ANNUAL REPORT

SOUTHERN UTAH FUEL COMPANY

Mine No. 1

March 1990

COAL MINING AND RECLAMATION OPERATIONS FOR 1989
(Authority UMC 784)

(Must be submitted to the Division by March 31, 1990)

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
3 Triad Centter, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

(801) 538-5340

RECEIVED
MAR 19 1990
DIVISION OF
OIL, GAS & MINING

Operator: Southern Utah Fuel Company

Mine Name: Mine No. 1

Mailing Address: 397 South 800 West, Salina, Utah 84654

Company Representative: Ken Payne

Permit Number: ACT/041/002

Date of Most Recent Permanent Program Permit: December 21, 1989

Quantity of Coal Mined (tonnage) 1989: 3,058,722

Attach Updated Mine Sequence Map.

All monitoring activities during the report period must be submitted with this report (including, but not limited to):

A. Summarized Water Monitoring Data

B. Precipitation or Other Climatological Data

C. Subsidence Monitoring Report

D. Vegetation Data (test plots) or Revegetation Success Monitoring (includes interim and final)

E. Permit Stipulation Status

djh
AT57/2

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 001

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	1	28	17.2	6.44	21
FLOW (CFS)	0.0048	0.02	0.01	0.00	21
WATER TEMPERATURE (C)	5	14	6.7	1.86	21
SPEC. COND. (UMHOS/CM) FIELD	340	921	500.2	120.85	21
PH (SU) FIELD	6.2	8	7.3	0.42	21
TURBIDITY (NTU) FIELD	0.05	35.48	4.25	7.90	21
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	220	596	302.4	90.92	21
COMMON IONS					
CALCIUM (CA)	46	108	60.9	15.41	21
MAGNESIUM (MG)	0.96	64.3	20.5	11.64	21
SODIUM (NA)	9	80	19.0	16.28	21
POTASSIUM (K)	0.3	5.1	2.7	2.30	4
ACIDITY AS CACO3	0.01	44	9.51	10.58	21
ALKALINITY AS CACO3 (LAB)	166	260	198.2	23.98	21
BICARBONATE (HCO3) (LAB)	185.4	312	237.2	27.31	21
HARDNESS (CACO3) TOTAL	196	396	241.7	46.04	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	0.1	0.04	0.04	19
SULFATE (SO4)	20	202	38.3	41.20	21
CHLORIDE (CL)	1	60.4	22.5	11.96	21
NUTRIENTS					
NITRATE (NO3-N)	0.02	0.99	0.42	0.19	21
TOTAL PHOSPHATE (PO4)	0.03	0.72	0.11	0.15	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.03	0.08	0.06	0.01	21
BORON (B) TOTAL	0.02	0.23	0.068	0.05	20
IRON (FE) TOTAL	0.01	1.13	0.12	0.24	21
IRON (FE) DISS	0.009	0.2	0.025	0.04	21
MANGANESE (MN) TOTAL	0.002	0.05	0.014	0.01	21
MANGANESE (MN) DISS	0.001	0.01	0.009	0.00	21

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 001

STATION LOCATION - EAST SPRING

SAMPLE DATE	06/21/83	08/16/83	10/12/83	06/21/84	08/09/84	10/11/84	06/13/85	08/14/85	10/22/85	06/04/86	08/13/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	21	16	9	19	28	7	21	23	1	14	18
FLOW (CFS)	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
WATER TEMPERATURE (C)	6	14	9	7	7	6	6	6	6	5.5	6
SPEC. COND. (UMHOS/CM) FIELD	420	430	340	390	450	360	921	432	455	461	432
PH (SU) FIELD	7.3	7.1	7.1	7.2	7.25	7.35	6.8	7.5	7.45	7.55	7.5
TURBIDITY (NTU) FIELD	2.7	0.8	7	10.2	2.4	0.27	1.2	5	35.48	0.84	0.05
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	238	260	220	250	290	286	596	280	266	242	220
COMMON IONS											
CALCIUM (CA)	50.4	49.6	48	64.4	60	46	49.6	51.2	60	49.6	57.6
MAGNESIUM (MG)	21.12	23.04	18.24	10.8	19.2	32.4	64.3	18.5	13.2	23	17.3
SODIUM (NA)	12	11.5	9	14	40	10.7	80	45	10.7	11.81	13.51
POTASSIUM (K)			0.3	0.5			5.1	4.9			
ACIDITY AS CACO3	3.5	13	14	44	15	14	7.6	18.9	13.7	<0.01	2.5
ALKALINITY AS CACO3 (LAB)	186	204	166	190	210	168	256	180	260	193	190
BICARBONATE (HCO3) (LAB)	227	249	202.5	231.8	256.2	205	312	219.6	268.4	235	231.8
HARDNESS (CACO3) TOTAL	214	220	196	206	230	250	396	205	205	220	216
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
SULFATE (SO4)	28	32	28	25	26	27	202	27	20	29	22
CHLORIDE (CL)	28	22	14	18.4	18.2	16	60.4	21.6	19.9	23	20.1
NUTRIENTS											
NITRATE (NO3-N)	<0.02	0.38	0.39	0.19	0.43	0.99	0.09	0.41	0.44	0.39	0.38
TOTAL PHOSPHATE (PO4)	0.16	0.09	0.07	0.05	0.12	0.72	0.18	0.05	0.03	0.24	0.03
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.07	0.06	0.071	0.06	0.06	0.05	0.03	0.05	0.07	0.06	0.07
BORON (B) TOTAL	0.03	0.03	0.024	0.021	0.053	0.09		0.05	0.23	0.038	0.088
IRON (FE) TOTAL	0.01	0.01	0.01	0.04	0.16	0.2	1.13	0.06	0.28	0.02	0.11
IRON (FE) DISS	0.01	0.01	0.009	0.01	<0.01	0.02	<0.01	<0.01	0.2	<0.01	<0.01
MANGANESE (MN) TOTAL	0.003	0.002	0.015	0.02	<0.01	0.01	0.03	<0.02	0.02	<0.01	<0.01
MANGANESE (MN) DISS	0.002	0.001	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 001

STATION LOCATION - EAST SPRING

SAMPLE DATE	10/09/86	06/18/87	08/05/87	10/28/87	06/07/88	08/09/88	10/05/88	06/14/89	08/15/89	10/09/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)	10	17	22	13	22	26	19	19	23	14
FLOW (CFS)	0.01	0.01	0.01	0.01	0.006	0.005	0.0056	0.0052	0.005	0.0048
WATER TEMPERATURE (C)	6	6	6.5	5	5.5	6	6	6.5	8.5	6.5
SPEC. COND. (UMHOS/CM) FIELD	467	489	570	450	556	513	560	593	597	613
PH (SU) FIELD	8	7.6	7.8	7.9	7	7.40	6.6	6.8	6.2	7.10
TURBIDITY (NTU) FIELD	0.17	2.43	0.72	14.8	1.85	0.12	2.8	0.22	0.10	0.15
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.	268	270	302	280	286	328	390	518	294	266
COMMON IONS										
CALCIUM (CA)	52.8	72	51.9	59.6	76	96.00	108.00	59.25	55.11	59.58
MAGNESIUM (MG)	20.2	9.6	19.38	21.93	12	0.96	16.80	22.95	22.72	22.29
SODIUM (NA)	9.2	12.76	13.52	14.29	14.48	15.08	13.66	15.48	16.66	16.21
POTASSIUM (K)										
ACIDITY AS CACO3	2.5	4	6	<0.01	<0.01	26.00	13.00	<1.00	<1.00	<0.01
ALKALINITY AS CACO3 (LAB)	192	190	178	194	190	188	235	205	191	197
BICARBONATE (HCO3) (LAB)	185.4	233	217	236	232	229	287	250	233	240
HARDNESS (CACO3) TOTAL	216	220	236	240	240	244	340	252	260	270
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3		<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	23	25	25	42	21	22	112	23	23	22
CHLORIDE (CL)	1	23	26.1	25.4	25.8	2.0	10.0	32.5	32.4	32.7
NUTRIENTS										
NITRATE (NO3-N)	0.41	0.52	0.46	0.74	0.37	0.50	0.33	0.59	0.48	0.47
TOTAL PHOSPHATE (PO4)	0.12	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	0.07	<0.04
TRACE ELEMENTS										
BARIUM (BA) TOTAL	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.07	0.07	0.07
BORON (B) TOTAL	0.05	0.09	0.13	0.06	0.15	0.09	0.020	0.050	0.050	0.020
IRON (FE) TOTAL	0.04	0.02	0.03	0.1	0.07	<0.03	<0.03	<0.03	<0.03	<0.03
IRON (FE) DISS	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
MANGANESE (MN) TOTAL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 006

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	4	26	19.0	5.43	21
FLOW (CFS)	0.14	2.08	0.79	0.58	21
WATER TEMPERATURE (C)	1	19.5	13.1	4.95	21
SPEC. COND. (UMHOS/CM) FIELD	490	1300	732.6	146.93	21
PH (SU) FIELD	7.1	8.4	7.9	0.38	21
TURBIDITY (NTU) FIELD	8.5	640	77.96	133.65	20
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	316	850	459.0	104.78	21
COMMON IONS					
CALCIUM (CA)	50.4	156	73.8	25.32	21
MAGNESIUM (MG)	0.1	108	32.0	21.02	21
SODIUM (NA)	29.69	80	46.91	12.13	21
POTASSIUM (K)	3.5	3.8	3.6	0.12	4
ACIDITY AS CACO3	0.01	72	11.10	16.42	21
ALKALINITY AS CACO3 (LAB)	210	341	283.6	32.63	21
BICARBONATE (HCO3) (LAB)	256	416	338.4	47.19	21
HARDNESS (CACO3) TOTAL	246	610	332.6	86.94	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	43.2	2.89	9.52	21
SULFATE (SO4)	18	405	96.7	73.64	21
CHLORIDE (CL)	2.9	36.4	19.4	11.10	21
NUTRIENTS					
NITRATE (NO3-N)	0.01	0.86	0.12	0.19	21
TOTAL PHOSPHATE (PO4)	0.02	1.12	0.18	0.26	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.09	0.57	0.14	0.10	21
BORON (B) TOTAL	0.05	0.8	0.13	0.16	20
IRON (FE) TOTAL	0.06	24.6	1.95	5.18	21
IRON (FE) DISS	0.01	0.23	0.04	0.06	21
MANGANESE (MN) TOTAL	0.03	0.73	0.12	0.14	21
MANGANESE (MN) DISS	0.01	0.14	0.05	0.03	20

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCD - 006

STATION LOCATION - SOUTH FORK OF NORTH FORK OF QUITCHUPAH CREEK

SAMPLE DATE	06/21/83	08/16/83	10/12/83	06/21/84	08/09/84	10/11/84	06/13/85	08/14/85	10/22/85	06/03/86	08/13/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	19	16	16	16	26	10	21	24	4	25	25
FLOW (CFS)	2.08	1.39	0.58	1.57	1.27	0.8	1.57	0.64	0.49	1.84	0.58
WATER TEMPERATURE (C)	16	17	10	11	18	6	14	13	1	16	17
SPEC. COND. (UMHOS/CM) FIELD	710	680	750	760	1300	680	490	708	719	635	622
PH (SU) FIELD	8	7.6	7.8	7.7	7.8	8.1	8	8.4	8.2	8.35	8.4
TURBIDITY (NTU) FIELD	53	640	32	180	74	26		63.12	20.97	50	25.81
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	424	432	490	490	850	520	316	460	484	366	340
COMMON IONS											
CALCIUM (CA)	60	56	68	91.6	64	64	58.8	60	77.6	50.4	54.4
MAGNESIUM (MG)	35.52	33.6	37.92	18.72	108	55.5	23.8	32.2	36.5	33.1	34.6
SODIUM (NA)	59	52.5	55	66	47.8	60.3	40	80	49.8	38.03	39.82
POTASSIUM (K)			3.5	3.6			3.8	3.5			
ACIDITY AS CACO3	<0.01	13	24	72	17	16	8.8	13.9	13.7	<0.01	1.2
ALKALINITY AS CACO3 (LAB)	328	308	320	341	315	320	210	286	270	259	250
BICARBONATE (HCO3) (LAB)	400.2	370.9	390.4	416	384.3	390.4	256	348.9	329.4	279	275.7
HARDNESS (CACO3) TOTAL	298	280	328	307	610	390	246	284	346	264	278
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	<0.01	2.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	14.4
SULFATE (SO4)	74	62	87	66	405	95	75	85	87	95	69
CHLORIDE (CL)	36	4	34	36.4	29.4	34	14.2	28	24.5	20.3	17.2
NUTRIENTS											
NITRATE (NO3-N)	<0.02	<0.01	0.06	0.01	0.02	0.09	0.42	0.03	0.05	0.06	0.03
TOTAL PHOSPHATE (PO4)	0.2	0.11	0.1	0.1	0.14	0.77	1.12	0.28	0.02	0.03	0.02
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.15	0.18	0.14	0.15	0.14	0.12	0.57	0.11	0.12	0.16	0.12
BORON (B) TOTAL	0.06	0.1	0.09	0.085	0.1	0.15		0.12	0.06	0.089	0.8
IRON (FE) TOTAL	0.81	5.4	0.25	0.07	1.3	0.06	24.6	0.06	0.56	0.62	0.57
IRON (FE) DISS	0.03	0.09	0.04	0.01	0.07	0.23	0.03	<0.01	<0.01	<0.01	<0.01
MANGANESE (MN) TOTAL	0.065	0.045	0.08	0.04	0.09	0.09	0.73	0.03	0.09	0.07	0.05
MANGANESE (MN) DISS	0.042	0.015	0.07	0.03		0.07	<0.01	<0.02	0.05	0.02	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 006

STATION LOCATION - SOUTH FORK OF NORTH FORK OF QUITCHUPAH CREEK

SAMPLE DATE	10/09/86	06/18/87	08/05/87	10/28/87	06/07/88	08/09/88	10/05/88	06/14/89	08/15/89	10/09/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)	15	19	26	14	19	25	18	21	21	18
FLOW (CFS)	0.4	0.88	0.4	0.25	0.92	0.25	0.21	0.25	0.14	0.14
WATER TEMPERATURE (C)	6	10	18	5	16	17.5	15.5	15.5	19.5	14
SPEC. COND. (UMHOS/CM) FIELD	742	666	717	635	715	659	782	798	759	857
PH (SU) FIELD	8.2	8	8.2	8.2	7.9	8.25	7.1	7.3	7.1	7.9
TURBIDITY (NTU) FIELD	56.67	23	29.3	42.9	22	55.7	75	51.3	30	8.5
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.	446	406	438	418	388	430	577	468	470	426
COMMON IONS										
CALCIUM (CA)	64.8	84	54.8	62.63	114.4	115.20	156.00	65.48	63.57	63.88
MAGNESIUM (MG)	33.6	18.7	31.29	33.53	<0.10	2.88	8.40	32.61	27.35	33.32
SODIUM (NA)	55.2	34.72	34.12	43.53	29.69	32.59	38.81	40.05	43.68	44.46
POTASSIUM (K)										
ACIDITY AS CACO3	2.5	<0.01	2	<0.01	<0.01	12.00	3.00	34.00	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	282	258	247	286	259	247	312	282	269	307
BICARBONATE (HCO3) (LAB)	256.2	315	301	348	316	301	381	344	328	374
HARDNESS (CACO3) TOTAL	302	288	280	295	286	300	425	318	525	335
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	43.2	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	80	77	75	80	73	83	174	18	84	87
CHLORIDE (CL)	3.9	15	13.7	17.4	11.3	32.5	15.0	2.9	13.8	2.9
NUTRIENTS										
NITRATE (NO3-N)	0.03	0.08	0.09	0.86	0.03	0.15	<0.02	0.12	0.20	0.06
TOTAL PHOSPHATE (PO4)	0.09	<0.04	<0.04	<0.04	0.05	0.09	0.12	0.11	0.27	0.05
TRACE ELEMENTS										
BARIUM (BA) TOTAL	0.14	0.1	0.09	0.09	0.11	0.12	0.11	0.11	0.11	0.09
BORON (B) TOTAL	0.1	0.11	0.16	0.09	0.09	0.10	0.070	<0.05	0.120	0.080
IRON (FE) TOTAL	1.01	0.26	0.2	0.64	0.3	0.68	0.75	0.86	1.29	0.67
IRON (FE) DISS	0.02	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	0.20	<0.03	<0.03
MANGANESE (MN) TOTAL	0.11	0.07	0.08	0.11	0.09	0.09	0.15	0.17	0.08	0.13
MANGANESE (MN) DISS	0.06	0.05	0.05	0.09	0.05	0.03	0.08	0.14	<0.01	0.08

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 007

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	0	28	17.2	5.63	21
FLOW (CFS)	0.1	12.86	2.07	3.15	21
WATER TEMPERATURE (C)	0.5	21	12.1	5.25	21
SPEC. COND. (UMHOS/CM) FIELD	390	1384	570.0	196.90	21
PH (SU) FIELD	7.3	8.4	8.0	0.28	21
TURBIDITY (NTU) FIELD	0.9	940	190.2	292.37	21
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	204	904	345.1	141.76	21
COMMON IONS					
CALCIUM (CA)	40.27	144	64.83	23.40	21
MAGNESIUM (MG)	0.1	188	27.5	37.68	21
SODIUM (NA)	11.03	60	30.3	11.70	21
POTASSIUM (K)	2	6.9	4.5	2.40	4
ACIDITY AS CACO3	0.01	52	10.12	12.94	21
ALKALINITY AS CACO3 (LAB)	166	404	238.3	50.03	21
BICARBONATE (HCO3) (LAB)	200	493	287.7	62.58	21
HARDNESS (CACO3) TOTAL	186	720	261.5	111.93	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	12	0.76	2.63	20
SULFATE (SO4)	20	475	68.5	95.48	21
CHLORIDE (CL)	3.5	86	16.7	17.03	21
NUTRIENTS					
NITRATE (NO3-N)	0.01	2.03	0.26	0.49	21
TOTAL PHOSPHATE (PO4)	0.02	1.64	0.20	0.38	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.06	1.25	0.29	0.25	21
BORON (B) TOTAL	0.01	0.67	0.11	0.13	20
IRON (FE) TOTAL	0.04	29.6	3.30	6.74	21
IRON (FE) DISS	0.01	0.12	0.03	0.03	21
MANGANESE (MN) TOTAL	0.01	1.46	0.13	0.31	21
MANGANESE (MN) DISS	0.003	0.13	0.019	0.03	19

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 007

STATION LOCATION - UPPER NORTH FORK OF QUITCHUPAH CREEK

SAMPLE DATE	06/21/83	08/16/83	10/12/83	06/21/84	08/09/84	10/11/84	06/13/85	09/14/85	10/22/85	06/02/86	08/13/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	19	16	12	18	29	9	21	16	0	20	18
FLOW (CFS)	12.86	1.15	0.6	5.86	0.8	1.53	4.94	0.64	0.21	7.55	0.55
WATER TEMPERATURE (C)	14	15	12	7	21	5	10	13	0.5	14	17
SPEC. COND. (UMHOS/CM) FIELD	390	540	560	450	580	500	1394	508	677	428	474
PH (SU) FIELD	8.4	8	7.6	7.85	7.7	9	7.8	8.2	8.05	8.4	8.2
TURBIDITY (NTU) FIELD	100	940	550	880	200	80	22	76.32	77.42	690	38.71
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	204	320	377	295	375	389	904	322	388	258	228
COMMON IONS											
CALCIUM (CA)	53.6	48	56	80	44	60	100	44.8	60	58.4	42.4
MAGNESIUM (MG)	13.92	28.8	29.28	2.4	36	44.4	188	32	27.4	16.8	22.6
SODIUM (NA)	12.5	37.5	41	24	36.3	35.6	41	60	42.4	16.39	31.37
POTASSIUM (K)			2.1	2			6.9	6.8			
ACIDITY AS CACO3	<0.01	5	28	52	17	19	22	13.1	21	<0.01	1.2
ALKALINITY AS CACO3 (LAB)	220	244	278	232	260	270	404	238	290	182	212
BICARBONATE (HCO3) (LAB)	258.6	292.8	339.2	283	317.2	329.4	493	290.4	353.8	200	258.6
HARDNESS (CACO3) TOTAL	192	240	262	210	260	335	720	208	264	216	200
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	<0.01	2.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
SULFATE (SO4)	28	40	48	28	39	46	475	36	47	88	31
CHLORIDE (CL)	12	16	20	6.4	16.8	17	86	19.7	22.8	4.1	13.9
NUTRIENTS											
NITRATE (NO3-N)	<0.02	0.09	0.02	0.06	0.08	1.39	2.03	0.09	<0.01	0.15	0.05
TOTAL PHOSPHATE (PO4)	0.92	0.02	0.05	0.06	0.18	0.49	0.18	0.09	0.03	1.64	0.02
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.35	0.71	0.32	0.33	0.23	0.21	0.06	0.17	0.22	1.25	0.22
BORON (B) TOTAL	0.02	0.1	0.095	0.09	0.151	0.08		0.06	0.14	0.161	0.67
IRON (FE) TOTAL	10.3	12.9	3.39	0.06	3.04	2.06	0.66	0.71	1.84	29.6	0.38
IRON (FE) DISS	0.08	0.11	0.12	0.01	<0.01	0.03	0.04	<0.01	0.03	<0.01	<0.01
MANGANESE (MN) TOTAL	0.285	0.012	0.21	0.01	0.07	0.07	0.14	<0.02	0.1	1.46	<0.01
MANGANESE (MN) DISS	0.003	0.01		0.01		0.03	0.13	<0.02	0.03	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 007

STATION LOCATION - UPPER NORTH FORK OF QUITCHUPAH CREEK

SAMPLE DATE	10/09/86	06/18/87	08/05/87	10/27/87	06/07/88	08/09/88	10/05/88	06/14/89	09/15/89	10/09/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)	15	16	23	13	20	22	17	23	19.5	16
FLOW (CFS)	0.39	1.71	0.27	0.22	2.89	0.16	0.21	0.70	0.21	0.10
WATER TEMPERATURE (C)	15	8	19	3	12	19	8	12.5	17	12
SPEC. COND. (UMHOS/CM) FIELD	618	432	535	580	468	490	619	510	548	660
PH (SU) FIELD	8.2	8.2	8.2	8	8.2	8.05	7.3	7.6	7.7	7.80
TURBIDITY (NTU) FIELD	51.67	209	19.9	1.8	7.8	0.9	5.5	26.6	13.1	2.8
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.	370	268	274	376	236	310	470	249	268	384
COMMON IONS										
CALCIUM (CA)	59.2	65.6	40.27	67.25	85.6	86.40	144.00	55.29	50.92	59.61
MAGNESIUM (MG)	24	10	19.61	26.95	<0.10	0.48	1.20	17.09	21.40	23.41
SODIUM (NA)	39.5	16.44	23.15	34.41	11.03	26.41	32.35	16.84	25.21	32.98
POTASSIUM (K)										
ACIDITY AS CACO3	1.2	2	2	<0.01	<0.01	8.00	3.00	18.00	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	248	196	166	258	188	200	260	196	206	256
BICARBONATE (HCO3) (LAB)	278.2	239	202	314	229	244	317	239	251	312
HARDNESS (CACO3) TOTAL	248	206	186	280	214	218	365	200	202	260
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	12	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	124	33	29	75	20	31	125	27	32	<37
CHLORIDE (CL)	4.4	5.7	10.4	14.5	3.5	33.0	16.0	5.9	9.4	13.7
NUTRIENTS										
NITRATE (NO3-N)	0.1	0.21	0.14	0.34	0.11	0.10	0.04	0.12	0.30	0.07
TOTAL PHOSPHATE (PO4)	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.08	0.06
TRACE ELEMENTS										
BARIUM (BA) TOTAL	0.22	0.21	0.16	0.2	0.2	0.19	0.18	0.19	0.19	0.19
BORON (B) TOTAL	0.12	0.09	0.13	0.07	0.06	0.07	0.030	<0.05	0.050	<0.01
IRON (FE) TOTAL	0.52	2.31	0.04	0.51	0.91	0.04	0.05	0.33	0.06	0.06
IRON (FE) DISS	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	0.05
MANGANESE (MN) TOTAL	0.04	0.08	<0.01	0.03	0.06	<0.01	0.02	0.03	0.03	0.06
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01

ALALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO -021

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	12	15	13.5	1.50	2
FLOW (CFS)	0.85	2.43	1.14	0.34	21
WATER TEMPERATURE (C)	9	12	10.6	0.96	9
SPEC. COND. (UMHOS/CM) FIELD	540	1087	884.0	136.87	21
PH (SU) FIELD	6.9	8.1	7.5	0.27	21
TURBIDITY (NTU) FIELD	0.02	8.7	1.26	1.80	21
TOTAL SUSP. SOLIDS	1	7	2.4	1.87	16
TOTAL DISS. SOLIDS MEAS.	350	802	582.4	101.50	21
COMMON IONS					
CALCIUM (CA)	56.8	160	90.5	21.86	20
MAGNESIUM (MG)	11.5	93.6	44.6	14.55	21
SODIUM (NA)	26	148.4	50.8	25.79	21
POTASSIUM (K)	2.6	5.5	4.0	1.21	5
ACIDITY AS CACO3	0.01	44	11.47	12.41	20
ALKALINITY AS CACO3 (LAB)	236	310	254.0	15.25	21
BICARBONATE (HCO3) (LAB)	288	378.2	311.3	20.53	21
HARDNESS (CACO3) TOTAL	305	618	414.3	58.44	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	0.1	0.04	0.04	20
SULFATE (SO4)	40	410	224.6	69.63	21
CHLORIDE (CL)	10.9	61.2	18.9	11.94	20
NUTRIENTS					
NITRATE (NO3-N)	0.01	1.16	0.23	0.31	21
TOTAL PHOSPHATE (PO4)	0.01	0.66	0.15	0.20	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.04	0.079	0.05	0.01	21
BORON (B) TOTAL	0.02	1.33	0.44	0.27	21
IRON (FE) TOTAL	0.01	0.62	0.08	0.13	21
IRON (FE) DISS	0.01	0.1	0.03	0.03	20
MANGANESE (MN) TOTAL	0.01	0.08	0.02	0.02	21
MANGANESE (MN) DISS	0.01	0.02	0.01	0.00	20

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 021

STATION LOCATION - MINE DISCHARGE INTO NORTH FORK OF QUITCHUPAH CREEK

SAMPLE DATE	06/22/83	08/31/83	10/12/83	06/20/84	08/08/84	10/10/84	06/13/85	08/14/85	10/22/85	06/05/86	08/12/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)			12							15	
FLOW (CFS)	0.96	1.03	1.16	0.95	0.90	0.85	1.06	1.01	1.15	1.07	1.08
WATER TEMPERATURE (C)	10	10	10	11	10					11	
SPEC. COND. (UMHOS/CM) FIELD	710	750	910	890	650	540	910	880	792	860	846
PH (SU) FIELD	7.3	7.1	7.2	7.3	7.4	7.9	7.35	7.25	7.4	7.6	7.4
TURBIDITY (NTU) FIELD	8.7	0.6	0.95	1	2.6	2.5	0.93	0.5	0.19	0.48	1.05
TOTAL SUSP. SOLIDS					4	2	2	4	3	6	2
TOTAL DISS. SOLIDS MEAS.	448	469	599	570	420	350	592	576	570	570	546
COMMON IONS											
CALCIUM (CA)	70.4	79.2	92	89.6	96	59	102.4	94.4	104		56.8
MAGNESIUM (MG)	42.72	40.8	47.52	51.84	42	38	42	41.8	44.2	38.9	60
SODIUM (NA)	33.5	26	40	33.9	34.1	30.4	56	60	35	148.4	37.74
POTASSIUM (K)		3.6	2.9	2.6			5.5	5.3			
ACIDITY AS CACO3	5.5	40	22	44	9	12	14.5	17.5	22.9	2.4	2.5
ALKALINITY AS CACO3 (LAB)	266	262	250	264	310	250	254	258	260	257	262
BICARBONATE (HCO3) (LAB)	324.5	319.6	305	322.1	378.2	305	305	314.8	317.2	350	319.6
HARDNESS (CACO3) TOTAL	354	368	428	420	415	305	430	410	444	384	392
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
SULFATE (SO4)	132	128	240	218	237	40	223	199	205	246	212
CHLORIDE (CL)	24	26	14	13	11	26	14	15.6	10.9		16
NUTRIENTS											
NITRATE (NO3-N)	<0.02	<0.02	0.04	<0.01	0.1	1.16	0.01	0.05	0.14	1.04	<0.01
TOTAL PHOSPHATE (PO4)	0.54	0.41	0.35	0.5	0.1	0.15	0.02	0.02	<0.01	0.01	0.05
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.06	0.06	0.079	0.07	0.05	0.05	0.04	0.04	0.06	0.05	0.05
BORON (B) TOTAL	0.45	0.04	0.05	0.065	0.552	0.39	0.02	0.36	0.35	0.513	1.33
IRON (FE) TOTAL	0.03	0.03	0.11	0.18	0.12	0.18	0.02	<0.01	0.05	0.62	0.1
IRON (FE) DISS	0.03	0.03	0.02	0.05	0.1	0.01	<0.01	<0.01	0.09	<0.01	<0.01
MANGANESE (MN) TOTAL	0.014	0.01	0.01	0.01	0.01	0.01	<0.01	<0.01	0.02	0.05	0.08
MANGANESE (MN) DISS	0.014	0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	0.02

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 021

STATION LOCATION - MINE DISCHARGE INTO NORTH FORK OF QUITCHUPAH CREEK

SAMPLE DATE	10/10/86	06/18/87	08/11/87	10/28/87	06/08/88	08/24/88	10/05/88	06/19/89	08/15/89	10/16/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)										
FLOW (CFS)	0.92	0.97	1.02	0.96	1.06	1.11	1.19	1.57	1.52	2.43
WATER TEMPERATURE (C)	12				12	9				
SPEC. COND. (UMHOS/CM) FIELD	907	1080	1005	912	983	920	1087	1031	1058	844
PH (SU) FIELD	7.6	7.6	7.5	8.1	7.8	7.60	7.60	6.9	7.2	7.4
TURBIDITY (NTU) FIELD	0.02	0.91	0.74	0.5	1.8	1.06	0.45	1.04	0.2	0.15
TOTAL SUSP. SOLIDS	7	<1.00	1	1	<1.00	<1.00	<1.00	<1.00		<1.00
TOTAL DISS. SOLIDS MEAS.	572	702	712	642	700	610	802	536	622	622
COMMON IONS										
CALCIUM (CA)	93.6	120	94	96.29	160	69.20	91.20	85.78	78.44	78.20
MAGNESIUM (MG)	41.8	36.4	47.15	46.49	11.5	60.24	93.60	37.86	34.50	36.86
SODIUM (NA)	41.2	44.36	44.96	43.98	45.77	48.90	45.35	63.12	85.00	68.29
POTASSIUM (K)										
ACIDITY AS CACO3	10	<0.01	12	<0.01	<0.01	11.00	4.00	<0.01		<0.01
ALKALINITY AS CACO3 (LAB)	240	240	253	243	238	236	248	250	244	248
BICARBONATE (HCO3) (LAB)	292.8	293	309	296	290	288	303	305	298	302
HARDNESS (CACO3) TOTAL	408	452	432	434	447	424	618	420	356	360
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	187	279	258	255	294	210	410	261	245	<238
CHLORIDE (CL)	40	12.8	12.7	12.9	14.3	61.2	14.6	12.3	11.9	14.9
NUTRIENTS										
NITRATE (NO3-N)	0.14	0.1	0.24	0.38	0.08	0.16	<0.02	0.51	0.26	0.25
TOTAL PHOSPHATE (PO4)	0.66	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.11	<0.04
TRACE ELEMENTS										
BARIUM (BA) TOTAL	0.06	0.05	0.04	0.04	0.04	0.05	0.05	0.04	0.06	0.06
BORON (B) TOTAL	0.44	0.58	0.51	0.49	0.67	0.50	0.480	0.48	0.480	0.510
IRON (FE) TOTAL	<0.01	0.03	<0.01	0.02	0.08	<0.03	<0.03	0.05	<0.03	<0.03
IRON (FE) DISS	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	
MANGANESE (MN) TOTAL	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	

ALALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 022

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	ERR	ERR	ERR	ERR	0
FLOW (CFS)	0	0	0.00	0.00	21
WATER TEMPERATURE (C)	ERR	ERR	ERR	ERR	0
SPEC. COND. (UMHOS/CM) FIELD	ERR	ERR	ERR	ERR	0
PH (SU) FIELD	ERR	ERR	ERR	ERR	0
TURBIDITY (NTU) FIELD	ERR	ERR	ERR	ERR	0
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	ERR	ERR	ERR	ERR	0
COMMON IONS					
CALCIUM (CA)	ERR	ERR	ERR	ERR	0
MAGNESIUM (MG)	ERR	ERR	ERR	ERR	0
SODIUM (NA)	ERR	ERR	ERR	ERR	0
POTASSIUM (K)	ERR	ERR	ERR	ERR	0
ACIDITY AS CACO3	ERR	ERR	ERR	ERR	0
ALKALINITY AS CACO3 (LAB)	ERR	ERR	ERR	ERR	0
BICARBONATE (HCO3) (LAB)	ERR	ERR	ERR	ERR	0
HARDNESS (CACO3) TOTAL	ERR	ERR	ERR	ERR	0
HYDROXIDE AS OH	ERR	ERR	ERR	ERR	0
CARBONATE AS CO3	ERR	ERR	ERR	ERR	0
SULFATE (SO4)	ERR	ERR	ERR	ERR	0
CHLORIDE (CL)	ERR	ERR	ERR	ERR	0
NUTRIENTS					
NITRATE (NO3-N)	ERR	ERR	ERR	ERR	0
TOTAL PHOSPHATE (PO4)	ERR	ERR	ERR	ERR	0
TRACE ELEMENTS					
BARIUM (BA) TOTAL	ERR	ERR	ERR	ERR	0
BORON (B) TOTAL	ERR	ERR	ERR	ERR	0
IRON (FE) TOTAL	ERR	ERR	ERR	ERR	0
IRON (FE) DISS	ERR	ERR	ERR	ERR	0
MANGANESE (MN) TOTAL	ERR	ERR	ERR	ERR	0
MANGANESE (MN) DISS	ERR	ERR	ERR	ERR	0

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 022

STATION LOCATION - MUD SPRING CANYON ABOVE MINE

SAMPLE DATE	06/21/83	08/16/83	10/12/83	06/21/84	08/09/84	10/10/84	06/12/85	08/14/85	10/22/85	06/05/86	08/13/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)											
FLOW (CFS)	0	0	0	0	0	0	0	0	0	0	0
WATER TEMPERATURE (C)											
SPEC. COND. (UMHOS/CM) FIELD											
PH (SU) FIELD											
TURBIDITY (NTU) FIELD											
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.											
COMMON IONS											
CALCIUM (CA)											
MAGNESIUM (MG)											
SODIUM (NA)											
POTASSIUM (K)											
ACIDITY AS CACO3											
ALKALINITY AS CACO3 (LAB)											
BICARBONATE (HCO3) (LAB)											
HARDNESS (CACO3) TOTAL											
HYDROXIDE AS OH											
CARBONATE AS CO3											
SULFATE (SO4)											
CHLORIDE (CL)											
NUTRIENTS											
NITRATE (NO3-N)											
TOTAL PHOSPHATE (PO4)											
TRACE ELEMENTS											
BARIUM (BA) TOTAL											
BORON (B) TOTAL											
IRON (FE) TOTAL											
IRON (FE) DISS											
MANGANESE (MN) TOTAL											
MANGANESE (MN) DISS											

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 022

STATION LOCATION - MUD SPRING CANYON ABOVE MINE

SAMPLE DATE	10/07/86	06/18/87	08/05/87	10/27/87	06/07/88	08/09/88	10/04/88	06/13/89	08/15/89	10/10/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)										
FLOW (CFS)	0	0	0	0	0	0	0	0	0	0
WATER TEMPERATURE (C)										
SPEC. COND. (UMHOS/CM) FIELD										
PH (SU) FIELD										
TURBIDITY (NTU) FIELD										
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.										
COMMON IONS										
CALCIUM (CA)										
MAGNESIUM (MG)										
SODIUM (NA)										
POTASSIUM (K)										
ACIDITY AS CACO3										
ALKALINITY AS CACO3 (LAB)										
BICARBONATE (HCO3) (LAB)										
HARDNESS (CACO3) TOTAL										
HYDROXIDE AS OH										
CARBONATE AS CO3										
SULFATE (SO4)										
CHLORIDE (CL)										
NUTRIENTS										
NITRATE (NO3-N)										
TOTAL PHOSPHATE (PO4)										
TRACE ELEMENTS										
BARIUM (BA) TOTAL										
BORON (B) TOTAL										
IRON (FE) TOTAL										
IRON (FE) DISS										
MANGANESE (MN) TOTAL										
MANGANESE (MN) DISS										

ALALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 030

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	ERR	ERR	ERR	ERR	0
FLOW (CFS)	0	0	0.00	0.00	21
WATER TEMPERATURE (C)	ERR	ERR	ERR	ERR	0
SPEC. COND. (UMHOS/CM) FIELD	ERR	ERR	ERR	ERR	0
PH (SU) FIELD	ERR	ERR	ERR	ERR	0
TURBIDITY (NTU) FIELD	ERR	ERR	ERR	ERR	0
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	ERR	ERR	ERR	ERR	0
COMMON IONS					
CALCIUM (CA)	ERR	ERR	ERR	ERR	0
MAGNESIUM (MG)	ERR	ERR	ERR	ERR	0
SODIUM (NA)	ERR	ERR	ERR	ERR	0
POTASSIUM (K)	ERR	ERR	ERR	ERR	0
ACIDITY AS CACO3	ERR	ERR	ERR	ERR	0
ALKALINITY AS CACO3 (LAB)	ERR	ERR	ERR	ERR	0
BICARBONATE (HCO3) (LAB)	ERR	ERR	ERR	ERR	0
HARDNESS (CACO3) TOTAL	ERR	ERR	ERR	ERR	0
HYDROXIDE AS OH	ERR	ERR	ERR	ERR	0
CARBONATE AS CO3	ERR	ERR	ERR	ERR	0
SULFATE (SO4)	ERR	ERR	ERR	ERR	0
CHLORIDE (CL)	ERR	ERR	ERR	ERR	0
NUTRIENTS					
NITRATE (NO3-N)	ERR	ERR	ERR	ERR	0
TOTAL PHOSPHATE (PO4)	ERR	ERR	ERR	ERR	0
TRACE ELEMENTS					
BARIUM (BA) TOTAL	ERR	ERR	ERR	ERR	0
BORON (B) TOTAL	ERR	ERR	ERR	ERR	0
IRON (FE) TOTAL	ERR	ERR	ERR	ERR	0
IRON (FE) DISS	ERR	ERR	ERR	ERR	0
MANGANESE (MN) TOTAL	ERR	ERR	ERR	ERR	0
MANGANESE (MN) DISS	ERR	ERR	ERR	ERR	0

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 030

STATION LOCATION - EAST SPRING CANYON ABOVE MINE

SAMPLE DATE	06/21/83	08/16/83	10/12/83	06/21/84	08/09/84	10/10/84	06/12/85	08/14/85	10/22/85	06/05/86	08/13/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)											
FLOW (CFS)	0	0	0	0	0	0	0	0	0	0	0
WATER TEMPERATURE (C)											
SPEC. COND. (UMHOS/CM) FIELD											
PH (SU) FIELD											
TURBIDITY (NTU) FIELD											
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.											
COMMON IONS											
CALCIUM (CA)											
MAGNESIUM (MG)											
SODIUM (NA)											
POTASSIUM (K)											
ACIDITY AS CACO3											
ALKALINITY AS CACO3 (LAB)											
BICARBONATE (HCO3) (LAB)											
HARDNESS (CACO3) TOTAL											
HYDROXIDE AS OH											
CARBONATE AS CO3											
SULFATE (SO4)											
CHLORIDE (CL)											
NUTRIENTS											
NITRATE (NO3-N)											
TOTAL PHOSPHATE (PO4)											
TRACE ELEMENTS											
BARIUM (BA) TOTAL											
BORON (B) TOTAL											
IRON (FE) TOTAL											
IRON (FE) DISS											
MANGANESE (MN) TOTAL											
MANGANESE (MN) DISS											

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 030

STATION LOCATION - EAST SPRING CANYON ABOVE MINE

SAMPLE DATE	10/09/86	06/18/87	08/05/07	10/27/87	06/07/88	08/09/88	10/04/88	06/13/89	08/15/89	10/10/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)										
FLOW (CFS)	0	0	0	0	0	0	0	0	0	0
WATER TEMPERATURE (C)										
SPEC. COND. (UMHOS/CM) FIELD										
PH (SU) FIELD										
TURBIDITY (NTU) FIELD										
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.										
COMMON IONS										
CALCIUM (CA)										
MAGNESIUM (MG)										
SODIUM (NA)										
POTASSIUM (K)										
ACIDITY AS CACO3										
ALKALINITY AS CACO3 (LAB)										
BICARBONATE (HCO3) (LAB)										
HARDNESS (CACO3) TOTAL										
HYDROXIDE AS OH										
CARBONATE AS CO3										
SULFATE (SO4)										
CHLORIDE (CL)										
NUTRIENTS										
NITRATE (NO3-N)										
TOTAL PHOSPHATE (PO4)										
TRACE ELEMENTS										
BARIUM (BA) TOTAL										
BORON (B) TOTAL										
IRON (FE) TOTAL										
IRON (FE) DISS										
MANGANESE (MN) TOTAL										
MANGANESE (MN) DISS										

ALALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 041

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	7	30	19.9	6.64	26
FLOW (CFS)	0.56	6.93	2.27	1.86	26
WATER TEMPERATURE (C)	6	25	16.1	6.10	26
SPEC. COND. (UMHOS/CM) FIELD	670	1544	1044.7	184.90	26
PH (SU) FIELD	7.4	8.45	8.02	0.29	26
TURBIDITY (NTU) FIELD	0.39	677.42	158.48	164.32	26
TOTAL SUSP. SOLIDS	392	1480	715.7	372.05	6
TOTAL DISS. SOLIDS MEAS.	434	896	687.6	107.45	26
COMMON IONS					
CALCIUM (CA)	42.4	132	71.4	26.63	21
MAGNESIUM (MG)	3.84	76.8	49.1	18.83	21
SODIUM (NA)	55	135	100.0	24.25	21
POTASSIUM (K)	3	5.2	3.9	0.94	3
ACIDITY AS CACO3	0.01	72	10.01	16.17	21
ALKALINITY AS CACO3 (LAB)	260	345	291.8	22.03	21
BICARBONATE (HCO3) (LAB)	253.8	420.9	342.5	39.63	21
HARDNESS (CACO3) TOTAL	314	500	394.2	40.69	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	36	3.01	8.46	21
SULFATE (SO4)	81	332	233.0	60.53	21
CHLORIDE (CL)	17.4	74	51.6	12.26	21
NUTRIENTS					
NITRATE (NO3-N)	0.01	0.89	0.21	0.21	21
TOTAL PHOSPHATE (PO4)	0.01	0.69	0.23	0.20	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.02	1.02	0.10	0.21	21
BORON (B) TOTAL	0.18	0.85	0.26	0.14	20
IRON (FE) TOTAL	0.05	15.9	4.20	4.64	21
IRON (FE) DISS	0.01	0.07	0.03	0.02	21
MANGANESE (MN) TOTAL	0.005	0.26	0.084	0.07	21
MANGANESE (MN) DISS	0.002	0.21	0.023	0.04	20

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 041

STATION LOCATION - QUITCHUPAH CREEK ABOVE CONFLUENCE WITH NORTH FORK

SAMPLE DATE	04/20/83	05/05/83	05/17/83	06/07/83	06/20/83	07/14/83	08/16/83	10/12/83	06/20/84	08/10/84	10/10/84
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	15	16	10	17	27	30	20	7	24	18	22
FLOW (CFS)	0.87	4.47	6.93	5.9	3.95	3.33	1.96	1.7	6.4	2.46	3.36
WATER TEMPERATURE (C)	11	10	13	11	22	19	16	5	17	12	13
SPEC. COND. (UMHOS/CM) FIELD	1544	820	730	946	880	1030	1040	1020	990	880	1100
PH (SU) FIELD	7.6	8.4	8.1	8.3	8	8.3	8	7.8	7.5	7.7	7.95
TURBIDITY (NTU) FIELD	100	100	100	100	100	100	480	330	140	66	200
TOTAL SUSP. SOLIDS	392	1480	866	345		533		479			
TOTAL DISS. SOLIDS MEAS.	896	506	572	578	578	666	700	766	630	570	790
COMMON IONS											
CALCIUM (CA)					56		52	67.2	94	94	72
MAGNESIUM (MG)					59.52		64.32	60.48	50.88	73.2	76.8
SODIUM (NA)					61.5		87	95	59.7	78	108
POTASSIUM (K)								3.5	3		
ACIDITY AS CACO3					<0.01		8	22	72	19	18
ALKALINITY AS CACO3 (LAB)					290		296	280	306	345	290
BICARBONATE (HCO3) (LAB)					348.9		356.2	341.6	373.3	420.9	253.8
HARDNESS (CACO3) TOTAL					388		398	420	427	465	500
HYDROXIDE AS OH					<0.01		<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3					<0.01		2.4	<0.01	<0.01	<0.01	<0.01
SULFATE (SO4)					190		224	267	174	110	276
CHLORIDE (CL)					48		48	40	60.7	74	65
NUTRIENTS											
NITRATE (NO3-N)					<0.02		0.14	<0.01	0.21	0.04	0.3
TOTAL PHOSPHATE (PO4)					0.5		0.05	0.06	0.42	0.14	0.15
TRACE ELEMENTS											
BARIUM (BA) TOTAL					0.05		0.04	0.058	0.05	0.04	0.06
BORON (B) TOTAL					0.2		0.18	0.19	0.195	0.196	0.3
IRON (FE) TOTAL					4.6		9.1	4.99	0.06	0.91	15.9
IRON (FE) DISS					0.07		0.02	0.05	0.02	0.06	0.06
MANGANESE (MN) TOTAL					0.085		0.005	0.13	0.01	0.02	0.2
MANGANESE (MN) DISS					0.005		0.002	0.01		0.03	0.03

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 041

STATION LOCATION - QUITCHUPAH CREEK ABOVE CONFLUENCE WITH NORTH FORK

SAMPLE DATE	06/12/85	08/13/85	10/08/85	06/04/86	08/12/86	10/08/86	06/16/87	08/05/87	10/14/87	06/07/88	08/08/88
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	23	29	7	28	21	18	20	21	8	16	28
FLOW (CFS)	3.13	1.03	1.48	1.98	0.93	0.97	1.03	0.77	0.73	2.03	0.64
WATER TEMPERATURE (C)	24	25	6	22	20	17	24	17	9	11	24
SPEC. COND. (UMHOS/CM) FIELD	670	1058	1150	999	1184	1190	1043	1170	1180	1176	1148
PH (SU) FIELD	7.4	8.45	8.15	8.4	8.4	8.2	8.2	8.2	8.2	8.1	8.20
TURBIDITY (NTU) FIELD	0.39	86.84	110	87.93	677.42	533.33	227	54.9	10.5	12.3	169
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	434	728	870	618	782	756	682	712	768	672	751
COMMON IONS											
CALCIUM (CA)	89.2	42.4	73.2	47.2	56	66.4	58.4	48.22	64.45	130.4	132.00
MAGNESIUM (MG)	40.6	66.2	48.24	61.9	62.9	51.4	10	53.39	52.69	15.3	3.84
SODIUM (NA)	55	135	82	82.66	105.72	111.6	95.9	115.08	126	86.97	124.38
POTASSIUM (K)		5.2									
ACIDITY AS CACO3	21.4	8.2	24	<0.01	<1.00	2.5	6	<0.01	<0.01	<0.01	4.00
ALKALINITY AS CACO3 (LAB)	326	260	283	271	266	306	266	268	321	303	261
BICARBONATE (HCO3) (LAB)	398	307.4	345	296	285.5	300.1	324	351	392	370	318
HARDNESS (CACO3) TOTAL	392	382	384	376	402	380	370	360	380	390	346
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10
CARBONATE AS CO3	<0.01	4.8	<0.01	<0.01	19.2	36	<0.01	<0.01	<0.01	<0.10	<0.10
SULFATE (SO4)	81	294	261	225	315	226	332	222	260	218	259
CHLORIDE (CL)	17.4	67.9	50	57.2	57.3	39	48.3	50.1	66	48.4	63.5
NUTRIENTS											
NITRATE (NO3-N)	0.89	0.18	0.22	0.07	0.55	0.39	0.09	0.47	0.2	<0.02	0.06
TOTAL PHOSPHATE (PO4)	0.08	<0.01	0.53	0.06	0.69	0.47	<0.04	0.05	0.33	<0.04	0.27
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.09	0.02	0.32	0.04	0.08	0.06	0.03	0.02	1.02	0.03	0.03
BORON (B) TOTAL		0.21	0.32	0.203	0.85	0.22	0.24	0.39	0.28	0.2	0.25
IRON (FE) TOTAL	0.06	0.05	8.36	0.97	14.7	5.68	3.15	0.21	4.49	0.31	2.91
IRON (FE) DISS	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03
MANGANESE (MN) TOTAL	0.21	<0.02	0.13	0.02	0.26	0.19	0.08	<0.01	0.09	0.02	0.07
MANGANESE (MN) DISS	0.21	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 041

STATION LOCATION - QUITCHUPAH CREEK ABOVE CONFLUENCE WITH NORTH FORK

SAMPLE DATE	10/04/88	06/13/89	08/14/89	10/10/89
PHYSICAL PARAMETERS				
AIR TEMPERATURE (C)	22	25	28	17
FLOW (CFS)	0.73	0.72	0.56	0.77
WATER TEMPERATURE (C)	15.5	25	22.3	7
SPEC. COND. (UMHOS/CM) FIELD	1190	706	1136	1182
PH (SU) FIELD	7.7	7.7	7.8	7.80
TURBIDITY (NTU) FIELD	79	105	142.8	8
TOTAL SUSP. SOLIDS				
TOTAL DISS. SOLIDS MEAS.	795	772	656	630
COMMON IONS				
CALCIUM (CA)	112.00	51.38	44.63	47.87
MAGNESIUM (MG)	38.40	50.44	45.99	44.66
SODIUM (NA)	123.91	120.86	130.67	125.08
POTASSIUM (K)				
ACIDITY AS CACO3	<0.10	4.00	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	294	288	274	314
BICARBONATE (HCO3) (LAB)	359	335	334	383
HARDNESS (CACO3) TOTAL	440	314	420	345
HYDROXIDE AS OH	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	310	238	206	296
CHLORIDE (CL)	51.0	46.7	41.8	42.8
NUTRIENTS				
NITRATE (NO3-N)	0.13	0.06	0.14	0.13
TOTAL PHOSPHATE (PO4)	0.06	0.32	0.38	0.08
TRACE ELEMENTS				
BARIUM (BA) TOTAL	0.02	0.03	0.02	0.02
BORON (B) TOTAL	0.210	0.23	0.220	0.210
IRON (FE) TOTAL	1.16	1.89	2.96	1.50
IRON (FE) DISS	<0.03	<0.03	<0.03	<0.03
MANGANESE (MN) TOTAL	0.03	0.06	0.06	0.06
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	0.03

