Proposal No: 214251360A

Roca Resource Co Inc
New Mexico 36 State Com No. 1

Lea County, New Mexico
March 9, 2003

Acidizing Recommendation

Prepared for:
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POWERVISION℠

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Manager, City Sales
Artesia, New Mexico

Operator Name: Roca Resource Co Inc
Well Name: New Mexico 36 St[illegible] Com No. 1
Job Description: 3,000 gals. Isosol Treatment w/CO2
Date: March 9, 2003

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JOB AT A GLANCE

Surface Treating Pressure (max)		8,253 psi
Total HHP (max)		982 hhp
Fluid HHP (avg)		115 hhp
CO2 HHP (avg)		527 hhp
Total Rate (max)		3.74 bpm
Fluid Rate (max)		2.00 bpm
CO2 Rate (max)		3.52 bpm
Estimated Pump Time (HH:MM)		1:49
Nitrogen Cooldown Volume		20,000 scf
CO2 Volume		63.62 tons
CO2 Cooldown		10.00 tons
Acid	6,000 gals	10% Isosol w/50% CO2
Flush	7,500 gals	CO2 Flush
Pre-Pad	4,930 gals	CO2 Pre-Pad
Divertors	60 ea	Ball Sealers, 7/8 in, 1.3 sg, (RCN)

ROCA TO SUPPLY ALL FLUSHES, CO2, BOOSTER, TREESAVER, AND ANNULUS PUMP.

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WELL DATA

RESERVOIR DATA

Formation	Morrow
Formation Type	Sandstone
Depth to Middle Perforation	13,510 ft
Reservoir Pressure	2,000 psi
Fracture Gradient	0.85 psi/ft
Bottom Hole Fracture Pressure	11,484 psi
Bottom Hole Static Temperature	171 ° F

PERFORATED INTERVAL

DEPTH(ft)		Shots per Foot	Perf Diameter (in)	Total Perfs
MEASURED	TRUE VERTICAL			
13,500 - 13,520	13,500 - 13,520	4	0.41	80

Total Number of Perforations	80
Total Feet Perforated	20 ft

TUBULAR GEOMETRY

				Top	Bottom
Tubing	2 3/8" O.D.	(1.995" .I.D)	4.7 # N-80	0	13,146
Casing	5 1/2" O.D.	(4.892" .I.D)	17 #	13,146	13,650

End of Tubing	13,146 ft
Pump Via	Tubing

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FLUID SPECIFICATIONS

Acid: 10% Isosol w/50% CO2

Foam Volume:	6,000 Gallons	
Pumped Liquid Volume:	3,000 Gallons	
Pumped Gas Volume:	13.10 tons CO2	
Base:	81 %	Methanol
	19 %	Acetic Acid, Glacial

Components:

10 gpt	MS-16	Solvent
2 gpt	CI-27	Corrosion Inhibitor

Flush: CO2 Flush

Gas Volume:	7,500 Gallons
Pumped Liquid Volume:	1 Gallons
Pumped Gas Volume:	30.48 tons CO2

Pre-Pad: CO2 Pre-Pad

Gas Volume:	4,930 Gallons
Pumped Liquid Volume:	0 Gallons
Pumped Gas Volume:	20.04 tons CO2

Divertors	60 ea	100%	Ball Sealers, 7/8 in, 1.3 sg, (RCN)

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ACID TREATMENT SCHEDULE
CARBON DIOXIDE GAS SYSTEM

INPUT PARAMETERS

TVD Depth (Mid Perforation)	13,510 ft
MD Depth (Mid Perforation)	13,510 ft
Perforations Number	80
Perforation Diameter	0.410 in
Bottom Hole Frac Pressure	11,484 psi
Bottom Hole Static Temperature	171 ° F
CO2 Transport Pressure	250 psi
Fluid Specific Gravity	0.800
Fluid Temperature in Tanks	50 ° F

				Top	Bottom
Tubing	2 3/8" O.D.	(1.995" I.D.)	4.7 # N-80	0	13,146
Casing	5 1/2" O.D.	(4.892" I.D.)	17 #	13,146	13,650

