

COMPATIBILITY TEST OF PRODUCED AND INJECTION WATERS

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : CONOCO
Date : 12-10-1990
Sample 1: 25% Warren McKee IPD - 75% Warren Unit #53
Sample 2: 50% Warren McKee IPD - 50% Warren Unit #53
Sample 3: 75% Warren McKee IPD - 50% Warren Unit #53

	Sample 1	Sample 2	Sample 3
Specific Gravity:	1.072	1.060	1.048
Total Dissolved Solids:	100318	84077	67835
pH:	7.00	7.10	7.20
IONIC STRENGTH:	2.258	1.813	1.368

CATIONS:		me/liter	mg/liter	me/liter	mg/liter	me/liter	mg/liter
Calcium	(Ca ⁺²)	271	5420	194	3880	117	2340
Magnesium	(Mg ⁺²)	568	6900	384	4670	200	2430
Sodium	(Na ⁺¹)	989	22700	934	21500	879	20200
Iron (total)	(Fe ⁺²)	0.951	26.5	0.648	18.1	0.346	9.65
Barium	(Ba ⁺²)	0.002	0.150	0.003	0.200	0.004	0.250
Manganese	(Mn ⁺²)	0.024	0.667	0.017	0.475	0.010	0.280

ANIONS:		me/liter	mg/liter	me/liter	mg/liter	me/liter	mg/liter
Bicarbonate	(HCO ₃ ⁻¹)	3.70	226	4.20	256	4.70	287
Carbonate	(CO ₃ ⁻²)	0	0	0	0	0	0
Hydroxide	(OH ⁻¹)	0	0	0	0	0	0
Sulfate	(SO ₄ ⁻²)	26.5	1280	27.1	1300	27.6	1330
Chloride	(Cl ⁻¹)	1800	63800	1480	52500	1160	41300

DISSOLVED GASES							
Carbon Dioxide	(CO ₂)		0		0		0
Hydrogen Sulfide	(H ₂ S)		0		0		0
Oxygen	(O ₂)		0		0		0

		SCALING INDEX (positive value indicates scale)					
Temperature		Calcium Carbonate	Calcium Sulfate	Calcium Carbonate	Calcium Sulfate	Calcium Carbonate	Calcium Sulfate
		0.49	-14	0.40	-22	0.34	-33

EXHIBIT 20

BEFORE EXAMINER STOGNER
OIL CONSERVATION DIVISION
EXHIBIT NO. 20
CASE NO. 10220
Submitted by Conoco Inc.
Hearing Date 1-24-91