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 042

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	7	30	20.1	6.77	26
FLOW (CFS)	1.15	20.88	5.45	5.25	26
WATER TEMPERATURE (C)	4	24	13.8	5.87	26
SPEC. COND. (UMHOS/CM) FIELD	500	1340	768.3	189.66	26
PH (SU) FIELD	7	8.4	7.9	0.41	26
TURBIDITY (NTU) FIELD	0.65	1155	161.6	278.54	26
TOTAL SUSP. SOLIDS	150	3083	1173.8	933.59	6
TOTAL DISS. SOLIDS MEAS.	328	868	502.7	125.75	26
COMMON IONS					
CALCIUM (CA)	43.2	160	77.6	30.75	21
MAGNESIUM (MG)	5.76	75.4	33.32	15.17	21
SODIUM (NA)	25.35	86	48.09	15.71	21
POTASSIUM (K)	1.8	8.8	5.1	3.01	4
ACIDITY AS CACO3	0.01	57	8.74	13.19	21
ALKALINITY AS CACO3 (LAB)	160	346	214.2	38.71	21
BICARBONATE (HCO3) (LAB)	195.2	442	257.0	53.54	21
HARDNESS (CACO3) TOTAL	244	644	335.6	87.04	21
HYDROXIDE AS OH	0.01	24	1.96	5.95	20
CARBONATE AS CO3	0.01	0.1	0.04	0.04	21
SULFATE (SO4)	3	345	183.5	87.47	21
CHLORIDE (CL)	10.3	96.5	23.1	17.53	21
NUTRIENTS					
NITRATE (NO3-N)	0.01	2.85	0.25	0.59	21
TOTAL PHOSPHATE (PO4)	0.01	1.05	0.20	0.29	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.05	0.53	0.16	0.14	21
BORON (B) TOTAL	0.1	1.04	0.31	0.20	20
IRON (FE) TOTAL	0.03	48.3	3.83	10.32	21
IRON (FE) DISS	0.01	0.2	0.03	0.04	21
MANGANESE (MN) TOTAL	0.004	0.64	0.090	0.18	21
MANGANESE (MN) DISS	0.003	0.04	0.012	0.01	20

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCD - 042

STATION LOCATION - NORTH FORK OF QUITCHUPAH CREEK ABOVE CONFLUENCE WITH SOUTH FORK

SAMPLE DATE	04/20/83	05/05/83	05/17/83	06/07/83	06/20/83	07/14/83	08/16/83	10/12/83	06/20/84	08/10/84	10/10/84
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	18	17	10	16	27	30	20	7	23	18	22
FLOW (CFS)	3.33	16.26	10.05	20.88	17.21	8.16	3.63	2.7	8.18	3	2.82
WATER TEMPERATURE (C)	9	5.5	12	6	15	12	15	4	13	12	13
SPEC. COND. (UMHOS/CM) FIELD	931	512	640	599	500	656	660	800	590	570	675
PH (SU) FIELD	8.4	7.6	8.4	8.4	8.2	8.3	8	7.8	7.6	7.7	9
TURBIDITY (NTU) FIELD	100	100	100	100	100	100	940	100	560	90	99.9
TOTAL SUSP. SOLIDS	858	1398	966	588		3083		150			
TOTAL DISS. SOLIDS MEAS.	454	332	412	378	342	426	422	540	375	570	520
COMMON IONS											
CALCIUM (CA)					56		43.2	64	71.6	56	70
MAGNESIUM (MG)					27.84		40.32	46.56	17.28	42	46.8
SODIUM (NA)					26.5		45.5	50	34.1	43.6	54.1
POTASSIUM (K)								2.5	1.8		
ACIDITY AS CACO3					<0.01		6	16	57	17.5	8
ALKALINITY AS CACO3 (LAB)					232		230	230	160	270	220
BICARBONATE (HCO3) (LAB)					270.8		280.6	280.6	195.2	329.4	268.4
HARDNESS (CACO3) TOTAL					256		276	354	251	315	370
HYDROXIDE AS OH					<0.01		<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3					<0.01		<0.01	<0.01	<0.01	<0.01	<0.01
SULFATE (SO4)					62		<3.00	194	133	40	190
CHLORIDE (CL)					14		24	20	14.9	22	25
NUTRIENTS											
NITRATE (NO3-N)					<0.02		<0.01	<0.01	0.08	0.22	2.85
TOTAL PHOSPHATE (PO4)					0.94		0.04	0.04	0.68	0.18	0.2
TRACE ELEMENTS											
BARIUM (BA) TOTAL					0.22		0.23	0.116	0.21	0.12	0.09
BORON (B) TOTAL					0.1		0.17	0.195	0.1	0.183	0.2
IRON (FE) TOTAL					4		8.1	0.51	0.08	1.58	0.56
IRON (FE) DISS					0.05		0.03	0.036	0.02	0.06	0.2
MANGANESE (MN) TOTAL					0.135		0.004	0.03	<0.01	0.04	0.04
MANGANESE (MN) DISS					0.005		0.003	0.01	<0.01		0.04

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 042

STATION LOCATION - NORTH FORK OF QUITCHUPAH CREEK ABOVE CONFLUENCE WITH SOUTH FORK

SAMPLE DATE	06/12/85	08/13/85	10/08/85	06/04/86	08/12/86	10/08/86	06/16/87	08/05/87	10/14/87	06/07/88	08/08/88
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	28	29	7	28	21	18	26	21	9	15.5	29
FLOW (CFS)	9.06	2.16	2.56	6.82	1.54	2.3	3.72	1.56	1.96	4.75	1.42
WATER TEMPERATURE (C)	20	22	6	17	19	15.5	20	14	8.5	9	24
SPEC. COND. (UMHOS/CM) FIELD	1340	674	832	524	900	797	653	858	1000	714	835
PH (SU) FIELD	7.5	8.35	7.95	8.4	8.3	8.1	8	9	8.2	8.0	7.50
TURBIDITY (NTU) FIELD	0.65	32.9	34	1155	29.03	31.67	205	2.3	150	54.5	42.90
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	868	440	630	328	580	518	444	564	660	386	580
COMMON IONS											
CALCIUM (CA)	132	48	101.2	60.8	49.6	64	78.4	60.52	85.2	104	135.20
MAGNESIUM (MG)	75.4	36.96	22.8	22.1	35.5	37.9	22.5	41.77	42	6.7	5.76
SODIUM (NA)	86	59	38	25.35	38.48	46.2	36.04	46.03	74.4	27.15	50.35
POTASSIUM (K)	8.8	7.3									
ACIDITY AS CACO3	21.4	10.7	24	<0.01	2.5	1.2	2	0.2	<0.01	<0.01	4.00
ALKALINITY AS CACO3 (LAB)	346	188	239	200	184	200	193	199	228	208	169
BICARBONATE (HCO3) (LAB)	442	229.4	292	220	195.2	295	239	243	278	254	206
HARDNESS (CACO3) TOTAL	644	274	347	244	272	318	230	330	388	288	362
HYDROXIDE AS OH	<0.01	<0.01	<0.01		14.4	24	<0.01	<0.01	<0.01	<0.10	<0.10
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10
SULFATE (SO4)	269	155	199	97	317	199	136	194	283	109	252
CHLORIDE (CL)	96.5	22.2	26	11.8	35.2	20.3	12.4	15.4	22.4	10.3	30.0
NUTRIENTS											
NITRATE (NO3-N)	0.3	0.05	0.48	0.1	0.1	0.05	0.19	0.12	0.08	0.03	0.11
TOTAL PHOSPHATE (PO4)	0.08	<0.01	0.05	0.1	0.02	0.13	<0.04	0.19	1.05	<0.04	0.09
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.06	0.06	0.3	0.53	0.08	0.09	0.11	0.06	0.52	0.13	0.07
BORON (B) TOTAL		0.28	0.3	0.153	1.04	0.24	0.23	0.54	0.39	0.23	0.38
IRON (FE) TOTAL	0.09	0.07	0.7	10.8	0.85	0.24	2.76	0.03	48.3	0.49	0.39
IRON (FE) DISS	0.04	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03
MANGANESE (MN) TOTAL	<0.01	<0.02	0.03	0.64	0.04	<0.01	0.1	<0.01	0.61	0.04	0.03
MANGANESE (MN) DISS	0.03	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 042

STATION LOCATION - NORTH FORK OF DUITCHUPAN CREEK ABOVE CONFLUENCE WITH SOUTH FORK

SAMPLE DATE	10/04/88	06/13/89	08/14/89	10/10/89
PHYSICAL PARAMETERS				
AIR TEMPERATURE (C)	22	18	28	17
FLOW (CFS)	1.15	2.26	1.34	2.87
WATER TEMPERATURE (C)	15	23.5	22.5	6
SPEC. COND. (UMHOS/CM) FIELD	969	820	940	988
PH (SU) FIELD	7.0	7.0	7.3	7.60
TURBIDITY (NTU) FIELD	4.8	2.34	59.1	8
TOTAL SUSP. SOLIDS				
TOTAL DISS. SOLIDS MEAS.	710	458	578	554
COMMON IONS				
CALCIUM (CA)	160.00	59.80	60.80	69.38
MAGNESIUM (MG)	18.00	34.79	37.72	39.03
SODIUM (NA)	48.86	42.52	68.92	68.87
POTASSIUM (K)				
ACIDITY AS CACO3	13.00	<0.01	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	209	190	180	215
BICARBONATE (HCO3) (LAB)	255	232	220	262
HARDNESS (CACO3) TOTAL	475	306	338	350
HYDROXIDE AS OH	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	345	189	245	241
CHLORIDE (CL)	18.0	14.5	15.1	15.4
NUTRIENTS				
NITRATE (NO3-N)	<0.02	0.04	0.12	0.28
TOTAL PHOSPHATE (PO4)	<0.04	<0.04	0.15	<0.04
TRACE ELEMENTS				
BARIUM (BA) TOTAL	0.05	0.08	0.07	0.06
BORON (B) TOTAL	0.360	0.24	0.400	0.430
IRON (FE) TOTAL	0.04	0.13	0.75	<0.03
IRON (FE) DISS	<0.03	<0.03	<0.03	<0.03
MANGANESE (MN) TOTAL	<0.01	0.02	0.04	0.03
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 046

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	3	28	18.6	6.42	21
FLOW (CFS)	0.009	0.8	0.22	0.20	21
WATER TEMPERATURE (C)	6	29.5	16.1	4.87	21
SPEC. COND. (UMHOS/CM) FIELD	480	1400	1115.3	194.48	21
PH (SU) FIELD	6.2	8.2	7.62	0.49	21
TURBIDITY (NTU) FIELD	0.11	70	17.82	15.97	21
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	306	916	718.5	141.68	20
COMMON IONS					
CALCIUM (CA)	50	224.8	104.8	42.07	21
MAGNESIUM (MG)	6.24	132	76.4	31.35	21
SODIUM (NA)	21.12	110	40.1	17.33	21
POTASSIUM (K)	3.3	5.6	4.2	0.88	4
ACIDITY AS CACO3	0.01	74	14.63	17.48	21
ALKALINITY AS CACO3 (LAB)	238	435	371.4	43.75	21
BICARBONATE (HCO3) (LAB)	290	560.7	450.0	57.09	21
HARDNESS (CACO3) TOTAL	294	715	583.8	105.34	21
HYDROXIDE AS OH	0.01	0.01	0.01	0.00	21
CARBONATE AS CO3	0.01	38.4	1.93	8.37	20
SULFATE (SO4)	1	290	182.7	68.68	21
CHLORIDE (CL)	10.6	110	61.4	29.75	21
NUTRIENTS					
NITRATE (NO3-N)	0.01	1.88	0.77	0.64	21
TOTAL PHOSPHATE (PO4)	0.01	0.8	0.11	0.18	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.05	0.24	0.07	0.04	21
BORON (B) TOTAL	0.05	0.82	0.212	0.15	20
IRON (FE) TOTAL	0.01	0.85	0.30	0.21	20
IRON (FE) DISS	0.01	0.25	0.04	0.06	21
MANGANESE (MN) TOTAL	0.015	0.14	0.094	0.04	20
MANGANESE (MN) DISS	0.01	0.13	0.06	0.04	20

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 046

STATION LOCATION - QUITCHUPAH CREEK ABOVE PUMPHOUSE

SAMPLE DATE	06/22/83	08/16/83	10/12/83	06/20/84	08/09/84	10/11/84	06/12/85	08/14/85	10/09/85	06/04/86	08/13/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	25	22	12	23	28	11	23	15	3	21	20
FLOW (CFS)	0.04	0.06	0.08	0.52	0.48	0.33	0.29	0.22	0.39	0.18	0.11
WATER TEMPERATURE (C)	21	19	11	17	18	9	18	13	6	16	14
SPEC. COND. (UMHOS/CM) FIELD	880	980	1200	1150	1100	1200	480	1400	1345	1326	1238
PH (SU) FIELD	7.9	7.8	7.6	7.55	7.6	7.65	7.75	8.1	7.6	8.1	8
TURBIDITY (NTU) FIELD	42	15	15	20	70	35	0.11	22.37	16	14.83	6.13
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	591	688	810		725	860	306	916	798	986	804
COMMON IONS											
CALCIUM (CA)	76	72	93.6	111.2	50	100	72.4	72.8	114.43	87.2	84.8
MAGNESIUM (MG)	63.36	73.44	103.68	77.76	132	111.6	27.1	111.4	102.34	107.5	107
SODIUM (NA)	32.5	37	38	49.9	47.8	52	27	110	34	42.11	38.06
POTASSIUM (K)			5.6	4.2			3.6	3.3			
ACIDITY AS CACO3	<0.01	12	32	74	20	15	10.7	30.3	44	2.4	2.5
ALKALINITY AS CACO3 (LAB)	332	352	394	388	435	390	238	418	409	384	392
BICARBONATE (HCO3) (LAB)	390.4	429.4	480.7	473.4	560.7	475.8	290	510	499	468	478.2
HARDNESS (CACO3) TOTAL	454	486	666	602	675	715	294	696	712	666	658
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
SULFATE (SO4)	159	136	209	158	99	220	65	259	229	290	230
CHLORIDE (CL)	32	50	100	109	108	110	10.6	96.7	78	64.2	70.3
NUTRIENTS											
NITRATE (NO3-N)	<0.02	<0.01	0.61	1.58	1.73	0.66	0.18	1.83	1.61	1.88	1.46
TOTAL PHOSPHATE (PO4)	0.28	0.02	0.05	0.22	0.11	0.8	0.02	<0.01	<0.01	<0.01	0.02
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.07	0.06	0.072	0.06	0.08	0.07	0.07	0.05	0.24	0.07	0.05
BORON (B) TOTAL	0.14	0.14	0.135	0.185	0.2	0.17		0.16	0.24	0.268	0.82
IRON (FE) TOTAL	0.64	0.33	0.16	0.1	0.55	0.45	0.04	<0.01	0.4	0.46	0.43
IRON (FE) DISS	0.02	0.01	0.059	0.02	0.02	0.2	0.02	<0.01	0.04	<0.01	<0.01
MANGANESE (MN) TOTAL	0.06	0.015	0.1	0.06	0.13	0.13	0.02	0.12	0.13	0.14	0.11
MANGANESE (MN) DISS	0.01	0.01	0.1	0.03		0.04	<0.01	0.13	0.13	0.1	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 046

STATION LOCATION - QUITCHUPAH CREEK ABOVE PUMPHOUSE

SAMPLE DATE	10/08/86	06/16/87	08/05/87	10/13/87	06/08/88	08/09/88	10/05/88	06/13/89	08/15/89	10/10/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)	13	28	24	13	20	19	12	27	14	17
FLOW (CFS)	0.12	0.08	0.02	0.41	0.16	0.10	0.80	0.06	0.009	0.14
WATER TEMPERATURE (C)	10	19	18	13	17.5	19.5	14	29.5	18.3	18
SPEC. COND. (UMHOS/CM) FIELD	1276	1140	1202	1050	1179	1081	1169	873	1074	1079
PH (SU) FIELD	8	8	8	8.2	7.6	7.1	6.8	6.2	6.9	7.60
TURBIDITY (NTU) FIELD	23.33	24	17.4	13.5	3.4	24.4	6.2	4.8	0.65	0.15
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.	824	722	772	687	680	765	820	492	644	580
COMMON IONS										
CALCIUM (CA)	92	116	85.86	92.68	156	224.80	212.00	88.79	58.24	89.48
MAGNESIUM (MG)	96	65.2	80.4	74.54	51.84	6.24	33.60	42.87	68.77	67.47
SODIUM (NA)	37.5	31.8	34.14	46.8	34.2	34.93	31.83	21.12	30.49	30.42
POTASSIUM (K)										
ACIDITY AS CACO3	6.3	8	6	<0.01	14	12.00	12.00	6.00	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	396	355	345	392	396	382	377	280	368	376
BICARBONATE (HCO3) (LAB)	405	433	421	478	483	466	460	341	449	459
HARDNESS (CACO3) TOTAL	630	562	566	541	606	588	670	410	542	529
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	38.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SULFATE (SO4)	264	210	187	170	191	180	275	<1.00	154	150
CHLORIDE (CL)	69.6	46.1	51.6	60	43.1	70.2	43.0	17.0	30	29.6
NUTRIENTS										
NITRATE (NO3-N)	1.23	0.63	0.63	0.57	0.38	0.45	0.18	0.05	0.24	0.25
TOTAL PHOSPHATE (PO4)	0.04	<0.04	<0.04	0.31	<0.04	0.05	<0.04	<0.04	0.05	0.06
TRACE ELEMENTS										
BARIUM (BA) TOTAL	0.07	0.05	0.05	0.05	0.05	0.07	0.06	0.10	0.06	0.06
BORON (B) TOTAL	0.17	0.22	0.29	0.17	0.33	0.18	0.140	<0.03	0.100	0.130
IRON (FE) TOTAL	0.43	0.36	0.3	0.38		0.29	0.11	<0.03	0.17	0.08
IRON (FE) DISS	<0.01	<0.01	<0.01	<0.01	0.05	<0.03	<0.03	<0.03	<0.03	<0.03
MANGANESE (MN) TOTAL	0.12	0.1	0.12	0.13		0.12	0.09	0.07	0.09	0.02
MANGANESE (MN) DISS	0.08	0.11	0.11	0.08	0.08	0.08	0.06	0.06	0.04	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCD - 047

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	3	27	19.2	7.08	21
FLOW (CFS)	0.04	0.13	0.07	0.02	17
WATER TEMPERATURE (C)	25	30	27.9	1.34	18
SPEC. COND. (UMHOS/CM) FIELD	350	873	766.5	110.78	21
PH (SU) FIELD	6.1	8	7.18	0.56	21
TURBIDITY (NTU) FIELD	0.13	9	1.77	2.33	21
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	224	868	498.6	114.16	21
COMMON IONS					
CALCIUM (CA)	53.6	163.2	97.7	25.70	21
MAGNESIUM (MG)	0.08	51.6	34.5	12.69	21
SODIUM (NA)	14	120	30.8	25.12	21
POTASSIUM (K)	2.5	4	3.3	0.55	4
ACIDITY AS CACO3	0.01	53	15.74	17.63	21
ALKALINITY AS CACO3 (LAB)	179	380	323.3	39.65	21
BICARBONATE (HCO3) (LAB)	218	463.6	390.7	48.24	21
HARDNESS (CACO3) TOTAL	208	540	393.0	54.65	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	24	1.24	5.22	20
SULFATE (SO4)	1	195	85.4	42.22	21
CHLORIDE (CL)	14	49.9	19.2	7.43	21
NUTRIENTS					
NITRATE (NO3-N)	0.01	1.52	0.17	0.32	21
TOTAL PHOSPHATE (PO4)	0.01	0.25	0.08	0.08	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.06	0.26	0.10	0.04	21
BORON (B) TOTAL	0.014	60.08	3.157	13.06	20
IRON (FE) TOTAL	0.01	0.46	0.09	0.10	21
IRON (FE) DISS	0.01	0.098	0.02	0.02	21
MANGANESE (MN) TOTAL	0.01	0.11	0.06	0.03	21
MANGANESE (MN) DISS	0.01	0.1	0.05	0.03	20

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 047

STATION LOCATION - PUMPHOUSE EFFLUENT

SAMPLE DATE	06/22/83	08/16/83	10/12/83	06/20/84	08/09/84	10/11/84	06/13/85	08/14/85	10/09/85	06/04/86	08/13/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	25	26	14	27	27	11	21	14	3	24	19
FLOW (CFS)	0.05	0.05	0.05	0.07	0.05	0.12		0.06	0.07	0.13	
WATER TEMPERATURE (C)	25	29	27	27	29	25	27	29	27	28	
SPEC. COND. (UMHOS/CM) FIELD	740	740	650	700	840	700	350	830	778	779	751
PH (SU) FIELD	7.4	7.6	7.3	7.25	7.3	7.2	7.4	7.2	6.65	7.4	7.5
TURBIDITY (NTU) FIELD	9	0.4	0.8	1	2.4	7	0.34	0.45	4	0.97	0.21
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	490	480	440	460	545	560	224	530	524	466	430
COMMON IONS											
CALCIUM (CA)	90	90.8	81.6	120.4	84	94	53.6	87.2	107.4	91.2	98.8
MAGNESIUM (MG)	46.56	38.4	40.8	22.32	51.6	45.6	17.8	37.9	27.98	38.4	39.4
SODIUM (NA)	22	21	14	22.2	76	69	25	120	16	21.57	21.19
POTASSIUM (K)			2.5	3.1			3.5	4			
ACIDITY AS CACO3	8	13	28	63	35.5	19	10.1	54.9	33	4.8	7.4
ALKALINITY AS CACO3 (LAB)	364	338	310	344	380	380	179	322	322	339	320
BICARBONATE (HCO3) (LAB)	422.1	412.4	378.2	419.7	463.6	463.6	218	392.8	394	414	390.4
HARDNESS (CACO3) TOTAL	394	362	374	394	425	425	208	376	385	382	386
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
SULFATE (SO4)	92	144	76	71	47	90	22	82	69	78	177
CHLORIDE (CL)	22	20	14	15.1	14.9	16	20.5	17.8	20	17.9	26.6
NUTRIENTS											
NITRATE (NO3-N)	<0.02	<0.01	<0.02	0.15	0.17	1.52	0.37	0.02	0.22	<0.01	0.03
TOTAL PHOSPHATE (PO4)	0.2	0.03	0.1	0.17	0.07	0.24	0.01	<0.01	<0.01	0.01	<0.01
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.09	0.09	0.105	0.08	0.09	0.07	0.06	0.08	0.26	0.11	0.09
BORON (B) TOTAL	0.08	0.08	60.08	0.095	0.156	0.17		0.11	0.26	0.084	1.03
IRON (FE) TOTAL	0.01	0.03	0.11	0.07	0.15	0.11	0.02	0.04	0.12	0.46	0.09
IRON (FE) DISS	0.01	0.03	0.098	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MANGANESE (MN) TOTAL	0.015	0.03	0.03	0.03	0.04	0.06	<0.01	0.06	0.07	0.11	0.11
MANGANESE (MN) DISS	0.015	0.02	0.04	0.01		0.06	<0.01	0.05	0.05	0.1	0.02

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 047

STATION LOCATION - PUMPHOUSE EFFLUENT

SAMPLE DATE	10/09/86	06/16/87	08/05/87	10/13/87	06/08/88	08/09/88	10/05/88	06/13/89	08/14/89	10/10/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)	18	27	24	9	24	12	8.5	27	23	17
FLOW (CFS)	0.06	0.04	0.06	0.06	0.07			0.06	0.05	0.068
WATER TEMPERATURE (C)	28.5	28	29	30	29			29.5	29.1	28
SPEC. COND. (UMHOS/CM) FIELD	760	792	853	750	865	817	819	873	854	856
PH (SU) FIELD	8	7.6	7.6	7.8	7.8	6.2	6.2	6.2	6.1	7.10
TURBIDITY (NTU) FIELD	0.17	0.61	0.61	1.2	2.8	0.80	3.7	0.13	0.20	0.3
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.	462	456	504	400	480	540	612	492	488	888
COMMON IONS										
CALCIUM (CA)	91.2	114.4	80.5	84.71	146.4	163.20	144.00	88.79	82.83	85.99
MAGNESIUM (MG)	36.5	23	38.53	37.69	10	0.08	43.20	42.87	44.27	41.87
SODIUM (NA)	18.4	19.74	20.42	32	21.23	22.46	20.45	21.12	21.86	21.82
POTASSIUM (K)										
ACIDITY AS CACO3	3.7	12	8	<0.01	<0.01	24.00	<0.01	5.00	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	324	317	298	325	337	317	336	280	325	332
BICARBONATE (HCO3) (LAB)	364.5	387	364	369	411	387	410	341	397	405
HARDNESS (CACO3) TOTAL	380	382	404	368	408	414	540	410	424	405
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	24	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	86	79	74	87	79	83	195	<1.00	83	79
CHLORIDE (CL)	17.1	15.4	15.4	18.8	15.3	49.9	18.0	17.0	16.1	16.0
NUTRIENTS										
NITRATE (NO3-N)	0.04	0.42	0.12	0.19	0.03	0.08	<0.02	0.05	0.10	0.08
TOTAL PHOSPHATE (PO4)	0.08	<0.04	<0.04	0.25	<0.04	<0.04	<0.04	<0.04	0.14	<0.04
TRACE ELEMENTS			5							
BARIUM (BA) TOTAL	0.1	0.09	0.08	0.11	0.09	0.10	0.09	0.10	0.09	0.09
BORON (B) TOTAL	0.13	0.014	0.22	0.11	0.13	0.12	0.090	<0.05	0.050	0.080
IRON (FE) TOTAL	0.04	0.06	0.04	0.2	0.1	<0.03	<0.03	<0.03	<0.03	<0.03
IRON (FE) DISS	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
MANGANESE (MN) TOTAL	0.08	0.08	0.09	0.08	0.08	0.08	0.06	0.07	0.07	0.02
MANGANESE (MN) DISS	0.05	0.09	0.09	0.06	0.08	0.08	0.05	0.06	0.05	<0.01

ALALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 047A

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	1	32	18.2	7.71	26
FLOW (CFS)	0.008	1	0.24	0.25	26
WATER TEMPERATURE (C)	6	17	13.5	2.21	25
SPEC. COND. (UMHOS/CM) FIELD	600	1870	1153.9	206.67	26
PH (SU) FIELD	6.1	8.65	7.48	0.61	26
TURBIDITY (NTU) FIELD	0.16	100	10.55	20.41	26
TOTAL SUSP. SOLIDS	7	248	74.5	80.74	6
TOTAL DISS. SOLIDS MEAS.	394	1200	739.8	133.48	26
COMMON IONS					
CALCIUM (CA)	44.8	192	120.0	36.50	21
MAGNESIUM (MG)	17.7	119.5	59.0	19.65	21
SODIUM (NA)	31.53	285	57.8	54.62	21
POTASSIUM (K)	2	4.1	3.0	0.78	5
ACIDITY AS CACO3	0.01	90	18.22	20.70	21
ALKALINITY AS CACO3 (LAB)	275	690	361.0	78.69	21
BICARBONATE (HCO3) (LAB)	336	841.8	438.2	96.74	21
HARDNESS (CACO3) TOTAL	279	660	544.0	81.17	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	24	1.24	5.22	20
SULFATE (SO4)	76	272	183.5	50.73	21
CHLORIDE (CL)	26.4	93	64.4	17.52	21
NUTRIENTS					
NITRATE (NO3-N)	0.02	4	0.56	0.84	21
TOTAL PHOSPHATE (PO4)	0.01	0.3	0.08	0.08	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.04	0.29	0.08	0.05	21
BORON (B) TOTAL	0.05	0.9	0.20	0.17	20
IRON (FE) TOTAL	0.04	6.54	0.45	1.37	21
IRON (FE) DISS	0.01	0.11	0.04	0.03	21
MANGANESE (MN) TOTAL	0.01	0.17	0.04	0.04	20
MANGANESE (MN) DISS	0.01	0.07	0.02	0.02	20

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 047A

STATION LOCATION - EAST SPRING CANYON ABOVE CONFLUENCE WITH QUITCHUPAH CREEK

SAMPLE DATE	04/19/83	05/05/83	05/17/83	06/07/83	06/20/83	07/14/83	08/16/83	10/12/83	06/20/84	08/09/84	10/11/84
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	14	16	11	22	26	32	26	11	27	27	11
FLOW (CFS)	0.12	0.15	0.84	0.79	0.53	1	0.12	0.11	0.09	0.14	0.16
WATER TEMPERATURE (C)	12	12	6	12	15	16	14	12	15	14	12
SPEC. COND. (UMHOS/CM) FIELD	1396	1230	1305	841	960	1120	1120	1030	1200	1090	1870
PH (SU) FIELD	6.7	7.4	7.7	8.3	7.7	8.2	7.8	7.6	7.4	7.4	7.2
TURBIDITY (NTU) FIELD	28	11	100	18	16	0.5	2.4	1	10	2.8	0.16
TOTAL SUSP. SOLIDS	7	61	248	24		74		33			
TOTAL DISS. SOLIDS MEAS.	796	738	846	522	660	636	804	670	770	720	1200
COMMON IONS											
CALCIUM (CA)					96.8		100	103.2	132.9	130	130
MAGNESIUM (MG)					47.04		60	58.08	53.52	73.2	79.2
SODIUM (NA)					56		57	55	54.1	47.8	285
POTASSIUM (K)								3.1	2.2		
ACIDITY AS CACO3					4		19	26	50	26	15
ALKALINITY AS CACO3 (LAB)					334		336	330	357	410	690
BICARBONATE (HCO3) (LAB)					407.5		409.9	402.6	435.5	500.2	841.8
HARDNESS (CACO3) TOTAL					438		490	500	555	630	655
HYDROXIDE AS OH					<0.01		<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3					<0.01		<0.01	<0.01	<0.01	<0.01	<0.01
SULFATE (SO4)					127		156	193	190	89	190
CHLORIDE (CL)					40		90	60	80.4	85.4	87
NUTRIENTS											
NITRATE (NO3-N)					<0.02		0.15	0.15	<0.34	0.04	1.09
TOTAL PHOSPHATE (PO4)					0.3		0.14	0.18	0.21	0.07	0.06
TRACE ELEMENTS											
BARIUM (BA) TOTAL					0.08		0.075	0.076	0.09	0.07	0.06
BORON (B) TOTAL					0.2		0.18	0.167	0.15	0.239	0.25
IRON (FE) TOTAL					0.29		0.09	0.13	0.1	0.3	0.23
IRON (FE) DISS					0.02		0.08	0.04	0.07	0.07	0.11
MANGANESE (MN) TOTAL					0.077		0.033	0.03	0.1		0.04
MANGANESE (MN) DISS					0.07		0.025	0.02	0.04		0.04

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 047A

STATION LOCATION - EAST SPRING CANYON ABOVE CONFLUENCE WITH QUITCHUPAH CREEK

SAMPLE DATE	06/12/85	08/14/85	10/09/85	06/04/86	08/13/86	10/09/86	06/16/87	08/05/87	10/13/87	06/08/88	08/09/88
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)	23	14	1	21	19	9	27	24	9	24	12
FLOW (CFS)	0.12	0.1	0.15	0.14	0.13	0.29	0.11	0.11	0.16	0.12	0.17
WATER TEMPERATURE (C)	14	13	10	14	14	12	16	16	14	14.5	
SPEC. COND. (UMHOS/CM) FIELD	600	1300	1200	1212	1105	1146	1101	1150	1100	1185	1078
PH (SU) FIELD	8.05	7.65	8.65	7.6	7.7	8	7.6	7.6	8	7.6	6.3
TURBIDITY (NTU) FIELD	42.4	0.79	6	1.32	1.29	2	15.62	2.5	2.6	2.3	2.7
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	394	850	826	796	740	752	712	740	720	756	745
COMMON IONS											
CALCIUM (CA)	53.2	44.8	152.8	123.2	119.2	114.4	132	102.8	108.1	192	181.60
MAGNESIUM (MG)	35	119.5	57.98	66.2	65.8	61.4	50.8	58.5	61.33	17.7	28.80
SODIUM (NA)	63	125	36	41.3	37.82	36	32.39	38.34	50.4	32.33	36.34
POTASSIUM (K)	4.1	3.4	2								
ACIDITY AS CACO3	8.8	36.9	31	4.8	5	5	14	14	<0.01	<0.01	16.00
ALKALINITY AS CACO3 (LAB)	275	332	324	360	350	354	321	294	340	365	341
BICARBONATE (HCO3) (LAB)	336	405	395	439	427	383.1	392	359	415	445	416
HARDNESS (CACO3) TOTAL	279	610	623	484	572	542	542	550	524	554	574
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10
CARBONATE AS CO3	<0.01	<0.01	<0.01		<0.01	24	<0.01	<0.01	<0.01	<0.10	<0.10
SULFATE (SO4)	76	271	272	220	198	219	181	171	210	174	181
CHLORIDE (CL)	26.4	89.5	68	66.3	65.1	66.5	53	55.1	66	54	93.0
NUTRIENTS											
NITRATE (NO3-N)	0.08	1.23	0.3	0.26	0.92	0.19	0.24	4	0.43	0.19	0.33
TOTAL PHOSPHATE (PO4)	0.06	<0.01	<0.01	<0.01	0.03	0.04	<0.04	<0.04	0.26	<0.04	0.05
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.11	0.05	0.29	0.06	0.06	0.06	0.04	0.05	0.1	0.06	0.06
BORON (B) TOTAL		0.16	0.29	0.158	0.9	0.11	0.17	0.28	0.13	0.21	0.14
IRON (FE) TOTAL	0.24	0.08	0.11	0.06	0.22	0.18	0.32	0.04	6.54	0.07	0.09
IRON (FE) DISS	0.03	0.04	0.05	0.04	<0.01	0.08	<0.01	<0.01	<0.01	<0.03	<0.03
MANGANESE (MN) TOTAL	0.06	0.03	0.03	0.02	0.04	0.03	<0.01	0.02	0.17	<0.01	0.03
MANGANESE (MN) DISS	0.03	0.03	0.02	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 047A

STATION LOCATION - EAST SPRING CANYON ABOVE CONFLUENCE WITH QUITCHUPAH CREEK

SAMPLE DATE	10/05/88	06/13/89	08/15/89	10/10/89
PHYSICAL PARAMETERS				
AIR TEMPERATURE (C)	9	27	13	17
FLOW (CFS)	0.13	0.008	0.154	0.17
WATER TEMPERATURE (C)	13.5	17	14.3	14.5
SPEC. COND. (UMHOS/CM) FIELD	1154	1202	1164	1142
PH (SU) FIELD	6.1	6.8	6.3	7.20
TURBIDITY (NTU) FIELD	3.9	0.18	0.35	0.5
TOTAL SUSP. SOLIDS				
TOTAL DISS. SOLIDS MEAS.	812	692	688	650
COMMON IONS				
CALCIUM (CA)	184.00	125.70	82.83	110.94
MAGNESIUM (MG)	48.00	70.80	64.47	61.41
SODIUM (NA)	32.50	32.32	33.83	31.53
POTASSIUM (K)				
ACIDITY AS CACO3	17.00	90.00	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	361	373	359	375
BICARBONATE (HCO3) (LAB)	440	456	438	458
HARDNESS (CACO3) TOTAL	660	568	558	525
HYDROXIDE AS OH	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	270	165	160	141
CHLORIDE (CL)	58.0	49.8	53.0	45.9
NUTRIENTS				
NITRATE (NO3-N)	0.05	0.17	0.41	0.57
TOTAL PHOSPHATE (PO4)	<0.04	<0.04	0.10	<0.04
TRACE ELEMENTS				
BARIUM (BA) TOTAL	0.05	0.06	0.05	0.06
BORON (B) TOTAL	0.110	<0.05	0.080	0.110
IRON (FE) TOTAL	0.08	0.09	<0.04	0.05
IRON (FE) DISS	0.05	<0.03	<0.03	0.04
MANGANESE (MN) TOTAL	0.02	<0.01	<0.01	<0.01
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCO - 057A

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	13	21	18.0	3.56	3
FLOW (CFS)	0	0.002	0.0004	0.00	6
WATER TEMPERATURE (C)	5	21	13.7	6.60	3
SPEC. COND. (UMHOS/CM) FIELD	580	667	620.0	35.86	3
PH (SU) FIELD	7	7.95	7.52	0.39	3
TURBIDITY (NTU) FIELD	1.6	20.3	8.2	8.59	3
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	328	408	370.7	32.88	3
COMMON IONS					
CALCIUM (CA)	97.03	107.2	103.20	4.43	3
MAGNESIUM (MG)	4.8	16.86	12.71	5.59	3
SODIUM (NA)	9.15	9.79	9.44	0.26	3
POTASSIUM (K)	ERR	ERR	ERR	ERR	0
ACIDITY AS CACO3	0.01	1	0.34	0.47	3
ALKALINITY AS CACO3 (LAB)	270	285	277.3	6.13	3
BICARBONATE (HCO3) (LAB)	329	348	338.3	7.76	3
HARDNESS (CACO3) TOTAL	288	333	310.3	18.37	3
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	3
CARBONATE AS CO3	0.01	0.1	0.04	0.04	3
SULFATE (SO4)	7	49	22.3	18.93	3
CHLORIDE (CL)	15.2	20.7	18.3	2.30	3
NUTRIENTS					
NITRATE (NO3-N)	0.02	0.25	0.11	0.10	3
TOTAL PHOSPHATE (PO4)	0.04	0.11	0.06	0.03	3
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.14	0.17	0.15	0.01	3
BORON (B) TOTAL	0.05	0.16	0.11	0.04	3
IRON (FE) TOTAL	0.16	0.32	0.24	0.07	3
IRON (FE) DISS	0.01	0.03	0.02	0.01	3
MANGANESE (MN) TOTAL	0.05	0.12	0.09	0.03	3
MANGANESE (MN) DISS	0.03	10.11	3.39	4.75	3

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE SUFCD - 062

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	10	11	10.5	0.50	2
FLOW (CFS)	0.0008	0.0016	0.0012	0.00	3
WATER TEMPERATURE (C)	9	13	10.4	1.10	8
SPEC. COND. (UMHOS/CM) FIELD	350	940	580.3	121.15	20
PH (SU) FIELD	6.4	8.2	7.5	0.36	21
TURBIDITY (NTU) FIELD	0.01	7.8	1.21	1.77	20
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	222	610	366.0	72.43	21
COMMON IONS					
CALCIUM (CA)	51.6	120	93.1	17.53	21
MAGNESIUM (MG)	0.1	38.4	25.6	9.84	21
SODIUM (NA)	3.5	69	12.6	15.24	20
POTASSIUM (K)	2	65.2	13.2	23.25	6
ACIDITY AS CACO3	0.01	54	11.21	12.96	21
ALKALINITY AS CACO3 (LAB)	192	340	254.6	27.64	21
BICARBONATE (HCO3) (LAB)	234	414.8	310.5	33.73	21
HARDNESS (CACO3) TOTAL	192	400	314.7	40.33	21
HYDROXIDE AS OH	0.01	0.1	0.04	0.04	21
CARBONATE AS CO3	0.01	0.1	0.04	0.04	20
SULFATE (SO4)	22	188	68.2	35.31	21
CHLORIDE (CL)	6	31	10.9	5.25	21
NUTRIENTS					
NITRATE (NO3-N)	0.02	1.45	0.17	0.31	21
TOTAL PHOSPHATE (PO4)	0.01	1.65	0.15	0.34	21
TRACE ELEMENTS					
BARIUM (BA) TOTAL	0.036	0.39	0.080	0.07	21
BORON (B) TOTAL	0.02	0.82	0.10	0.17	20
IRON (FE) TOTAL	0.01	1.54	0.16	0.39	21
IRON (FE) DISS	0.009	0.03	0.017	0.01	20
MANGANESE (MN) TOTAL	0.01	0.57	0.05	0.12	21
MANGANESE (MN) DISS	0.01	0.05	0.02	0.01	19

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 062

STATION LOCATION - UNDERGROUND NORTH MAIN AT #6 ENTRY

SAMPLE DATE	06/22/83	08/31/83	10/12/83	06/20/84	08/08/84	10/10/84	06/13/85	08/14/85	10/22/85	06/05/86	08/12/86
PHYSICAL PARAMETERS											
AIR TEMPERATURE (C)			11							10	
FLOW (CFS)										0.0008	
WATER TEMPERATURE (C)	10	10	9							10	
SPEC. COND. (UMHOS/CM) FIELD	525	520	480	500	940	495	350	582	637	626	606
PH (SU) FIELD	7.3	7.3	7.5	7.3	7.4	7.3	8.2	7.85	7.75	7.75	7.8
TURBIDITY (NTU) FIELD	2.8	1	0.5	1	2.6	0.17		0.25	0.16	0.32	<0.01
TOTAL SUSP. SOLIDS											
TOTAL DISS. SOLIDS MEAS.	309	336	312	330	610	350	232	379	374	388	378
COMMON IONS											
CALCIUM (CA)	68.8	68.8	71.2	77.2	116	74	51.6	77.6	88.4	60	84
MAGNESIUM (MG)	25.92	27.36	26.88	27.36	12	38.4	15.1	28.8	32.2	33.1	32.2
SODIUM (NA)	7	12	3.5	7.2	69	7.5	24	40	6.3	7.37	8.3
POTASSIUM (K)		4.1	2	2.4			2.8	2.9			
ACIDITY AS CACO3	5	18	31	54	22	15	6.9	18	23.8	4.8	5
ALKALINITY AS CACO3 (LAB)	272	250	230	261	340	250	192	248	268	267	266
BICARBONATE (HCO3) (LAB)	331.8	305	280.6	318.4	414.8	305	234	302.6	327	326	324.5
HARDNESS (CACO3) TOTAL	280	286	290	307	340	345	192	314	355	338	334
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
SULFATE (SO4)	56	54	55	46	52	52	22	78	80	79	68
CHLORIDE (CL)	14	10	6	8	8.3	9	6.9	9.8	8.8	13.5	7.1
NUTRIENTS											
NITRATE (NO3-N)	<0.02	<0.02	<0.02	0.03	0.05	1.45	0.26	0.02	0.02	0.04	0.03
TOTAL PHOSPHATE (PO4)	0.2	0.19	0.02	0.05	0.07	0.34	1.65	<0.01	<0.01	0.02	0.03
TRACE ELEMENTS											
BARIUM (BA) TOTAL	0.07	0.036	0.088	0.09	0.08	0.06	0.39	0.06	0.05	0.07	0.07
BORON (B) TOTAL	0.03	0.032	0.11	0.1	0.081	0.1		0.04	0.046	0.04	0.82
IRON (FE) TOTAL	0.026	0.01	0.01	0.04	1.54	0.12	1.14	0.09	0.09	<0.01	0.02
IRON (FE) DISS	0.011	0.01	0.009	<0.01	0.01	<0.01	0.03	<0.01	0.02	<0.01	<0.01
MANGANESE (MN) TOTAL	0.015	0.05	0.04	0.06	0.12	0.03	0.57	<0.01	0.02	<0.01	<0.01
MANGANESE (MN) DISS	0.01	0.05	0.05	0.05		<0.01	<0.01	0.02	<0.01	<0.01	<0.01

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 062

STATION LOCATION - UNDERGROUND NORTH MAIN AT #6 ENTRY

SAMPLE DATE	10/10/86	06/18/87	08/05/87	10/28/87	06/08/88	08/24/88	10/05/88	06/19/89	08/15/89	10/16/89
PHYSICAL PARAMETERS										
AIR TEMPERATURE (C)										
FLOW (CFS)						0.0013				0.0016
WATER TEMPERATURE (C)	10.5			11	10	13				
SPEC. COND. (UMHOS/CM) FIELD	581	598	691	550	378	575	638	655	688	
PH (SU) FIELD	7.6	7.6	7.6	7.8	7.0	7.6	6.4	7.1	7.4	7.4
TURBIDITY (NTU) FIELD	0.02	1.18	0.71	0.5	1.1	0.5	3.2	7.8	0.2	0.15
TOTAL SUSP. SOLIDS										
TOTAL DISS. SOLIDS MEAS.	338	358	382	349	346	355	438	470	326	336
COMMON IONS										
CALCIUM (CA)	68	96	74.68	65.65	120	119.20	96.00	84.18	77.56	85.50
MAGNESIUM (MG)	31.7	16.8	26.18	32.32	<0.10	5.58	38.40	27.76	29.14	30.20
SODIUM (NA)	5.7	6.44	6.66	5.26	8.29	6.23	6.72	6.91	7.30	
POTASSIUM (K)										65.20
ACIDITY AS CACO3	3.8	6	8	<0.01	<0.01	3.00	11.00	<0.01	<0.01	<0.01
ALKALINITY AS CACO3 (LAB)	234	239	242	254	259	260	213	278	255	268
BICARBONATE (HCO3) (LAB)	285.5	292	295	308	316	317	260	339	311	327
HARDNESS (CACO3) TOTAL	302	310	324	261	300	320	400	326	344	340
HYDROXIDE AS OH	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CARBONATE AS CO3	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	66	59	51	93	46	46	140	55	46	188
CHLORIDE (CL)	16.3	8.6	9.1	8.6	9.2	16.0	31.0	9.0	9.6	9.4
NUTRIENTS										
NITRATE (NO3-N)	0.09	0.08	0.29	0.3	0.06	0.07	<0.02	0.46	0.09	0.12
TOTAL PHOSPHATE (PO4)	0.11	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	0.11	<0.04
TRACE ELEMENTS										
BARIUM (BA) TOTAL	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
BORON (B) TOTAL	0.05	0.087	0.11	0.04	0.08	0.020	0.030	0.04	0.050	0.040
IRON (FE) TOTAL	<0.01	0.1	<0.01	0.02	0.04	<0.03	<0.03	0.04	<0.03	<0.03
IRON (FE) DISS	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	
MANGANESE (MN) TOTAL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	

ALALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - 057A

STATION LOCATION - SPRING AT THE HEAD OF DUNCAN DRAW

SAMPLE DATE	08/12/87	10/28/87	06/07/88	08/09/88	10/05/88	06/13/89	08/15/89	10/09/89
					STATION NOT ACCESSIBLE			
PHYSICAL PARAMETERS								
AIR TEMPERATURE (C)	20	13	21					
FLOW (CFS)		0.00014	0.002	0		0	0	0
WATER TEMPERATURE (C)	21	5	15					
SPEC. COND. (UMHOS/CM) FIELD	667	580	613					
PH (SU) FIELD	7.6	7.95	7					
TURBIDITY (NTU) FIELD	20.3	2.6	1.6					
TOTAL SUSP. SOLIDS								
TOTAL DISS. SOLIDS MEAS.	408	376	328					
COMMON IONS								
CALCIUM (CA)	97.03	105.37	107.2					
MAGNESIUM (MG)	16.46	16.86	4.8					
SODIUM (NA)	9.15	9.38	9.79					
POTASSIUM (K)								
ACIDITY AS CACO3	1	<0.01	<0.01					
ALKALINITY AS CACO3 (LAB)	285	277	270					
BICARBONATE (HCO3) (LAB)	348	338	329					
HARDNESS (CACO3) TOTAL	310	333	288					
HYDROXIDE AS OH	<0.01	<0.01	<0.10					
CARBONATE AS CO3	<0.01	<0.01	<0.10					
SULFATE (SO4)	11	49	7					
CHLORIDE (CL)	19	20.7	15.2					
NUTRIENTS								
NITRATE (NO3-N)	0.06	0.25	<0.02					
TOTAL PHOSPHATE (PO4)	0.11	<0.04	<0.04					
TRACE ELEMENTS								
BARIUM (BA) TOTAL	0.14	0.17	0.14					
BORON (B) TOTAL	0.11	0.05	0.16					
IRON (FE) TOTAL	0.32	0.23	0.16					
IRON (FE) DISS	<0.01	0.02	<0.03					
MANGANESE (MN) TOTAL	0.12	0.09	0.05					
MANGANESE (MN) DISS	0.11	0.04	0.03					

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - SUFCO-089

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	8	18	12.7	4.11	3
FLOW (STAFF GAGE LEVEL)	1.29	1.3	1.30	0.00	2
WATER TEMPERATURE (C)	2	14	8.0	4.30	4
SPEC. COND. (UMHOS/CM) FIELD	97	139	118	15.65	4
PH (SU) FIELD	5.9	7.2	6.4	0.51	4
TURBIDITY (NTU) FIELD	5	5	5.0	0.00	3
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	43	108	85.0	25.76	4
COMMON IONS					
CALCIUM (CA)	7.48	12.32	10.63	1.86	4
MAGNESIUM (MG)	1.95	2.94	2.49	0.36	4
SODIUM (NA)	0.97	2.29	1.95	0.56	4
POTASSIUM (K)	2.28	2.94	2.62	0.28	4
BICARBONATE (HCO3) (LAB)	1	54	33.5	21.29	4
HARDNESS (CACO3) TOTAL	40	80	56.0	15.75	4
CARBONATE AS CO3	0.1	0.1	0.1	0.00	4
SULFATE (SO4)	3	30	14.0	10.89	4
CHLORIDE (CL)	1.5	2.7	2.2	0.44	4
FLUORIDE (F)	0.03	0.05	0.04	0.01	4
NUTRIENTS					
NITRATE (NO3-N)	0.04	0.18	0.09	0.05	4
NITRITE (NO2-N)	0.02	0.02	0.02	0.00	4
AMMONIA (NH3 AS N)	0.03	0.37	0.14	0.14	4
TOTAL PHOSPHATE (PO4)	0.04	0.52	0.22	0.19	4
TRACE ELEMENTS					
ALUMINUM (AL) DISS	0.02	0.37	0.1	0.14	4
ARSENIC (AS) DISS	0.001	0.002	0.002	0.00	4
BARIUM (BA) DISS	0.01	0.02	0.0	0.00	4
BORON (B) DISS	0.001	0.050	0.020	0.02	4
CADMIUM (CD) DISS	0.001	0.001	0.001	0.001	4
CHROMIUM (CR) DISS	0.001	0.001	0.001	0.001	4
COPPER (CU) DISS	0.01	0.02	0.01	0.00	4
IRON (FE) DISS	0.19	0.83	0.47	0.24	4
LEAD (PB) DISS	0.001	0.001	0.001	0.001	4
MANGANESE (MN) DISS	0.04	0.28	0.18	0.09	4
MERCURY (HG) DISS	0.0002	0.0002	0.0002	0.0002	4
MOLYBDENUM (MO) DISS	0.002	0.002	0.002	0.002	4
NICKEL (NI) DISS	0.03	0.03	0.03	0.03	4
SELENUM (SE) DISS	0.001	0.001	0.001	0.001	4
ZINC (ZN) DISS	0.001	0.001	0.001	0.001	4