CALCULATED TEMPERATURES

	Maximum	Minimum
CO2 Discharge	31 ° F	24 ° F
System at Wellhead	44 ° F	24 ° F
System at Perforation	63 ° F	63 ° F

CALCULATED RATES, PRESSURES & HHP REQUIREMENTS

	Maximum	Minimum	Average
Surface Treating Pressure (psi)	8,253	6,674	7,189
Surface CO2 Rate (high pressure bpm)	3.5	1.9	3.0
Fluid Rate (bpm)	2.0	0.0	0.7
Fluid Hydraulic Horsepower	405	1	115
CO2 Hydraulic Horsepower	577	379	527

Volumes, Rates and Qualities are based on Downhole Temperature and Pressures.

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ACID TREATMENT SCHEDULE
CARBON DIOXIDE GAS SYSTEM

RATE SCHEDULE

Stage	Downhole System			Wellhead Rates			
	Clean Volume (gal)	Base Fluid Description	Total Rate (bpm)	Clean System (bpm)	Clean Fluid (bpm)	Carbon Dioxide (bpm)	Diverting Agent (unit/min)
1	4930	CO2 Pre-Pad	4.0	3.5	0.0	3.5	
2	6000	10% Isosol w/50% CO2	4.0	3.9	2.0	1.9	1.7
3	7500	CO2 Flush	4.0	3.5	0.0	3.5	

FLUID & GAS QUANTITIES

Stage	Surface Stage Totals			Surface Cumulative Totals			Average Specific Gravity
	Clean (bbls)	CO2 (bbls)	CO2 (tons)	Clean (bbls)	CO2 (bbls)	CO2 (tons)	
1	0.0	103.4	20.0	0.0	103.4	20.0	1.111
2	71.4	66.9	13.1	71.4	170.3	33.1	1.091
3	0.0	157.3	30.5	71.5	327.5	63.6	1.111

NOTE: CO2 Barrel Volumes calculated for high pressure barrels.

PROCEDURE

Stage	Downhole Volumes Clean			Diverting Agent					Surface Treating Pressure (psi)
	System (gals)	Fluid (gals)	Fluid (bbls)	Conc. (pda)	Type	Stage (volume)	Cum (lbs)	Cum (b.s.)	
1	4930	0	0.0		Pre-Pad		0		6676
2	6000	3000	71.4		BS, 7/8 in, 1.3 sg,	60	0	60	8253
3	7500	1	0.0		Flush		0	60	6673
Totals	18430	3001	71.5				0	60	

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ACID TREATMENT SCHEDULE
CARBON DIOXIDE GAS SYSTEM

TREATMENT SCHEDULE

Stage	Wellhead Rates			Clean Volume Without CO2		CO2 (tons)		Stage Pump Time	Total Pump Time
	Clean Fluid (bpm)	CO2 (bpm)	Diverting Agent (unit/min)	(bbls)	(cum)	(stg)	(cum)	hh:mm:ss	hh:mm:ss
1	0.0	3.5		0.0	0.0	20.0	20.0	00:29:20	00:29:20
2	2.0	1.9		71.4	71.4	13.1	33.1	00:35:42	01:05:03
3	0.0	3.5		0.0	71.5	30.5	63.6	00:44:38	01:49:42
							Total Pump Time:		01:49:42

SYSTEM QUALITIES & CONCENTRATIONS

Stage	Mitchell Quality						Carbon Dioxide	
	Wellhead		Perforations		Formation		Conc. scf/bbl	Solubility scf/bbl
	C	T	C	T	C	T		
1	100	100	100	100	100	100	*******	240
2	47	47	46	46	50	50	3156	240
3	100	100	100	100	100	100	*******	240

C = Carbon Dioxide and T = Total

NOTE: The Mitchell Quality is the Gas Rate divided by the Gas + Gel Rate.

Volumes, Rates and Qualities are based on Downhole Temperature and Pressures.

