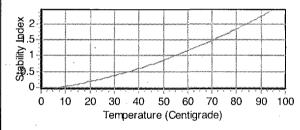
Total Dissolved Solids (Mg/I)	31,599
Total Ionic Strength	0.5784
Maximum CaSO4, (calc.)	0.00
Maximum BaSO4, (calc.)	0.00
Total SRB (colonies/cc)	
Total APB (colonies/cc)	
Total Aerobic (colonies/cc)	
Manganese (Mg/I):	0.84

Conclusion:

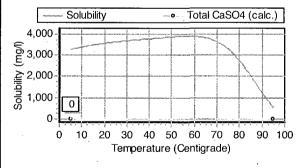
Calcium Carbonate scaling index is positive above 9 degrees Centigrade. Calcium Sulfate scale is not indicated from 0 to 100 degrees Centigrade. Barium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.

Scaling Indices vs. Temperature

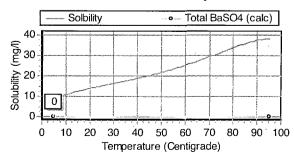
Calcium Carbonate Saturation Index



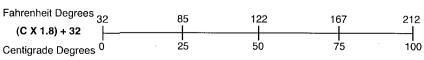
Calcium Sulfate Solubility



Barium Sulfate Solubility







Water Analysis Analysis #: 1059

Company: Rosetta Resources

Lease:

Date: January 16, 2007 Attention: Bryan Enns

Description:

Well: Tsah Tah 33 #2

Sulfide, S

Location: Farmington, New Mexico Sample Point: 33 #2



meq/I

12.88 0.00

507.04

DISSOLVED SOLIDS

			·	
<u>CATIONS</u>	mg/l	meq/l	<u>ANIONS</u>	<u>mg/l</u>
Sodium, Na (calc)	10,979.97	477.39	Hydroxyl, OH	
Calcium, Ca	400.00	19.90	Carbonate, CO3	
Magnesium, Mg	245.22	20.10	Bicarbonate, HCO3	786.90
Barium, Ba	3.19	0.05	Sulfate, SO4	0.00
Iron, Fe	46.22	2.48	Chloride, Cl	18,000.00
•			_ · ·	

OTHER PROPERTIES

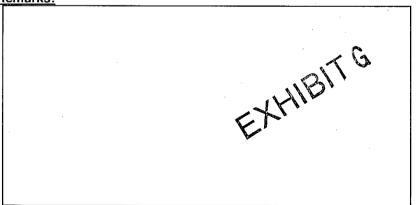
6.80
1.014
7.90
0.00
F. 72 C. 22
40.00

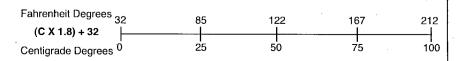
•	
Total Dissolved Solids (Mg/l)	30,462
Total Ionic Strength	0.5402
Maximum CaSO4, (calc.)	0.00
Maximum BaSO4, (calc.)	0.00
Total SRB (colonies/cc)	
Total APB (colonies/cc)	
Total Aerobic (colonies/cc)	
Manganese (Mg/l):	0.43

Conclusion:

Calcium Carbonate scaling index is positive above 41 degrees Centigrade. Calcium Sulfate scale is not indicated from 0 to 100 degrees Centigrade. Barium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.

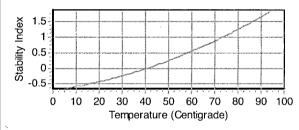
Remarks:



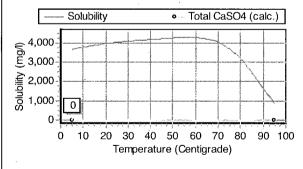


Scaling Indices vs. Temperature

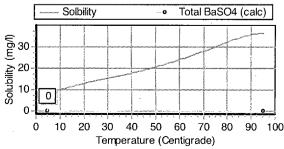
Calcium Carbonate Saturation Index



Calcium Sulfate Solubility



Barium Sulfate Solubility



Water Analysis #: 1060

Company: Rosetta Resources

Lease:

Location: Farmington, New Mexico

Date: January 16, 2007

Attention: Bryan Enns

Description:

Well: Tsah Tah 34 #4

Sample Point: 34 #4



PRODUCTION CHEMICALS

DISSOLVED SOLIDS

CATIONS	mg/l	meq/l
Sodium, Na (calc)	9,166.19	398.53
Calcium, Ca	960.00	47.76
Magnesium, Mg	149.33	12.24
Barium, Ba	2.26	0.03
Iron, Fe	21.77	1.17