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES - SUFCO-089

STATION LOCATION - BOX CANYON AT LEASE BOUNDARY

SAMPLE DATE	07/27/89	08/22/89	09/18/89	10/09/89
PHYSICAL PARAMETERS				
AIR TEMPERATURE (C)		18	8	12
FLOW (STAFF GAGE LEVEL)			1.29	1.30
WATER TEMPERATURE (C)	14	9	7	2
SPEC. COND. (UMHOS/CM) FIELD	97	111	125	139
PH (SU) FIELD	7.2	6.5	6.0	5.9
TURBIDITY (NTU) FIELD		5	5	5
TOTAL SUSP. SOLIDS				
TOTAL DISS. SOLIDS MEAS.	104	43	85	108
COMMON IONS				
CALCIUM (CA)	12.32	7.48	11.22	11.50
MAGNESIUM (MG)	2.94	1.95	2.61	2.44
SODIUM (NA)	2.28	0.97	2.24	2.29
POTASSIUM (K)	2.94	2.86	2.28	2.40
BICARBONATE (HCO3) (LAB)	54.0	<1.00	28.0	51.0
HARDNESS (CACO3) TOTAL	60.0	44.0	40.0	80.0
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	5	30	18	3
CHLORIDE (CL)	2.7	1.5	2.4	2.3
FLUORIDE (F)	0.04	0.04	0.03	<0.05
NUTRIENTS				
NITRATE (NO3-N)	0.04	0.18	0.06	0.07
NITRITE (NO2-N)	<0.02	<0.02	<0.02	<0.02
AMMONIA (NH3 AS N)	0.37	0.12	<0.03	<0.03
TOTAL PHOSPHATE (PO4)	0.21	0.52	<0.04	0.09
TRACE ELEMENTS				
ALUMINUM (AL) DISS	0.040	0.37	<0.02	<0.05
ARSENIC (AS) DISS	<0.002	<0.001	<0.001	<0.002
BARIUM (BA) DISS	0.01	0.01	0.01	0.02
BORON (B) DISS	0.020	0.050	<0.001	<0.010
CADMIUM (CD) DISS	<0.001	<0.001	<0.001	<0.001
CHROMIUM (CR) DISS	<0.001	<0.001	<0.002	<0.001
COPPER (CU) DISS	<0.01	<0.01	<0.01	<0.02
IRON (FE) DISS	0.54	0.83	0.19	0.31
LEAD (PB) DISS	<0.001	<0.001	<0.001	<0.001
MANGANESE (MN) DISS	0.19	0.22	0.04	0.28
MERCURY (HG) DISS	<0.0002	<0.0002	<0.0002	<0.0002
MOLYBDENUM (MO) DISS	<0.010	<0.050	<0.002	<0.010
NICKEL (NI) DISS	<0.03	<0.03	<0.03	<0.03
SELENUM (SE) DISS	<0.001	<0.001	<0.001	<0.001
ZINC (ZN) DISS	<0.005	<0.005	<0.001	<0.010

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - SUFCO-090

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	7	17	13.7	4.71	3
FLOW (CFS)	0.021	0.089	0.060	0.03	4
WATER TEMPERATURE (C)	6	19	12.3	5.80	4
SPEC. COND. (UMHOS/CM) FIELD	127	247	208	47.38	4
PH (SU) FIELD	6.2	7.03	6.61	0.30	4
TURBIDITY (NTU) FIELD	0.4	4.5	1.8	1.92	3
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	89	118	103.8	11.10	4
COMMON IONS					
CALCIUM (CA)	19.4	21.87	20.42	0.90	4
MAGNESIUM (MG)	4.87	5.58	5.21	0.25	4
SODIUM (NA)	5.07	5.65	5.39	0.22	4
POTASSIUM (K)	1.6	3.16	2.15	0.63	4
BICARBONATE (HCO3) (LAB)	55	73	64.3	6.61	4
HARDNESS (CACO3) TOTAL	80	362	154.0	120.14	4
CARBONATE AS CO3	0.1	0.1	0.1	0.00	4
SULFATE (SO4)	12	32	23.5	7.26	4
CHLORIDE (CL)	5.6	5.9	5.8	0.11	4
FLUORIDE (F)	0.03	0.07	0.06	0.01	4
NUTRIENTS					
NITRATE (NO3-N)	0.09	0.4	0.18	0.13	4
NITRITE (NO2-N)	0.02	0.02	0.02	0.00	4
AMMONIA (NH3 AS N)	0.03	0.06	0.05	0.01	4
TOTAL PHOSPHATE (PO4)	0.04	0.44	0.15	0.17	4
TRACE ELEMENTS					
ALUMINUM (AL) DISS	0.02	0.2	0.1	0.07	4
ARSENIC (AS) DISS	0.001	0.003	0.002	0.00	4
BARIUM (BA) DISS	0.02	0.02	0.0	0.00	4
BORON (B) DISS	0.001	0.050	0.023	0.02	4
CADMIUM (CD) DISS	0.001	0.001	0.001	0.001	4
CHROMIUM (CR) DISS	0.001	0.001	0.001	0.001	4
COPPER (CU) DISS	0.01	0.02	0.01	0.00	4
IRON (FE) DISS	0.11	0.64	0.25	0.23	4
LEAD (PB) DISS	0.001	0.001	0.001	0.001	4
MANGANESE (MN) DISS	0.01	0.04	0.02	0.01	4
MERCURY (HG) DISS	0.0001	0.0001	0.0001	0.0001	4
MOLYBDENUM (MO) DISS	0.002	0.002	0.002	0.002	4
NICKEL (NI) DISS	0.03	0.03	0.03	0.03	4
SELENUM (SE) DISS	0.001	0.001	0.001	0.001	4
ZINC (ZN) DISS	0.005	0.005	0.005	0.005	4

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES - SUFCO-090

STATION LOCATION - BOX CANYON AT LEASE BOUNDARY

SAMPLE DATE	07/27/89	08/22/89	09/18/89	10/09/89
PHYSICAL PARAMETERS				
AIR TEMPERATURE (C)		17	7	17
FLOW (CFS)	0.021	0.078	0.052	0.089
WATER TEMPERATURE (C)	19	17	6	7
SPEC. COND. (UMHOS/CM) FIELD	127	247	221	235
PH (SU) FIELD	7.03	6.5	6.2	6.7
TURBIDITY (NTU) FIELD		4.5	0.4	0.45
TOTAL SUSP. SOLIDS				
TOTAL DISS. SOLIDS MEAS.	118	98	110	89
COMMON IONS				
CALCIUM (CA)	20.06	21.87	20.36	19.40
MAGNESIUM (MG)	5.17	5.58	5.22	4.87
SODIUM (NA)	5.54	5.07	5.30	5.65
POTASSIUM (K)	3.16	2.20	1.60	1.62
BICARBONATE (HCO3) (LAB)	55.0	67.0	62.0	73.0
HARDNESS (CACO3) TOTAL	84.0	362.0	80.0	90.0
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	32	26	24	12
CHLORIDE (CL)	5.6	5.7	5.9	5.8
FLUORIDE (F)	0.03	0.06	0.07	0.06
NUTRIENTS				
NITRATE (NO3-N)	0.09	0.40	0.11	0.10
NITRITE (NO2-N)	<0.02	<0.02	<0.02	<0.02
AMMONIA (NH3 AS N)	0.06	<0.03	0.06	<0.05
TOTAL PHOSPHATE (PO4)	0.06	0.44	<0.04	<0.04
TRACE ELEMENTS				
ALUMINUM (AL) DISS	0.200	0.05	<0.02	<0.05
ARSENIC (AS) DISS	0.003	<0.001	<0.001	<0.002
BARIUM (BA) DISS	0.02	0.02	0.02	0.02
BORON (B) DISS	0.030	0.050	<0.001	<0.010
CADMIUM (CD) DISS	<0.001	<0.001	<0.001	<0.001
CHROMIUM (CR) DISS	<0.001	<0.001	<0.002	<0.001
COPPER (CU) DISS	<0.01	<0.01	<0.01	<0.02
IRON (FE) DISS	0.14	0.64	0.11	0.11
LEAD (PB) DISS	<0.001	<0.001	<0.001	<0.001
MANGANESE (MN) DISS	0.02	0.04	<0.01	0.02
MERCURY (HG) DISS	<0.0002	<0.0002	<0.0001	<0.0002
MOLYBDENUM (MO) DISS	<0.010	<0.050	<0.002	<0.010
NICKEL (NI) DISS	<0.03	<0.03	<0.03	<0.03
SELENUM (SE) DISS	<0.001	<0.001	<0.001	<0.001
ZINC (ZN) DISS	0.014	<0.005	<0.005	<0.010

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - SUFCO - GW-13

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	12	16	13.3	1.89	3
FLOW (CFS)	0.0016	0.0019	0.0018	0.00	4
WATER TEMPERATURE (C)	6	12	8.8	2.38	4
SPEC. COND. (UMHOS/CM) FIELD	557	1372	1150	342.43	4
PH (SU) FIELD	6.5	7.3	7.0	0.31	4
TURBIDITY (NTU) FIELD	0.08	0.7	0.4	0.26	3
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	690	818	753.8	50.44	4
COMMON IONS					
CALCIUM (CA)	58.04	73.1	64.23	5.60	4
MAGNESIUM (MG)	40.6	44.3	42.16	1.34	4
SODIUM (NA)	154.12	164.37	158.25	4.14	4
POTASSIUM (K)	2.6	3.05	2.85	0.16	4
BICARBONATE (HCO3) (LAB)	0.1	558	369.5	217.47	4
HARDNESS (CACO3) TOTAL	334	524	382.0	81.98	4
CARBONATE AS CO3	0.1	0.1	0.1	0.00	4
SULFATE (SO4)	94	229	162.8	57.77	4
CHLORIDE (CL)	58.4	390	141.8	143.33	4
FLUORIDE (F)	0.23	0.42	0.32	0.08	4
NUTRIENTS					
NITRATE (NO3-N)	0.11	0.38	0.22	0.11	4
NITRITE (NO2-N)	0.02	0.02	0.02	0.00	4
AMMONIA (NH3 AS N)	0.03	0.09	0.05	0.02	4
TOTAL PHOSPHATE (PO4)	0.05	0.57	0.19	0.22	4
TRACE ELEMENTS					
ALUMINUM (AL) DISS	0.01	0.05	0.0	0.02	4
ARSENIC (AS) DISS	0.001	0.002	0.002	0.00	4
BARIUM (BA) DISS	0.05	0.06	0.1	0.00	4
BORON (B) DISS	0.070	0.080	0.078	0.00	4
CADMIUM (CD) DISS	0.001	0.001	0.001	0.001	4
CHROMIUM (CR) DISS	0.001	0.001	0.001	0.001	4
COPPER (CU) DISS	0.01	0.02	0.01	0.00	4
IRON (FE) DISS	0.02	0.32	0.10	0.13	4
LEAD (PB) DISS	0.001	0.001	0.001	0.001	4
MANGANESE (MN) DISS	0.01	0.22	0.06	0.09	4
MERCURY (HG) DISS	0.0002	0.0002	0.0002	0.0002	4
MOLYBDENUM (MO) DISS	0.002	0.002	0.002	0.002	4
NICKEL (NI) DISS	0.03	0.03	0.03	0.03	4
SELENUM (SE) DISS	0.001	0.001	0.001	0.001	4
ZINC (ZN) DISS	0.005	0.005	0.005	0.005	4

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES - SUFCO - GW-13

STATION LOCATION - SPRING ON NORTH SLOPE OF BIG RIDGE

SAMPLE DATE	07/27/89	08/22/89	09/19/89	10/09/89
PHYSICAL PARAMETERS				
AIR TEMPERATURE (C)		16	12	12
FLOW (CFS)	0.0018	0.0019	0.0017	0.0016
WATER TEMPERATURE (C)	12	10	6	7
SPEC. COND. (UMHOS/CM) FIELD	557	1337	1332	1372
PH (SU) FIELD	7.06	7.2	6.5	7.3
TURBIDITY (NTU) FIELD		0.5	0.7	0.08
TOTAL SUSP. SOLIDS				
TOTAL DISS. SOLIDS MEAS.	722	690	795	818
COMMON IONS				
CALCIUM (CA)	61.31	58.04	64.45	73.10
MAGNESIUM (MG)	42.03	41.72	40.60	44.30
SODIUM (NA)	154.12	159.72	154.79	164.37
POTASSIUM (K)	2.92	2.60	2.83	3.05
BICARBONATE (HCO3) (LAB)	<0.10	558.0	440	480
HARDNESS (CACO3) TOTAL	334.0	524.0	335	335
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	94	118	210	229
CHLORIDE (CL)	390	59.7	58.4	58.9
FLUORIDE (F)	0.26	0.23	0.42	0.37
NUTRIENTS				
NITRATE (NO3-N)	0.12	0.38	0.28	0.11
NITRITE (NO2-N)	<0.02	<0.02	<0.02	<0.02
AMMONIA (NH3 AS N)	0.09	<0.03	0.04	<0.05
TOTAL PHOSPHATE (PO4)	0.05	0.57	0.07	0.08
TRACE ELEMENTS				
ALUMINUM (AL) DISS	<0.010	<0.01	<0.02	<0.05
ARSENIC (AS) DISS	<0.002	<0.001	<0.001	<0.002
BARIUM (BA) DISS	0.05	0.05	0.06	0.06
BORON (B) DISS	0.080	0.080	0.070	0.080
CADMIUM (CD) DISS	<0.001	<0.001	<0.001	<0.001
CHROMIUM (CR) DISS	<0.001	0.002	<0.002	<0.001
COPPER (CU) DISS	<0.01	<0.01	<0.01	<0.02
IRON (FE) DISS	<0.02	0.32	<0.03	<0.03
LEAD (PB) DISS	<0.001	<0.001	<0.001	<0.001
MANGANESE (MN) DISS	<0.01	0.22	<0.01	<0.01
MERCURY (HG) DISS	<0.0002	<0.0002	<0.0002	<0.0002
MOLYBDENUM (MO) DISS	<0.010	<0.050	<0.002	<0.010
NICKEL (NI) DISS	<0.03	<0.03	<0.03	<0.03
SELENUM (SE) DISS	<0.001	<0.001	<0.001	<0.001
ZINC (ZN) DISS	<0.005	<0.005	<0.005	<0.010

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - SUFCO - GW-21

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	14	17.5	15.8	1.43	3
FLOW (CFS)	0.0018	0.002	0.0019	0.00	4
WATER TEMPERATURE (C)	8	14	9.8	2.49	4
SPEC. COND. (UMHOS/CM) FIELD	223	371	326	59.59	4
PH (SU) FIELD	5.9	8.16	6.7	0.87	4
TURBIDITY (NTU) FIELD	0.1	0.15	0.1	0.02	3
TOTAL SUSP. SOLIDS	ERR	ERR	ERR	ERR	0
TOTAL DISS. SOLIDS MEAS.	169	178	173.3	3.27	4
COMMON IONS					
CALCIUM (CA)	32.41	34.46	33.69	0.77	4
MAGNESIUM (MG)	8.74	9.41	9.14	0.25	4
SODIUM (NA)	13.99	14.24	14.09	0.10	4
POTASSIUM (K)	1.11	1.32	1.23	0.08	4
BICARBONATE (HCO3) (LAB)	104	127	116.3	10.80	4
HARDNESS (CACO3) TOTAL	124	160	143.5	13.29	4
CARBONATE AS CO3	0.1	0.1	0.1	0.00	4
SULFATE (SO4)	20	40	29.8	8.07	4
CHLORIDE (CL)	16.8	17.4	17.2	0.25	4
FLUORIDE (F)	0.08	0.14	0.10	0.02	4
NUTRIENTS					
NITRATE (NO3-N)	0.14	0.52	0.25	0.16	4
NITRITE (NO2-N)	0.02	0.02	0.02	0.00	4
AMMONIA (NH3 AS N)	0.03	0.08	0.05	0.02	4
TOTAL PHOSPHATE (PO4)	0.04	0.45	0.16	0.17	4
TRACE ELEMENTS					
ALUMINUM (AL) DISS	0.01	0.05	0.0	0.02	4
ARSENIC (AS) DISS	0.001	0.002	0.002	0.00	4
BARIUM (BA) DISS	0.05	0.05	0.1	0.00	4
BORON (B) DISS	0.030	0.040	0.038	0.00	4
CADMIUM (CD) DISS	0.001	0.001	0.001	0.001	4
CHROMIUM (CR) DISS	0.001	0.001	0.001	0.001	4
COPPER (CU) DISS	0.01	0.02	0.01	0.00	4
IRON (FE) DISS	0.02	0.03	0.03	0.00	4
LEAD (PB) DISS	0.001	0.001	0.001	0.001	4
MANGANESE (MN) DISS	0.01	0.01	0.01	0.00	4
MERCURY (HG) DISS	0.0002	0.0002	0.0002	0.0002	4
MOLYBDENUM (MO) DISS	0.002	0.002	0.002	0.002	4
NICKEL (NI) DISS	0.03	0.03	0.03	0.03	4
SELENUM (SE) DISS	0.001	0.001	0.001	0.001	4
ZINC (ZN) DISS	0.005	0.005	0.005	0.005	4

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES - SUFCO - GW-21

STATION LOCATION - SPRING AT HEAD OF LINK CANYON

SAMPLE DATE	07/27/89	08/22/89	09/19/89	10/09/89
PHYSICAL PARAMETERS				
AIR TEMPERATURE (C)		17.5	14	16
FLOW (CFS)	0.0020	0.0018	0.0018	0.0018
WATER TEMPERATURE (C)	14	9	8	8
SPEC. COND. (UMHOS/CM) FIELD	223	355	353	371
PH (SU) FIELD	8.16	6.5	6.2	5.9
TURBIDITY (NTU) FIELD		0.15	0.1	0.1
TOTAL SUSP. SOLIDS				
TOTAL DISS. SOLIDS MEAS.	174	169	178	172
COMMON IONS				
CALCIUM (CA)	34.05	32.41	34.46	33.84
MAGNESIUM (MG)	9.29	9.41	9.12	8.74
SODIUM (NA)	14.01	14.13	13.99	14.24
POTASSIUM (K)	1.25	1.11	1.24	1.32
BICARBONATE (HCO3) (LAB)	127	107.0	104	127
HARDNESS (CACO3) TOTAL	124	150	140	160
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10
SULFATE (SO4)	24	35	40	20
CHLORIDE (CL)	16.8	17.3	17.4	17.4
FLUORIDE (F)	0.08	0.08	0.14	0.11
NUTRIENTS				
NITRATE (NO3-N)	0.14	0.52	0.17	0.18
NITRITE (NO2-N)	<0.02	<0.02	<0.02	<0.02
AMMONIA (NH3 AS N)	0.08	<0.03	0.04	<0.03
TOTAL PHOSPHATE (PO4)	0.11	0.45	0.05	<0.04
TRACE ELEMENTS				
ALUMINUM (AL) DISS	<0.010	<0.01	<0.02	<0.05
ARSENIC (AS) DISS	<0.002	<0.001	<0.001	<0.002
BARIUM (BA) DISS	0.05	0.05	0.05	0.05
BORON (B) DISS	0.040	0.040	0.030	0.040
CADMIUM (CD) DISS	<0.001	<0.001	<0.001	<0.001
CHROMIUM (CR) DISS	<0.001	<0.001	<0.002	<0.001
COPPER (CU) DISS	<0.01	<0.01	<0.01	<0.02
IRON (FE) DISS	<0.02	<0.03	<0.03	<0.03
LEAD (PB) DISS	<0.001	<0.001	<0.001	<0.001
MANGANESE (MN) DISS	<0.01	<0.01	<0.01	<0.01
MERCURY (HG) DISS	<0.0002	<0.0002	<0.0002	<0.0002
MOLYBDENUM (MO) DISS	<0.010	<0.050	<0.002	<0.010
NICKEL (NI) DISS	<0.03	<0.03	<0.03	<0.03
SELENUM (SE) DISS	<0.001	<0.001	<0.001	<0.001
ZINC (ZN) DISS	<0.005	<0.005	<0.005	<0.010

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - WRDS # B-3

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	-3.5	18	9.6	7.57	11
WATER LEVEL (FT)	7863	7864.7	7863.6	0.50	15
WATER TEMPERATURE (C)	6	12	7.9	1.63	12
SPEC. COND. (UMHOS/CM) FIELD	7110	8500	7419.2	368.00	12
PH (SU) FIELD	6.1	8.05	6.9	0.54	12
TURBIDITY (NTU) FIELD	0.5	458	59.1	150.77	8
COMMON IONS					
ALKALINITY AS CACO3 (LAB)	301	301	301.0	0.00	1
BICARBONATE (HCO3) (LAB)	366	426	395.6	21.39	12
CALCIUM (CA)	557.6	1516	818.6	293.93	12
CARBONATE AS CO3	0.1	0.1	0.1	ERR	11
CHLORIDE (CL)	1330	1800	1515.4	104.59	12
FLUORIDE (FL)	0	0.25	0.2	0.06	12
HARDNESS (CACO3) TOTAL	368	3790	3177.3	863.88	12
MAGNESIUM (MG)	0.1	459.4	335.3	143.49	12
POTASSIUM (K)	4.38	21.3	6.5	4.68	11
SODIUM (NA)	508.6	595.2	557.1	26.67	12
SULFATE (SO4)	1560	2200	2008.1	171.22	12
SULFIDE (S)	0.01	1.2	0.2	0.38	11
TOTAL DISS. SOLIDS MEAS.	5030	6090	5507.1	340.48	12
NUTRIENTS					
AMMONIA (NH3-N)	0.03	0.16	0.1	0.04	11
NITRATE (NO3-N)	0.29	7.8	4.1	1.68	12
NITRITE (NO2-N)	0.01	0.03	0.0	0.00	11
TOTAL PHOSPHATE (PO4)	0.04	2	0.4	0.68	12
TRACE ELEMENTS					
ALUMINUM (AL) DISS	0.001	0.05	0.0	0.01	11
ARSENIC (AR) DISS	0.001	0.002	0.0	0.00	11
BARIUM (BA) TOTAL	0.06	0.06	0.1	0.00	1
BARIUM (BA) DISS	0.01	0.05	0.0	0.01	11
BORON (B) TOTAL	0.45	0.45	0.5	0.00	1
BORON (B) DISS	0.1	0.19	0.1	0.03	11
CADMIUM (CD) DISS	0.001	0.001	0.0	ERR	11
CHROMIUM (CR) DISS	0.001	0.003	0.0	0.00	11
COPPER (CU) DISS	0.01	0.02	0.0	0.00	11
IRON (FE) TOTAL	10.45	10.45	10.5	0.00	1
IRON (FE) DISS	0.01	1.65	0.2	0.45	12
LEAD (PB) DISS	0.001	0.001	0.0	ERR	11
MANGANESE (MN) TOTAL	0.46	0.46	0.5	ERR	1
MANGANESE (MN) DISS	0.01	4	0.4	1.10	12
MERCURY (HG) DISS	0.0002	0.0004	0.0	0.00	11
MOLYDENUM (MO) DISS	0.001	0.01	0.0	0.00	11
NICKEL (NI) DISS	0.01	0.03	0.0	0.01	11
SELENIUM (SE) TOTAL	0.009	0.009	0.0	0.00	1
SELENIUM (SE) DISS	0.003	0.042	0.0	0.01	11
ZINC (ZN) DISS	0.012	0.04	0.0	0.01	11

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-3

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	08/12/87	10/27/87	12/09/87	02/16/88	02/25/88	03/07/88	04/12/88
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)			0			-1	18
WATER LEVEL (FT)	7864.2	7863.9	7863.7	7863.1	7863.6	7863	7863.1
WATER TEMPERATURE (C)			7	6.5		7	7
SPEC. COND. (UMHOS/CM) FIELD			7440	7200		7300	7300
PH (SU) FIELD			6.8	7.65		7.05	7.05
TURBIDITY (NTU) FIELD			3			458	
COMMON IONS							
ALKALINITY AS CACO3 (LAB)			301				
BICARBONATE (HCO3) (LAB)			367	373		416	366
CALCIUM (CA)			663.4	613.8		557.6	720
CARBONATE AS CO3				<0.1		<0.1	<0.1
CHLORIDE (CL)			1475	1475		1330	1530
FLUORIDE (FL)				0.17		0.16	0.24
HARDNESS (CACO3) TOTAL			3410	3350		3350	3360
MAGNESIUM (MG)			410.2	455.7		432.4	374.4
POTASSIUM (K)				21.3		5.4	5.42
SODIUM (NA)			595.2	574.5		508.6	558.5
SULFATE (SO4)			2115	2190		2010	1940
SULFIDE (S)				<0.1		<0.01	<0.01
TOTAL DISS. SOLIDS MEAS.			6052	5535		5085	5350
NUTRIENTS							
AMMONIA (NH3-N)				0.05		<0.03	0.07
NITRATE (NO3-N)			3.55	3.25		4.2	3.6
NITRITE (NO2-N)				<0.02		0.03	<0.01
TOTAL PHOSPHATE (PO4)			2	1.85		0.08	<0.04
TRACE ELEMENTS							
ALUMINUM (AL) DIS				<0.001		<0.001	<0.001
ARSENIC (AR) DISS				<0.001		<0.002	<0.001
BARIUM (BA) TOTAL			0.06				
BARIUM (BA) DISS				0.05		0.01	0.02
BORON (B) TOTAL			0.45				
BORON (B) DISS				0.14		0.19	0.13
CADMIUM (CD) DISS				<0.001		<0.001	<0.001
CHROMIUM (CR) DISS				<0.002		0.002	<0.001
COPPER (CU) DISS				<0.01		0.02	<0.01
IRON (FE) TOTAL			10.45				
IRON (FE) DISS			1.65	<0.01		<0.01	<0.01
LEAD (PB) DISS				<0.001		<0.001	<0.001
MANGANESE (MN) TOTAL			0.46				
MANGANESE (MN) DISS			0.03	0.03		<0.02	<0.03
MERCURY (HG) DI				<0.0002		<0.0002	<0.0002
MOLYDENUM (MO) DISS				<0.01		<0.001	<0.001
NICKEL (NI) DISS				0.03		0.02	<0.01
SELENIUM (SE) TOTAL			0.009				
SELENIUM (SE) DISS				0.018		0.01	0.023
ZINC (ZN) DISS				0.018		0.015	0.012

SUMMARY OF WATER QUALITY ANALYSES SUFCO - WRDS # B-3

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	05/11/88	06/08/88	08/10/88	10/06/88	12/07/88	03/13/89	06/20/89
						STATION NOT ACCESSIBLE	
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)	10	13	11	7.5	-3.5		17
WATER LEVEL (FT)	7863.1	7863.8	7864.2	7863.8	7863.3		7864.7
WATER TEMPERATURE (C)	9	12	9.5	7	6		6.4
SPEC. COND. (UMHOS/CM) FIELD	7200	7670	7150	7110	8500		7620
PH (SU) FIELD	6.8	6.7	6.1	6.1	7.05		6.4
TURBIDITY (NTU) FIELD			0.5	3	1.5		0.5
COMMON IONS							
ALKALINITY AS CACO3 (LAB)							
BICARBONATE (HCO3) (LAB)	416	420	371	426	401		410
CALCIUM (CA)	835.2	828	1516	1360.00	850.00		653.50
CARBONATE AS CO3	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
CHLORIDE (CL)	1565	1480	1800	1555	1480		1550
FLUORIDE (FL)	0.25	0.22	0.17	0.17	0.24		0.15
HARDNESS (CACO3) TOTAL	3366	3370	3790	3730	3458		3460
MAGNESIUM (MG)	306.5	312	<0.1	79.20	320.00		424.00
POTASSIUM (K)	4.88	4.38	5.00	5.58	4.97		5.14
SODIUM (NA)	518.4	579.2	562.00	525.80	539.80		583.40
SULFATE (SO4)	1820	2072	2015	2200	2125		1950
SULFIDE (S)	<0.01	<0.01	1.20	0.80	<0.10		<0.10
TOTAL DISS. SOLIDS MEAS.	5260	5399	6090	5980	5520		5385
NUTRIENTS							
AMMONIA (NH3-N)	0.08	0.04	0.04	<0.03	0.09		0.04
NITRATE (NO3-N)	2.85	5	5.15	0.29	4.15		4.95
NITRITE (NO2-N)	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02
TOTAL PHOSPHATE (PO4)	<0.04	0.15	0.23	0.05	0.13		0.14
TRACE ELEMENTS							
ALUMINUM (AL) DIS	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
ARSENIC (AR) DISS	<0.001	<0.001	<0.002	<0.001	<0.001		<0.001
BARIUM (BA) TOTAL							
BARIUM (BA) DISS	0.01	0.02	0.01	0.02	0.02		0.02
BORON (B) TOTAL							
BORON (B) DISS	0.14	0.12	0.110	0.120	0.160		0.150
CADMIUM (CD) DISS	<0.001	0.001	<0.001	<0.001	<0.001		<0.001
CHROMIUM (CR) DISS	<0.001	<0.001	<0.002	<0.002	0.003		<0.001
COPPER (CU) DISS	0.02	0.02	0.02	<0.01	<0.01		<0.01
IRON (FE) TOTAL							
IRON (FE) DISS	<0.01	<0.03	<0.03	<0.03	<0.03		<0.03
LEAD (PB) DISS	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
MANGANESE (MN) TOTAL							
MANGANESE (MN) DISS	0.02	<0.01	4.00	<0.01	<0.01		<0.01
MERCURY (HG) DI	<0.0002	<0.0002	0.0004	<0.0002	<0.0002		<0.0002
MOLYDENUM (MO) DISS	<0.001	<0.001	<0.010	<0.010	<0.001		<0.001
NICKEL (NI) DISS	<0.01	<0.01	<0.02	<0.03	<0.03		<0.03
SELENIUM (SE) TOTAL							
SELENIUM (SE) DISS	0.029	0.017	0.042	0.021	0.015		0.003
ZINC (ZN) DISS	0.018	0.014	0.028	0.024	0.018		0.024

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-3

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	08/16/89	10/11/89
PHYSICAL PARAMETERS		
AIR TEMPERATURE (C)	16	18
WATER LEVEL (FT)	7863.4	7863.0
WATER TEMPERATURE (C)	9	9
SPEC. COND. (UMHOS/CM) FIELD	7180	7360
PH (SU) FIELD	8.05	6.80
TURBIDITY (NTU) FIELD	5	1.5
COMMON IONS		
ALKALINITY AS CACO3 (LAB)		
BICARBONATE (HCO3) (LAB)	386	395
CALCIUM (CA)	600.90	625.20
CARBONATE AS CO3	<0.10	<0.10
CHLORIDE (CL)	1495	1450
FLUORIDE (FL)	0.17	0.14
HARDNESS (CACO3) TOTAL	368	3115
MAGNESIUM (MG)	459.40	450.10
POTASSIUM (K)	4.57	5.22
SODIUM (NA)	577.60	562.40
SULFATE (SO4)	1560	2100
SULFIDE (S)	<0.10	<0.02
TOTAL DISS. SOLIDS MEAS.	5030	5399
NUTRIENTS		
AMMONIA (NH3-N)	<0.03	0.16
NITRATE (NO3-N)	7.80	3.95
NITRITE (NO2-N)	<0.02	<0.02
TOTAL PHOSPHATE (PO4)	0.11	0.20
TRACE ELEMENTS		
ALUMINUM (AL) DIS	<0.010	<0.050
ARSENIC (AR) DISS	<0.001	<0.002
BARIUM (BA) TOTAL		
BARIUM (BA) DISS	0.02	0.02
BORON (B) TOTAL		
BORON (B) DISS	0.100	0.170
CADMIUM (CD) DISS	<0.001	<0.001
CHROMIUM (CR) DISS	<0.001	<0.001
COPPER (CU) DISS	<0.01	<0.02
IRON (FE) TOTAL		
IRON (FE) DISS	<0.03	0.04
LEAD (PB) DISS	<0.001	<0.001
MANGANESE (MN) TOTAL		
MANGANESE (MN) DISS	<0.01	0.02
MERCURY (HG) DI	<0.0002	<0.0002
MOLYBDENUM (MO) DISS	<0.010	<0.010
NICKEL (NI) DISS	<0.03	<0.03
SELENIUM (SE) TOTAL		
SELENIUM (SE) DISS	0.021	<0.020
ZINC (ZN) DISS	0.016	0.040

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - WRDS # B-5

	RANGE MIN	MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)					
DEPTH (FT)	7940.3	7941.6	7940.9	0.40	11
WATER TEMPERATURE (C)					
SPEC. COND. (UMHOS/CM) FIELD					
PH (SU) FIELD					
TURBIDITY (NTU) FIELD					
COMMON IONS					
ALKALINITY AS CACO3 (LAB)					
BICARBONATE (HCO3) (LAB)					
CALCIUM (CA)					
CARBONATE AS CO3					
CHLORIDE (CL)					
FLUORIDE (FL)					
HARDNESS (CACO3) TOTAL					
MAGNESIUM (MG)					
SODIUM (NA)					
SULFIDE (S)					
SULFATE (SO4)					
TOTAL DISS. SOLIDS MEAS.					
NUTRIENTS					
AMMONIA (NH3-N)					
NITRATE (NO3-N)					
NITRITE (NO2-N)					
TOTAL PHOSPHATE (PO4)					
TRACE ELEMENTS					
ALUMINUM (AL) DISS					
ARSENIC (AR) DISS					
BARIUM (BA) TOTAL					
BARIUM (BA) DISS					
BORON (B) TOTAL					
BORON (B) DISS					
CADMIUM (CD) DISS					
CHROMIUM (CR) DISS					
COPPER (CU) DISS					
IRON (FE) TOTAL					
IRON (FE) DISS					
LEAD (PB) DISS					
MANGANESE (MN) TOTAL					
MANGANESE (MN) DISS					
MERCURY (HG) DISS					
MOLYDENUM (MO) DISS					
NICKEL (NI) DISS					
SELENIUM (SE) TOTAL					
SELENIUM (SE) DISS					
ZINC (ZN) DISS					

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-5

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	08/12/87	10/27/87	12/09/87	02/25/87	03/07/88	04/13/88	05/11/88
PHYSICAL PARAMETERS				STATION NOT ACCESSIBLE	STATION NOT ACCESSIBLE		
AIR TEMPERATURE (C)							
DEPTH (FT)	7941.6	7941.1	7940.7			7940.3	7940.4
WATER TEMPERATURE (C)							
SPEC. COND. (UMHOS/CM) FIELD							
PH (SU) FIELD							
TURBIDITY (NTU) FIELD							
COMMON IONS							
ALKALINITY AS CACO3 (LAB)							
BICARBONATE (HCO3) (LAB)							
CALCIUM (CA)							
CARBONATE AS CO3							
CHLORIDE (CL)							
FLUORIDE (FL)							
HARDNESS (CACO3) TOTAL							
MAGNESIUM (MG)							
SODIUM (NA)							
SULFIDE (S)							
SULFATE (SO4)							
TOTAL DISS. SOLIDS MEAS.							
NUTRIENTS							
AMMONIA (NH3-N)							
NITRATE (NO3-N)							
NITRITE (NO2-N)							
TOTAL PHOSPHATE (PO4)							
TRACE ELEMENTS							
ALUMINUM (AL) DISS							
ARSENIC (AR) DISS							
BARIUM (BA) TOTAL							
BARIUM (BA) DISS							
BORON (B) TOTAL							
BORON (B) DISS							
CADMIUM (CD) DISS							
CHROMIUM (CR) DISS							
COPPER (CU) DISS							
IRON (FE) TOTAL							
IRON (FE) DISS							
LEAD (PB) DISS							
MANGANESE (MN) TOTAL							
MANGANESE (MN) DISS							
MERCURY (HG) DISS							
MOLYDENUM (MO) DISS							
NICKEL (NI) DISS							
SELENIUM (SE) TOTAL							
SELENIUM (SE) DISS							
ZINC (ZN) DISS							

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-5

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	06/08/88	08/09/88	10/06/88	12/07/88	03/13/89	06/20/89	08/15/89
					STATION NOT ACCESSIBLE		
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)							
DEPTH (FT)	7941.4	7941.1	7940.5	7940.9		7941.2	7940.8
WATER TEMPERATURE (C)							
SPEC. COND. (UMHOS/CM) FIELD							
PH (SU) FIELD							
TURBIDITY (NTU) FIELD							
COMMON IONS							
ALKALINITY AS CACO3 (LAB)							
BICARBONATE (HCO3) (LAB)							
CALCIUM (CA)							
CARBONATE AS CO3							
CHLORIDE (CL)							
FLUORIDE (FL)							
HARDNESS (CACO3) TOTAL							
MAGNESIUM (MG)							
SODIUM (NA)							
SULFIDE (S)							
SULFATE (SO4)							
TOTAL DISS. SOLIDS MEAS.							
NUTRIENTS							
AMMONIA (NH3-N)							
NITRATE (NO3-N)							
NITRITE (NO2-N)							
TOTAL PHOSPHATE (PO4)							
TRACE ELEMENTS							
ALUMINUM (AL) DISS							
ARSENIC (AR) DISS							
BARIUM (BA) TOTAL							
BARIUM (BA) DISS							
BORON (B) TOTAL							
BORON (B) DISS							
CADMIUM (CD) DISS							
CHROMIUM (CR) DISS							
COPPER (CU) DISS							
IRON (FE) TOTAL							
IRON (FE) DISS							
LEAD (PB) DISS							
MANGANESE (MN) TOTAL							
MANGANESE (MN) DISS							
MERCURY (HG) DISS							
MOLYDENUM (MO) DISS							
NICKEL (NI) DISS							
SELENIUM (SE) TOTAL							
SELENIUM (SE) DISS							
ZINC (ZN) DISS							

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-5

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	10/10/89
	DRY
PHYSICAL PARAMETERS	
AIR TEMPERATURE (C)	
DEPTH (FT)	
WATER TEMPERATURE (C)	
SPEC. COND. (UMHOS/CM) FIELD	
PH (SU) FIELD	
TURBIDITY (NTU) FIELD	
COMMON IONS	
ALKALINITY AS CACO3 (LAB)	
BICARBONATE (HCO3) (LAB)	
CALCIUM (CA)	
CARBONATE AS CO3	
CHLORIDE (CL)	
FLUORIDE (FL)	
HARDNESS (CACO3) TOTAL	
MAGNESIUM (MG)	
SODIUM (NA)	
SULFIDE (S)	
SULFATE (SO4)	
TOTAL DISS. SOLIDS MEAS.	
NUTRIENTS	
AMMONIA (NH3-N)	
NITRATE (NO3-N)	
NITRITE (NO2-N)	
TOTAL PHOSPHATE (PO4)	
TRACE ELEMENTS	
ALUMINUM (AL) DISS	
ARSENIC (AR) DISS	
BARIUM (BA) TOTAL	
BARIUM (BA) DISS	
BORON (B) TOTAL	
BORON (B) DISS	
CADMIUM (CD) DISS	
CHROMIUM (CR) DISS	
COPPER (CU) DISS	
IRON (FE) TOTAL	
IRON (FE) DISS	
LEAD (PB) DISS	
MANGANESE (MN) TOTAL	
MANGANESE (MN) DISS	
MERCURY (HG) DISS	
MOLYDENUM (MO) DISS	
NICKEL (NI) DISS	
SELENIUM (SE) TOTAL	
SELENIUM (SE) DISS	
ZINC (ZN) DISS	

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - WRDS # B-6

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	-4	19	9.8	7.63	11
WATER LEVEL (FT)	7884.6	7891.6	7888.8	2.45	15
WATER TEMPERATURE (C)	6	10.3	8.3	1.27	12
SPEC. COND. (UMHOS/CM) FIELD	5530	8900	7289.6	708.47	12
PH (SU) FIELD	6	7.6	6.8	0.41	12
TURBIDITY (NTU) FIELD	0.5	8	2.3	2.50	7
COMMON IONS					
ALKALINITY AS CACO3 (LAB)	322	322	322.0	0.00	1
BICARBONATE (HCO3) (LAB)	383	434	405.4	19.02	12
CALCIUM (CA)	525.8	1428	791.5	317.16	12
CARBONATE AS CO3	0.1	0.1	0.1	ERR	11
CHLORIDE (CL)	1130	1450	1225.2	81.94	12
FLUORIDE (FL)	0.11	0.18	0.14	0.02	11
HARDNESS (CACO3) TOTAL	3360	4460	3880.2	303.74	12
MAGNESIUM (MG)	60.48	580.1	441.2	171.46	12
POTASSIUM (K)	11.46	17.5	12.98	1.53	11
SODIUM (NA)	465.2	561.5	524.8	27.59	12
SULFATE (SO4)	2650	3035	2735.8	97.81	12
SULFIDE (S)	0.01	0.80	0.16	0.23	11
TOTAL DISS. SOLIDS MEAS.	5535	6918	6057.6	392.15	12
NUTRIENTS					
AMMONIA (NH3-N)	0.03	0.17	0.07	0.04	11
NITRATE (NO3-N)	0.10	3.10	1.88	1.02	12
NITRITE (NO2-N)	0.01	0.03	0.02	0.00	11
TOTAL PHOSPHATE (PO4)	0.04	0.45	0.17	0.13	12
TRACE ELEMENTS					
ALUMINUM (AL) DISS	0.001	0.050	0.006	0.01	11
ARSENIC (AR) DISS	0.001	0.002	0.001	0.00	11
BARIUM (BA) TOTAL	0.07	0.07	0.07	ERR	1
BARIUM (BA) DISS	0.01	0.06	0.02	0.01	11
BORON (B) TOTAL	0.42	0.42	0.42	ERR	1
BORON (B) DISS	0.08	0.16	0.11	0.02	11
CADMIUM (CD) DISS	0.001	0.002	0.001	0.00	11
CHROMIUM (CR) DISS	0.001	0.005	0.002	0.00	11
COPPER (CU) DISS	0.01	0.03	0.02	0.01	11
IRON (FE) TOTAL	20	20	20.0	0.00	1
IRON (FE) DISS	0.010	1.400	0.137	0.38	12
LEAD (PB) DISS	0.001	0.001	0.001	ERR	11
MANGANESE (MN) TOTAL	0.26	0.26	0.26	0.00	1
MANGANESE (MN) DISS	0.01	0.03	0.02	0.01	12
MERCURY (HG) DISS	0.0002	0.0002	0.0002	ERR	11
MOLYDENUM (MO) DISS	0.001	0.010	0.006	0.00	11
NICKEL (NI) DISS	0.01	0.03	0.02	0.01	11
SELENIUM (SE) TOTAL	0.009	0.009	0.009	0.00	1
SELENIUM (SE) DISS	0.001	0.014	0.009	0.00	11
ZINC (ZN) DISS	0.005	0.041	0.020	0.01	11

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-6

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	08/12/87	10/27/87	12/09/87	02/16/88	02/25/88	03/07/88	04/13/88
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)			1			-1	17
WATER LEVEL (FT)	7886.0	7886.2	7886.1	7884.6	7890.1	7889.7	7886.1
WATER TEMPERATURE (C)			9	6.5		7	9
SPEC. COND. (UMHOS/CM) FIELD			7400	7100		7300	7200
PH (SU) FIELD			6.7	7.6		7.05	6.7
TURBIDITY (NTU) FIELD			3				
COMMON IONS							
ALKALINITY AS CACO3 (LAB)			322				
BICARBONATE (HCO3) (LAB)			393	386		434	392
CALCIUM (CA)			624.6	583.7		525.8	636
CARBONATE AS CO3				0.10		<0.10	<0.10
CHLORIDE (CL)			1240	1300		1130	1185
FLUORIDE (FL)				0.16		0.14	0.15
HARDNESS (CACO3) TOTAL			3850	3750		3730	3750
MAGNESIUM (MG)			544	580.1		569.6	518.4
POTASSIUM (K)				17.5		13.21	13.54
SODIUM (NA)			536.3	503.1		465.2	519
SULFATE (SO4)			2700	2680		2655	2675
SULFIDE (S)				<0.10		<0.01	<0.01
TOTAL DISS. SOLIDS MEAS.			6918	6216		5535	5751
NUTRIENTS							
AMMONIA (NH3-N)				0.08		<0.03	0.09
NITRATE (NO3-N)			2.5	2.7		2.55	2.7
NITRITE (NO2-N)				<0.02		0.03	<0.01
TOTAL PHOSPHATE (PO4)			0.26	0.45		0.16	0.21
TRACE ELEMENTS							
ALUMINUM (AL) DISS				<0.001		<0.001	<0.001
ARSENIC (AR) DISS				<0.001		<0.002	<0.001
BARIUM (BA) TOTAL			0.07				
BARIUM (BA) DISS				0.06		0.01	0.02
BORON (B) TOTAL			0.42				
BORON (B) DISS				0.1		0.14	0.100
CADMIUM (CD) DISS				<0.001		<0.001	<0.001
CHROMIUM (CR) DISS				0.003		0.004	<0.001
COPPER (CU) DISS				0.02		0.02	0.03
IRON (FE) TOTAL			20				
IRON (FE) DISS			1.4	<0.01		<0.01	<0.01
LEAD (PB) DISS				<0.001		<0.001	<0.001
MANGANESE (MN) TOTAL			0.26				
MANGANESE (MN) DISS			0.02	0.02		0.02	0.03
MERCURY (HG) DISS				<0.0002		<0.0002	<0.0002
MOLYDENUM (MO) DISS				<0.010		<0.001	<0.001
NICKEL (NI) DISS				0.02		<0.01	<0.01
SELENIUM (SE) TOTAL			0.009				
SELENIUM (SE) DISS				0.013		0.009	0.010
ZINC (ZN) DISS				0.010		0.019	<0.005

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-6

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	05/11/88	06/08/88	08/10/88	10/06/88	12/07/88	03/13/89 STATION NOT ACCESSIBLE	06/20/89
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)	12	14	12	6	-4		16
WATER LEVEL (FT)	7890.3	7891.3	7891.4	7890.9	7890.4		7886.2
WATER TEMPERATURE (C)	9	9	9	7	6		10.3
SPEC. COND. (UMHOS/CM) FIELD	7100	7570	7040	5530	8900		7360
PH (SU) FIELD	6.9	6.7	6.2	6.0	7.05		6.7
TURBIDITY (NTU) FIELD			0.5	0.5	2.5		0.7
COMMON IONS							
ALKALINITY AS CACO3 (LAB)							
BICARBONATE (HCO3) (LAB)	427	432	383	426	395		414
CALCIUM (CA)	1388	692	1428	1156.00	710.00		604.40
CARBONATE AS CO3	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10
CHLORIDE (CL)	1170	1142	1450	1245	1240		1225
FLUORIDE (FL)	0.15	0.18	0.13	0.14	0.16		0.11
HARDNESS (CACO3) TOTAL	4100	3360	4100	4170	3712		4460
MAGNESIUM (MG)	60.48	463.2	127.20	307.20	465.00		544.50
POTASSIUM (K)	12.16	12.11	12.60	12.92	11.46		12.37
SODIUM (NA)	506.4	554.5	561.50	530.80	509.40		548.30
SULFATE (SO4)	2730	2730	2775	3035	2650		2750
SULFIDE (S)	<0.01	0.8	<0.10	0.40	<0.10		<0.10
TOTAL DISS. SOLIDS MEAS.	6100	5821	6550	6490	5790		5920
NUTRIENTS							
AMMONIA (NH3-N)	0.08	0.08	0.08	0.04	0.05		0.17
NITRATE (NO3-N)	1.8	3.1	0.30	0.10	2.60		0.28
NITRITE (NO2-N)	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02
TOTAL PHOSPHATE (PO4)	0.1	<0.04	0.32	<0.04	0.07		0.06
TRACE ELEMENTS							
ALUMINUM (AL) DISS	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
ARSENIC (AR) DISS	<0.001	<0.001	<0.002	<0.002	<0.001		<0.001
BARIUM (BA) TOTAL							
BARIUM (BA) DISS	0.01	0.02	0.01	0.02	0.02		0.01
BORON (B) TOTAL							
BORON (B) DISS	0.1	0.1	0.080	0.090	0.160		0.110
CADMIUM (CD) DISS	<0.001	0.002	<0.001	<0.001	<0.001		<0.001
CHROMIUM (CR) DISS	<0.001	0.003	<0.002	<0.002	0.005		<0.001
COPPER (CU) DISS	0.03	0.03	0.03	<0.01	<0.01		<0.01
IRON (FE) TOTAL							
IRON (FE) DISS	<0.01	<0.03	<0.03	<0.03	<0.03		<0.03
LEAD (PB) DISS	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
MANGANESE (MN) TOTAL							
MANGANESE (MN) DISS	0.02	0.03	0.03	<0.01	0.02		<0.01
MERCURY (HG) DISS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002
MOLYDENUM (MO) DISS	<0.001	<0.001	<0.001	<0.010	<0.010		<0.010
NICKEL (NI) DISS	<0.01	<0.01	<0.02	<0.03	<0.03		<0.03
SELENIUM (SE) TOTAL							
SELENIUM (SE) DISS	<0.001	0.009	0.014	0.014	0.009		<0.001
ZINC (ZN) DISS	0.015	0.01	0.041	0.032	0.027		0.012

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-6

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	08/16/89	10/11/89
PHYSICAL PARAMETERS		
AIR TEMPERATURE (C)	16	19
WATER LEVEL (FT)	7891.6	7890.7
WATER TEMPERATURE (C)	9	9
SPEC. COND. (UMHOS/CM) FIELD	7580	7395
PH (SU) FIELD	7.2	6.9
TURBIDITY (NTU) FIELD	8	1
COMMON IONS		
ALKALINITY AS CACO3 (LAB)		
BICARBONATE (HCO3) (LAB)	400	383
CALCIUM (CA)	542.90	606.70
CARBONATE AS CO3	<0.10	<0.10
CHLORIDE (CL)	1195	1180
FLUORIDE (FL)	0.14	0.12
HARDNESS (CACO3) TOTAL	4120	3460
MAGNESIUM (MG)	571.20	543.00
POTASSIUM (K)	12.13	12.77
SODIUM (NA)	558.60	504.56
SULFATE (SO4)	2750	2700
SULFIDE (S)	<0.10	<0.02
TOTAL DISS. SOLIDS MEAS.	5835	5765
NUTRIENTS		
AMMONIA (NH3-N)	0.04	0.06
NITRATE (NO3-N)	1.70	2.20
NITRITE (NO2-N)	<0.02	<0.02
TOTAL PHOSPHATE (PO4)	0.30	0.06
TRACE ELEMENTS		
ALUMINUM (AL) DISS	<0.010	<0.050
ARSENIC (AR) DISS	<0.001	<0.002
BARIUM (BA) TOTAL		
BARIUM (BA) DISS	0.01	0.02
BORON (B) TOTAL		
BORON (B) DISS	0.080	0.120
CADMIUM (CD) DISS	<0.001	<0.001
CHROMIUM (CR) DISS	<0.001	<0.001
COPPER (CU) DISS	<0.01	<0.02
IRON (FE) TOTAL		
IRON (FE) DISS	<0.03	<0.03
LEAD (PB) DISS	<0.001	<0.001
MANGANESE (MN) TOTAL		
MANGANESE (MN) DISS	<0.01	<0.01
MERCURY (HG) DISS	<0.0002	<0.0002
MOLYDENUM (MO) DISS	<0.010	<0.010
NICKEL (NI) DISS	<0.03	<0.03
SELENIUM (SE) TOTAL		
SELENIUM (SE) DISS	0.014	<0.010
ZINC (ZN) DISS	0.016	0.031