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PRICE ESTIMATE

Product Material

QTY	UNIT	PRODUCT DESCRIPTION	UNIT PRICE	GROSS AMOUNT	DISC (%)	NET AMOUNT
60	ea	Ball Sealers, 7/8 in, 1.3 sg, (RCN)	3.78	226.80	60.0	90.72
570	gals	Acetic Acid, Glacial	19.65	11,200.50	60.0	4,480.20
2430	gals	Methanol	1.75	4,252.50	0.0	4,252.50
200	c-scf	Nitrogen	2.86	572.00	60.0	228.80
6	gals	CI-27	77.75	466.50	60.0	186.60
30	gals	MS-16	50.50	1,515.00	60.0	606.00
1	ea	Fire Unit & Nomex Coveralls	1,500.00	1,500.00	0.0	1,500.00
		Product Material Subtotal:		$19,733.30		$11,344.82

Service Charges

QTY	UNIT	PRODUCT DESCRIPTION	UNIT PRICE	GROSS AMOUNT	DISC (%)	NET AMOUNT
74	tons	CO2 Handling Service Charge	46.80	3,463.20	60.0	1,385.28
		Service Charges Subtotal:		$3,463.20		$1,385.28

Equipment

QTY	UNIT	PRODUCT DESCRIPTION	UNIT PRICE	GROSS AMOUNT	DISC (%)	NET AMOUNT
1	2hrs	Acid Pump, 5001- 7500 psi - Slurry	1,735.00	1,735.00	60.0	694.00
1	job	Portable Emergency Shower	815.00	815.00	60.0	326.00
1	2hrs	Frac Eqp Min, <1.2K HHP, Init hrs	3,500.00	3,500.00	60.0	1,400.00
1	job	Data Acquisition, Acid, Standard	1,155.00	1,155.00	60.0	462.00
1	job	2 in Frac Valve	295.00	295.00	60.0	118.00
270	miles	Mileage, Heavy Vehicle	4.40	1,188.00	60.0	475.20
90	miles	Mileage, Auto, Pick-Up or Treating Van	2.67	240.30	60.0	96.12
2	2hrs	Manual Ball Injector	223.50	447.00	60.0	178.80
1	2hrs	N2 Pump, 0-4k scfm, 5001 - 7000 psi	1,690.00	1,690.00	55.0	760.50
		Equipment Subtotal:		$11,065.30		$4,510.62

The technical data contained in this proposal is based on the best information available at the time of writing and is subject to further analysis and testing. The pricing data contained in this proposal are estimates only and may vary depending on the work actually performed. Pricing does not include federal, state and local taxes or royalties.
This quotation is based on BJ Services Company being awarded the work on a first call basis and within thirty (30) days of the proposal date. These prices will be subject to review if the work is done after thirty (30) days from the proposal date, or on a second or third call basis.

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PRICE ESTIMATE

Freight/Delivery Charges

QTY	UNIT	PRODUCT DESCRIPTION	UNIT PRICE	GROSS AMOUNT	DISC (%)	NET AMOUNT
6	hrs	Bulk Delivery,Trans.,Over 3000 gals	104.25	625.50	60.0	250.20
		Freight/Delivery Charges Subtotal:		$625.50		$250.20
			TOTAL:	**$34,887.30**		**$17,490.92**

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PRODUCT DESCRIPTIONS

Acetic Acid, Glacial
A colorless organic acid used in well stimulation for its lower corrosion rate and easier inhibiting properties at high temperatures; may be used as an iron control agent to prevent the precipitation of insoluble metal compounds.

CI-27
An inhibitor for use in hydrochloric acid and in formulations which combine hydrochloric with other acids, such as acetic, formic or hydrofluoric. It provides effective protection of tubulars and downhole equipment in bottomhole temperatures up to 250 deg F (121 deg C), and with the use of Hy-Temp intensifiers it can provide protection at temperatures in excess of 325 deg F (163 deg C).

MS-16
A micellar, non-ionic, water soluble mutual solvent that water-wets and aids in fluid recovery in treatments performed on carbonate and sandstone formations.

Methanol
Alcohols are used to reduce absorption of surfactants, lower surface tension, or water-wet formation fines. Used in concentrations up to 30% by volume.