ANIONS	<u>mg/l</u> 、	meq/l
Hydroxyl, OH		
Carbonate, CO3		
Bicarbonate, HCO3	549.00	8.99
Sulfate, SO4	2.00	0.04
Chloride, Cl	16,000.00	450.70
Sulfide S		

OTHER PROPERTIES

рН	7.00
Specific Gravity	1.014
Dissolved Oxygen, (Mg/l)	
Dissolved Carbon Dioxide	11.90
Sulfide as H2S, (ppm)	0.00
Sample Temp	F. 72 C. 22
CO2 in Gas Phase (Mg/l)	
H2S in Gas Phase (Mg/l)	
Total Hardness (Me/I)	60.00

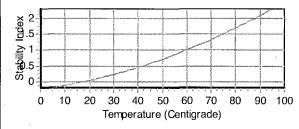
Total Dissolved Solids (Mg/l)	26,851
Total Ionic Strength	0.4905
Maximum CaSO4, (calc.)	2.85
Maximum BaSO4, (calc.)	-3.87
Total SRB (colonies/cc)	
Total APB (colonies/cc)	
Total Aerobic (colonies/cc)	 -
Manganese (Mg/l):	0.26

Conclusion:

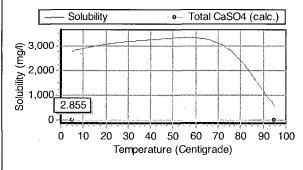
Calcium Carbonate scaling index is positive above 19 degrees Centigrade. Calcium Sulfate scale is not indicated from 0 to 100 degrees Centigrade. Barium Sulfate scale is indicated below 5 degrees Centigrade.

Scaling Indices vs. Temperature

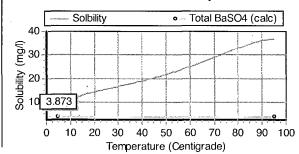


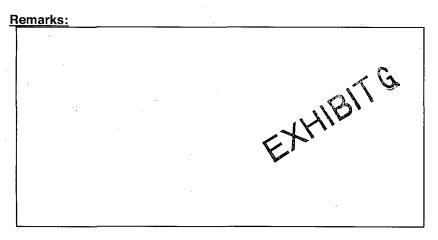


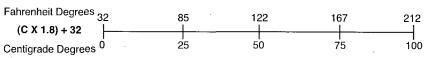
Calcium Sulfate Solubility



Barium Sulfate Solubility









Jim Lovato BLM 1235 LaPlata Highway Farmington, NM 87401

Dear Jim,

Rosetta Resources Operating LP is applying (see attached application) to amend the approval for its existing Tsah Tah SWD #36 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed additional water disposal zone. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Tsah Tah SWD #36

Total Depth: ≈4,495'

Additional Disposal Zone: Menefee (from ≈3,325' to ≈4,192') Location: 1800' FNL & 1360' FWL Sec. 36, T. 25 N., R. 10 W.,

San Juan County, NM on state lease VO-6298-0000

Approximate Location: ≈25 air miles south of Bloomfield, NM

Applicant Name: Rosetta Resources Operating LP (720) 359-9144

Applicant's Address: 1200 17th St., Suite 770, Denver, CO 80202

<u>Submittal Information:</u> Application for a water disposal well will be filed with the NM Oil Conservation Division. If they determine the application complies with the applicable regulations, then it will be approved. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr., Santa Fe, NM 87505. Their phone number is (505) 476-3440.

Please call me if you have any questions.



Sincerely,

Brian Wood

EXHIBIT



Jim Stockbridge FIMO 1235 LaPlata Highway Farmington, NM 87401

Dear Jim,

Rosetta Resources Operating LP is applying (see attached application) to amend the approval for its existing Tsah Tah SWD #36 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed additional water disposal zone. This letter is a notice only. No action is needed unless you have questions or objections.

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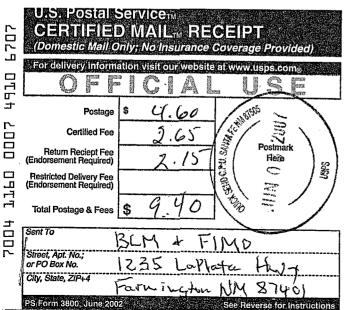
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Please call me if you have any questions.



Sincerely,

Brian Wood

EXHIBITH



Joe Mraz NM State Land Office P. O. Box 1148 Santa Fe, NM 87504

Dear Joe,

Rosetta Resources Operating LP is applying (see attached application) to amend the approval for its existing Tsah Tah SWD #36 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed additional water disposal zone. This letter is a notice only. No action is needed unless you have questions or objections.