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - WRDS # B-7

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)					
DEPTH (FT)	7898.8	7903.1	7900.35	1.73	6
WATER TEMPERATURE (C)					
SPEC. COND. (UMHOS/CM) FIELD					
PH (SU) FIELD					
TURBIDITY (NTU) FIELD					
COMMON IONS					
ALKALINITY AS CACO3 (LAB)					
BICARBONATE (HCO3) (LAB)					
CALCIUM (CA)					
CARBONATE AS CO3					
CHLORIDE (CL)					
FLUORIDE (FL)					
HARDNESS (CACO3) TOTAL					
MAGNESIUM (MG)					
SODIUM (NA)					
SULFIDE (S)					
SULFATE (SO4)					
TOTAL DISS. SOLIDS MEAS.					
NUTRIENTS					
AMMONIA (NH3-N)					
NITRATE (NO3-N)					
NITRITE (NO2-N)					
TOTAL PHOSPHATE (PO4)					
TRACE ELEMENTS					
ALUMINUM (AL) DISS					
ARSENIC (AR) DISS					
BARIUM (BA) TOTAL					
BARIUM (BA) DISS					
BORON (B) TOTAL					
BORON (B) DISS					
CADMIUM (CD) DISS					
CHROMIUM (CR) DISS					
COPPER (CU) DISS					
IRON (FE) TOTAL					
IRON (FE) DISS					
LEAD (PB) DISS					
MANGANESE (MN) TOTAL					
MANGANESE (MN) DISS					
MERCURY (HG) DISS					
MOLYDENUM (MO) DISS					
NICKEL (NI) DISS					
SELENIUM (SE) TOTAL					
SELENIUM (SE) DISS					
ZINC (ZN) DISS					

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT, THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-7

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	10/27/87	12/09/87	02/25/88	03/07/88	04/13/88	05/11/88	06/08/88
							WELL BLOCKED - STATION DISCONTINUED
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)							
DEPTH (FT)	7898.9	7898.9	7898.8	7900.1	7902.3	7903.1	
WATER TEMPERATURE (C)							
SPEC. COND. (UMHOS/CM) FIELD							
PH (SU) FIELD							
TURBIDITY (NTU) FIELD							
COMMON IONS							
ALKALINITY AS CACO3 (LAB)							
BICARBONATE (HCO3) (LAB)							
CALCIUM (CA)							
CARBONATE AS CO3							
CHLORIDE (CL)							
FLUORIDE (FL)							
HARDNESS (CACO3) TOTAL							
MAGNESIUM (MG)							
SODIUM (NA)							
SULFIDE (S)							
SULFATE (SO4)							
TOTAL DISS. SOLIDS MEAS.							
NUTRIENTS							
AMMONIA (NH3-N)							
NITRATE (NO3-N)							
NITRITE (NO2-N)							
TOTAL PHOSPHATE (PO4)							
TRACE ELEMENTS							
ALUMINUM (AL) DISS							
ARSENIC (AR) DISS							
BARIUM (BA) TOTAL							
BARIUM (BA) DISS							
BORON (B) TOTAL							
BORON (B) DISS							
CADMIUM (CD) DISS							
CHROMIUM (CR) DISS							
COPPER (CU) DISS							
IRON (FE) TOTAL							
IRON (FE) DISS							
LEAD (PB) DISS							
MANGANESE (MN) TOTAL							
MANGANESE (MN) DISS							
MERCURY (HG) DISS							
MOLYDENUM (MO) DISS							
NICKEL (NI) DISS							
SELENIUM (SE) TOTAL							
SELENIUM (SE) DISS							
ZINC (ZN) DISS							

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - WRDS # B-8

	RANGE MIN	RANGE MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	-5	18	9.7	7.83	9
WATER LEVEL (FT)	7910.7	7913.5	7911.9	0.98	10
WATER TEMPERATURE (C)	6	14	9.2	1.99	9
SPEC. COND. (UMHOS/CM) FIELD	2870	7300	4117.8	1687.71	9
PH (SU) FIELD	6.5	7.25	6.9	0.24	9
TURBIDITY (NTU) FIELD	0.3	2.5	1.1	0.94	5
COMMON IONS					
ALKALINITY AS CACO3 (LAB)	ERR	ERR	ERR	ERR	0
BICARBONATE (HCO3) (LAB)	326	361	347.3	11.41	9
CALCIUM (CA)	256.4	708	427.6	155.54	9
CARBONATE AS CO3	0.1	0.1	0.1	ERR	9
CHLORIDE (CL)	390	610	504.7	64.99	9
FLUORIDE (FL)	0.08	0.29	0.23	0.06	9
HARDNESS (CACO3) TOTAL	1150	1640	1414.9	140.50	9
MAGNESIUM (MG)	0.01	134.4	73.3	56.29	9
POTASSIUM (K)	4.74	5.86	5.32	0.37	9
SODIUM (NA)	212.2	249.5	231.5	11.98	9
SULFATE (SO4)	695	1135	833.3	127.17	9
SULFIDE (S)	0.01	2.80	0.44	0.87	9
TOTAL DISS. SOLIDS MEAS.	1922	2792	2266.8	242.73	9
NUTRIENTS					
AMMONIA (NH3-N)	0.03	0.14	0.06	0.04	9
NITRATE (NO3-N)	0.02	0.35	0.12	0.09	9
NITRITE (NO2-N)	0.01	0.03	0.02	0.00	9
TOTAL PHOSPHATE (PO4)	0.08	0.93	0.40	0.25	9
TRACE ELEMENTS					
ALUMINUM (AL) DISS	0.001	0.010	0.002	0.00	9
ARSENIC (AR) DISS	0.001	0.002	0.001	0.00	9
BARIUM (BA) TOTAL	ERR	ERR	ERR	ERR	0
BARIUM (BA) DISS	0.01	0.02	0.01	0.00	9
BORON (B) TOTAL	ERR	ERR	ERR	ERR	0
BORON (B) DISS	0.01	0.14	0.10	0.03	9
CADMIUM (CD) DISS	0.001	0.001	0.001	ERR	9
CHROMIUM (CR) DISS	0.001	0.002	0.001	0.00	9
COPPER (CU) DISS	0.01	0.02	0.01	0.00	9
IRON (FE) TOTAL	ERR	ERR	ERR	ERR	0
IRON (FE) DISS	0.01	0.03	0.02	0.01	9
LEAD (PB) DISS	0.001	0.001	0.001	ERR	9
MANGANESE (MN) TOTAL	ERR	ERR	ERR	ERR	0
MANGANESE (MN) DISS	0.01	0.02	0.01	0.00	9
MERCURY (HG) DISS	0.0002	0.0002	0.0002	ERR	9
MOLYDENUM (MO) DISS	0.001	0.010	0.004	0.00	9
NICKEL (NI) DISS	0.01	0.03	0.02	0.01	9
SELENIUM (SE) TOTAL	ERR	ERR	ERR	ERR	0
SELENIUM (SE) DISS	0.001	0.004	0.002	0.00	9
ZINC (ZN) DISS	0.005	0.048	0.014	0.01	9

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-8

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	02/25/88	03/07/88	04/13/88	05/11/88	06/08/88	08/10/88	10/06/88
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)		-2	18	7	13	12	10
WATER LEVEL (FT)	7911.0	7911.3	7910.8	7913.5	7913.5	7912.2	7910.7
WATER TEMPERATURE (C)		8	9	9	14	9.5	8.5
SPEC. COND. (UMHOS/CM) FIELD		7200	7300	3200	3470	3180	3280
PH (SU) FIELD		6.6	7.05	7.05	6.9	6.6	6.5
TURBIDITY (NTU) FIELD						0.3	2
COMMON IONS							
ALKALINITY AS CACO3 (LAB)							
BICARBONATE (HCO3) (LAB)		348	328	354	353	351	355
CALCIUM (CA)		299	344	299.2	528	598.00	708.00
CARBONATE AS CO3		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CHLORIDE (CL)		510	534	538	544	610	534
FLUORIDE (FL)		0.28	0.29	0.08	0.27	0.24	0.26
HARDNESS (CACO3) TOTAL		1380	1340	1304	1400	1495	1590
MAGNESIUM (MG)		134.4	115.2	133.44	19.2	<0.01	<0.10
POTASSIUM (K)		5.81	5.86	5.43	5.54	5.43	5.08
SODIUM (NA)		212.2	240	214.23	249.5	241.50	223.00
SULFATE (SO4)		760	780	695	830	810	1135
SULFIDE (S)		<0.01	<0.01	<0.01	<0.01	0.80	2.80
TOTAL DISS. SOLIDS MEAS.		2110	2188	2065	2355	2440	2792
NUTRIENTS							
AMMONIA (NH3-N)		<0.03	0.14	0.05	0.1	<0.03	<0.03
NITRATE (NO3-N)		0.06	0.12	0.1	0.35	0.17	<0.02
NITRITE (NO2-N)		0.03	<0.01	<0.02	<0.02	<0.02	<0.02
TOTAL PHOSPHATE (PO4)		0.93	0.36	0.3	0.08	0.21	0.65
TRACE ELEMENTS							
ALUMINUM (AL) DISS		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
ARSENIC (AR) DISS		<0.002	<0.001	<0.001	<0.001	<0.002	<0.002
BARIUM (BA) TOTAL							
BARIUM (BA) DISS		0.01	0.02	0.01	0.01	0.01	0.01
BORON (B) TOTAL							
BORON (B) DISS		0.14	0.110	0.12	0.01	0.090	0.100
CADMIUM (CD) DISS		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
CHROMIUM (CR) DISS		<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
COPPER (CU) DISS		<0.01	<0.01	0.02	<0.01	<0.01	<0.01
IRON (FE) TOTAL							
IRON (FE) DISS		<0.01	<0.01	<0.01	<0.03	<0.03	<0.03
LEAD (PB) DISS		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MANGANESE (MN) TOTAL							
MANGANESE (MN) DISS		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MERCURY (HG) DISS		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MOLYDENUM (MO) DISS		<0.001	<0.001	<0.001	<0.001	<0.001	<0.010
NICKEL (NI) DISS		<0.01	<0.01	<0.01	<0.01	<0.02	<0.03
SELENIUM (SE) TOTAL							
SELENIUM (SE) DISS		0.003	<0.001	<0.001	<0.001	0.003	0.004
ZINC (ZN) DISS		0.008	<0.005	0.016	0.006	0.048	0.012

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

SUMMARY OF WATER QUALITY ANALYSES SUFCO - WRDS # B-8

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	12/07/88	03/13/89	06/20/89	08/16/89	10/11/89
		STATION NOT ACCESSIBLE			
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)	-5		17	17	20
WATER LEVEL (FT)	7912.4		7912.4	7911.6	7910.0
WATER TEMPERATURE (C)	6		9.7	9	10
SPEC. COND. (UMHOS/CM) FIELD	3600		2960	2870	2820
PH (SU) FIELD	7.25		7.0	6.7	7.2
TURBIDITY (NTU) FIELD	0.5		0.3	2.5	2.4
COMMON IONS					
ALKALINITY AS CACO3 (LAB)					
BICARBONATE (HCO3) (LAB)	326		361	350	349
CALCIUM (CA)	530.00		285.50	256.40	264.50
CARBONATE AS CO3	<0.10		<0.10	<0.10	<0.10
CHLORIDE (CL)	466		416	390	366
FLUORIDE (FL)	0.18		0.22	0.25	0.23
HARDNESS (CACO3) TOTAL	1435		1640	1150	1090
MAGNESIUM (MG)	26.40		117.30	113.50	105.90
POTASSIUM (K)	4.74		5.14	4.85	5.08
SODIUM (NA)	232.40		238.70	232.20	213.66
SULFATE (SO4)	960		790	740	718
SULFIDE (S)	<0.10		<0.10	<0.10	<0.20
TOTAL DISS. SOLIDS MEAS.	2379		2150	1922	1850
NUTRIENTS					
AMMONIA (NH3-N)	<0.03		0.10	<0.03	0.04
NITRATE (NO3-N)	0.04		0.09	0.12	<0.02
NITRITE (NO2-N)	<0.02		<0.02	<0.02	<0.02
TOTAL PHOSPHATE (PO4)	0.17		0.35	0.54	0.64
TRACE ELEMENTS					
ALUMINUM (AL) DISS	<0.001		<0.001	<0.010	<0.050
ARSENIC (AR) DISS	<0.001		<0.001	<0.001	<0.002
BARIUM (BA) TOTAL					
BARIUM (BA) DISS	<0.01		0.01	0.01	0.02
BORON (B) TOTAL					
BORON (B) DISS	0.100		0.120	0.080	0.120
CADMIUM (CD) DISS	<0.001		<0.001	<0.001	<0.001
CHROMIUM (CR) DISS	<0.002		<0.001	<0.001	<0.001
COPPER (CU) DISS	<0.01		<0.01	<0.01	<0.02
IRON (FE) TOTAL					
IRON (FE) DISS	<0.03		<0.03	<0.03	<0.03
LEAD (PB) DISS	<0.001		<0.001	<0.001	<0.001
MANGANESE (MN) TOTAL					
MANGANESE (MN) DISS	<0.01		0.02	<0.01	<0.01
MERCURY (HG) DISS	<0.0002		<0.0002	<0.0002	<0.0002
MOLYDENUM (MO) DISS	<0.001		<0.010	<0.010	<0.010
NICKEL (NI) DISS	<0.03		<0.03	<0.03	<0.03
SELENIUM (SE) TOTAL					
SELENIUM (SE) DISS	<0.001		<0.001	0.004	0.003
ZINC (ZN) DISS	0.021		<0.005	<0.005	0.025

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

STATISTICAL SUMMARY OF WATER QUALITY ANALYSES FOR SITE - WRDS # B-9

	RANGE MIN	MAX	MEAN	STANDARD DEVIATION	NUMBER OF SAMPLES
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)					
DEPTH (FT)	7874.6	7879.7	7876.7	1.74	6
WATER TEMPERATURE (C)					
SPEC. COND. (UMHOS/CM) FIELD					
PH (SU) FIELD					
TURBIDITY (NTU) FIELD					
COMMON IONS					
ALKALINITY AS CACO3 (LAB)					
BICARBONATE (HCO3) (LAB)					
CALCIUM (CA)					
CARBONATE AS CO3					
CHLORIDE (CL)					
FLUORIDE (FL)					
HARDNESS (CACO3) TOTAL					
MAGNESIUM (MG)					
SODIUM (NA)					
SULFIDE (S)					
SULFATE (SO4)					
TOTAL DISS. SOLIDS MEAS.					
NUTRIENTS					
AMMONIA (NH3-N)					
NITRATE (NO3-N)					
NITRITE (NO2-N)					
TOTAL PHOSPHATE (PO4)					
TRACE ELEMENTS					
ALUMINUM (AL) DISS					
ARSENIC (AR) DISS					
BARIUM (BA) TOTAL					
BARIUM (BA) DISS					
BORON (B) TOTAL					
BORON (B) DISS					
CADMIUM (CD) DISS					
CHROMIUM (CR) DISS					
COPPER (CU) DISS					
IRON (FE) TOTAL					
IRON (FE) DISS					
LEAD (PB) DISS					
MANGANESE (MN) TOTAL					
MANGANESE (MN) DISS					
MERCURY (HG) DISS					
MOLYDENUM (MO) DISS					
NICKEL (NI) DISS					
SELENIUM (SE) TOTAL					
SELENIUM (SE) DISS					
ZINC (ZN) DISS					

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED. FOR VALUES BELOW THE DETECTION LIMIT. THE DETECTION LIMIT WAS USED IN THE STATISTICAL ANALYSIS.

SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-9

STATION LOCATION - WASTE ROCK DISPOSAL SITE

SAMPLE DATE	02/25/88	03/07/88	04/13/88	05/11/88	06/08/88	08/09/88	10/05/8[illegible] WELL DR[illegible]
PHYSICAL PARAMETERS							
AIR TEMPERATURE (C)							
DEPTH (FT)	7879.7	7874.8	7877.7	7877.1	7876.5	7874.6	
WATER TEMPERATURE (C)							
SPEC. COND. (UMHOS/CM) FIELD							
PH (SU) FIELD							
TURBIDITY (NTU) FIELD							
COMMON IONS							
ALKALINITY AS CACO3 (LAB)							
BICARBONATE (HCO3) (LAB)							
CALCIUM (CA)							
CARBONATE AS CO3							
CHLORIDE (CL)							
FLUORIDE (FL)							
HARDNESS (CACO3) TOTAL							
MAGNESIUM (MG)							
SODIUM (NA)							
SULFIDE (S)							
SULFATE (SO4)							
TOTAL DISS. SOLIDS MEAS.							
NUTRIENTS							
AMMONIA (NH3-N)							
NITRATE (NO3-N)							
NITRITE (NO2-N)							
TOTAL PHOSPHATE (PO4)							
TRACE ELEMENTS							
ALUMINUM (AL) DISS							
ARSENIC (AR) DISS							
BARIUM (BA) TOTAL							
BARIUM (BA) DISS							
BORON (B) TOTAL							
BORON (B) DISS							
CADMIUM (CD) DISS							
CHROMIUM (CR) DISS							
COPPER (CU) DISS							
IRON (FE) TOTAL							
IRON (FE) DISS							
LEAD (PB) DISS							
MANGANESE (MN) TOTAL							
MANGANESE (MN) DISS							
MERCURY (HG) DISS							
MOLYDENUM (MO) DISS							
NICKEL (NI) DISS							
SELENIUM (SE) TOTAL							
SELENIUM (SE) DISS							
ZINC (ZN) DISS							

ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

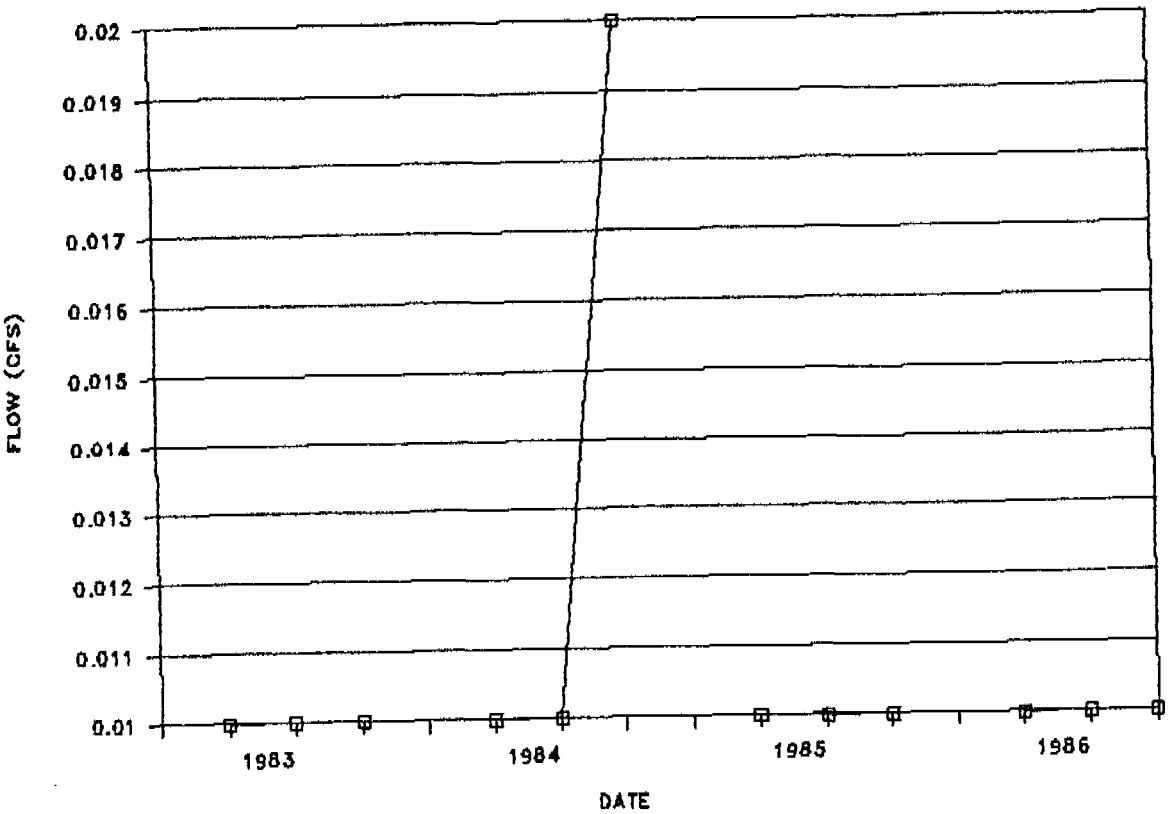
SUMMARY OF WATER QUALITY
ANALYSES SUFCO - WRDS # B-9

STATION LOCATION - WASTE ROCK DISPOSAL SITE

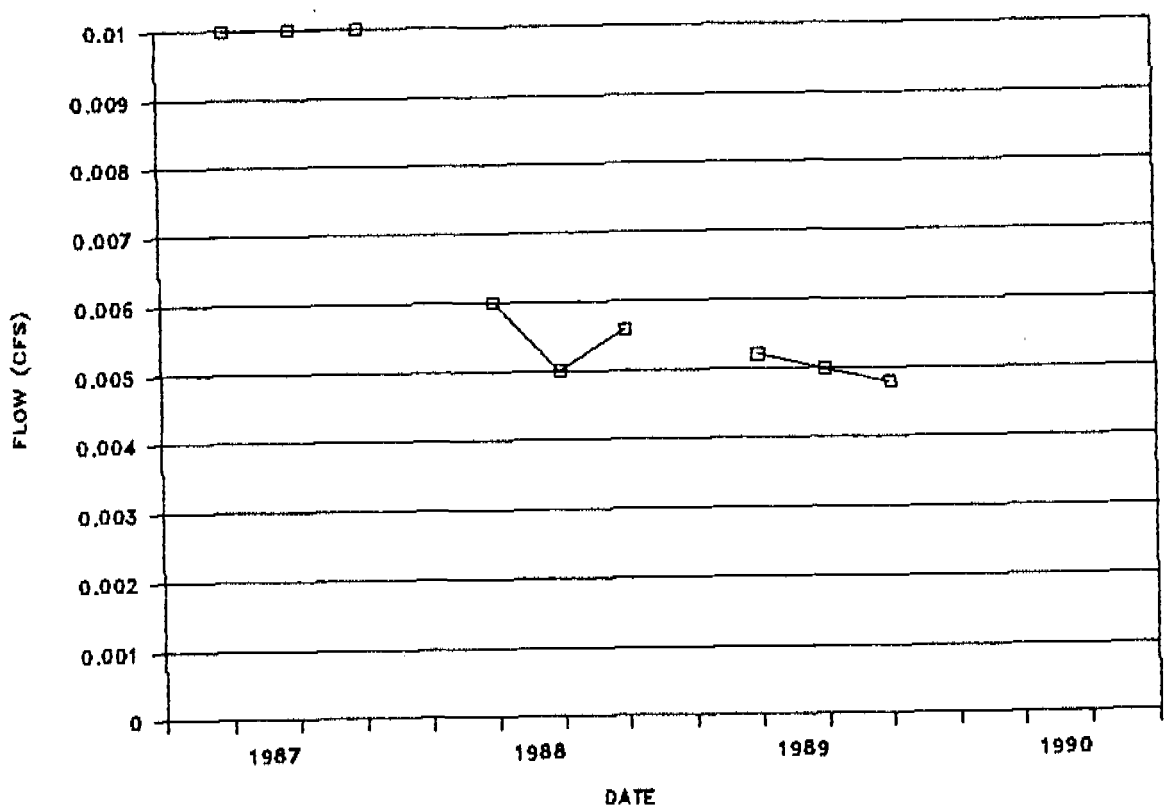
SAMPLE DATE	12/07/88	03/13/89	06/20/89	08/15/89	10/10/89
	WELL DRY	STATION NOT ACCESSIBLE	WELL DRY	WELL DRY	WELL DRY
PHYSICAL PARAMETERS					
AIR TEMPERATURE (C)					
DEPTH (FT)					
WATER TEMPERATURE (C)					
SPEC. COND. (UMHOS/CM) FIELD					
PH (SU) FIELD					
TURBIDITY (NTU) FIELD					
COMMON IONS					
ALKALINITY AS CACO3 (LAB)					
BICARBONATE (HCO3) (LAB)					
CALCIUM (CA)					
CARBONATE AS CO3					
CHLORIDE (CL)					
FLUORIDE (FL)					
HARDNESS (CACO3) TOTAL					
MAGNESIUM (MG)					
SODIUM (NA)					
SULFIDE (S)					
SULFATE (SO4)					
TOTAL DISS. SOLIDS MEAS.					
NUTRIENTS					
AMMONIA (NH3-N)					
NITRATE (NO3-N)					
NITRITE (NO2-N)					
TOTAL PHOSPHATE (PO4)					
TRACE ELEMENTS					
ALUMINUM (AL) DISS					
ARSENIC (AR) DISS					
BARIUM (BA) TOTAL					
BARIUM (BA) DISS					
BORON (B) TOTAL					
BORON (B) DISS					
CADMIUM (CD) DISS					
CHROMIUM (CR) DISS					
COPPER (CU) DISS					
IRON (FE) TOTAL					
IRON (FE) DISS					
LEAD (PB) DISS					
MANGANESE (MN) TOTAL					
MANGANESE (MN) DISS					
MERCURY (HG) DISS					
MOLYDENUM (MO) DISS					
NICKEL (NI) DISS					
SELENIUM (SE) TOTAL					
SELENIUM (SE) DISS					
ZINC (ZN) DISS					

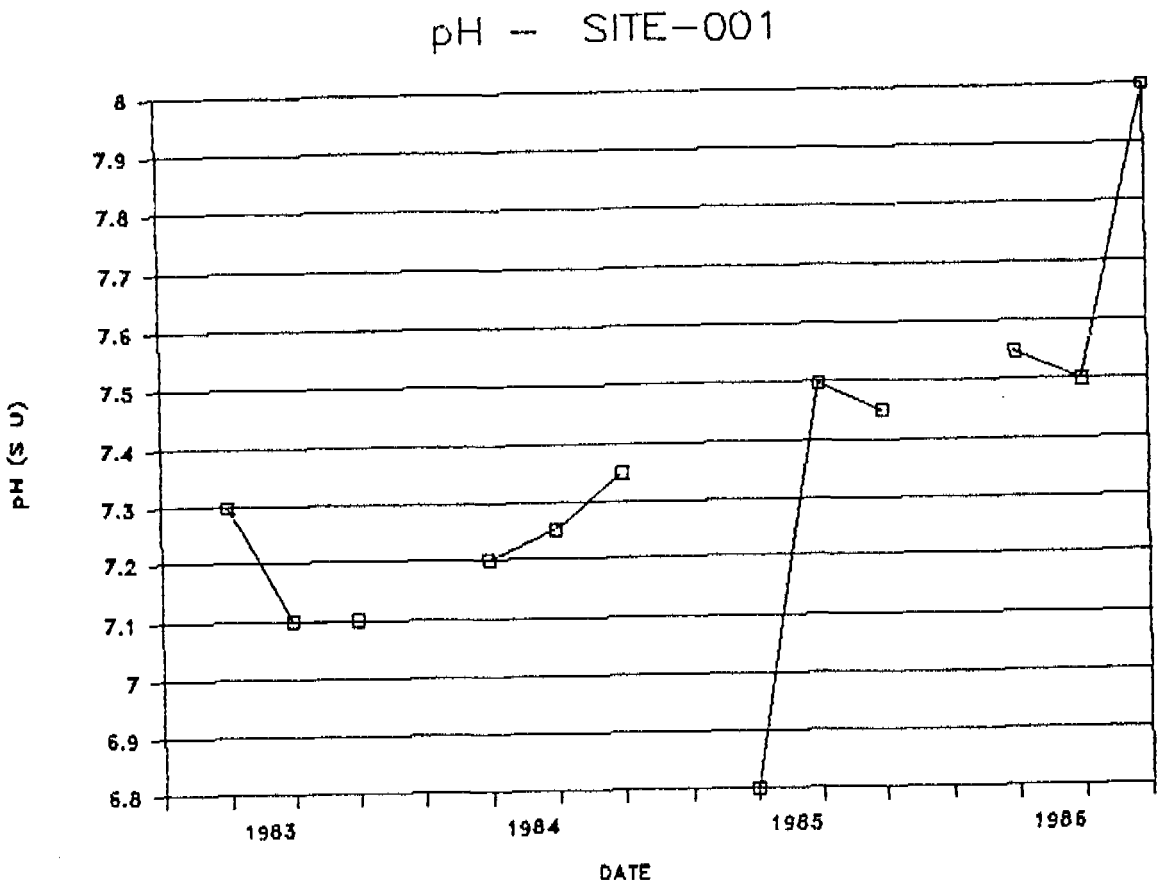
ALL QUANTITIES IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED.

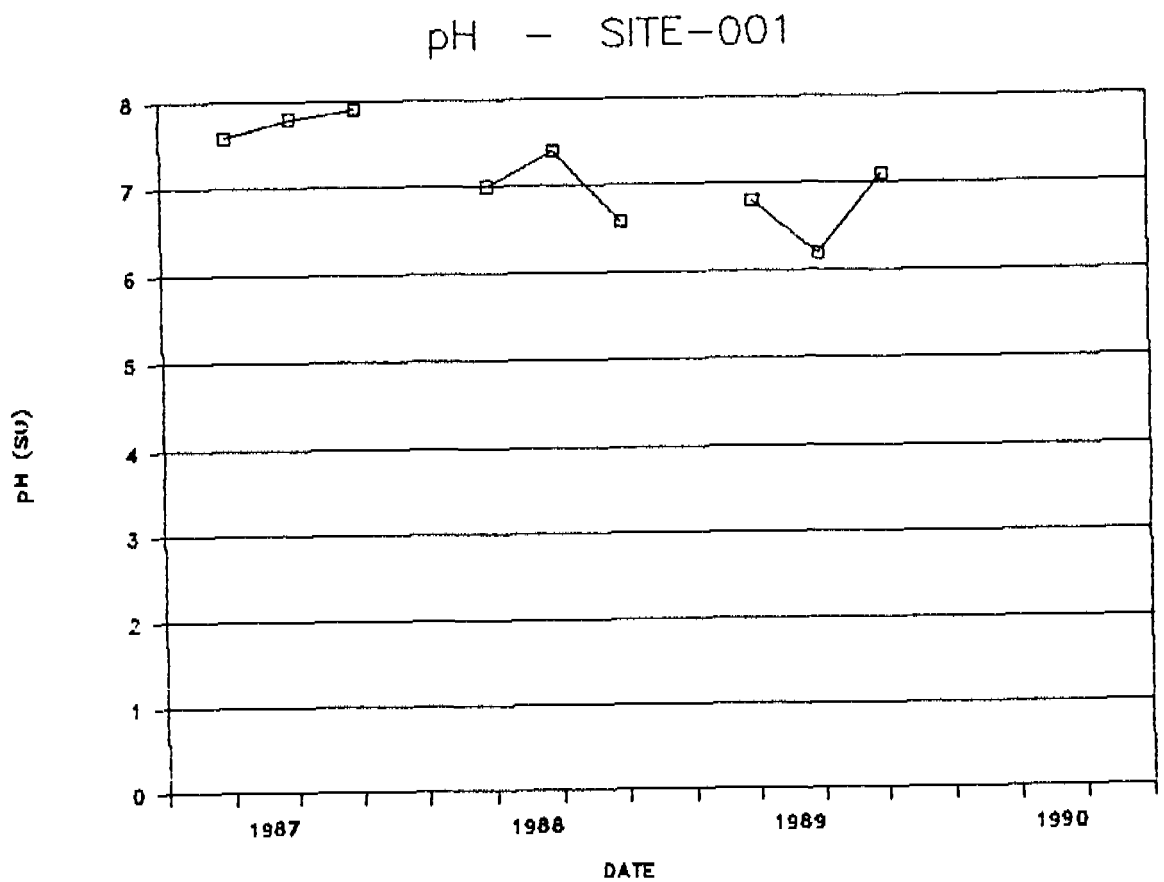
FLOW SITE-001



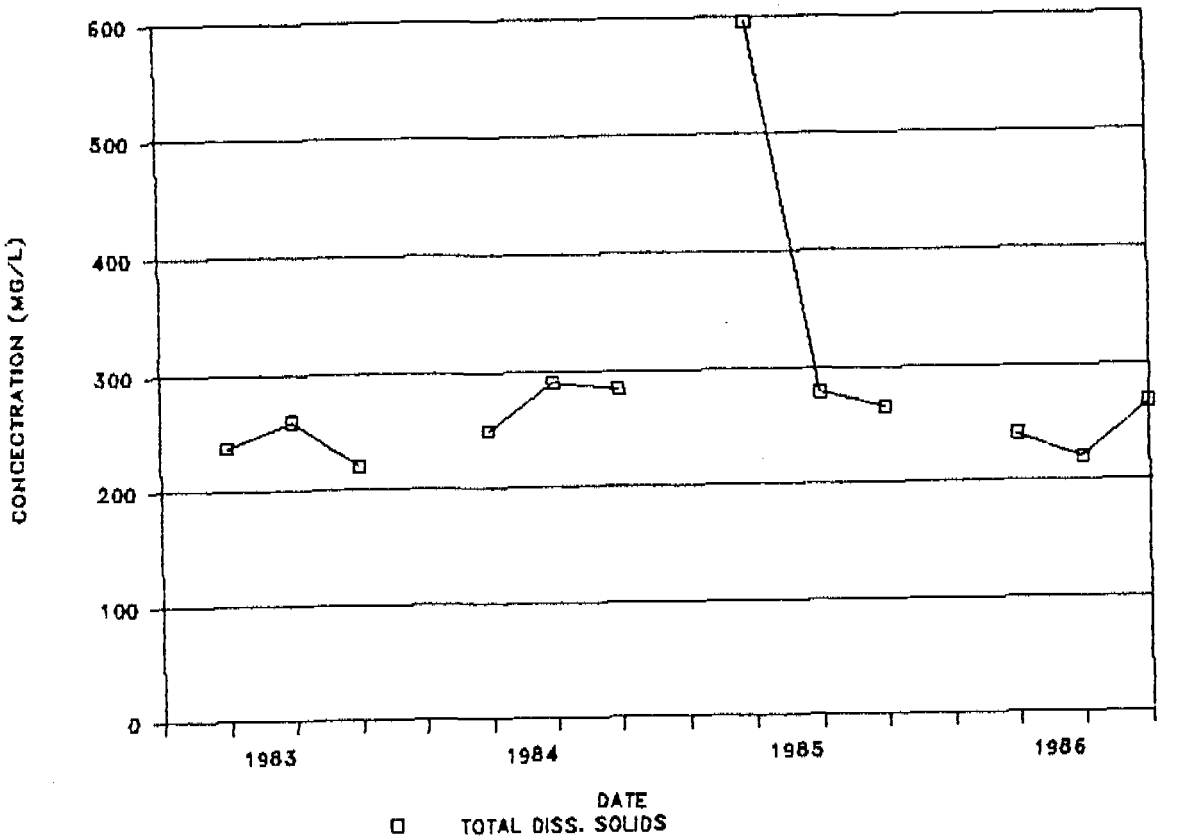
FLOW - SITE-001



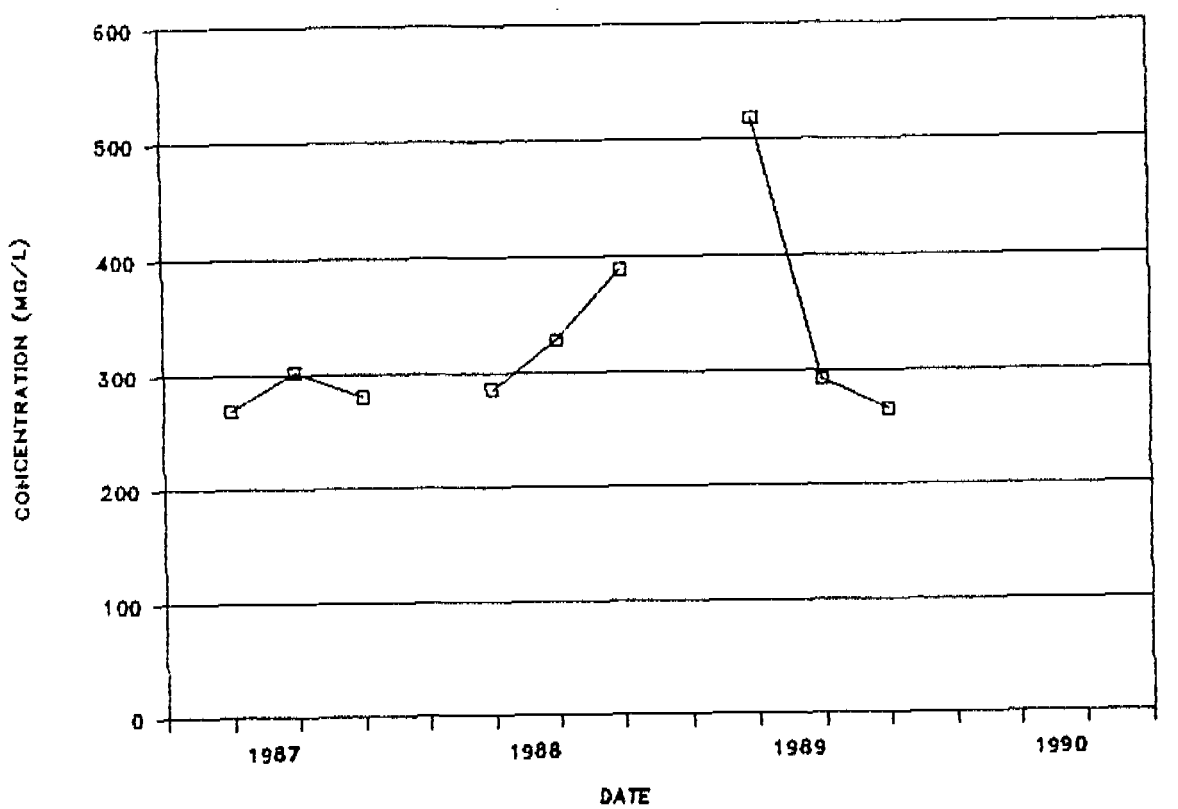

pH -- SITE-001
8
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7
6.9
6.8
pH (S U)
1983
1984
1985
1986
DATE

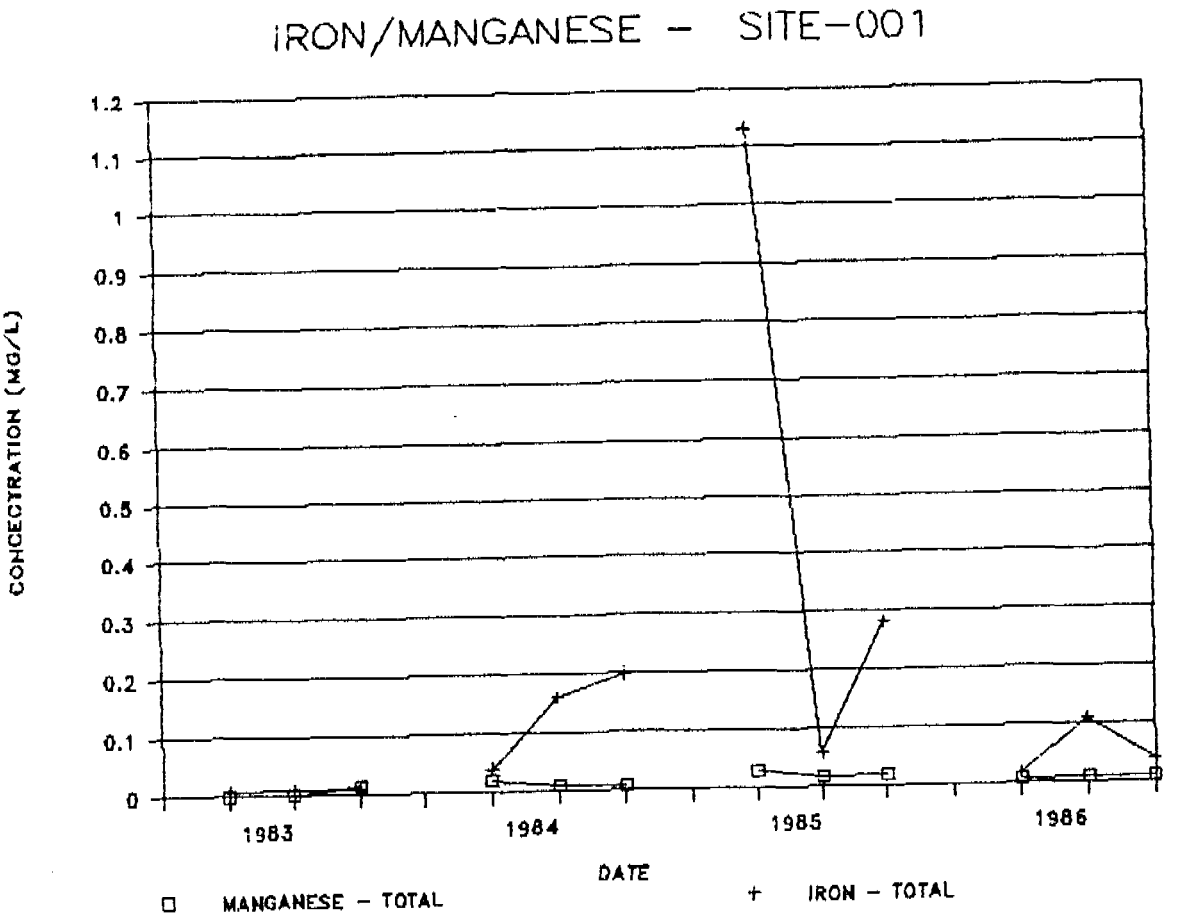

pH - SITE-001
8
7
6
5
4
3
2
1
0
pH (SU)
1987
1988
1989
1990
DATE

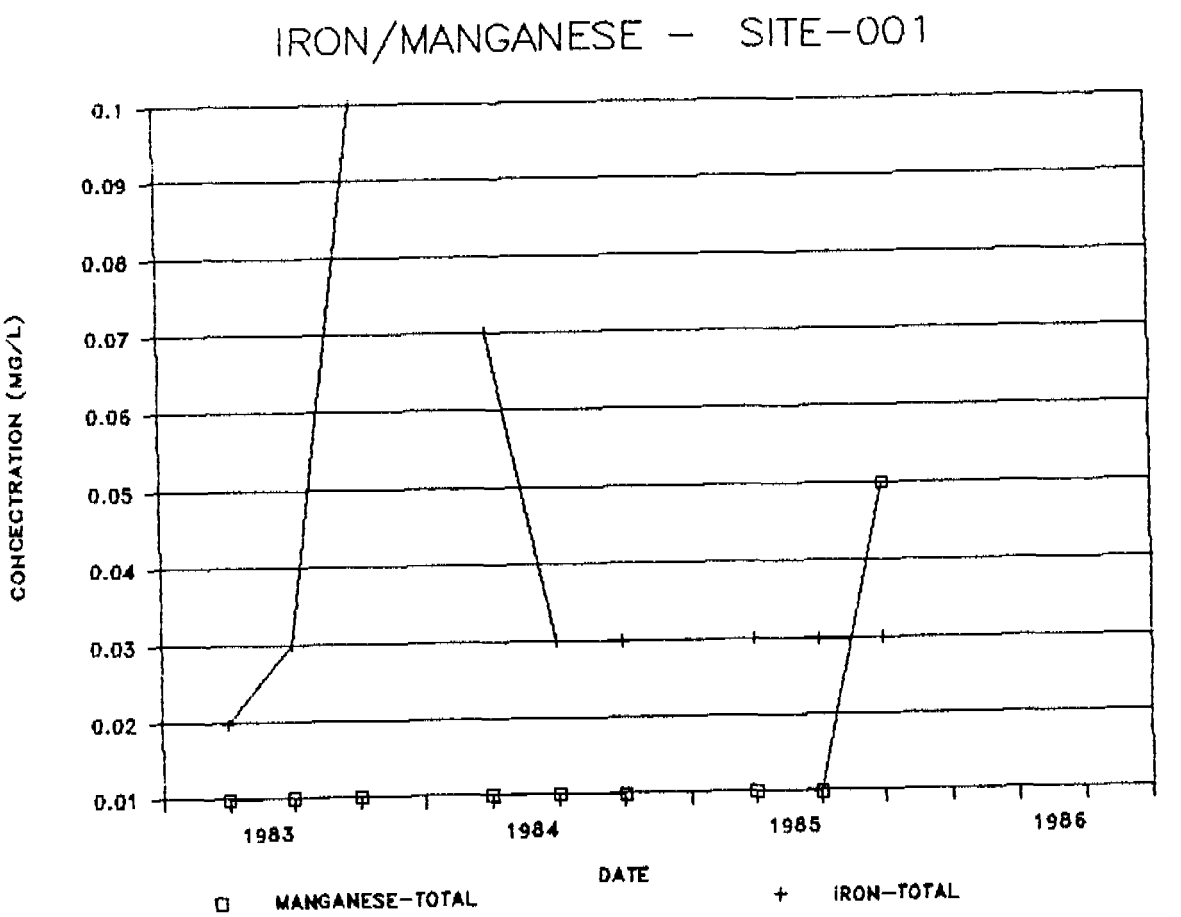
SOLIDS - SITE-001

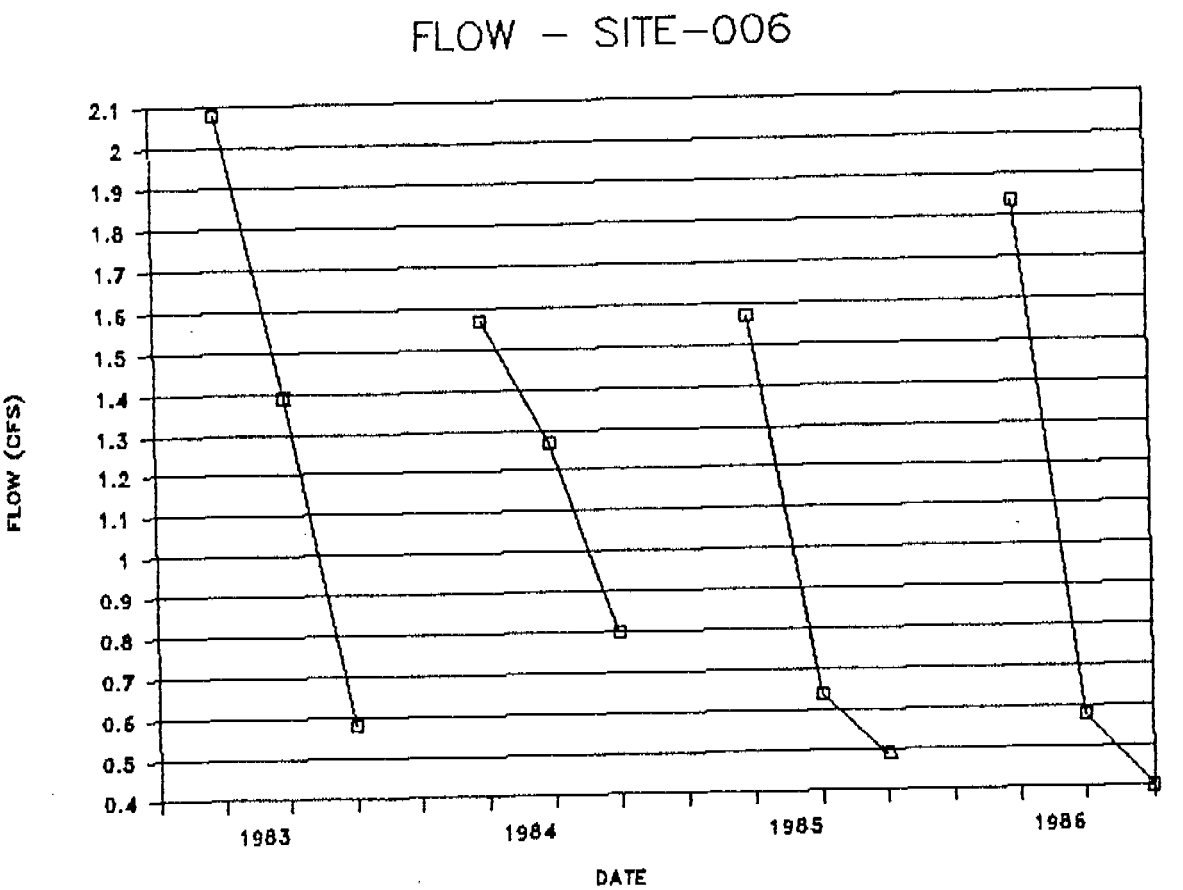


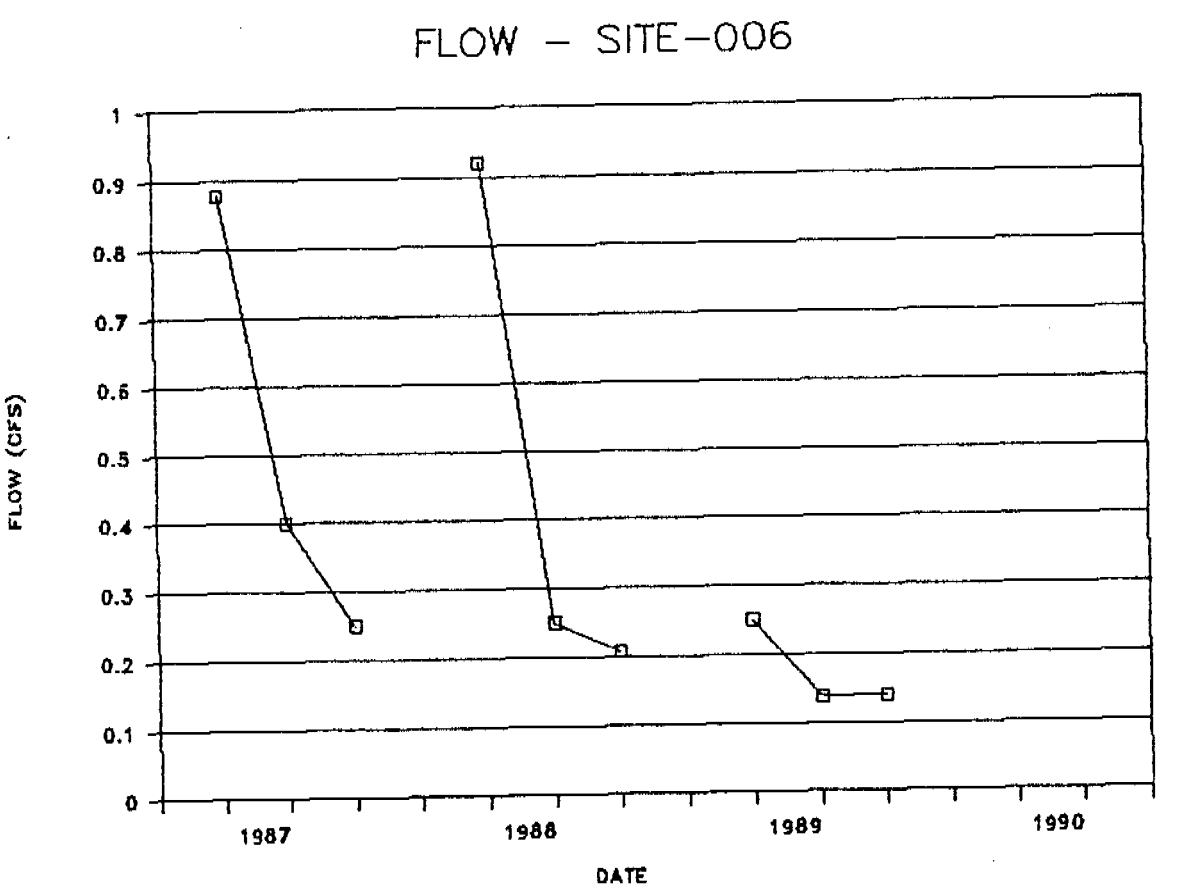
TOTAL DISS. SOLIDS - SITE-001

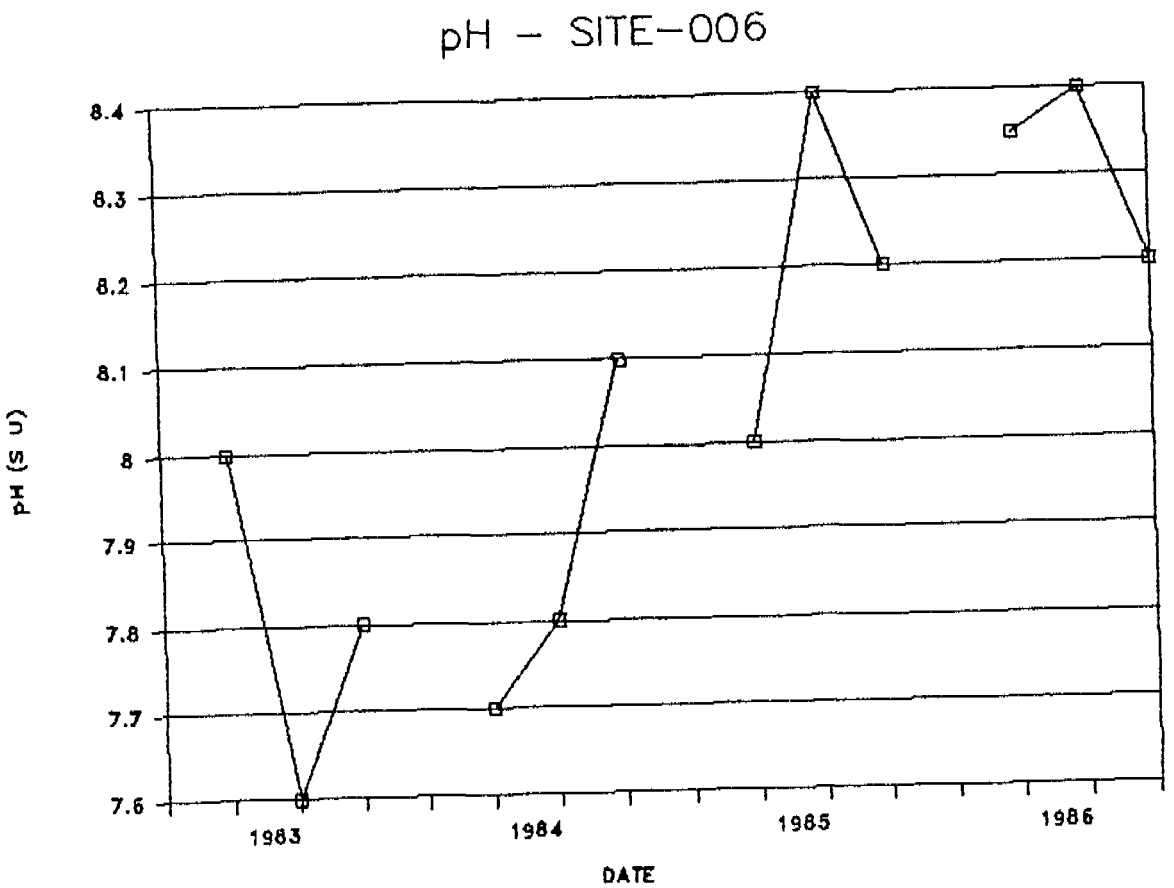


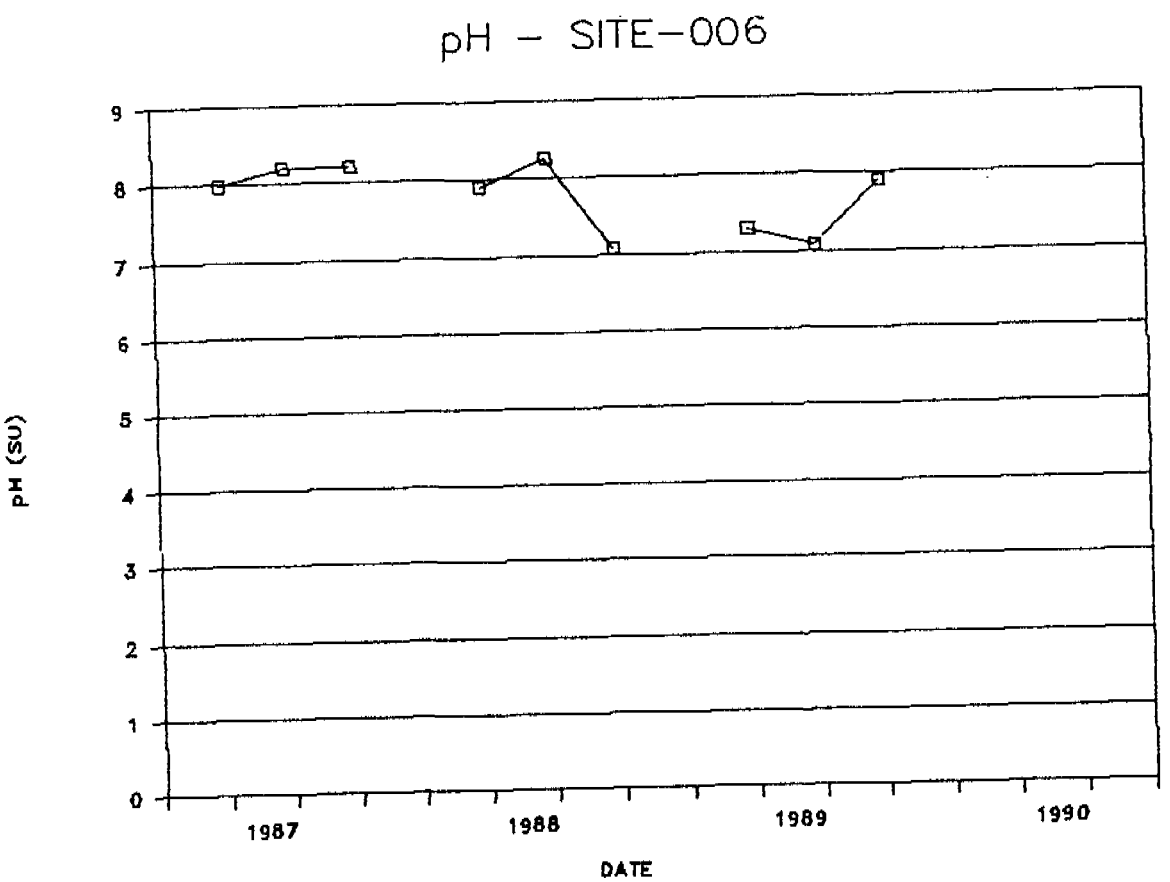

IRON/MANGANESE - SITE-001
CONCECTRATION (MG/L)
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL

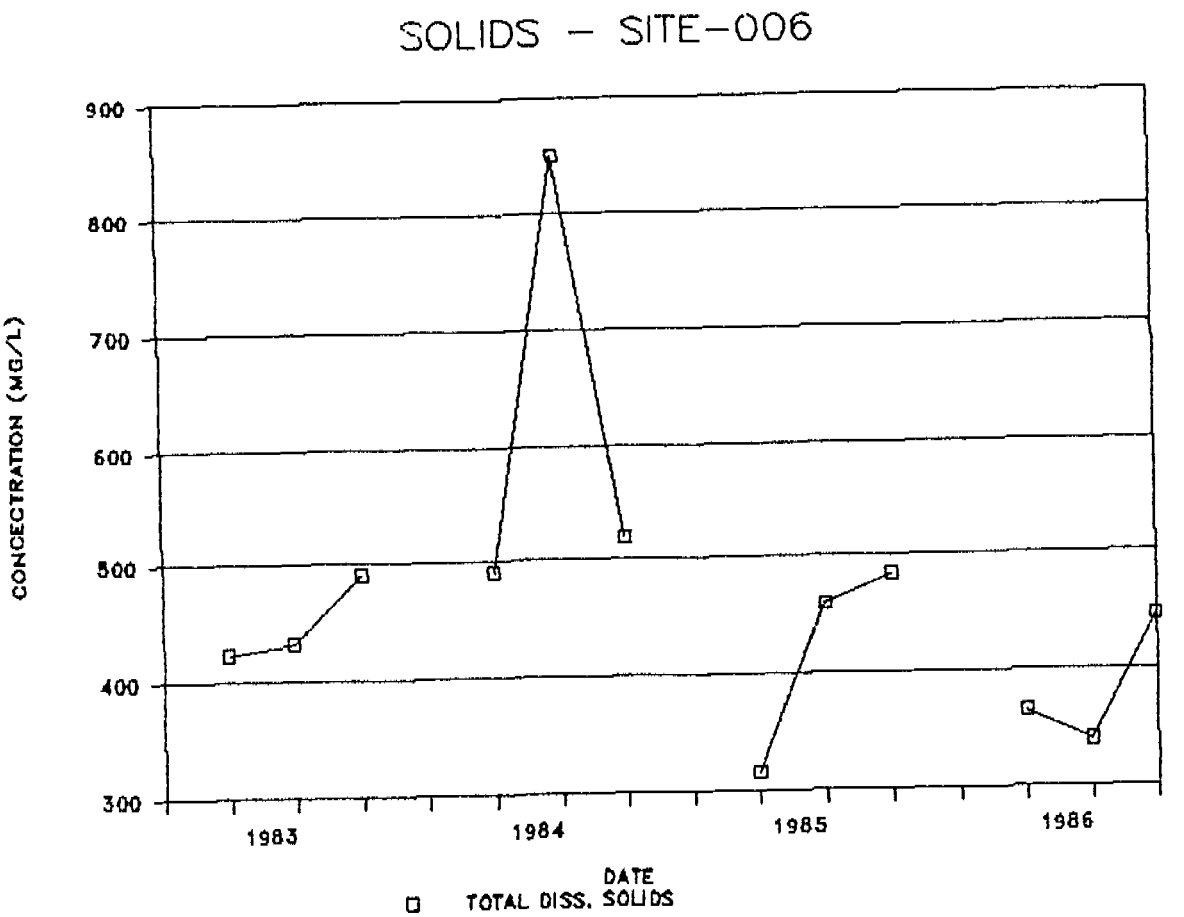

IRON/MANGANESE - SITE-001
CONCECTRATION (MG/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1983
1984
1985
1986
DATE
MANGANESE-TOTAL
IRON-TOTAL

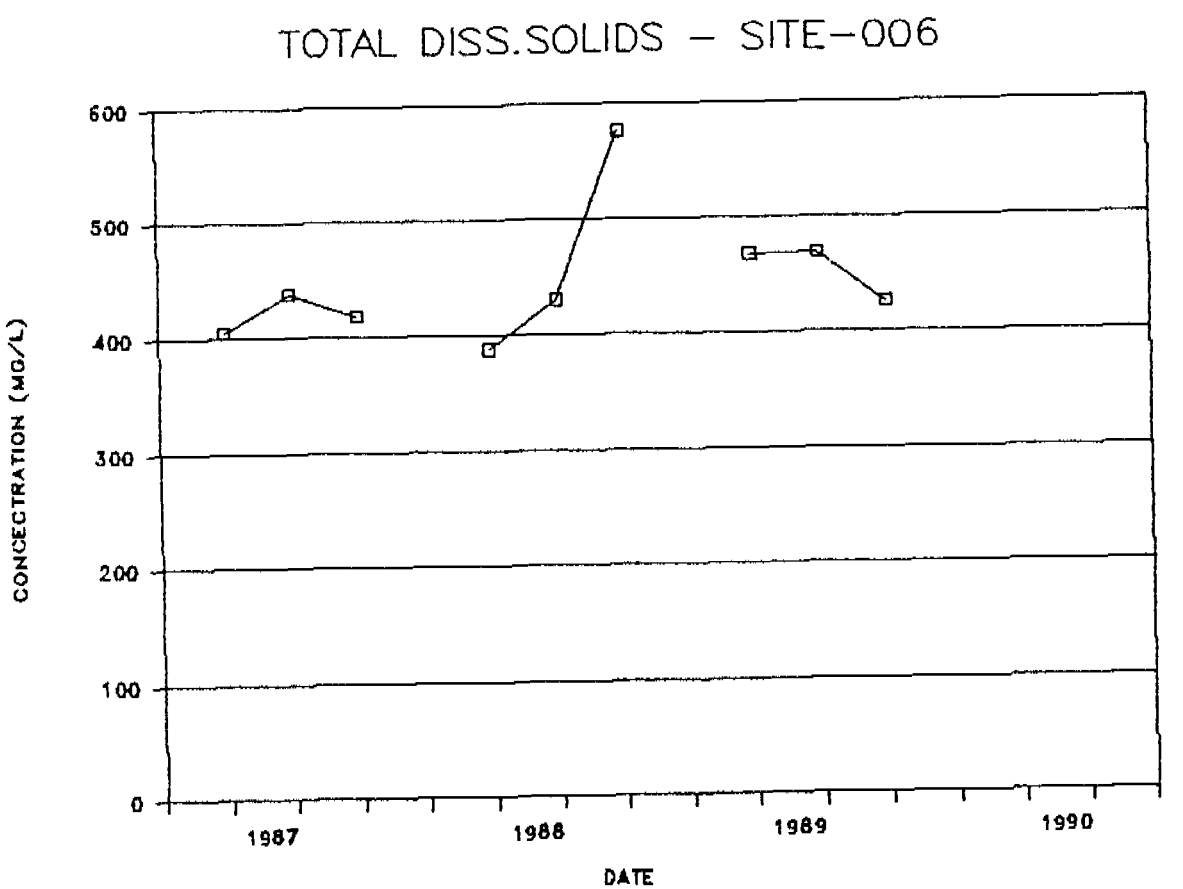

FLOW - SITE-006
FLOW (CFS)
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
1983
1984
1985
1986
DATE

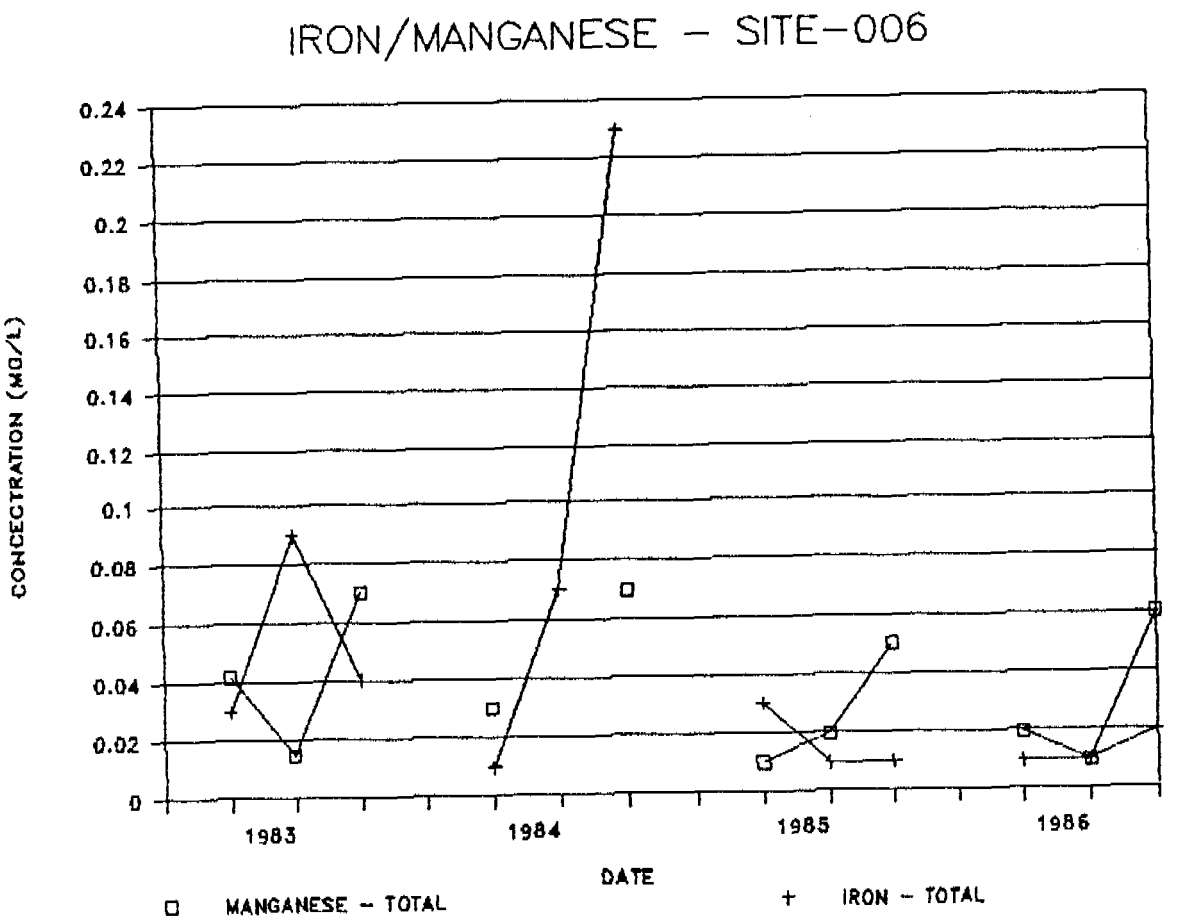

FLOW - SITE-006
FLOW (CFS)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1987
1988
1989
1990
DATE

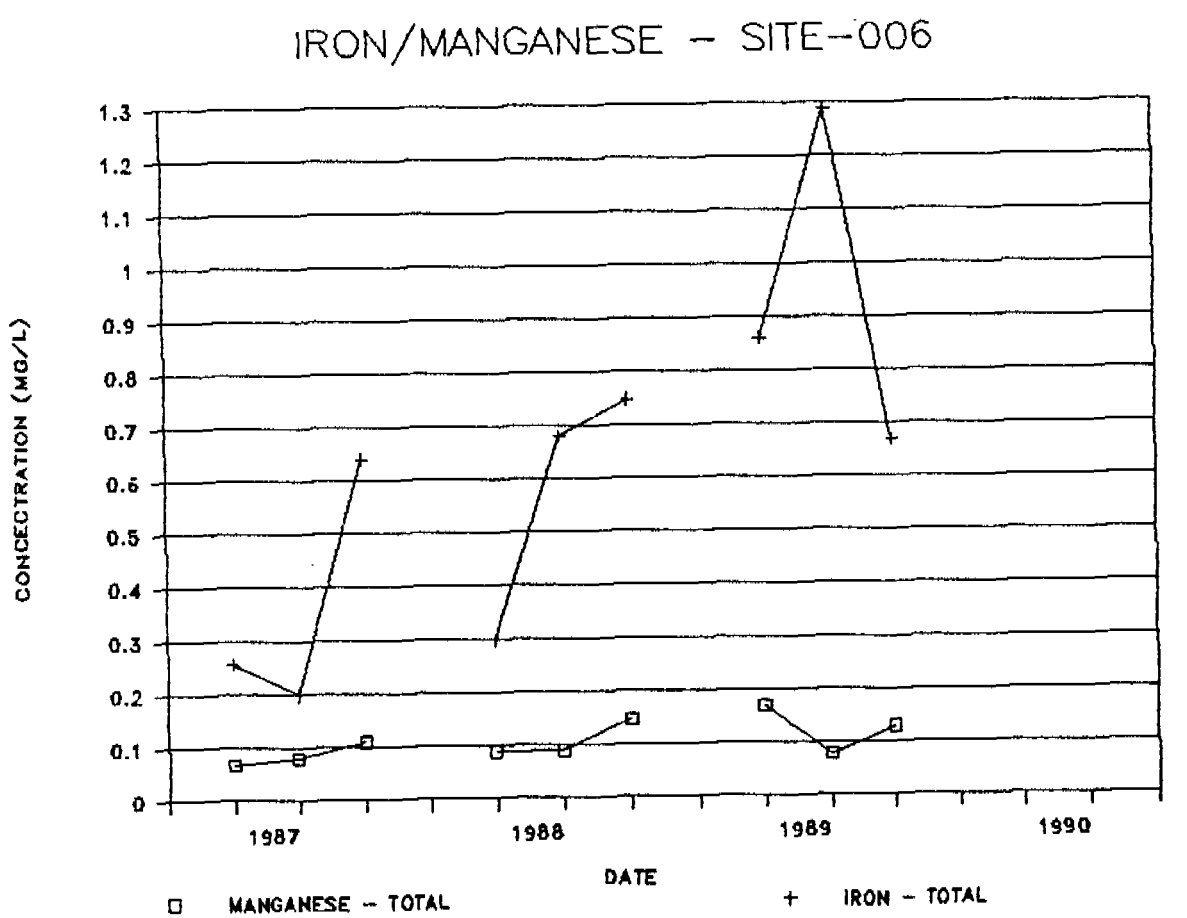

pH - SITE-006
8.4
8.3
8.2
8.1
8
7.9
7.8
7.7
7.6
pH (S U)
1983
1984
1985
1986
DATE


pH - SITE-006
9
8
7
6
5
4
3
2
1
0
pH (SU)
1987
1988
1989
1990
DATE

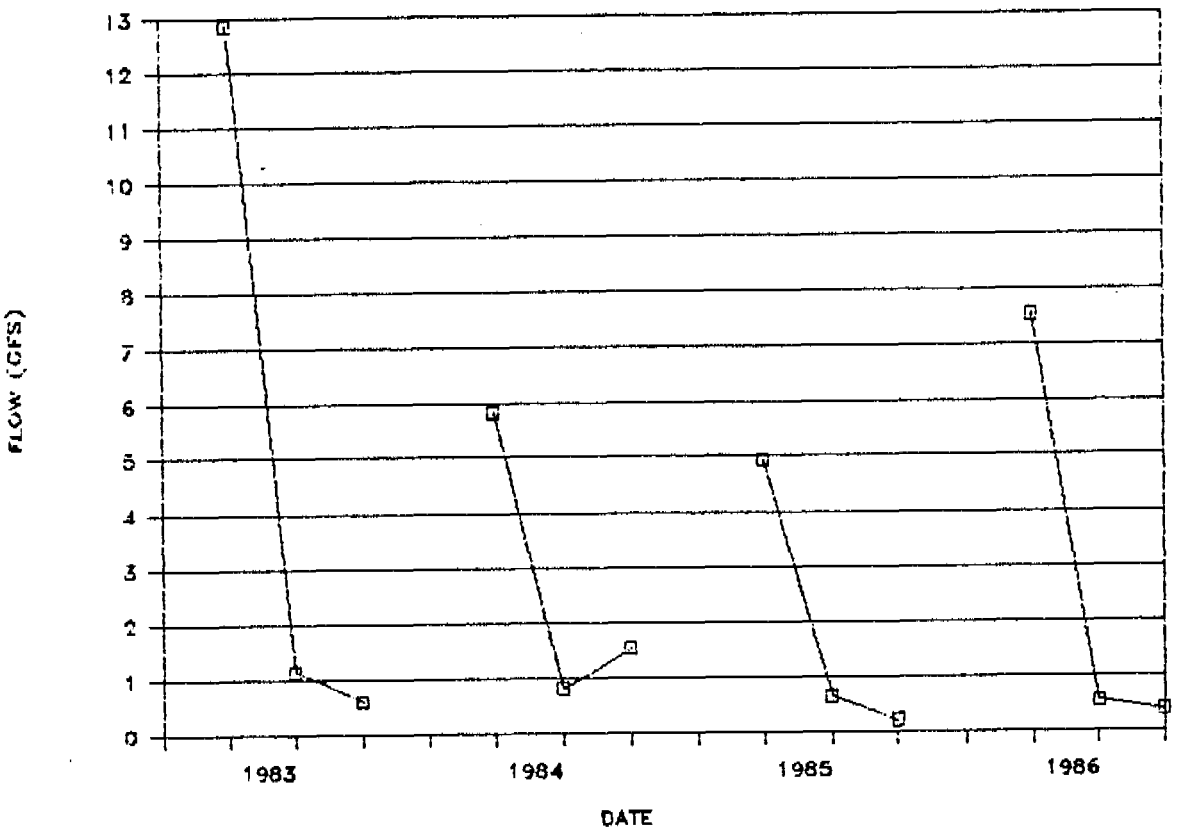

SOLIDS - SITE-006
900
800
700
600
500
400
300
CONCECTRATION (MG/L)
1983
1984
1985
1986
DATE
TOTAL DISS. SOLIDS


TOTAL DISS.SOLIDS - SITE-006
600
500
400
300
200
100
0
CONCECTRATION (MG/L)
1987
1988
1989
1990
DATE

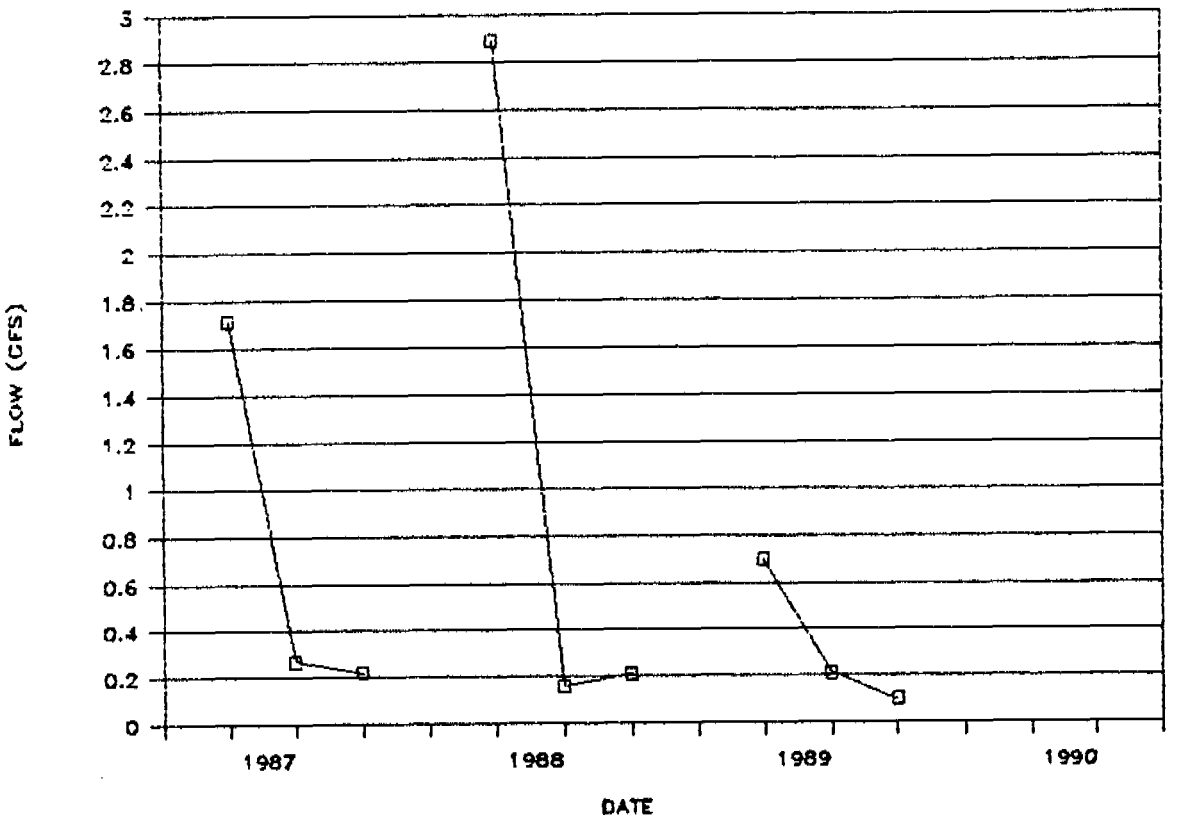

IRON/MANGANESE - SITE-006
CONCECTRATION (MG/L)
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL

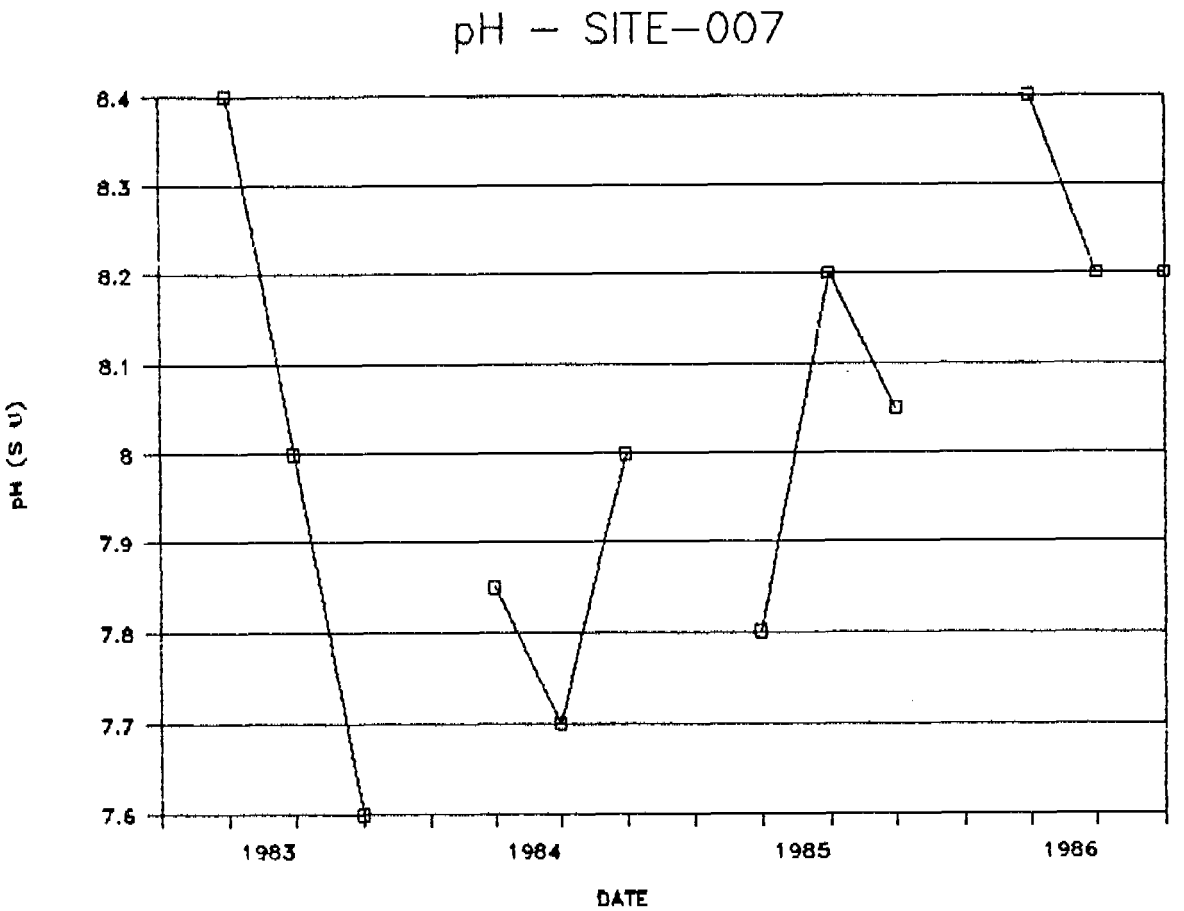

IRON/MANGANESE - SITE-006
CONCECTRATION (MG/L)
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