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San Juan County, NM on state lease VO-6298-0000

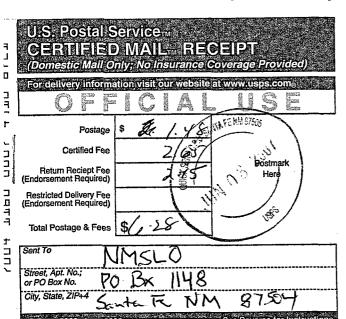
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Please call me if you have any questions.



Sincerely,

Brian Wood

EXHIBITH



June 2, 20Q7

Kaiser-Francis Oil Co. P. O. Box 21468 Tulsa, OK 74121

Rosetta Resources Operating LP is applying (see attached application) to amend the approval for its existing Tsah Tah SWD #36 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed additional water disposal zone. This letter is a notice only. No action is needed unless you have questions or objections.

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San Juan County, NM on state lease VO-6298-0000

Approximate Location: ≈25 air miles south of Bloomfield, NM

Applicant Name: Rosetta Resources Operating LP (720) 359-9144

Applicant's Address: 1200 17th St., Suite 770, Denver, CO 80202

<u>Submittal Information:</u> Application for a water disposal well will be filed with the NM Oil Conservation Division. If they determine the application complies with the applicable regulations, then it will be approved. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr., Santa Fe, NM 87505. Their phone number is (505) 476-3440.

Please call me if you have any questions.

Sincerely,

Brian Wood

673

497

7004

EXHIBITIA



1

Bill Speer 900 Crestview Dr. Farmington, NM 87401

Dear Bill,

Rosetta Resources Operating LP is applying (see attached application) to amend the approval for its existing Tsah Tah SWD #36 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed additional water disposal zone. This letter is a notice only. No action is needed unless you have questions or objections.

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San Juan County, NM on state lease VO-6298-0000

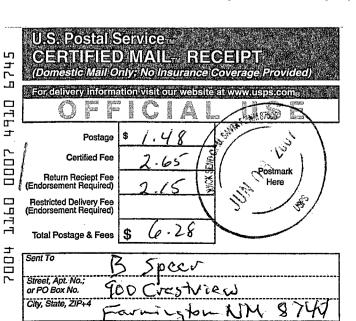
Approximate Location: ≈25 air miles south of Bloomfield, NM

Applicant Name: Rosetta Resources Operating LP (720) 359-9144

Applicant's Address: 1200 17th St., Suite 770, Denver, CO 80202

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Please call me if you have any questions.



Sincerely,

Brian Wood

EXHIBITH



Kyla Vaughan XTO Energy Inc. 2700 Farmington Ave., Bldg. K-1 Farmington, NM 87401

Dear Kyla,

Rosetta Resources Operating LP is applying (see attached application) to amend the approval for its existing Tsah Tah SWD #36 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed additional water disposal zone. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Tsah Tah SWD #36

Total Depth: ≈4,495'

Additional Disposal Zone: Menefee (from $\approx 3,325$ ' to $\approx 4,192$ ') Location: 1800' FNL & 1360' FWL Sec. 36, T. 25 N., R. 10 W.,

San Juan County, NM on state lease VO-6298-0000

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Please call me if you have any questions.



4910

Sincerely.

Brian Wood

EXHIBITIN

AFFIDAVIT OF PUBLICATION

Ad No. 54980

STATE OF NEW MEXICO County of San Juan:

ROBIN ALLISON, being duly sworn says: That she is the CLASSIFIED MANAGER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Wednesday, April 18, 2007

And the cost of the publication is \$58.59

ROBIN ON **ALLISON** appeared before me, whom I know personally to be the person who signed the above document.

COPY OF PUBLICATION

Rosetta Resources Op 3,000 bwpd, and de Wednesday April 18, erating LP is applying crease the maximum to amend its approval pressure to 525 psi. If for the Tsah Tah SWD approved in its entire well. The Tsah Tah SWD 36 is located at 1800' FNL & 1360' FWL, Sec. 36, T. 25 N., R. 10. W., San Juan County, NM. The well is currently approved to dispose of water produced from oil and gas wells into the Point Lookout sand stone at a depth of 4,300' to 4,400' at a 36 water disposal 4,300' to 4,400' at a mation can be ob tained by contacting Brian Wood, Permits West, Inc., 37 Verano Loop, maximum pressure of 860 psi Rosetta is ap plying to add two is (505) 466-8120. zones (La Ventana ongue of the Cliff Legal No. 54980 pub House and Menerel, lished in The Daily ocrease the volume Times, Farmington, to a maximum of New Mexico on

maximum 2007 ty, then the disposal Santa Fe, NM 87508. Phone number

EXHIBITI