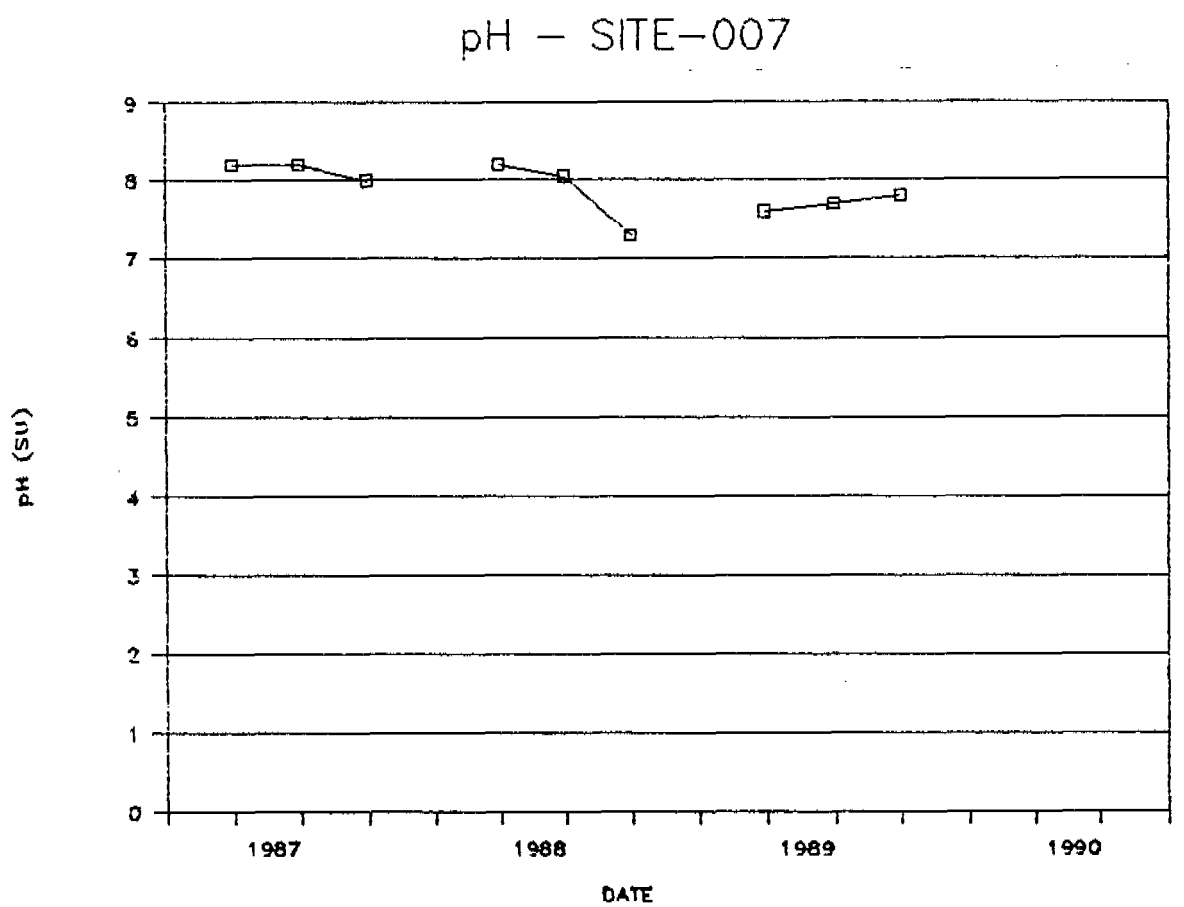
FLOW – SITE–007



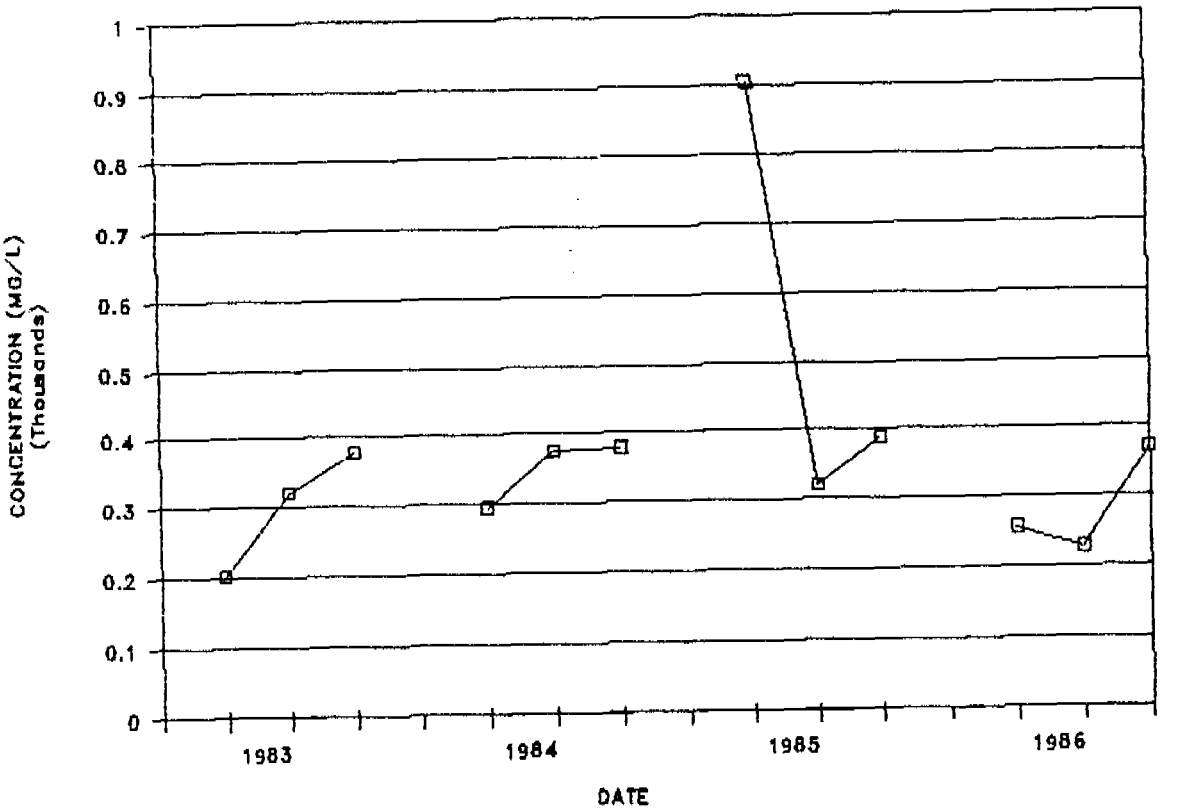
FLOW – SITE–007



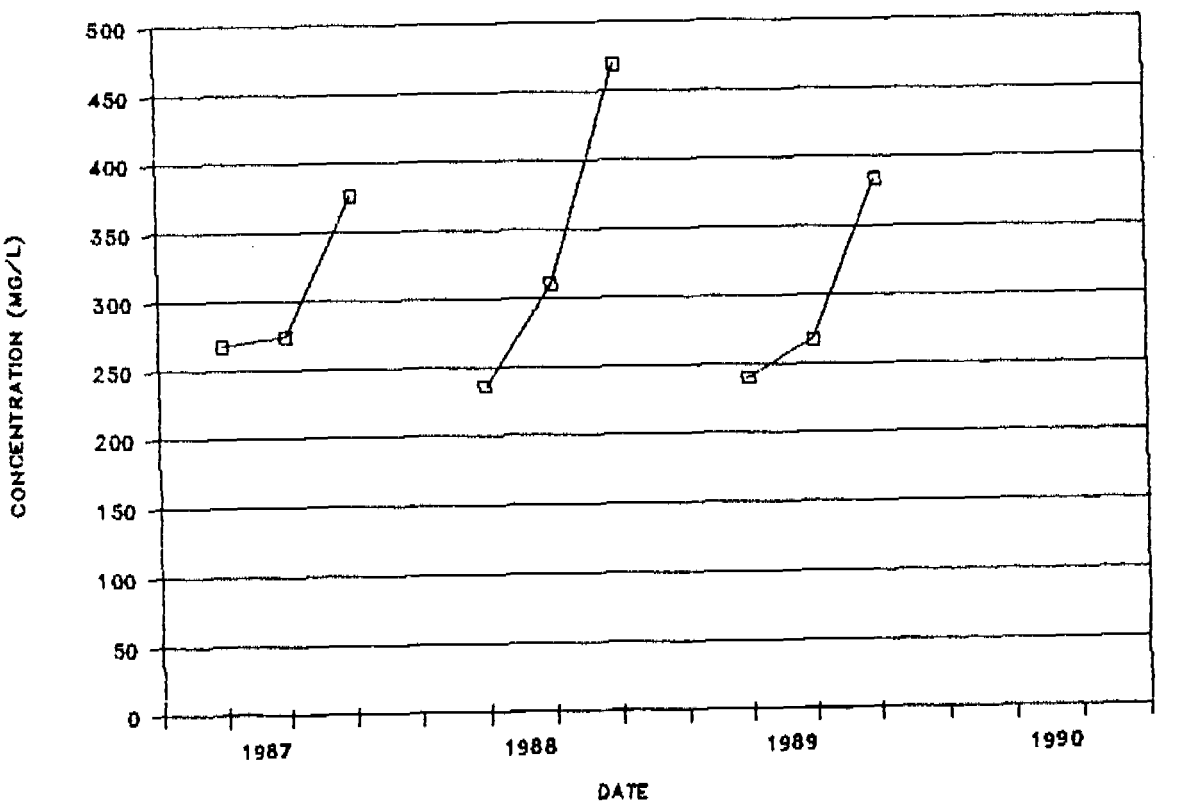

pH - SITE-007
8.4
8.3
8.2
8.1
8
7.9
7.8
7.7
7.6
pH (S U)
1983
1984
1985
1986
DATE


pH - SITE-007
9
8
7
6
5
4
3
2
1
0
pH (SU)
1987
1988
1989
1990
DATE

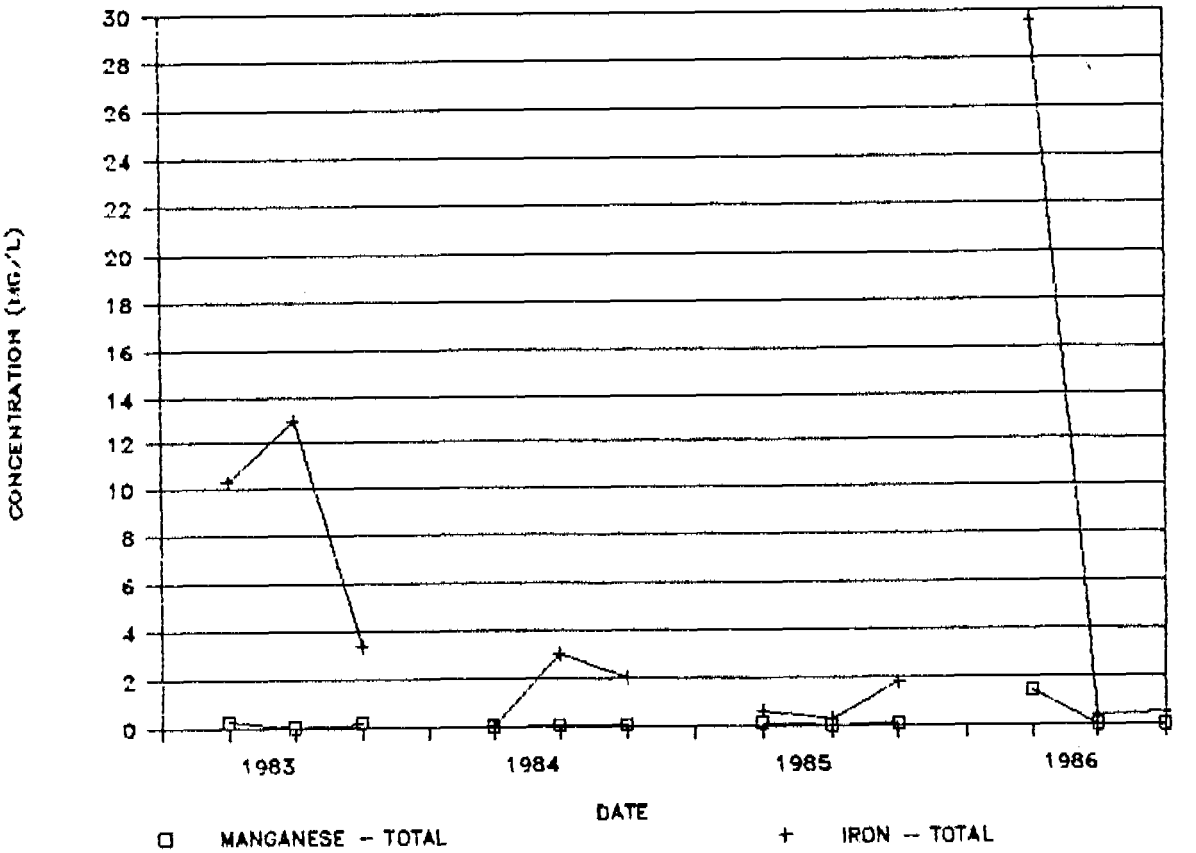
TOTAL DISS. SOLIDS - SITE-007



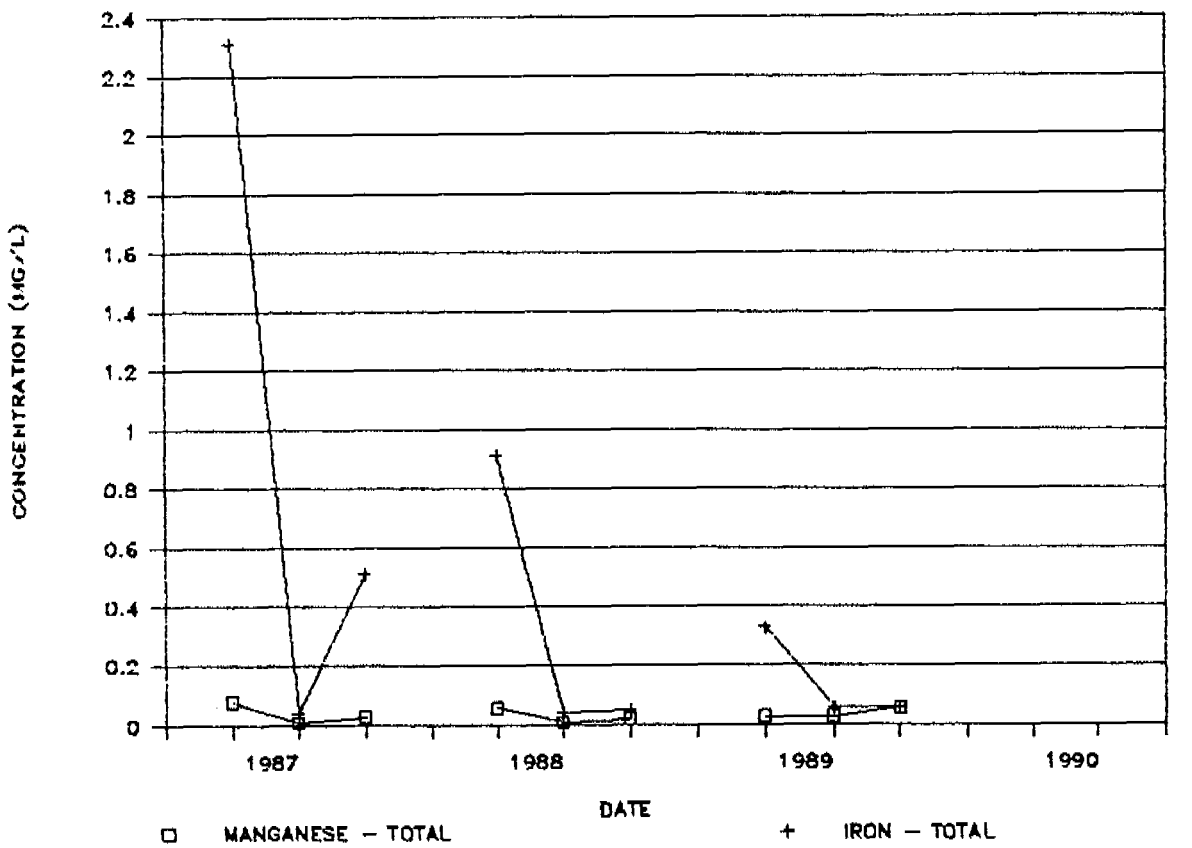
TOTAL DISS. SOLIDS - SITE-007

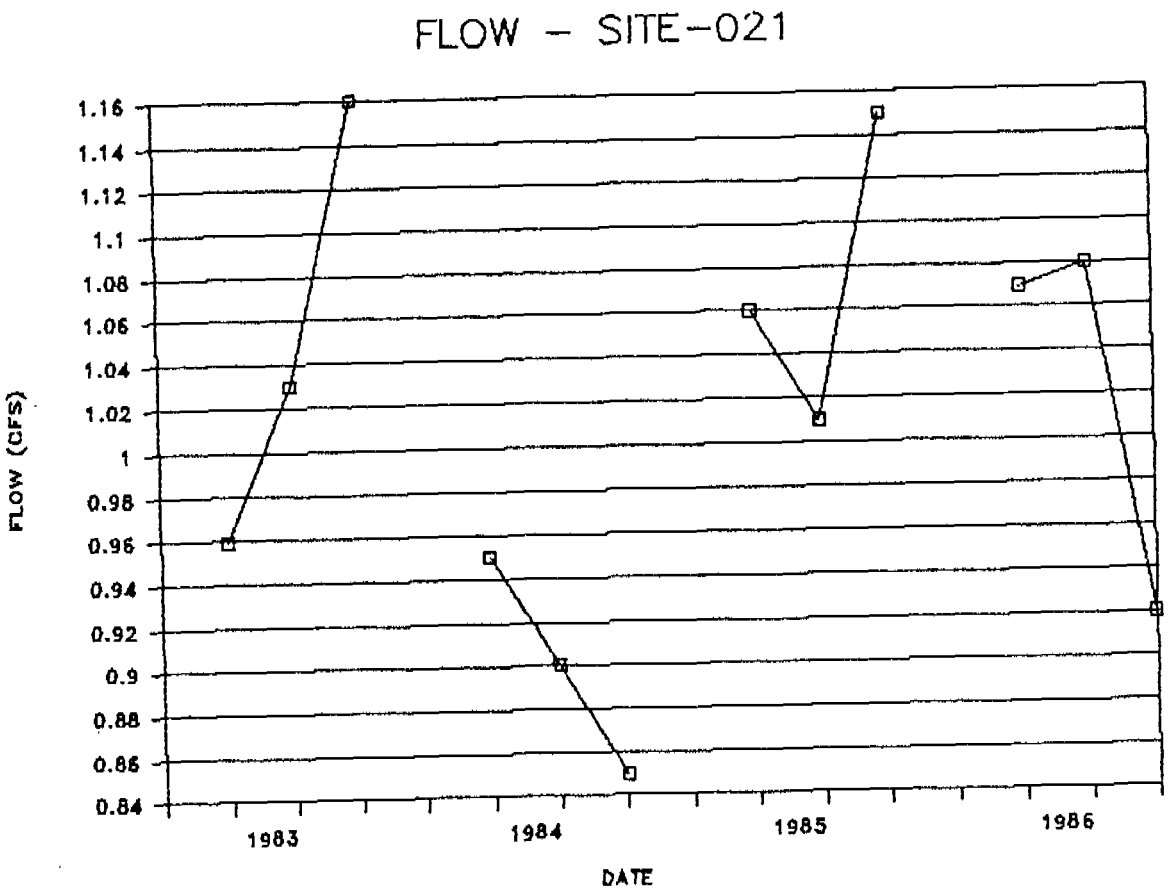


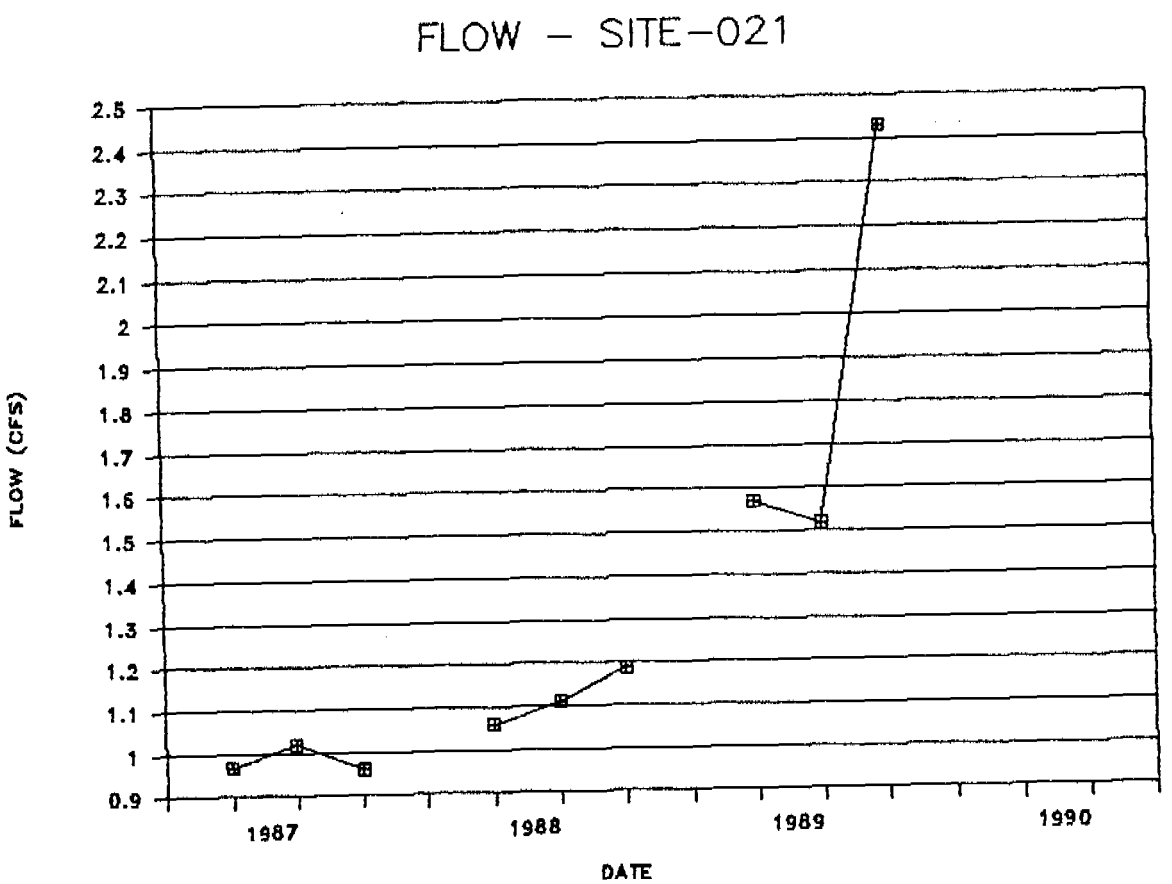
IRON/MANGANESE – SITE–007

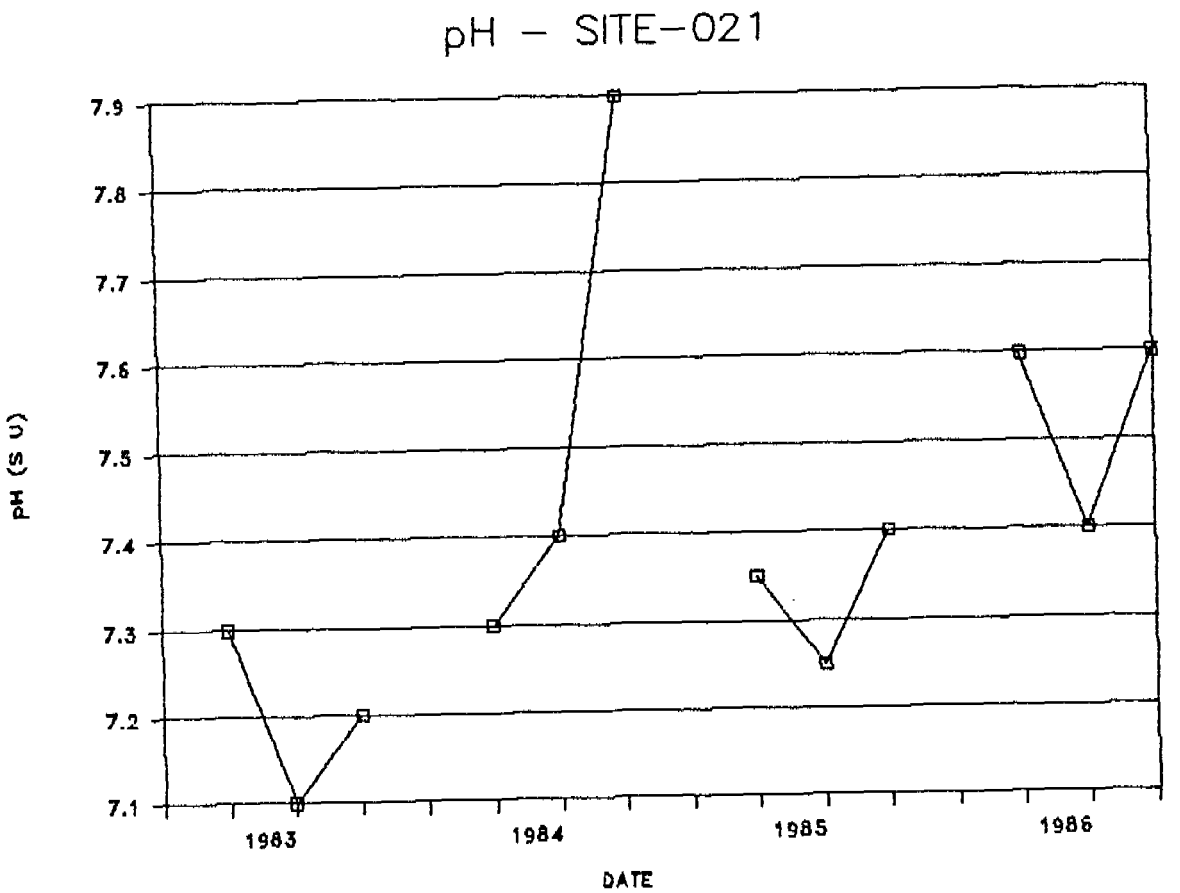


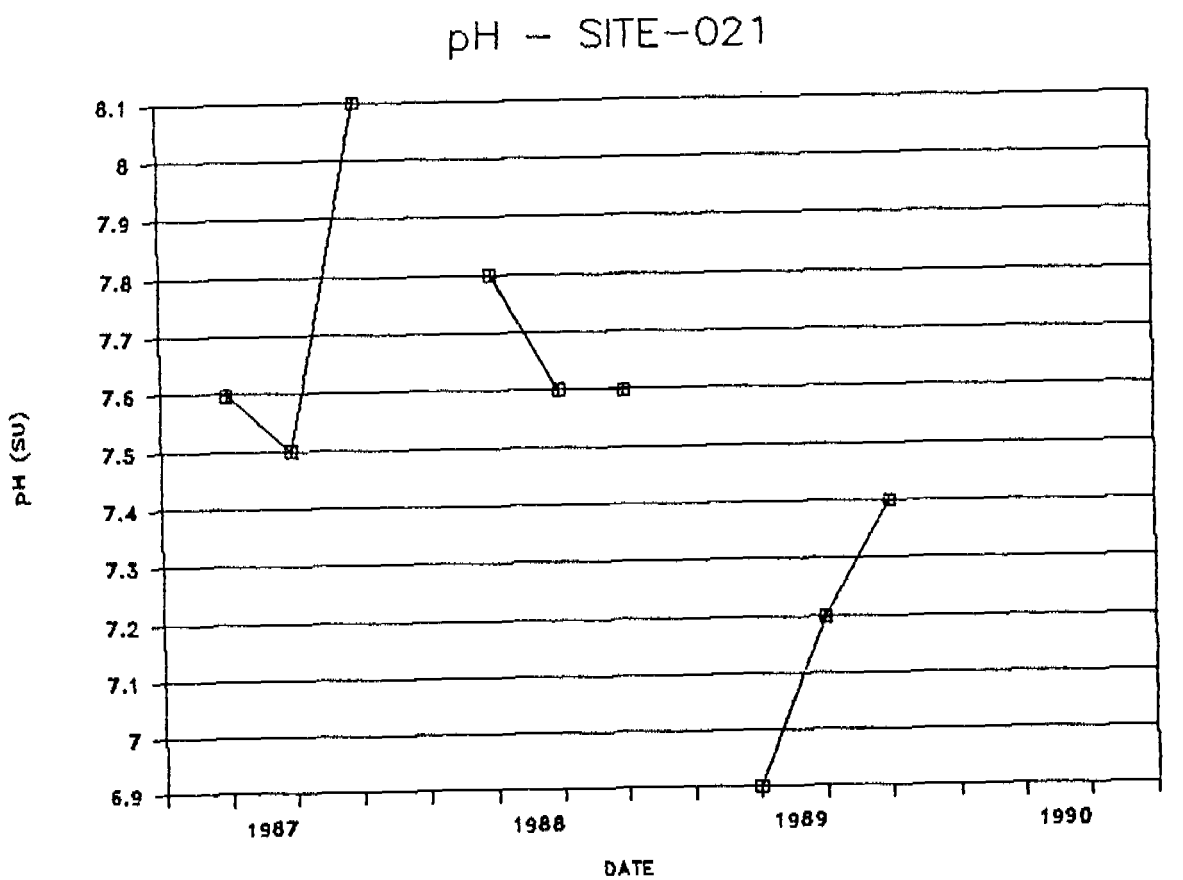
IRON/MANGANESE – SITE–007

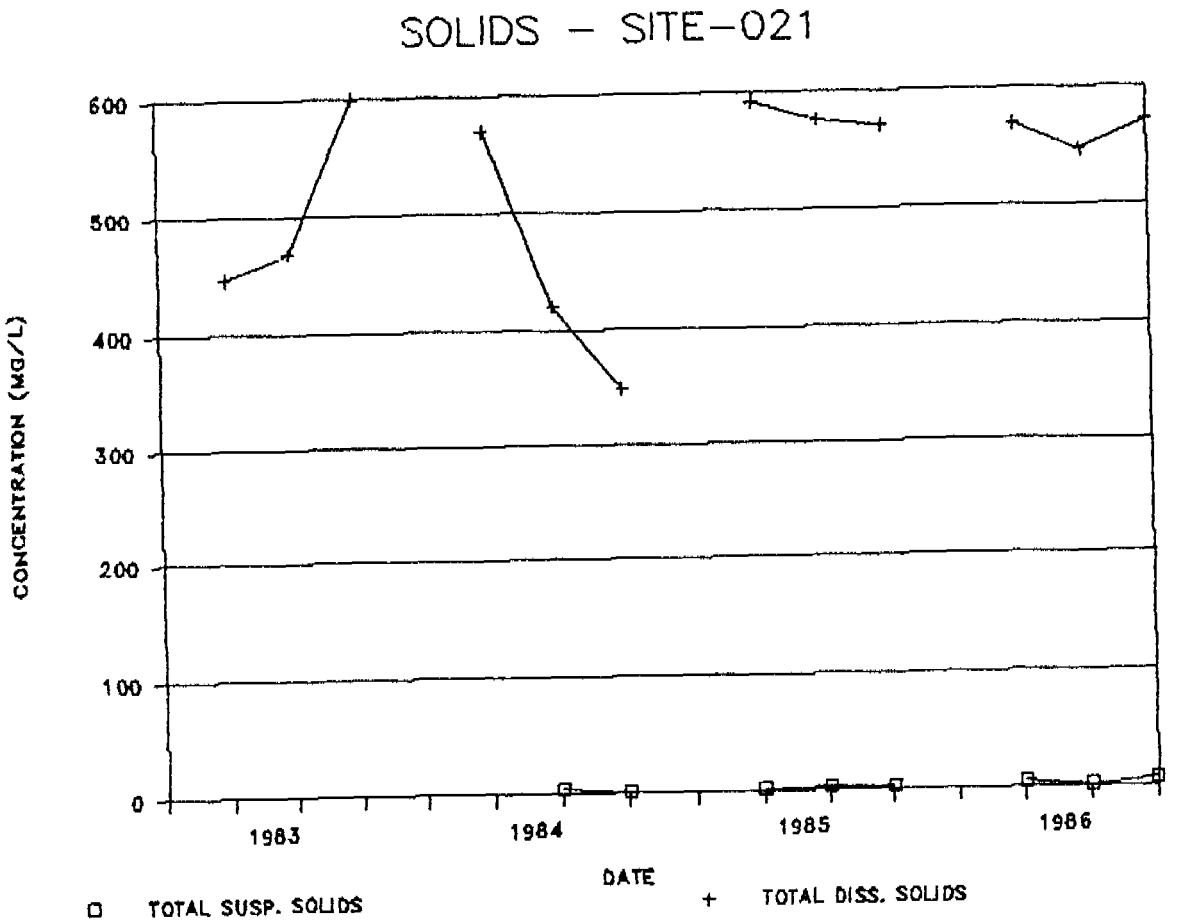


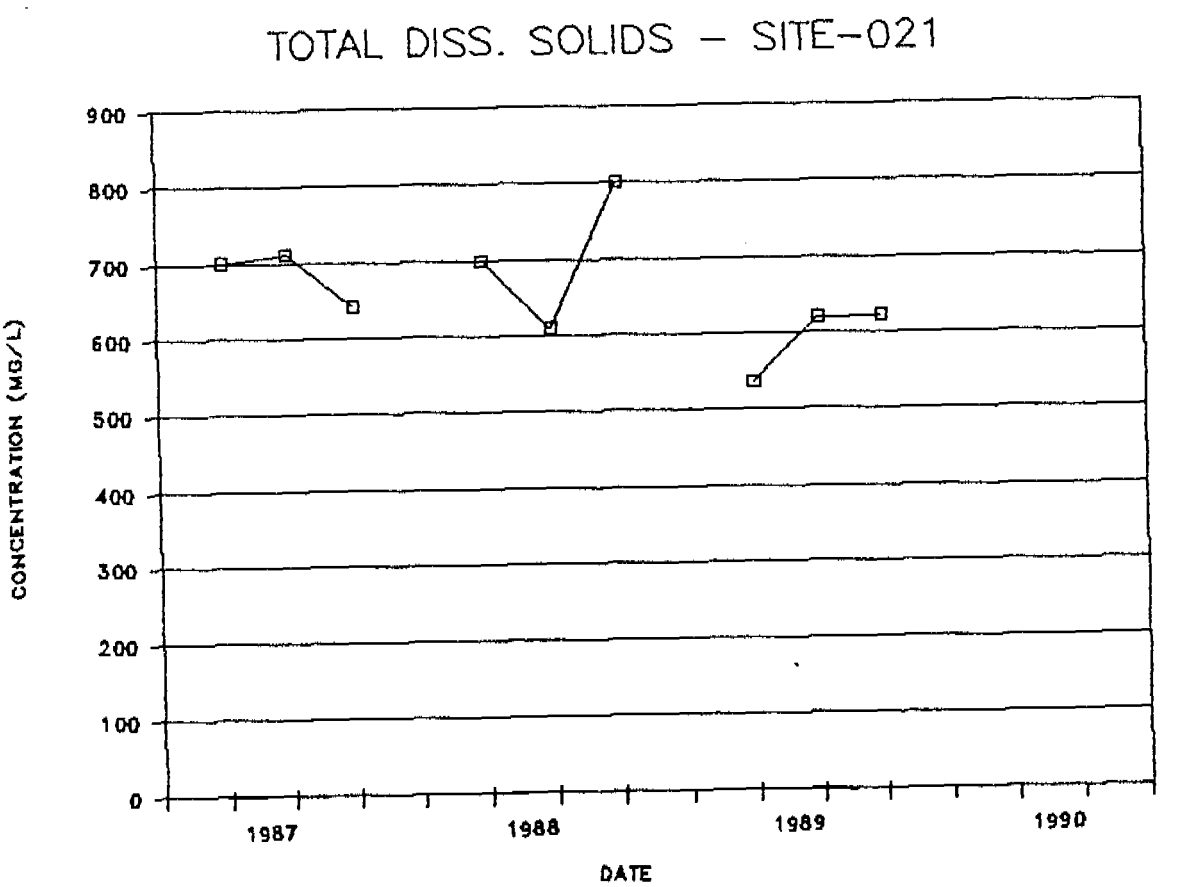

FLOW - SITE-021
FLOW (CFS)
1.16
1.14
1.12
1.1
1.08
1.06
1.04
1.02
1
0.98
0.96
0.94
0.92
0.9
0.88
0.86
0.84
1983
1984
1985
1986
DATE

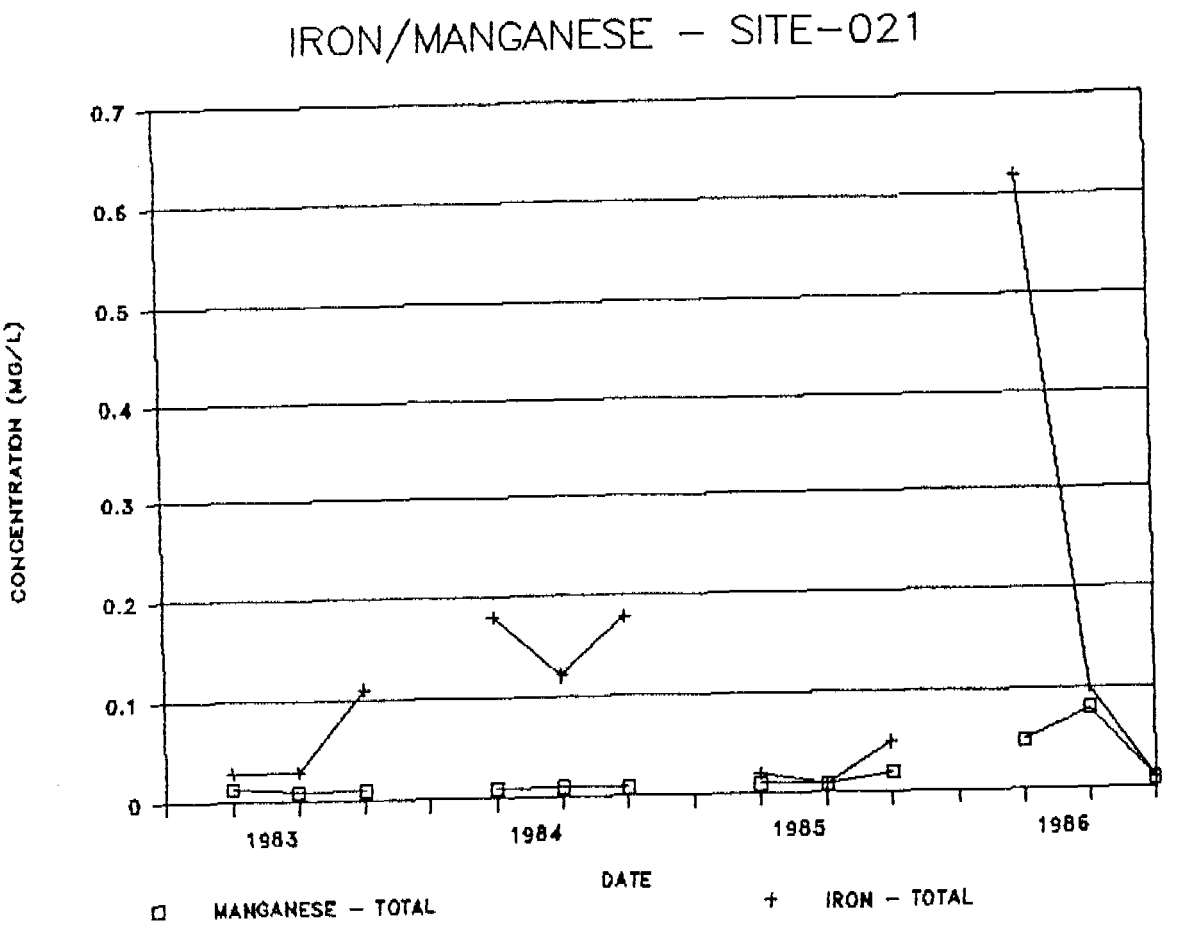

FLOW - SITE-021
FLOW (CFS)
2.5
2.4
2.3
2.2
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
1987
1988
1989
1990
DATE

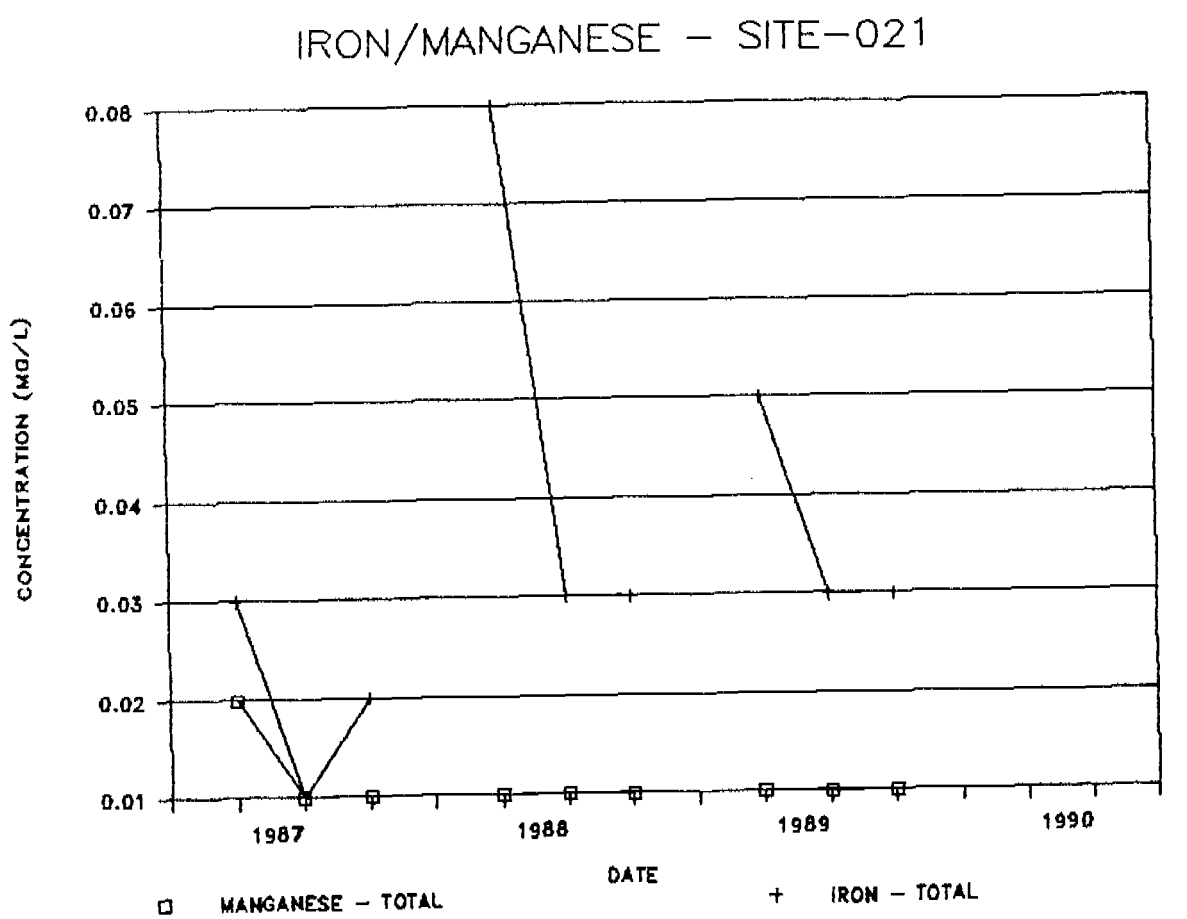

pH - SITE-021
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
pH (S U)
1983
1984
1985
1986
DATE


pH - SITE-021
8.1
8
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7
6.9
pH (SU)
1987
1988
1989
1990
DATE

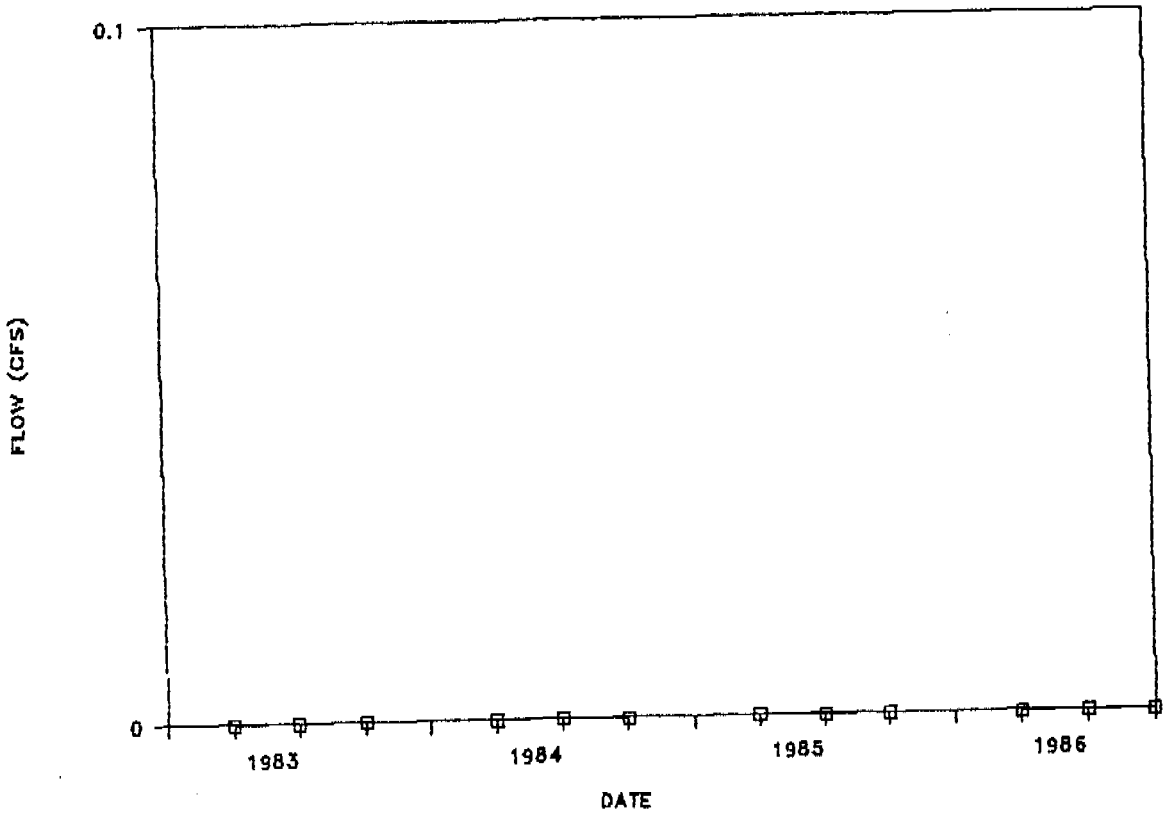

SOLIDS - SITE-021
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
1983
1984
1985
1986
DATE
TOTAL SUSP. SOLIDS
TOTAL DISS. SOLIDS


TOTAL DISS. SOLIDS - SITE-021
900
800
700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
1987
1988
1989
1990
DATE

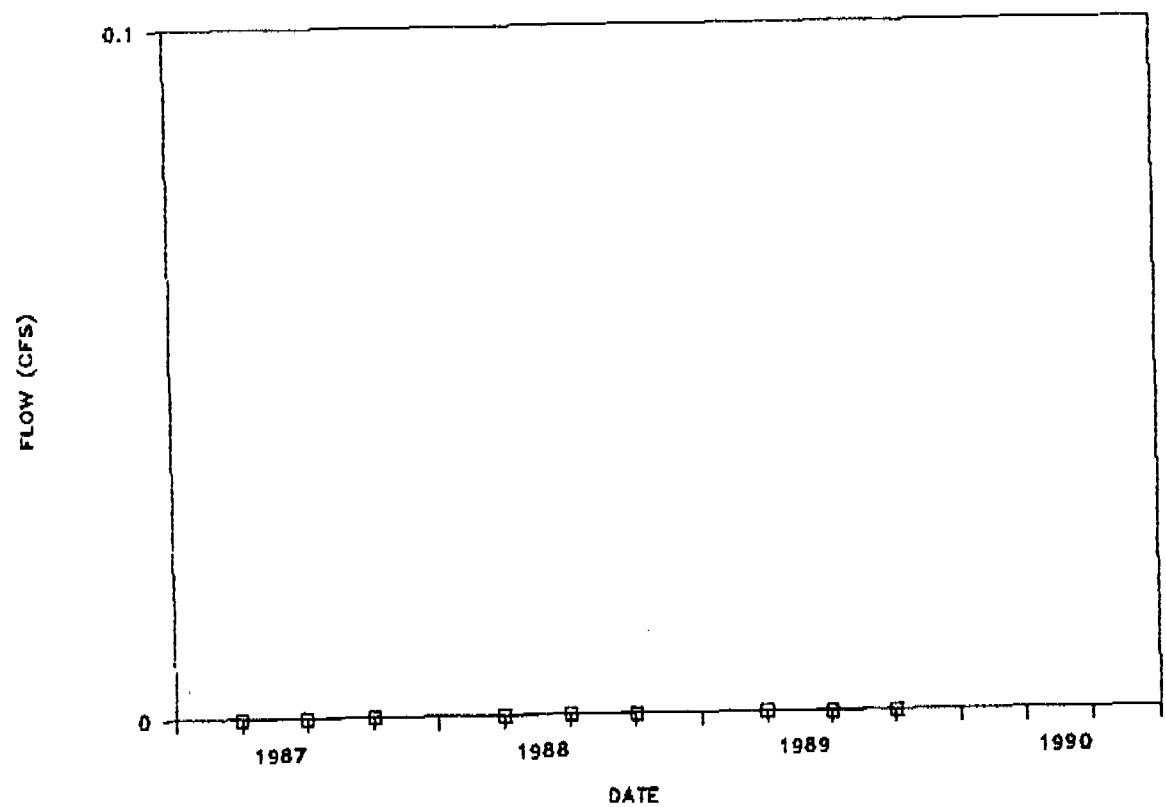

IRON/MANGANESE - SITE-021
CONCENTRATION (MG/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL

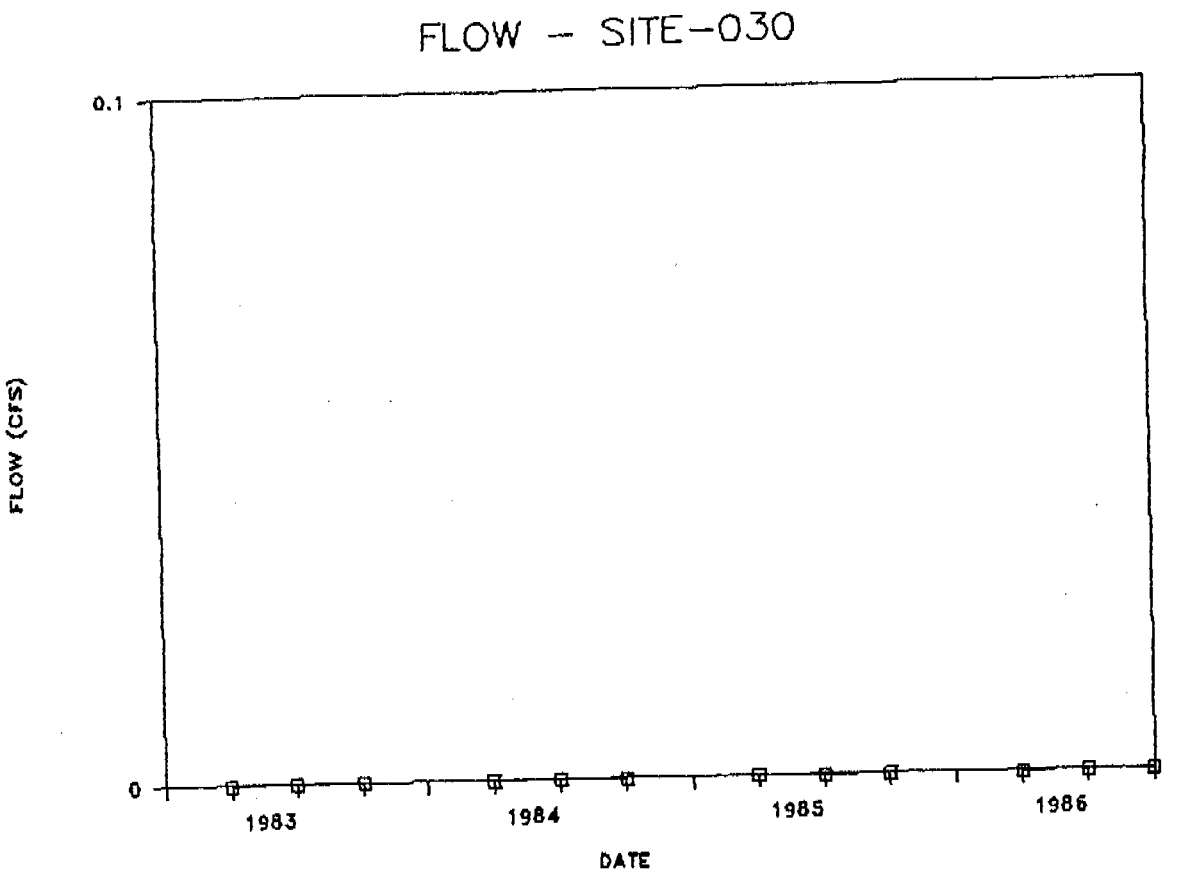

IRON/MANGANESE - SITE-021
CONCENTRATION (MG/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

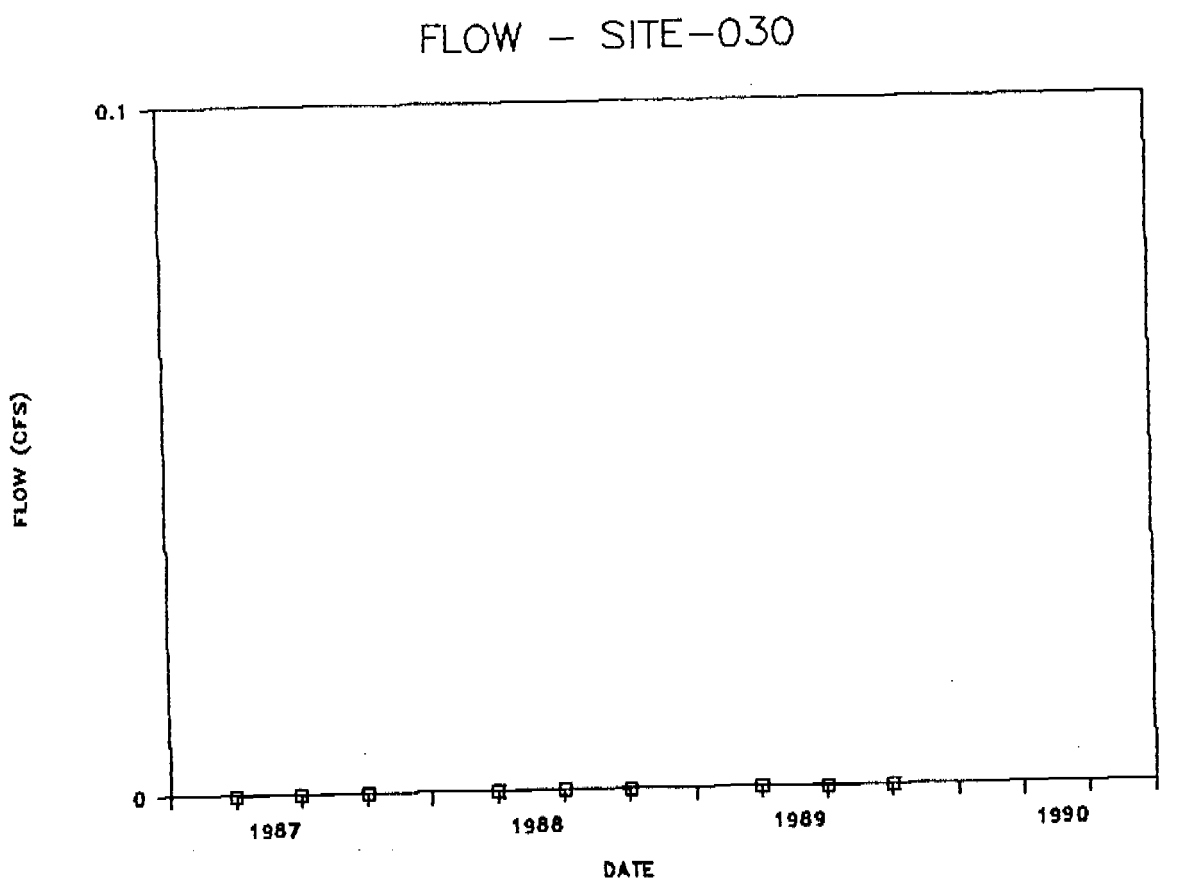
FLOW - SITE-022



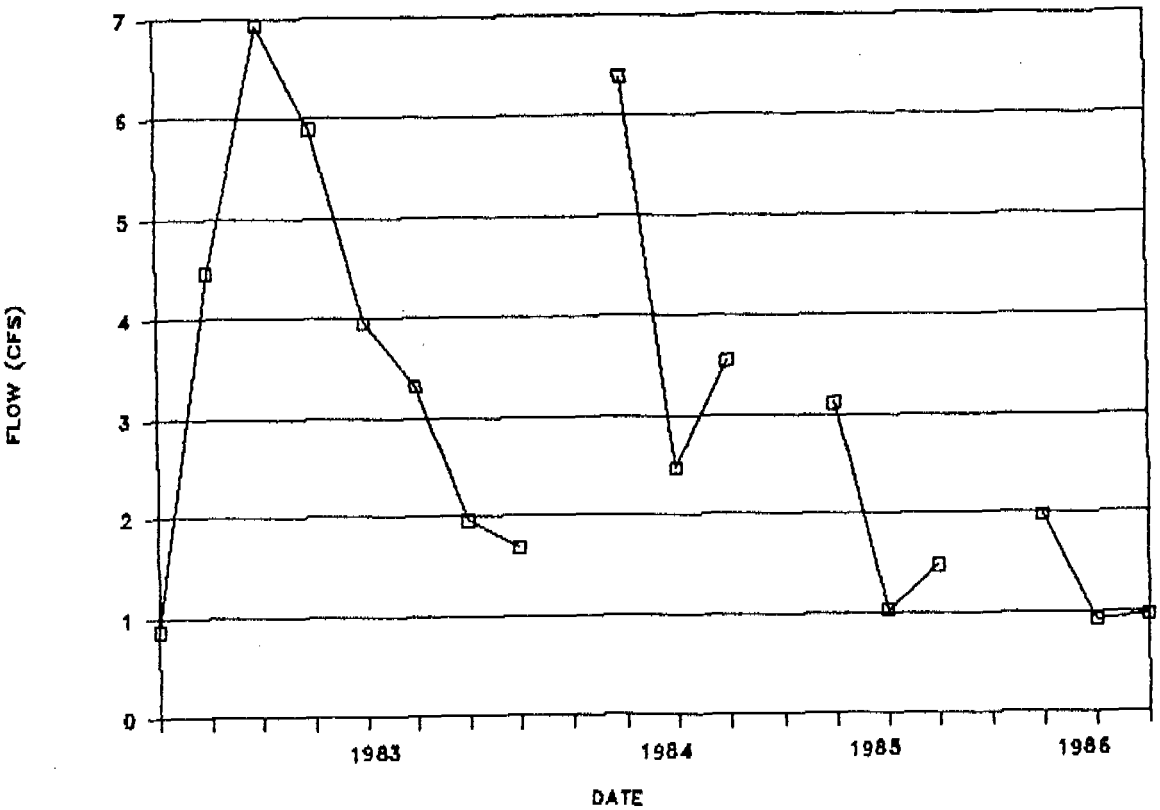
FLOW - SITE-022



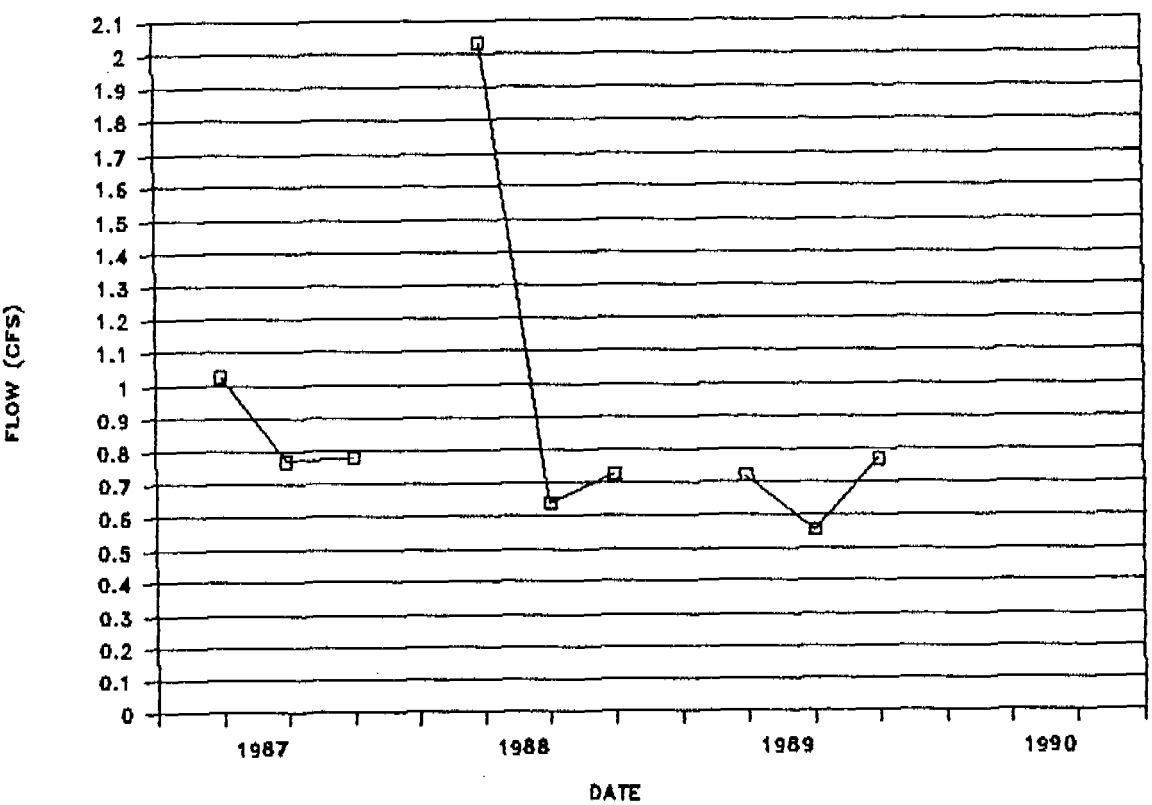

FLOW - SITE-030
0.1
0
FLOW (CFS)
1983
1984
1985
1986
DATE

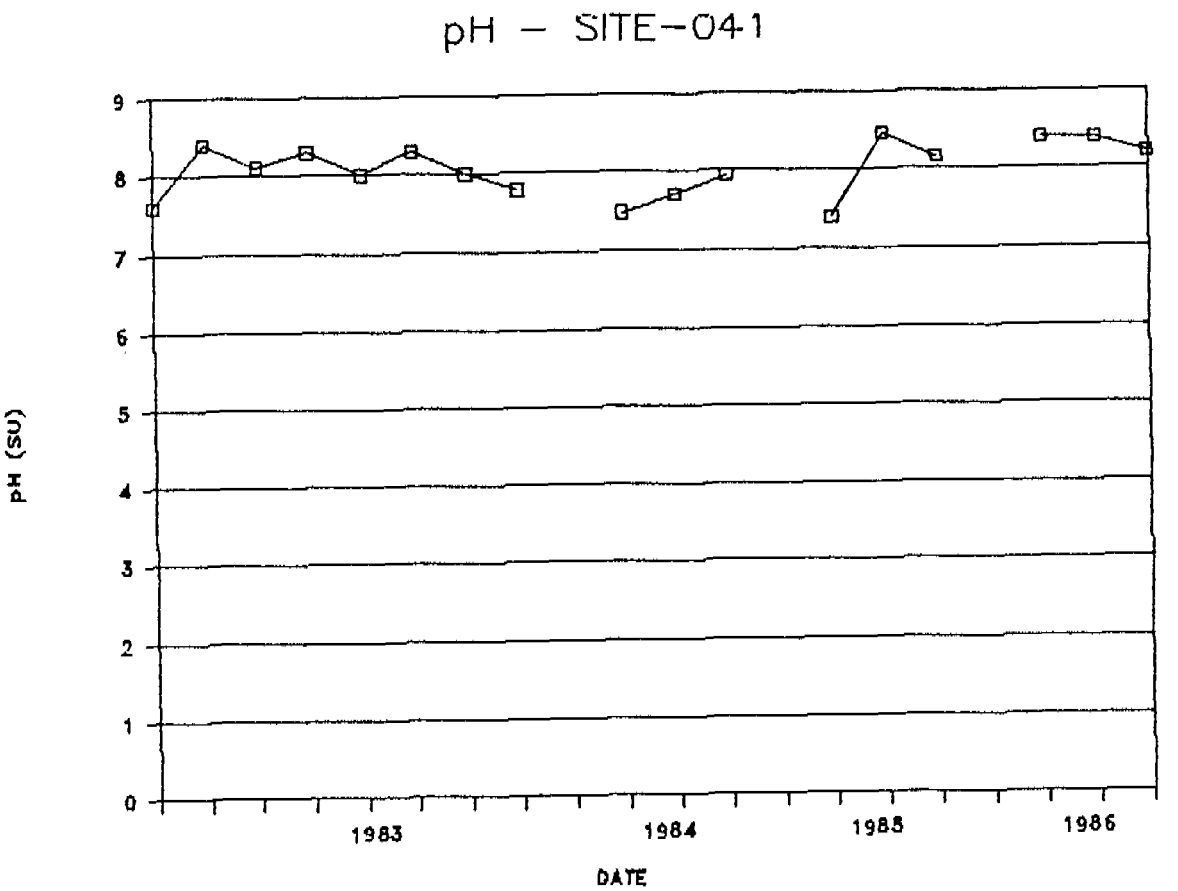

FLOW - SITE-030
0.1
0
FLOW (CFS)
1987
1988
1989
1990
DATE

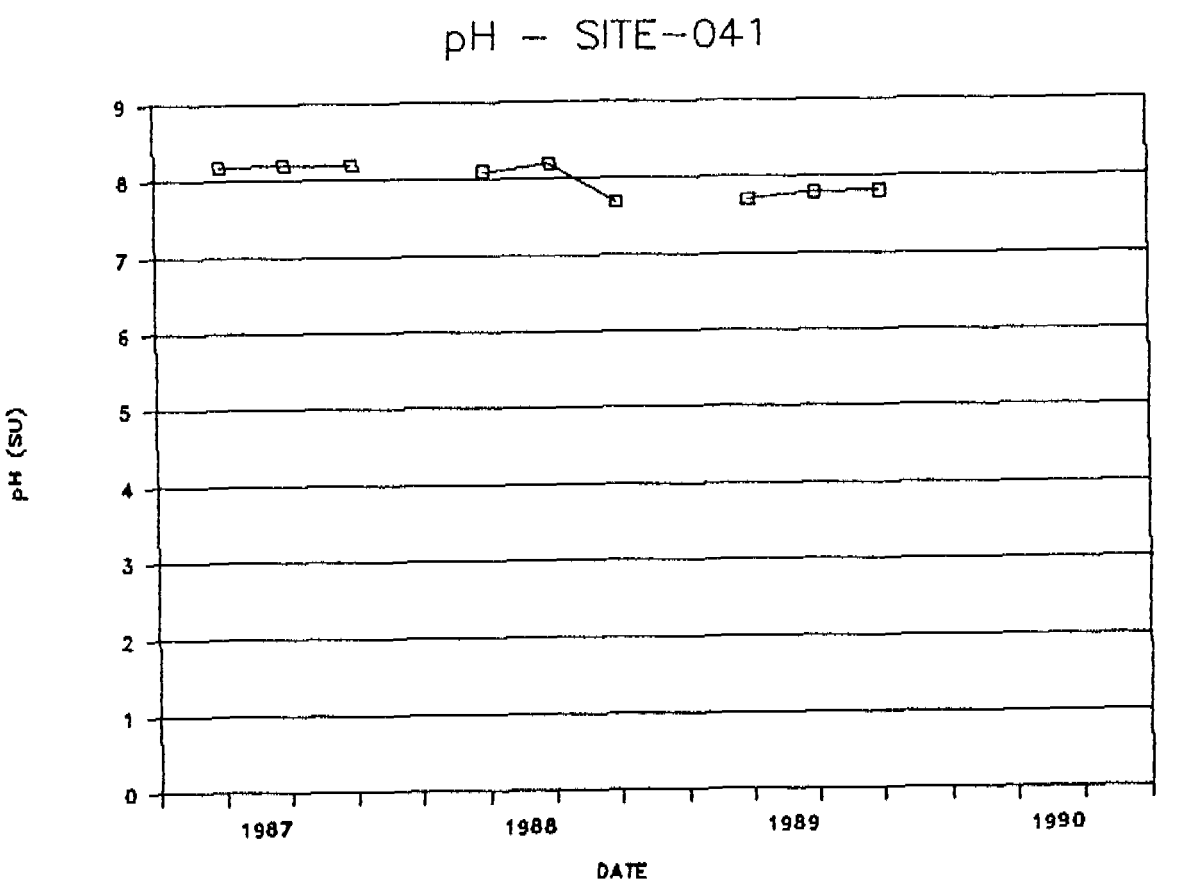
FLOW - SITE-041



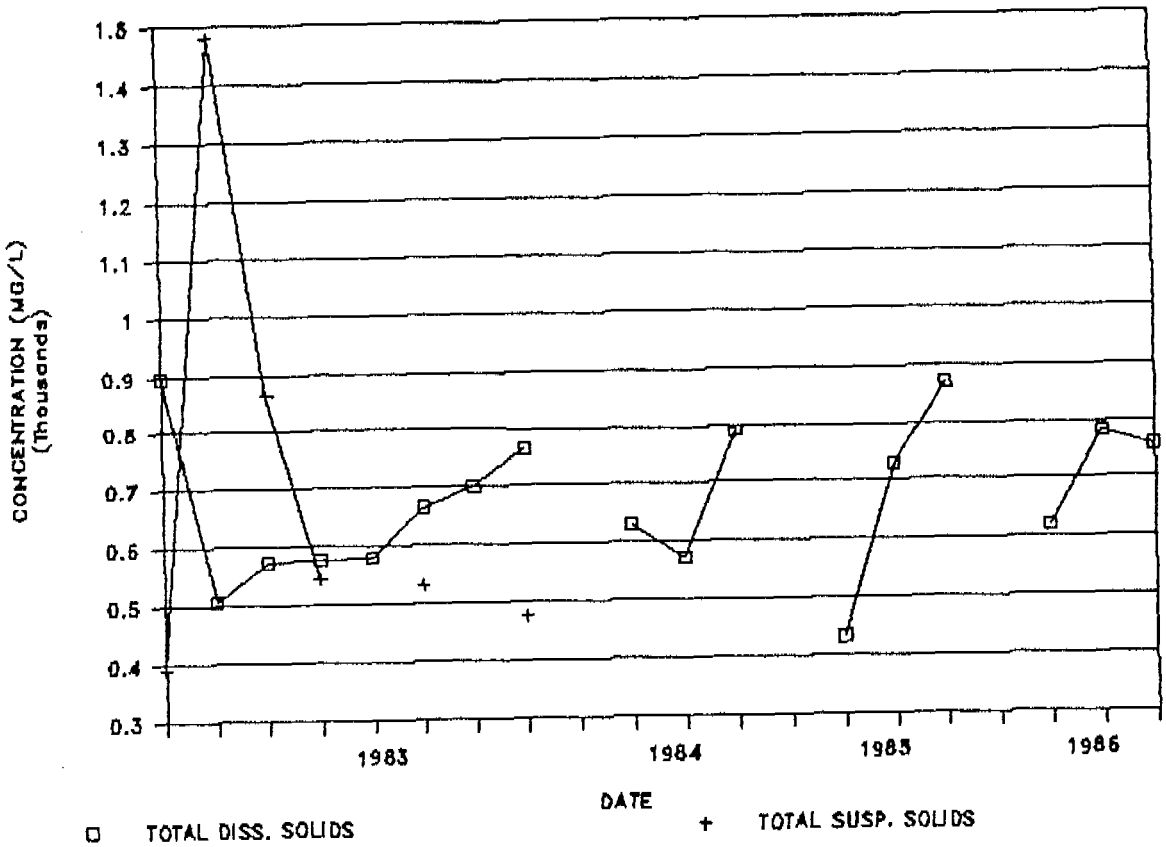
FLOW - SITE-041



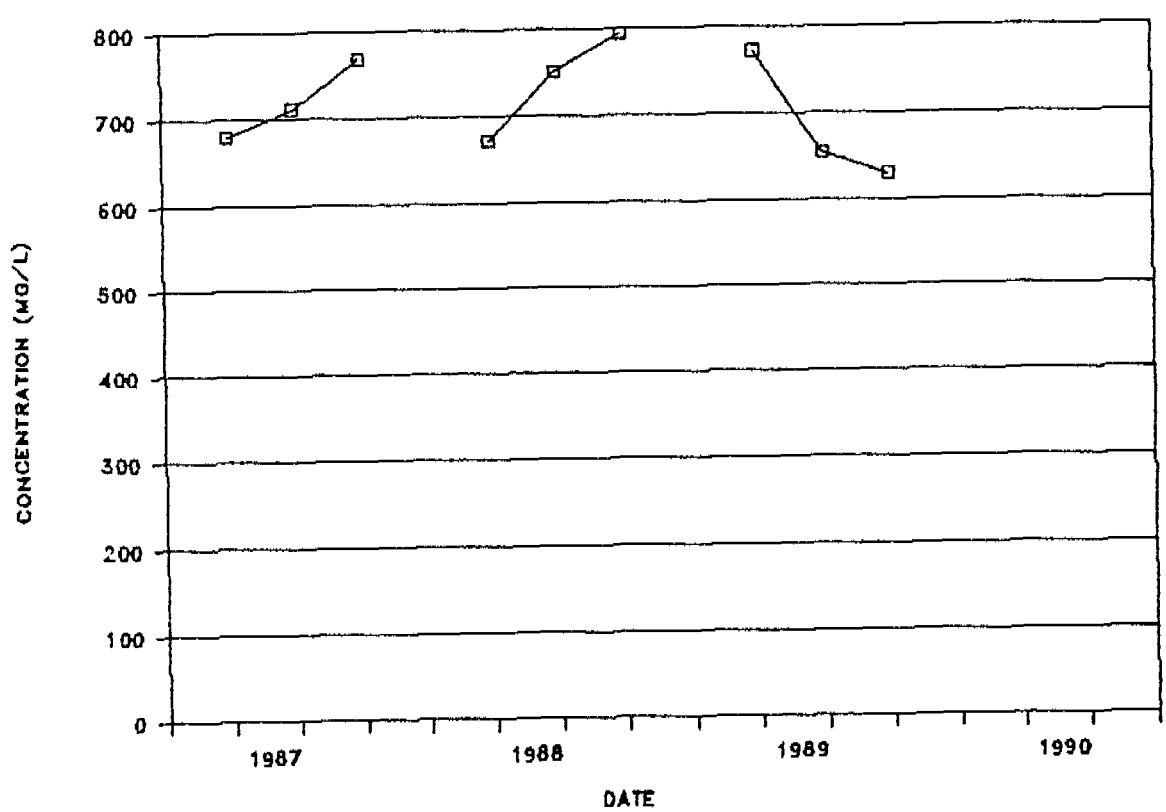

pH - SITE-041
pH (SU)
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
DATE

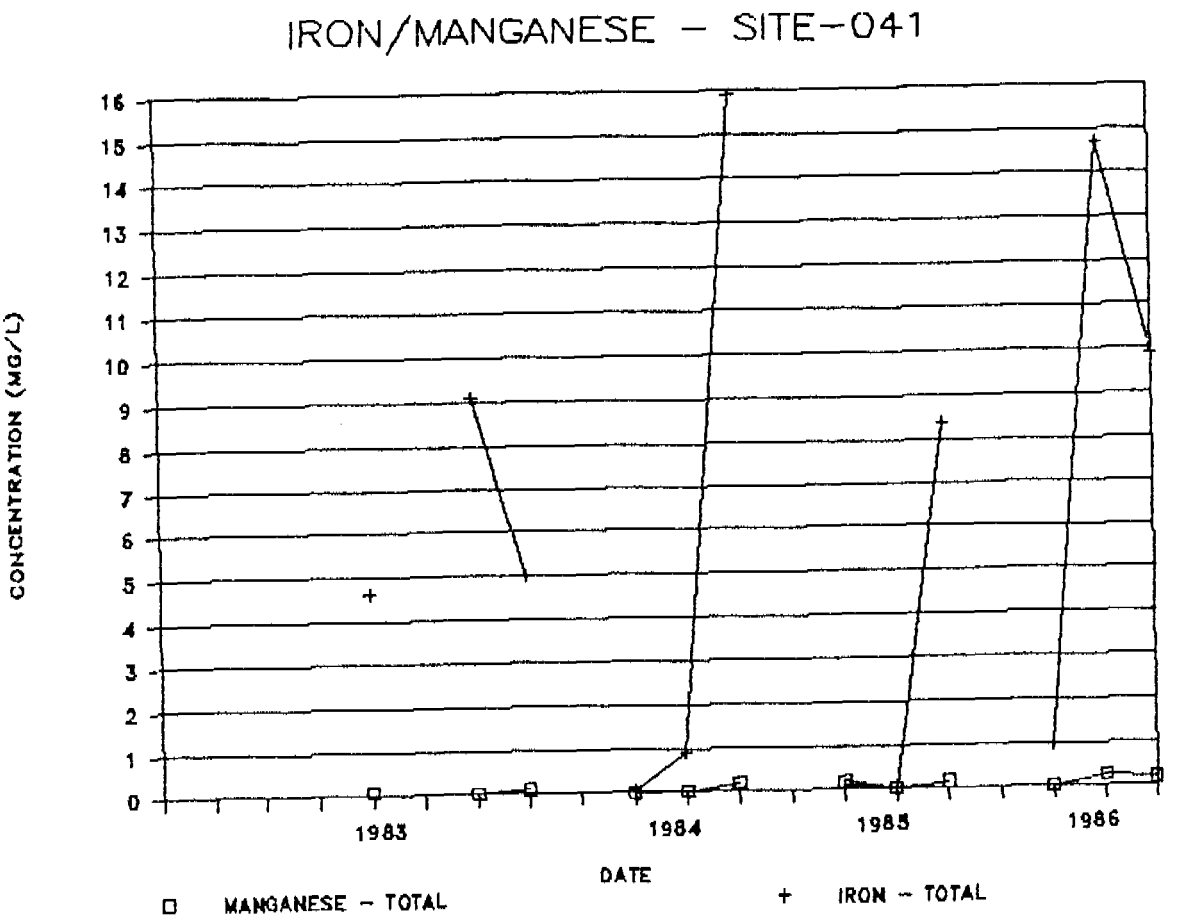

pH - SITE-041
pH (SU)
9
8
7
6
5
4
3
2
1
0
1987
1988
1989
1990
DATE

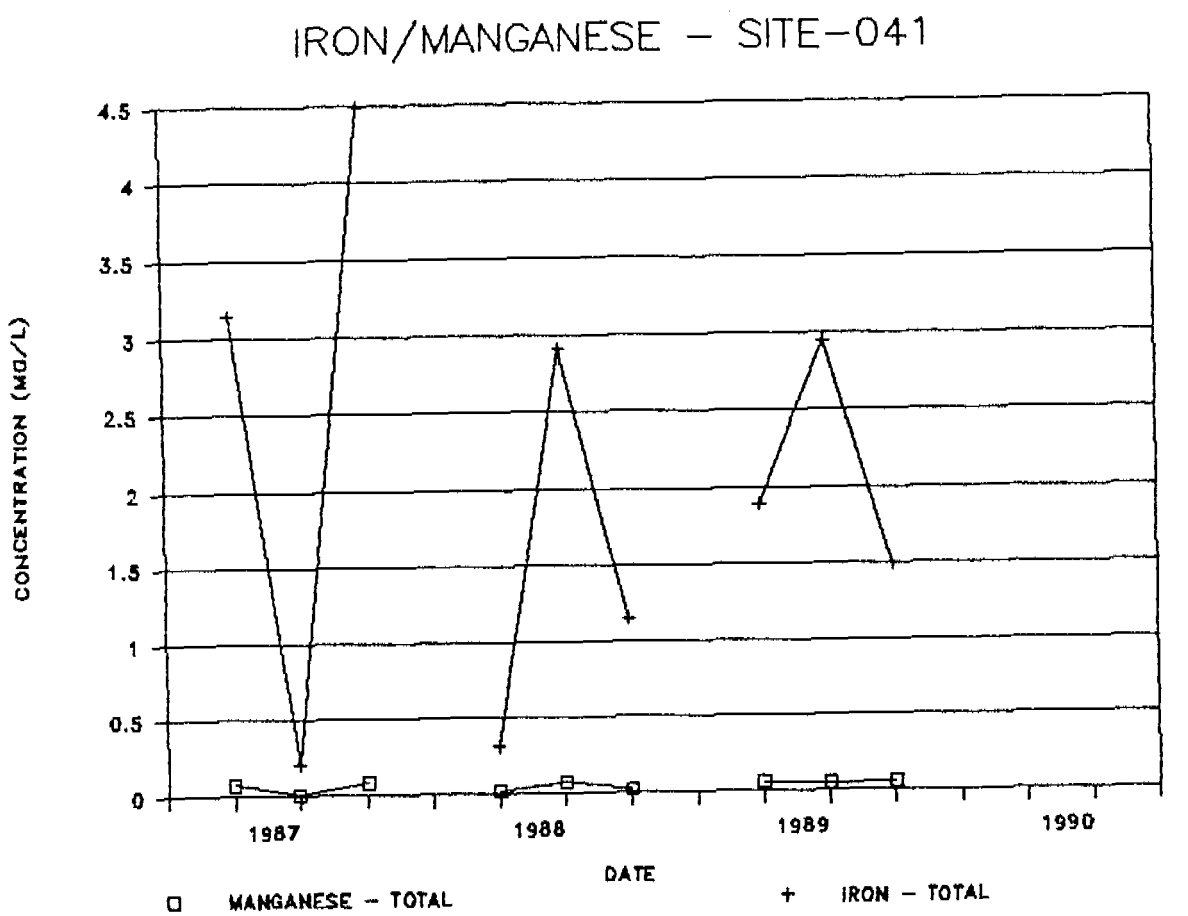
SOLIDS – SITE–041

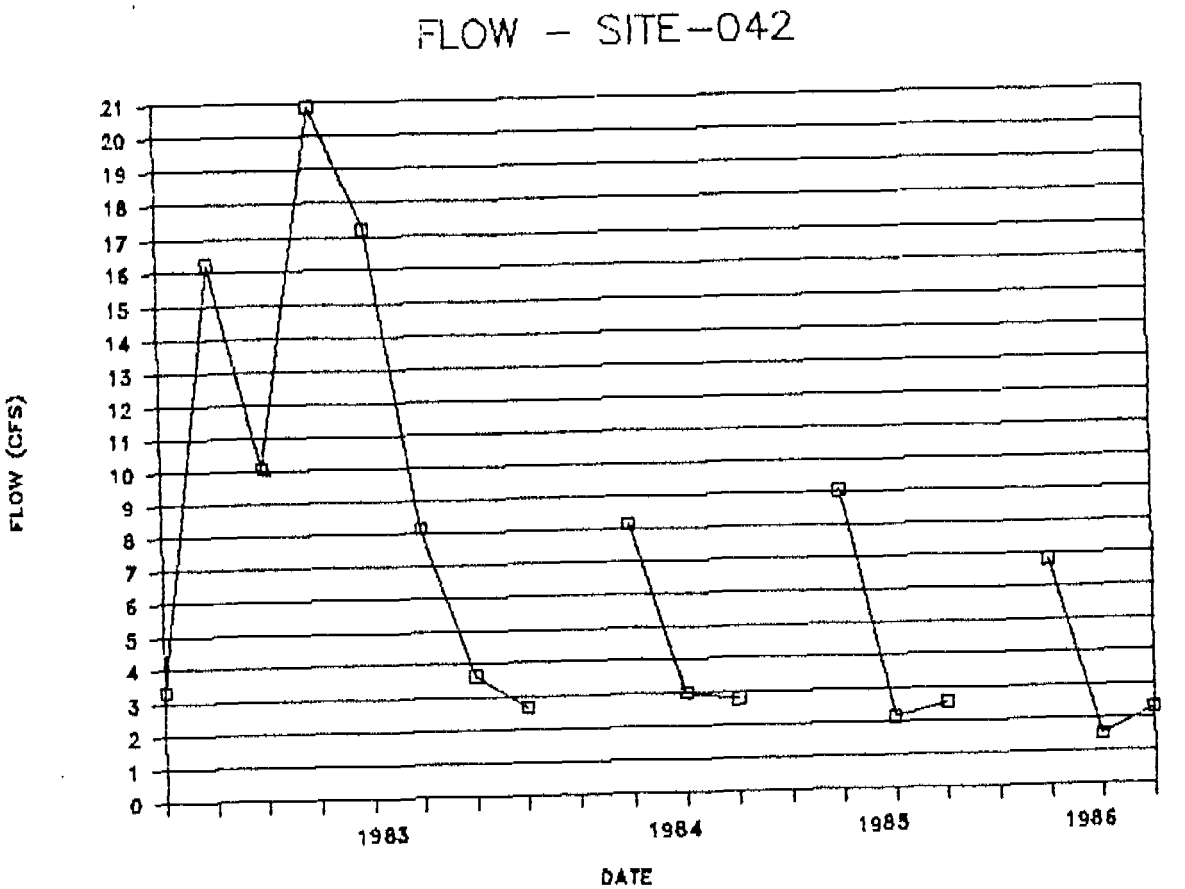


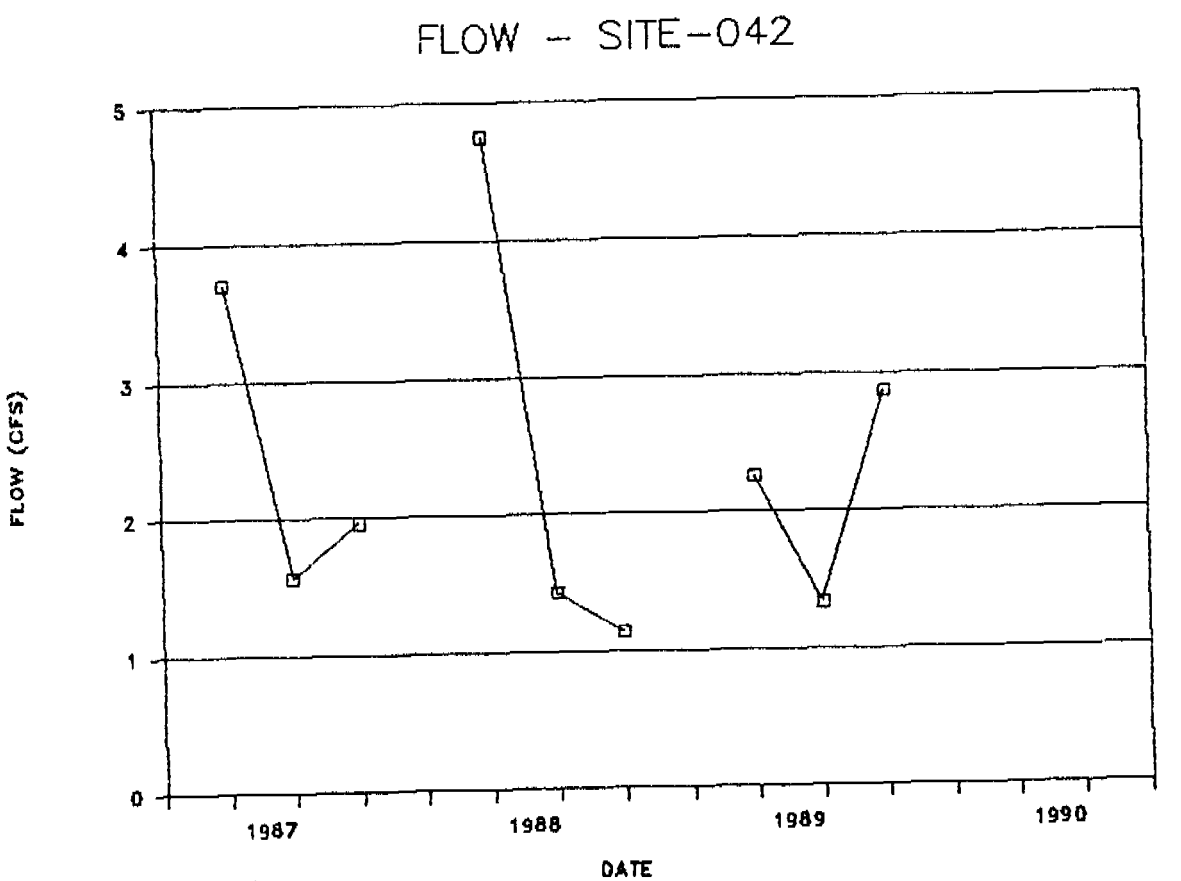
TOTAL DISS. SOLIDS – SITE–041



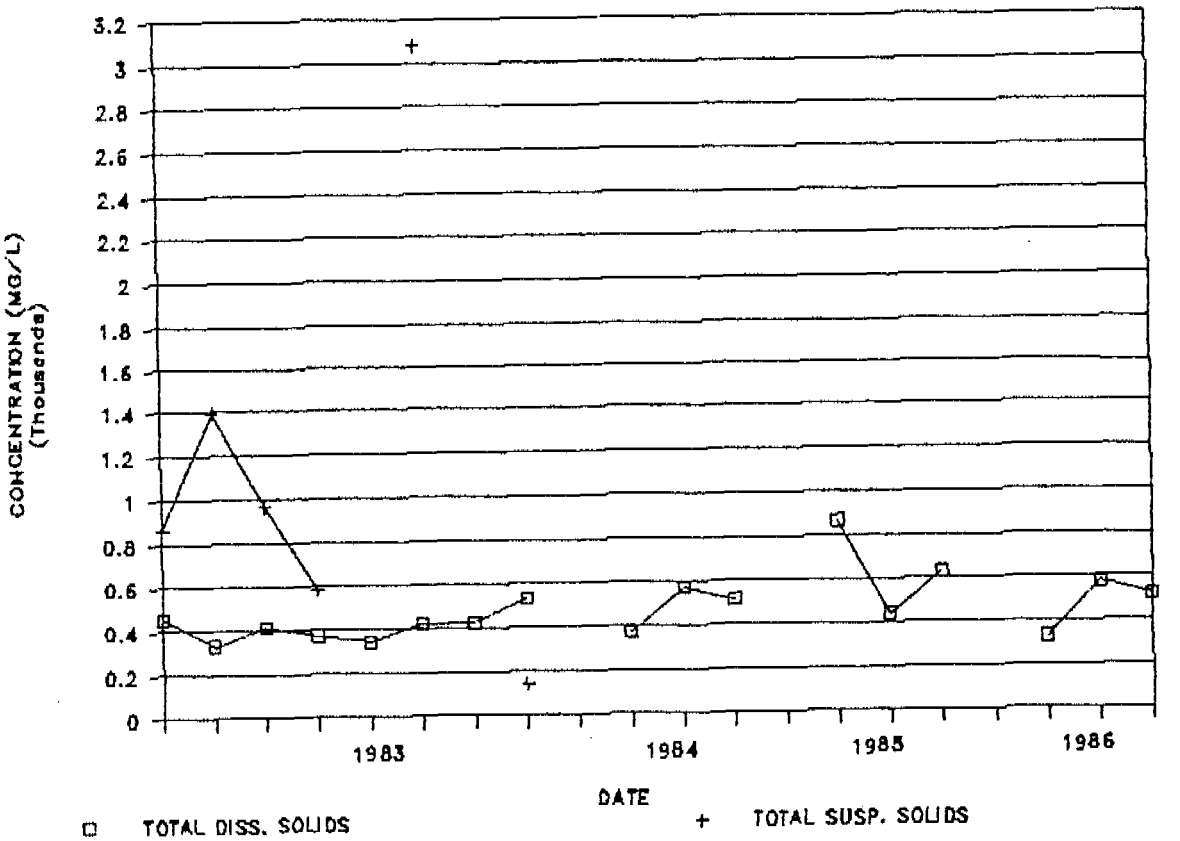

IRON/MANGANESE - SITE-041
CONCENTRATION (MG/L)
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL


IRON/MANGANESE - SITE-041
CONCENTRATION (MG/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

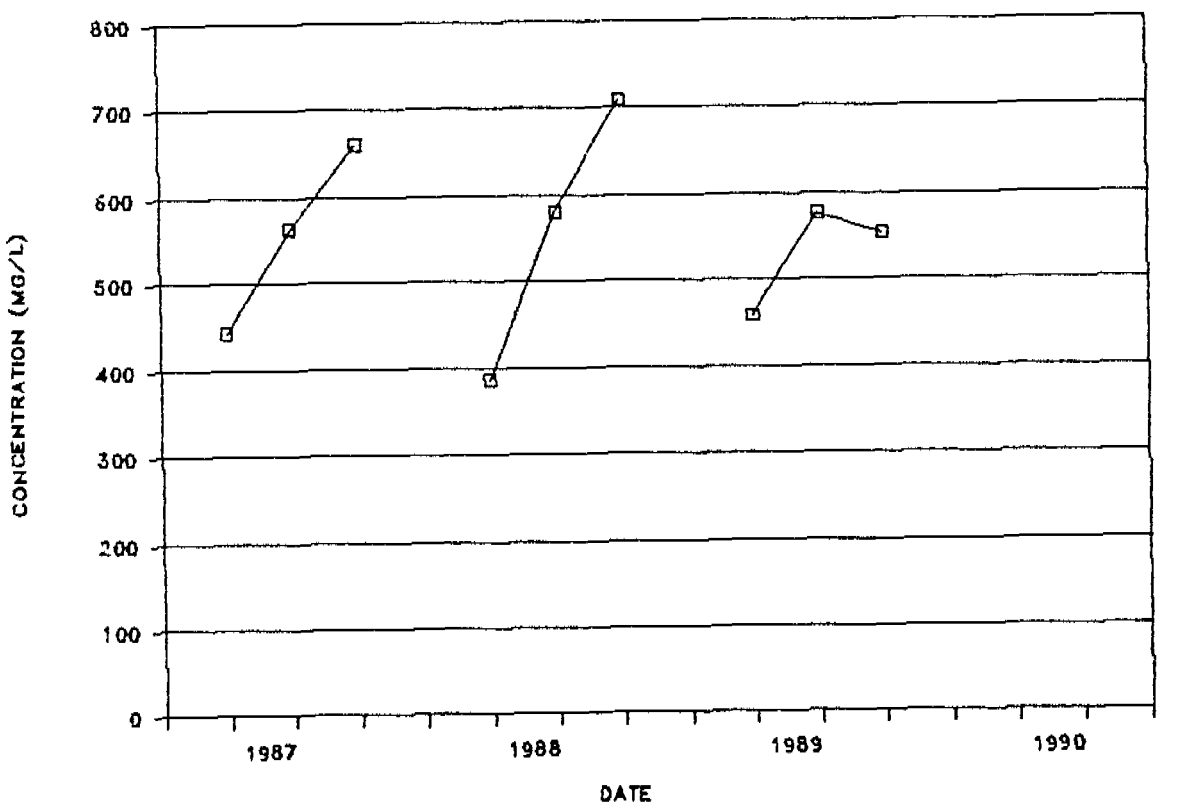

FLOW - SITE-042
FLOW (CFS)
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
DATE

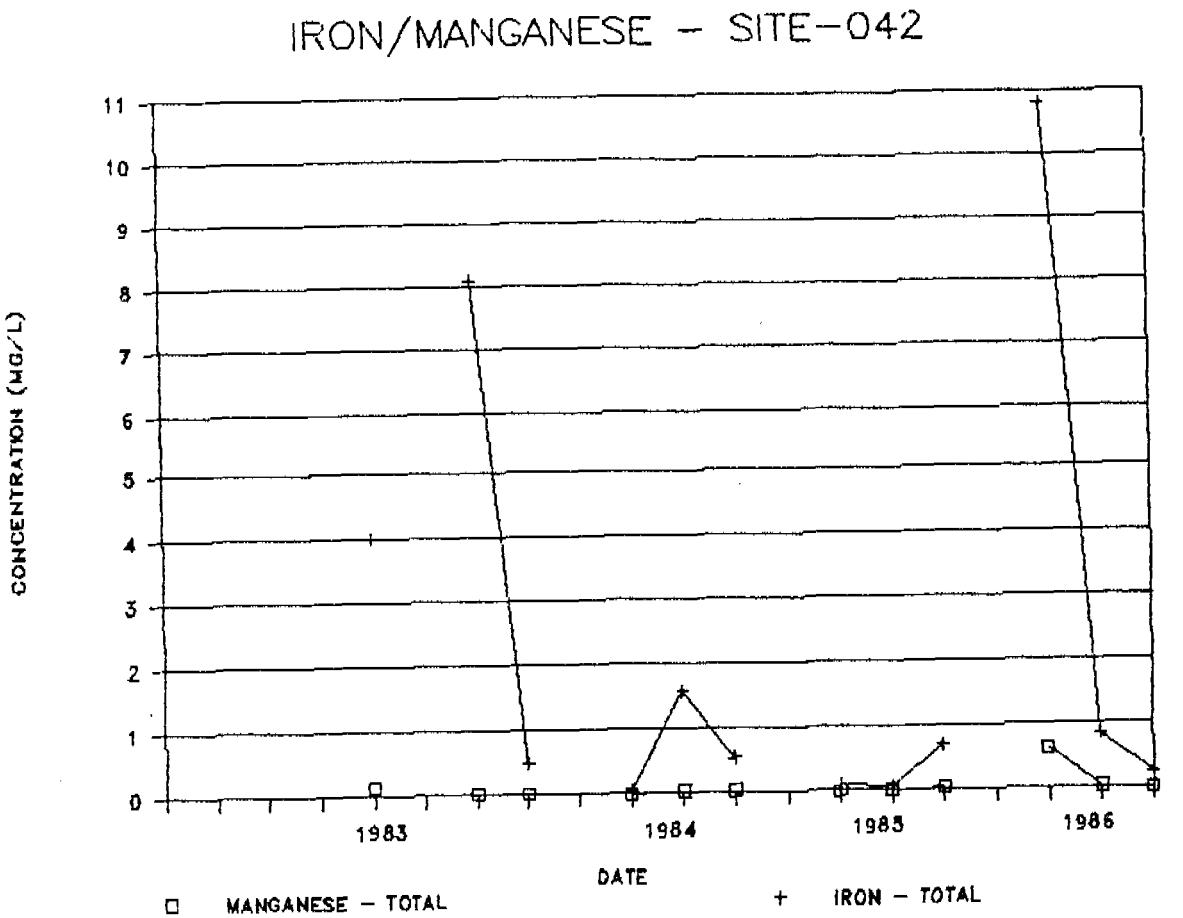

FLOW - SITE-042
FLOW (CFS)
5
4
3
2
1
0
1987
1988
1989
1990
DATE

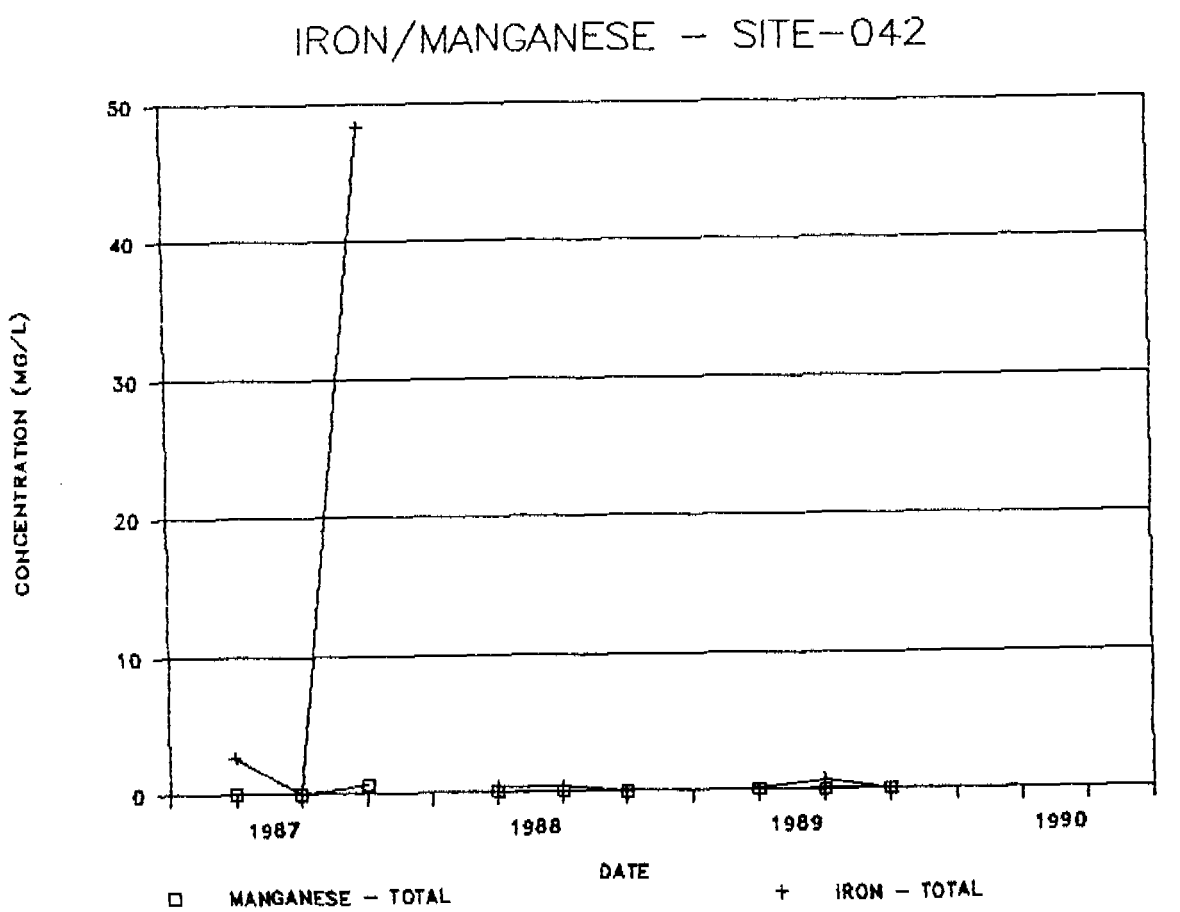
SOLIDS - SITE-042



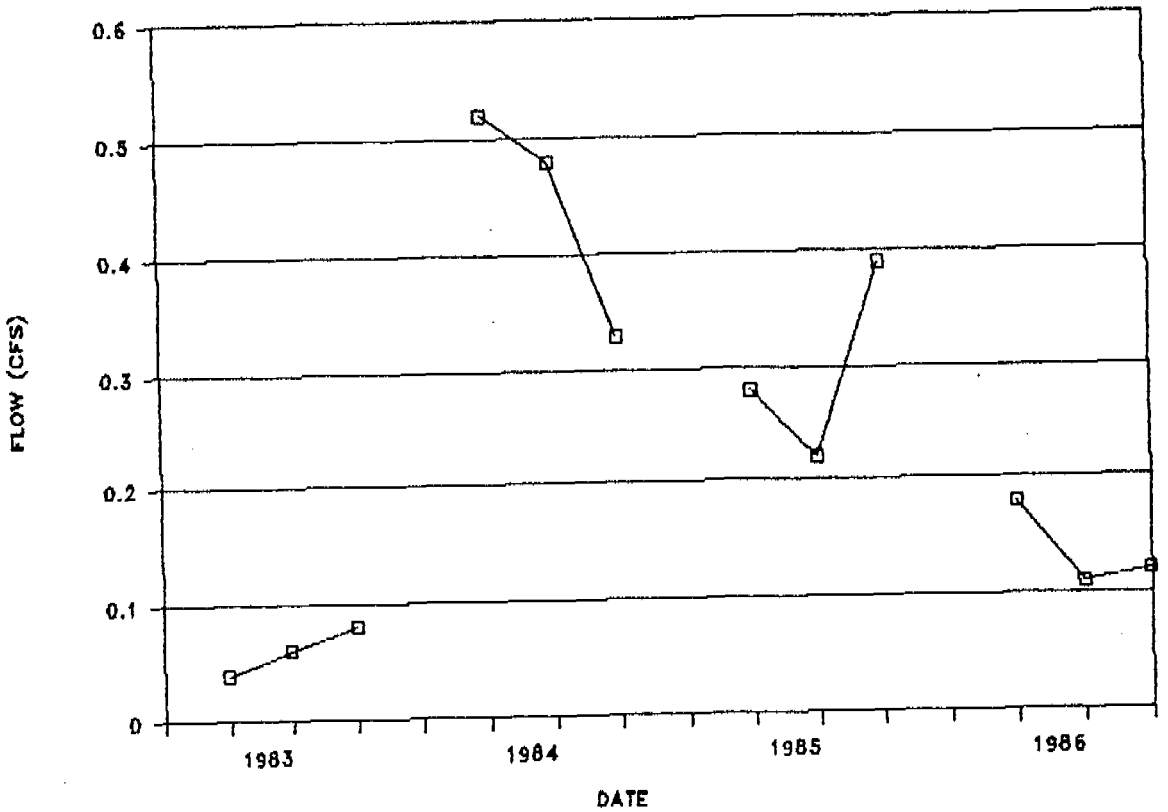
TOTAL DISS. SOLIDS - SITE-042



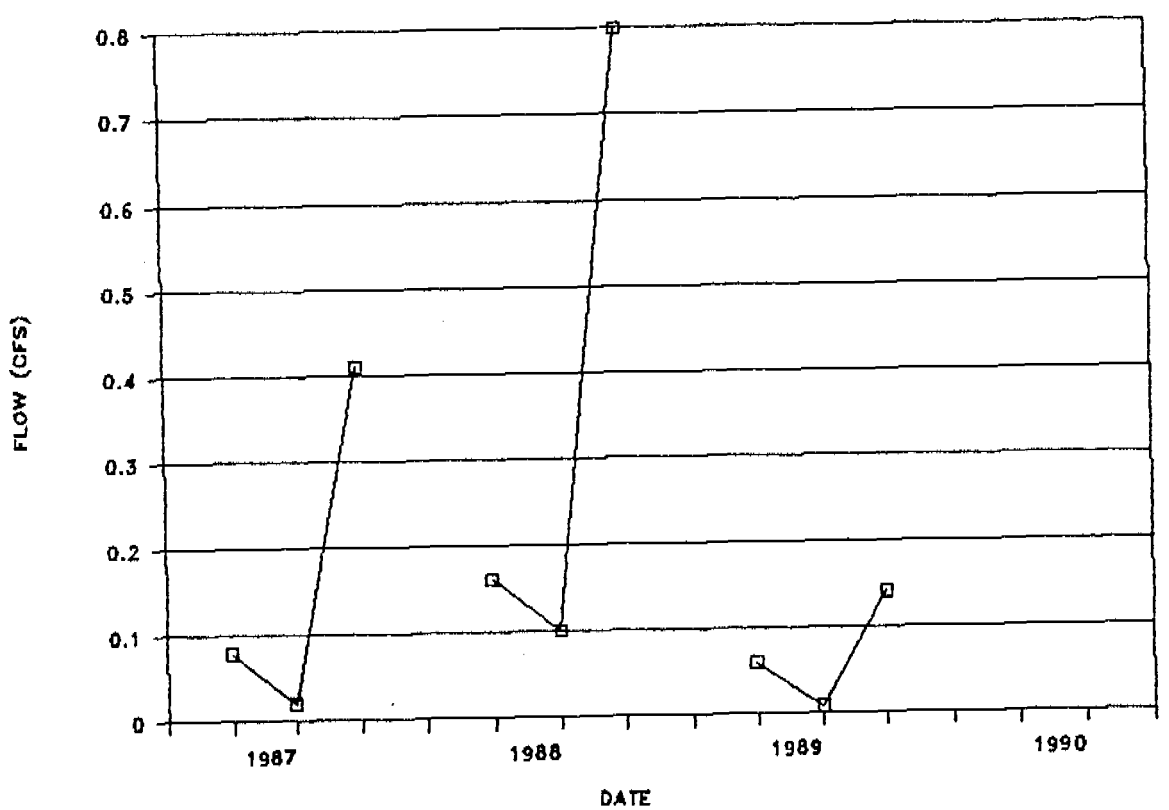

IRON/MANGANESE - SITE-042
CONCENTRATION (MG/L)
11
10
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL

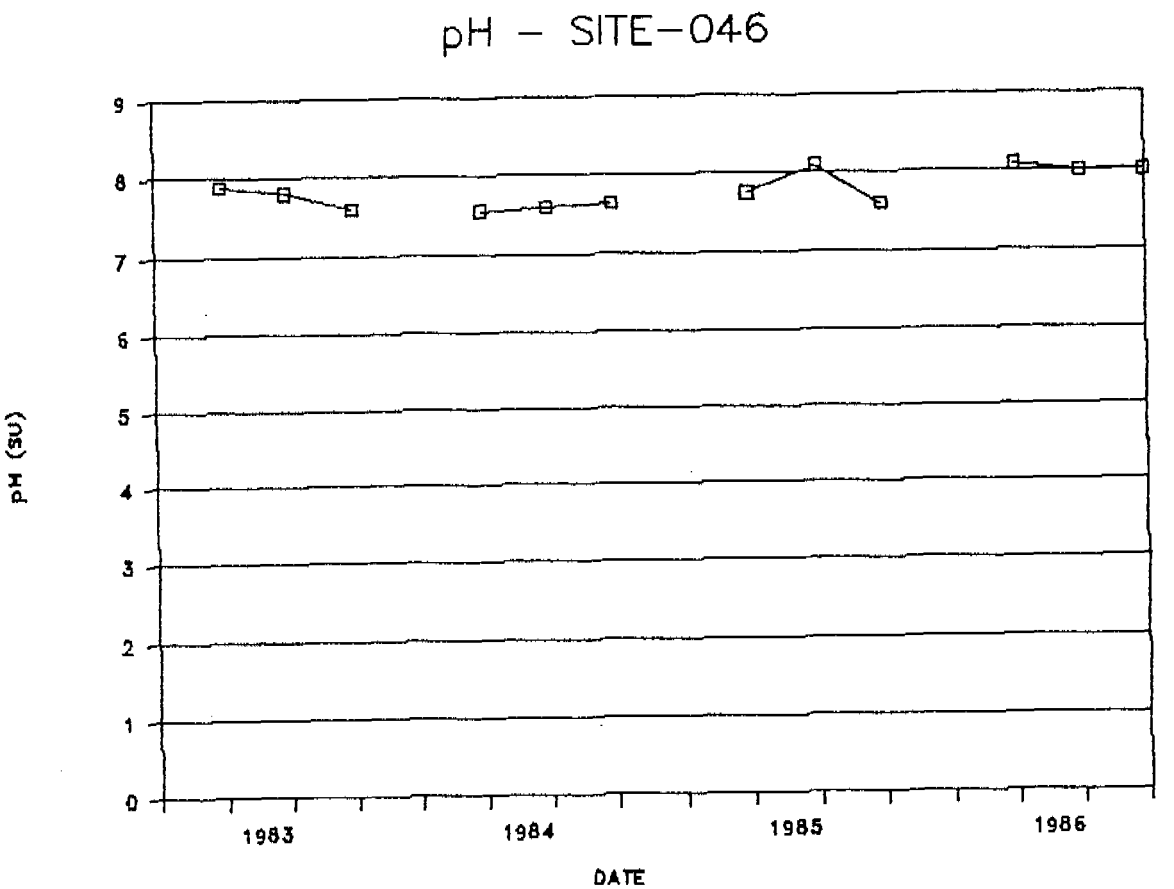

IRON/MANGANESE - SITE-042
CONCENTRATION (MG/L)
50
40
30
20
10
0
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

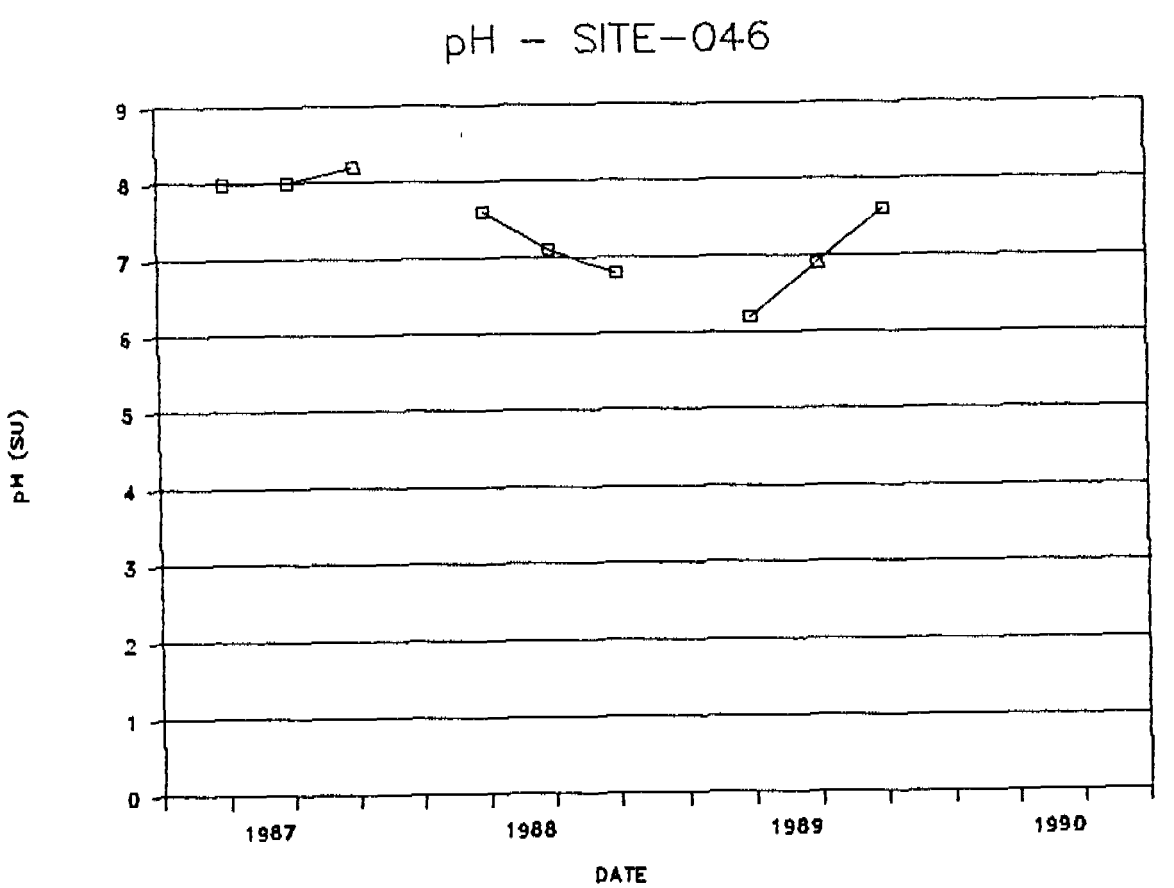
FLOW - SITE-046

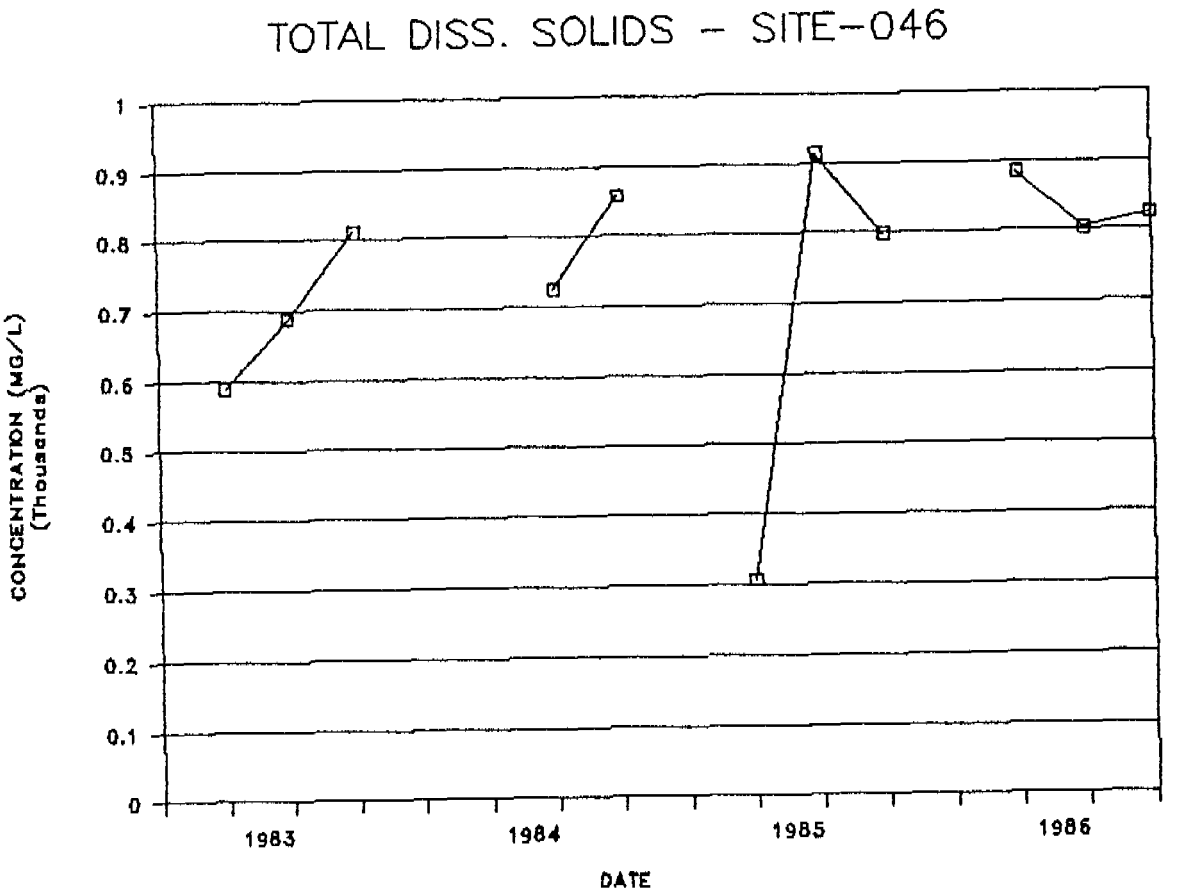


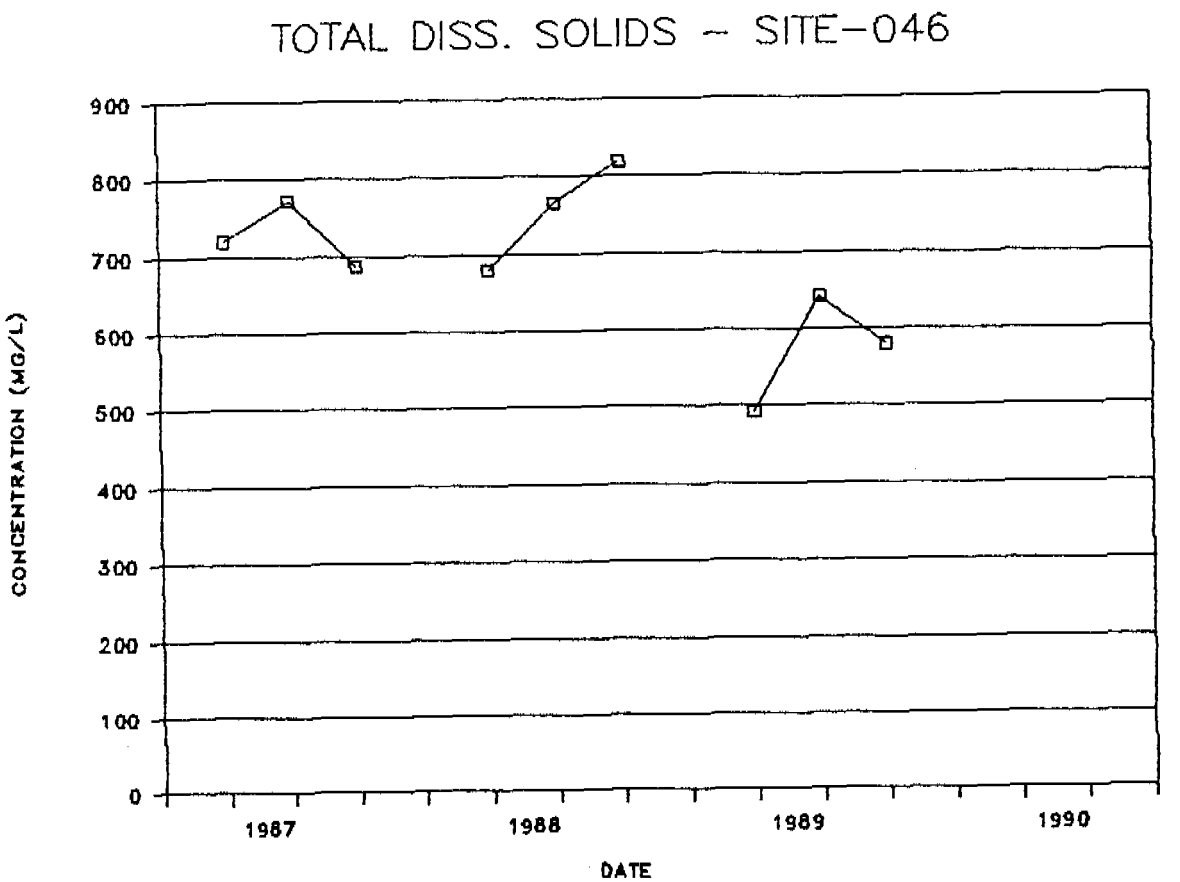
FLOW - SITE-046

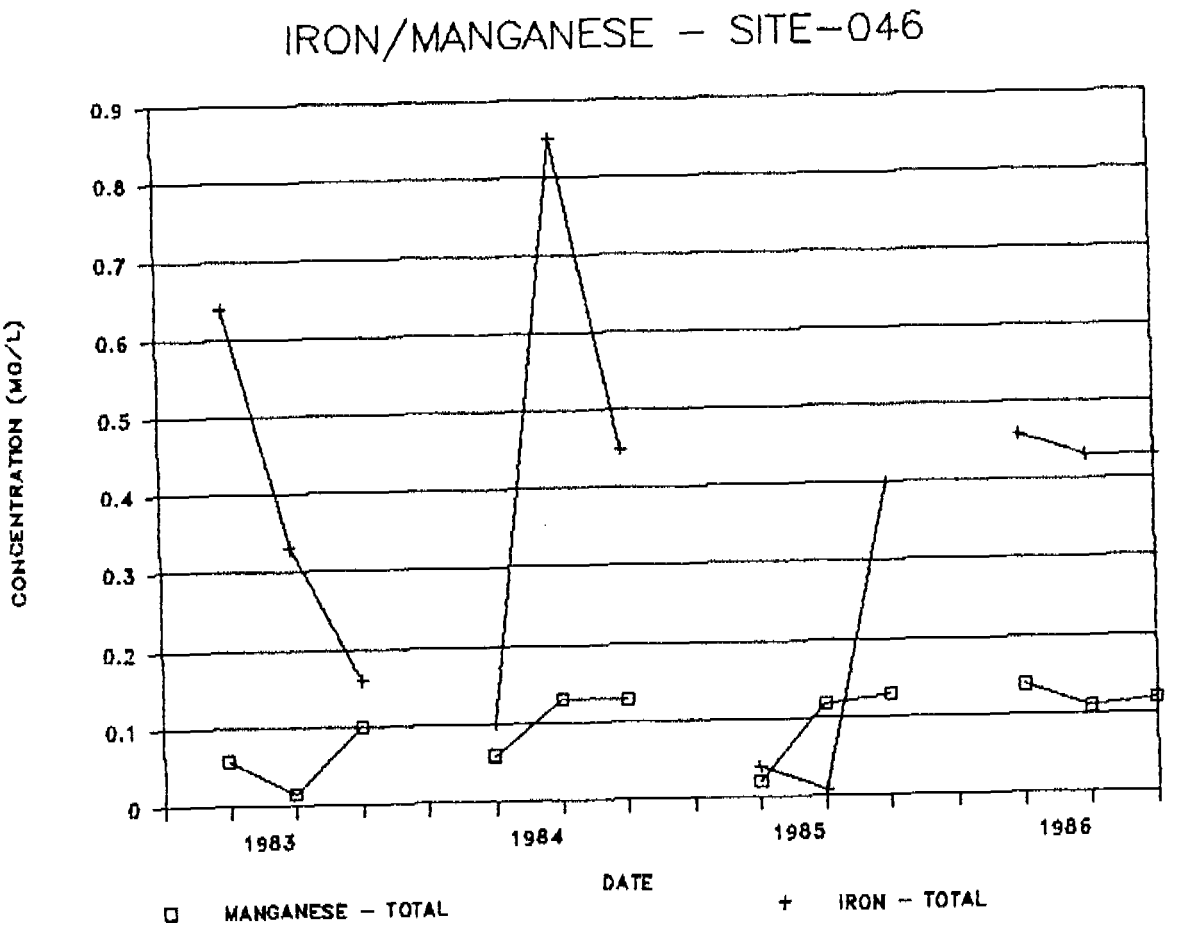


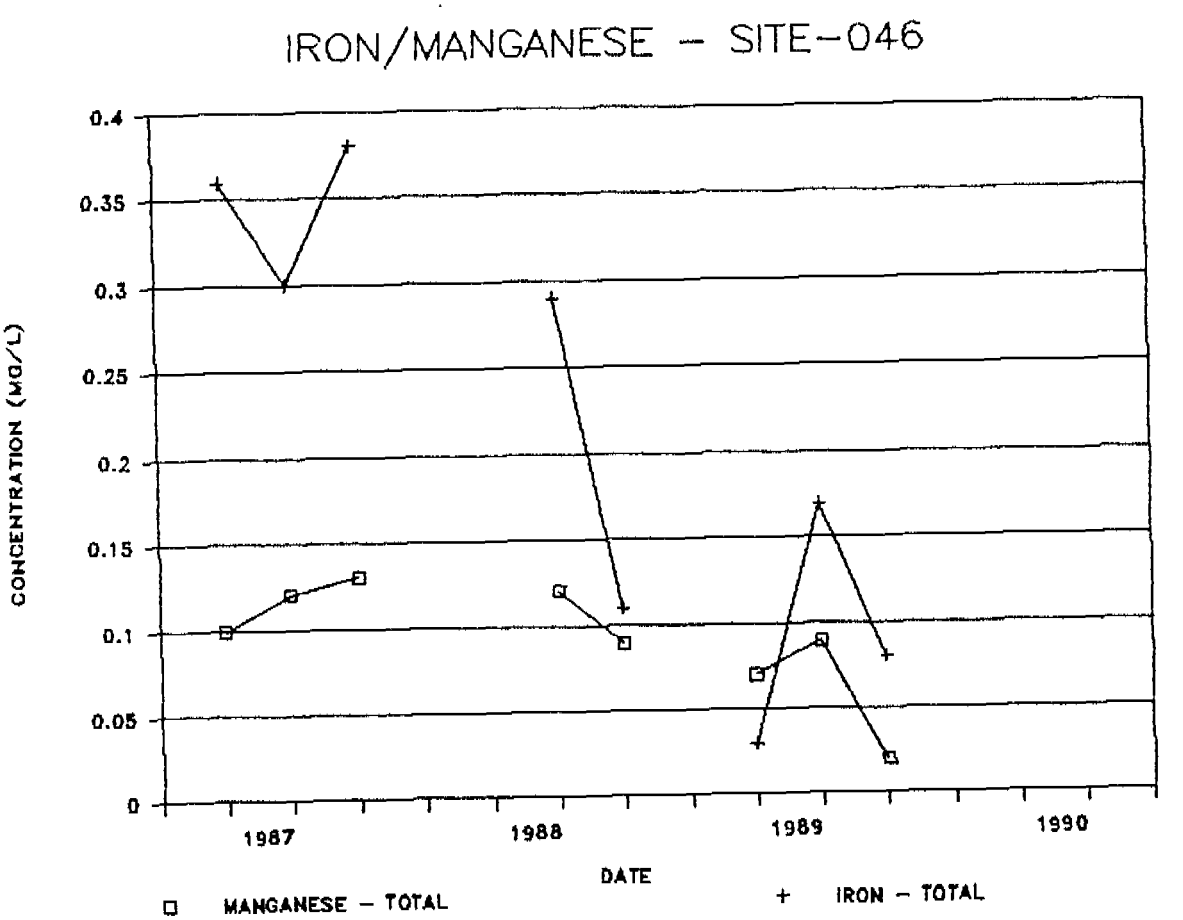

pH - SITE-046
pH (SU)
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
DATE

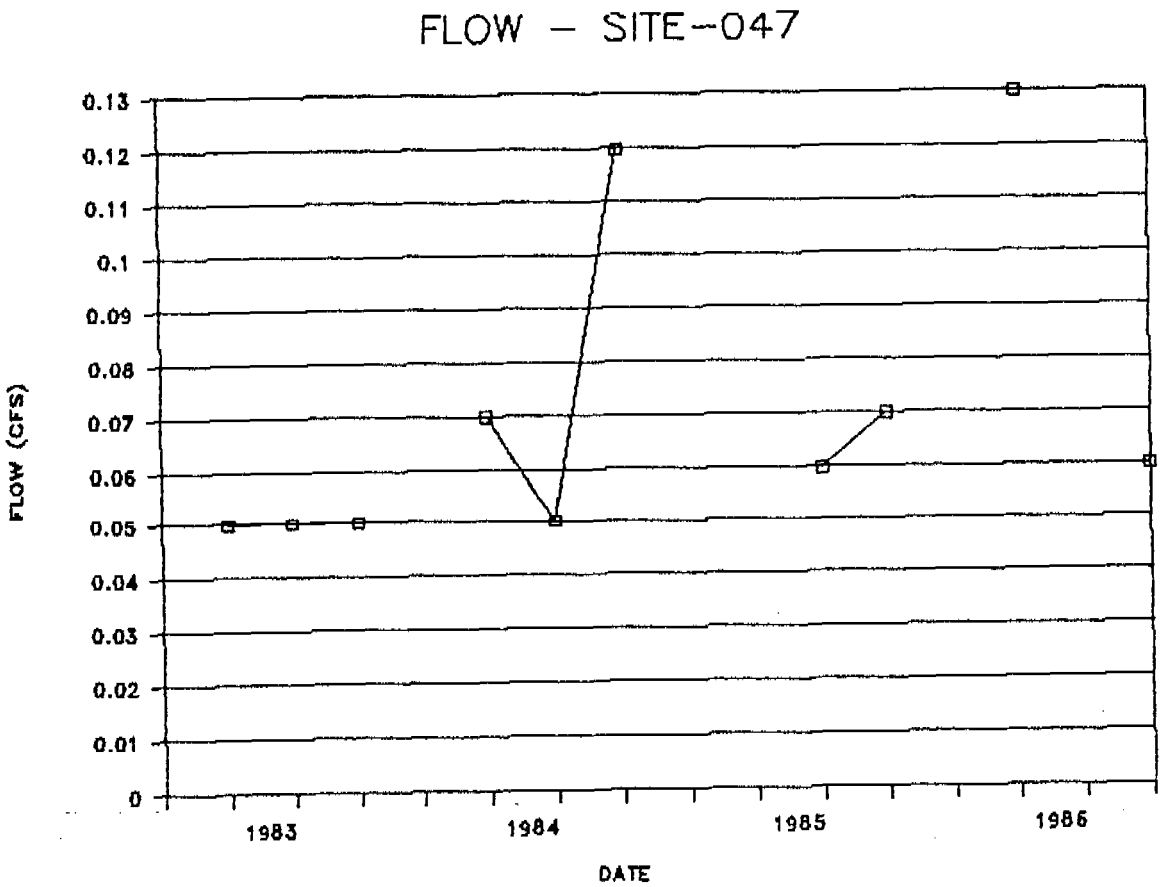

pH - SITE-046
pH (SU)
9
8
7
6
5
4
3
2
1
0
1987
1988
1989
1990
DATE

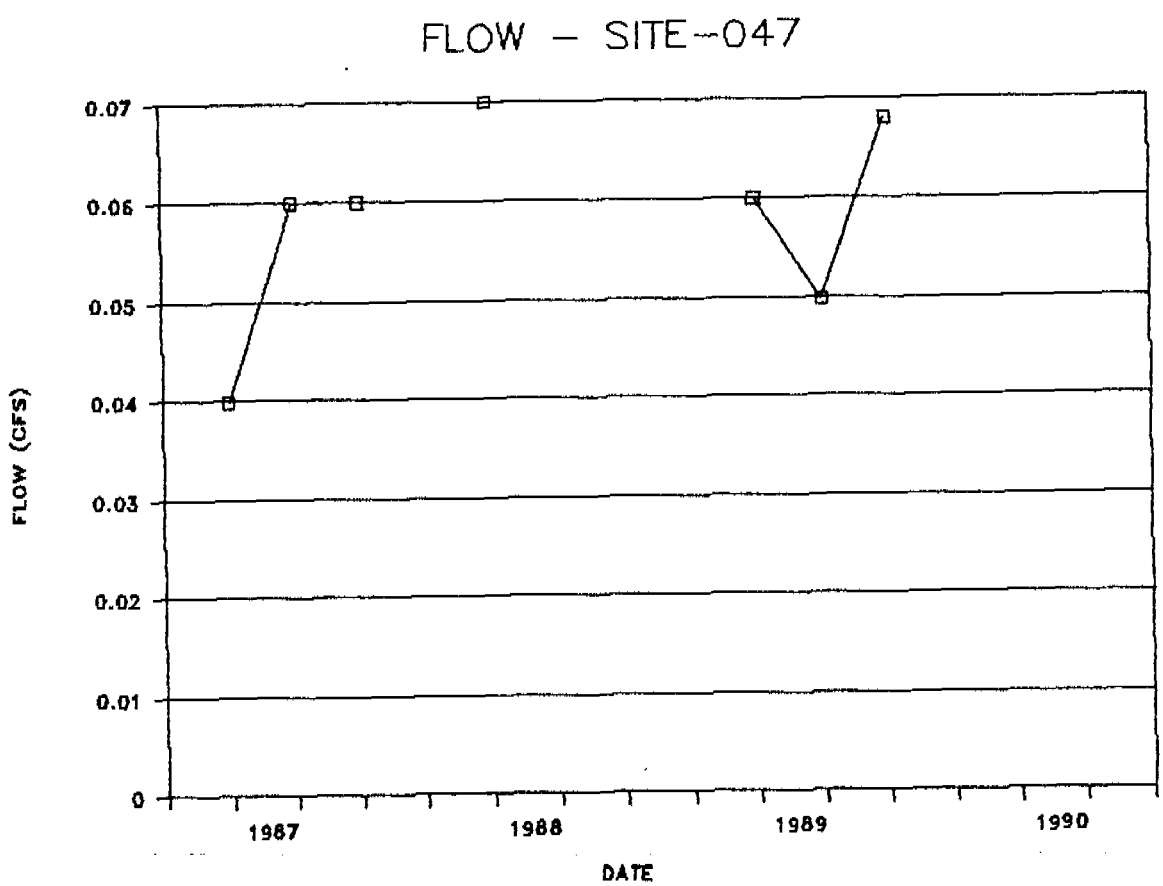

TOTAL DISS. SOLIDS - SITE-046
CONCENTRATION (MG/L)
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1983
1984
1985
1986
DATE

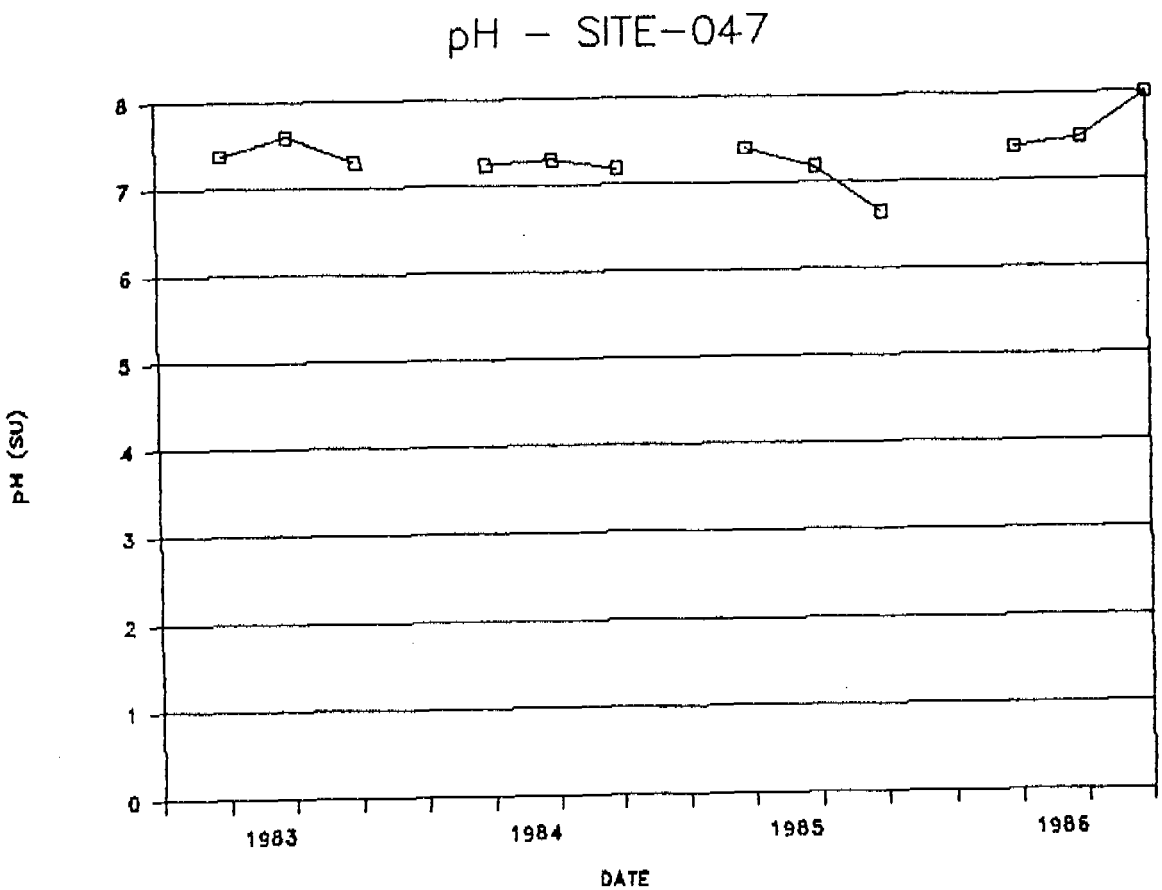

TOTAL DISS. SOLIDS - SITE-046
CONCENTRATION (MG/L)
900
800
700
600
500
400
300
200
100
0
1987
1988
1989
1990
DATE

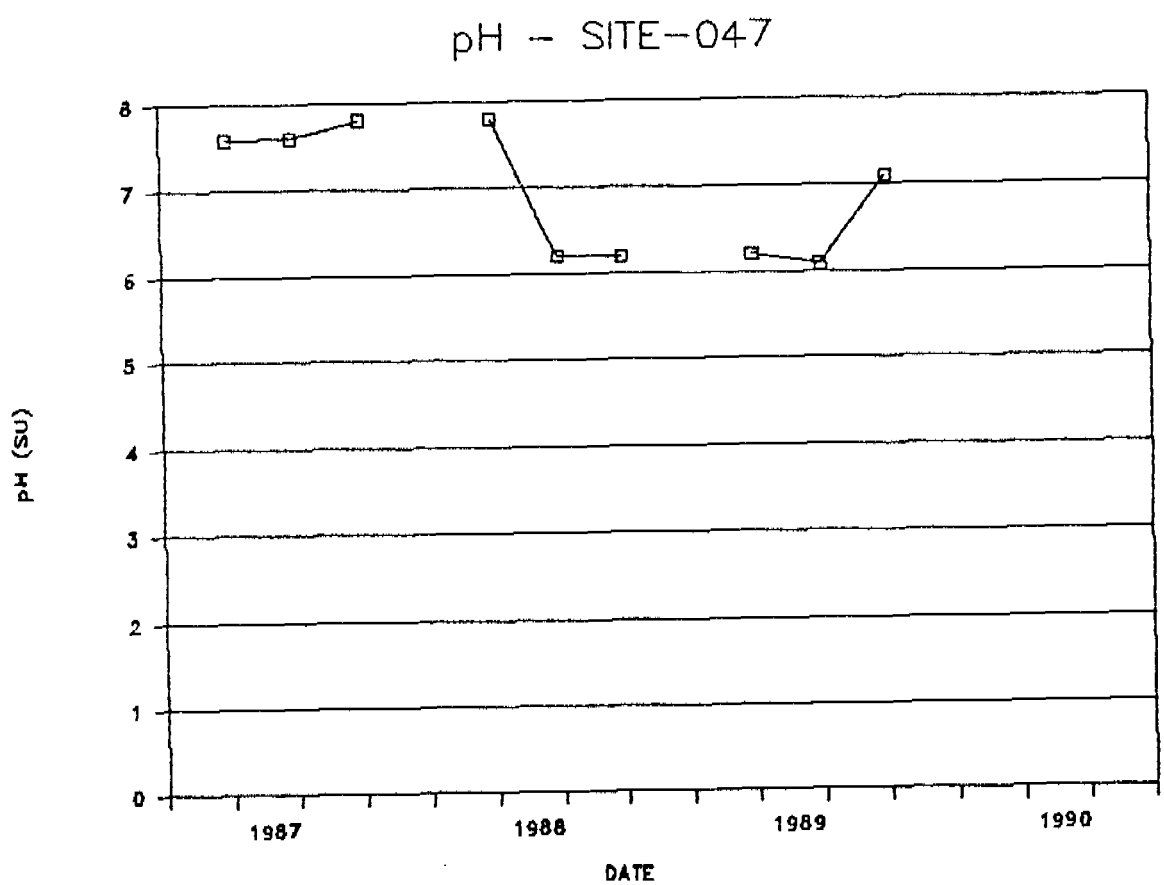

IRON/MANGANESE - SITE-046
CONCENTRATION (MG/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL

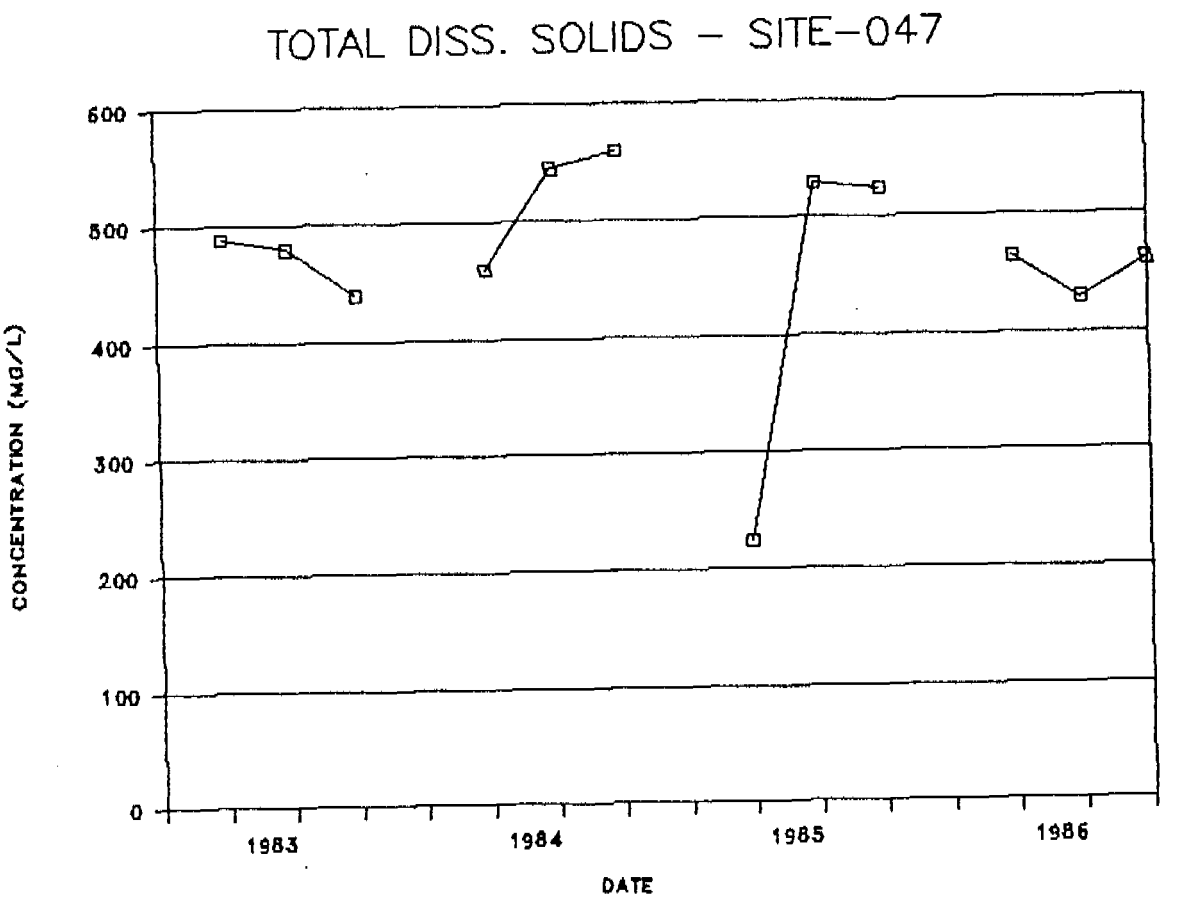

IRON/MANGANESE - SITE-046
CONCENTRATION (MG/L)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

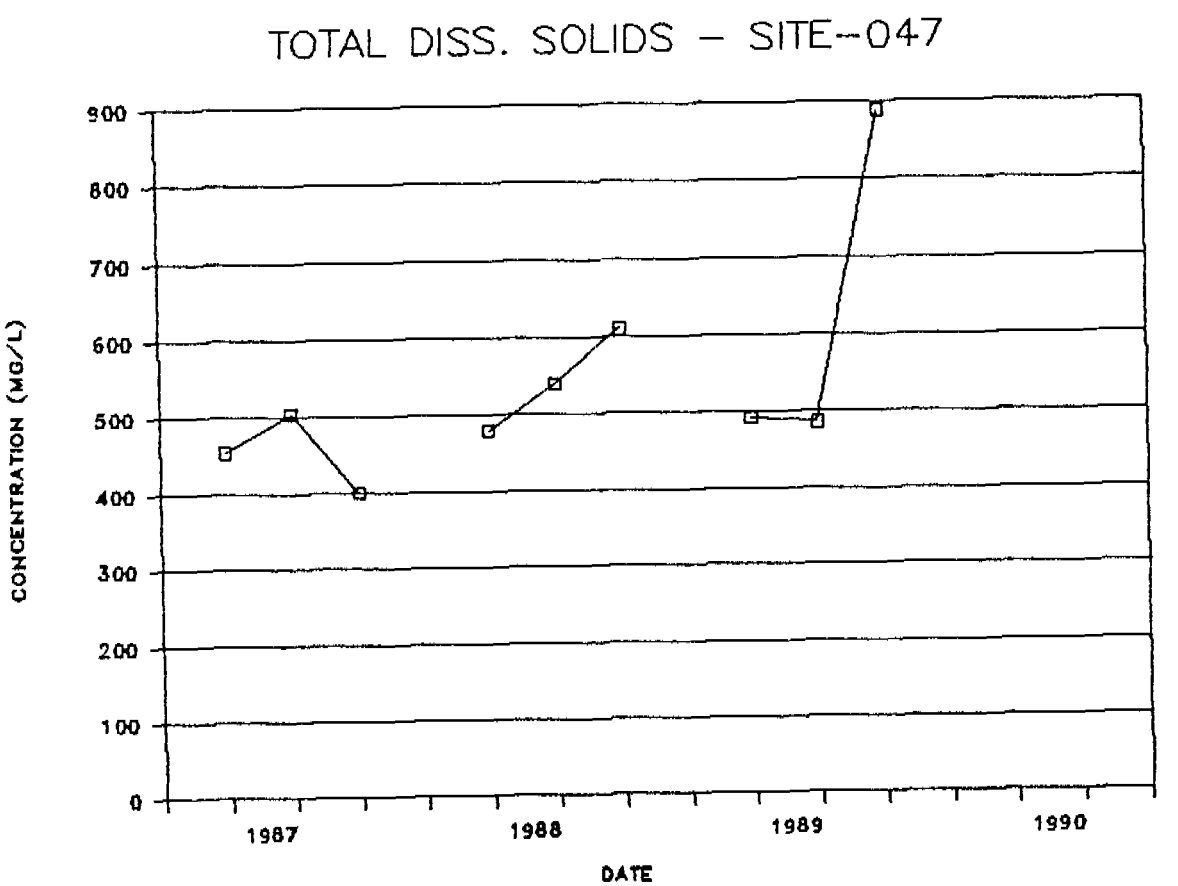

FLOW - SITE-047
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
FLOW (CFS)
1983
1984
1985
1986
DATE

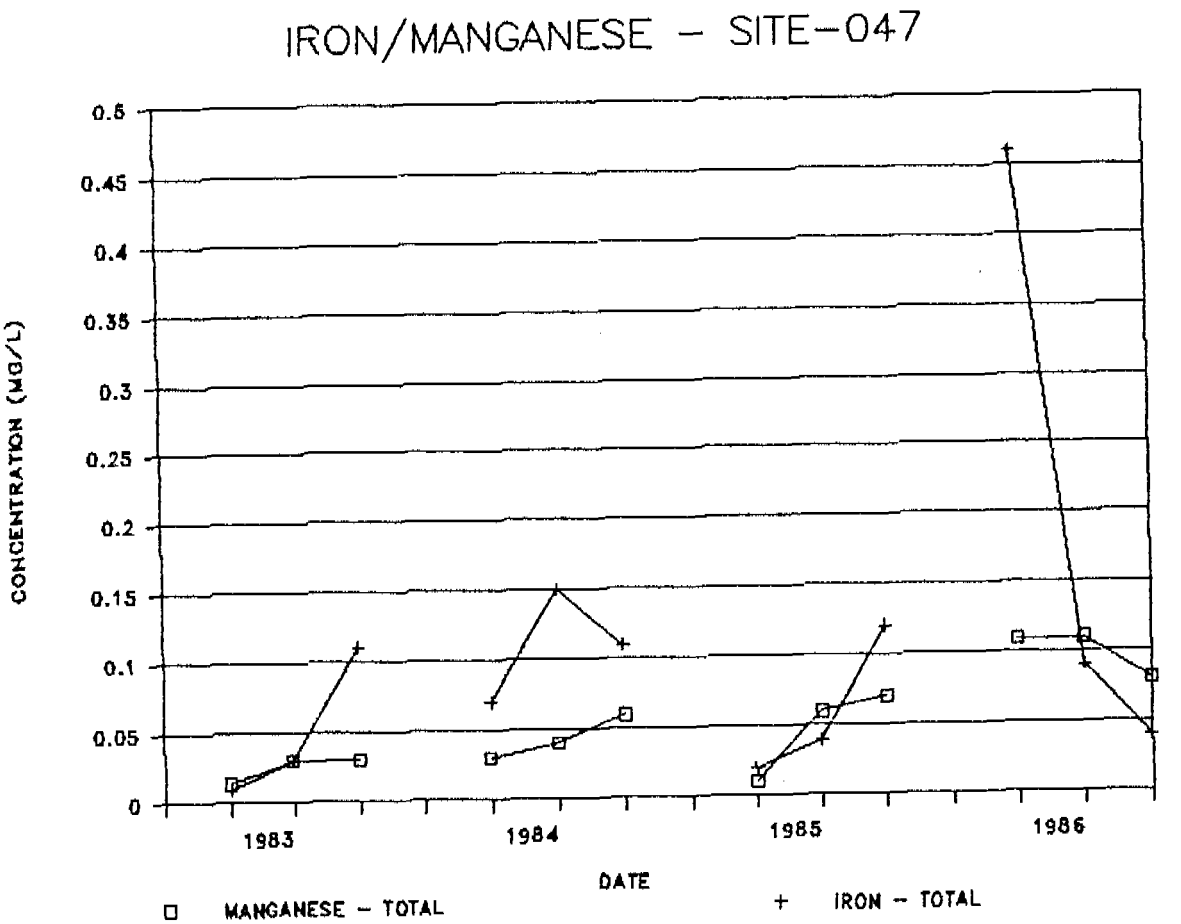

FLOW - SITE-047
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
FLOW (CFS)
1987
1988
1989
1990
DATE

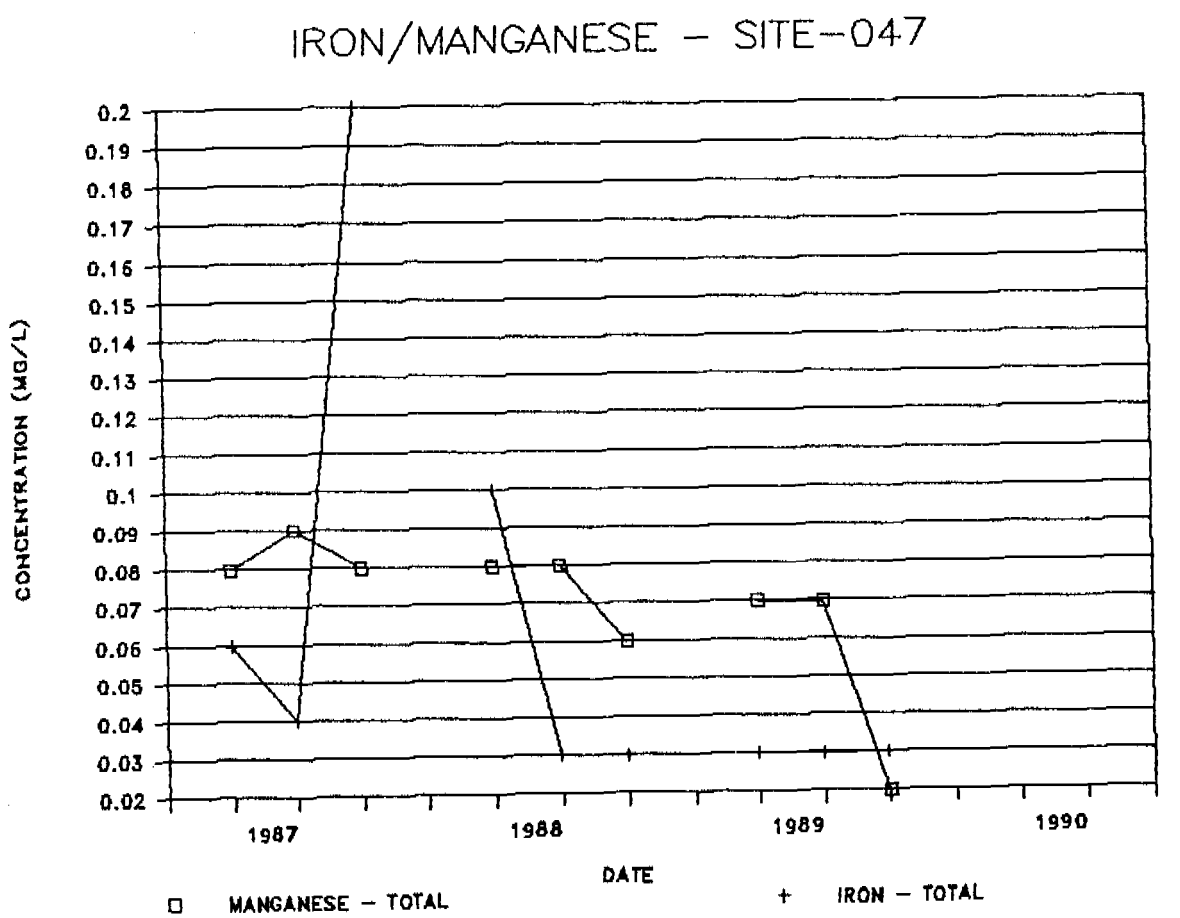

pH - SITE-047
pH (SU)
0
1
2
3
4
5
6
7
8
1983
1984
1985
1986
DATE

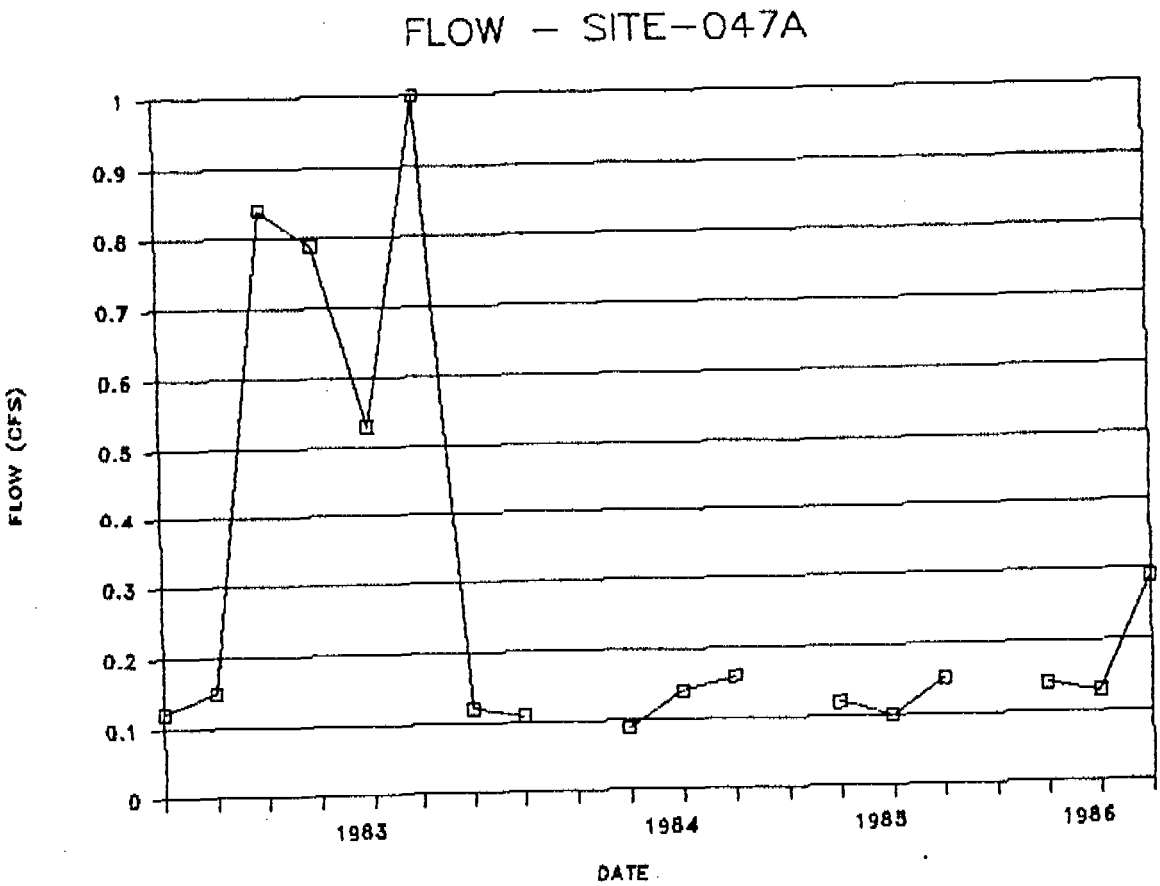

pH - SITE-047
pH (SU)
0
1
2
3
4
5
6
7
8
1987
1988
1989
1990
DATE

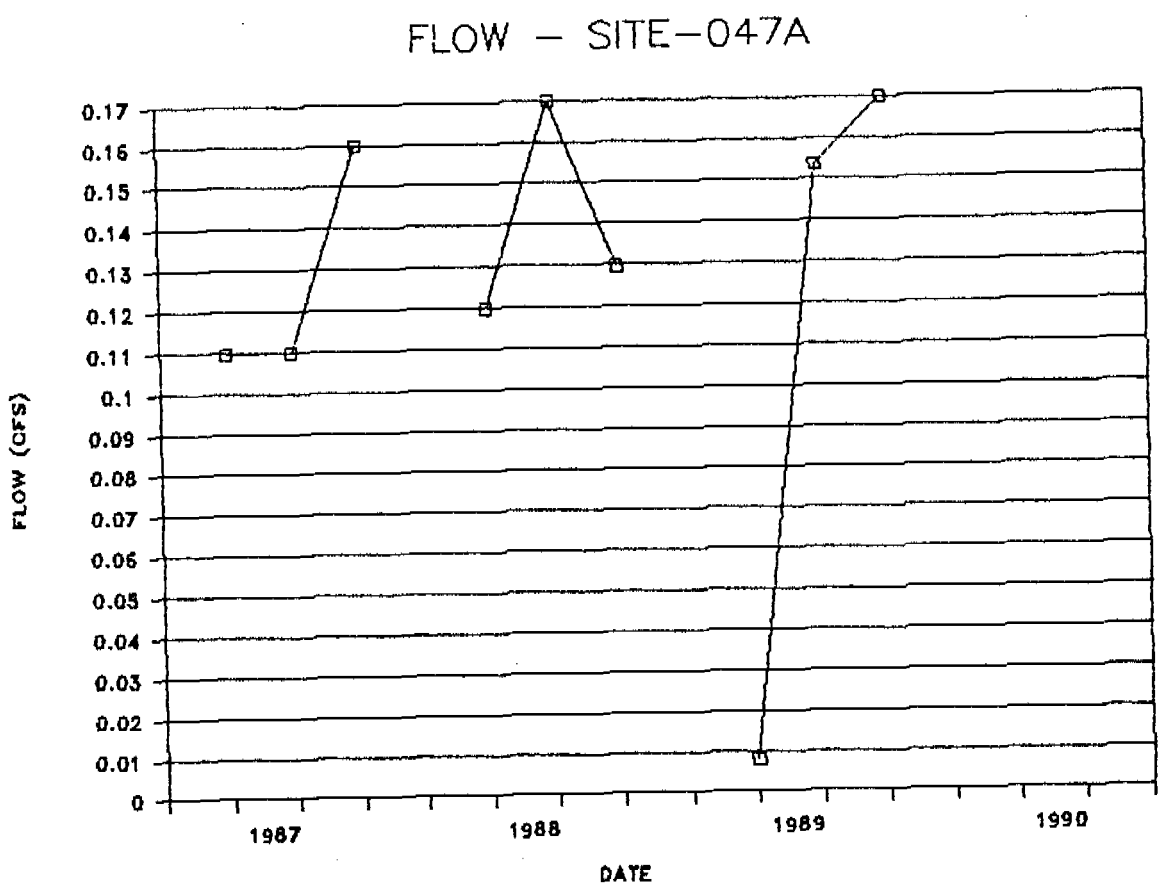

TOTAL DISS. SOLIDS - SITE-047
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
1983
1984
1985
1986
DATE

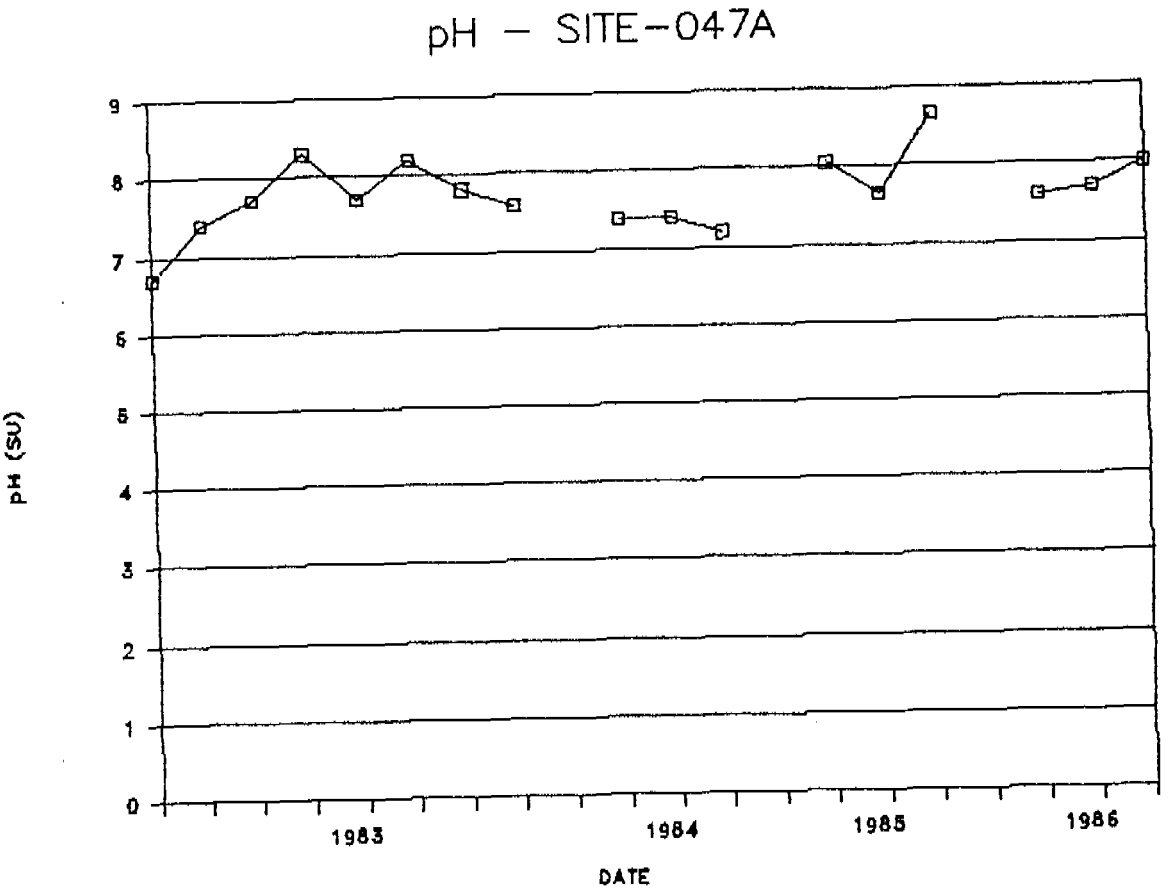

TOTAL DISS. SOLIDS - SITE-047
900
800
700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
1987
1988
1989
1990
DATE

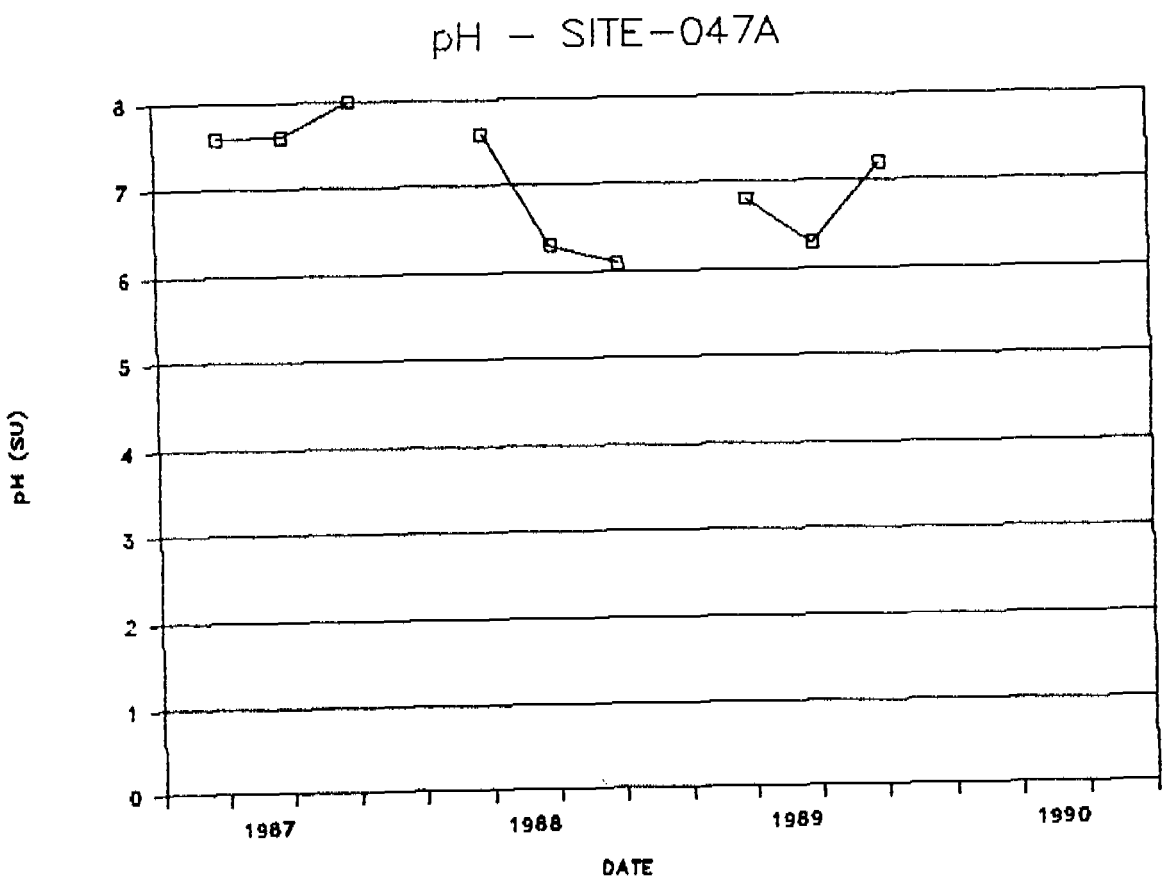

IRON/MANGANESE - SITE-047
CONCENTRATION (MG/L)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL


IRON/MANGANESE - SITE-047
CONCENTRATION (MG/L)
0.2
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

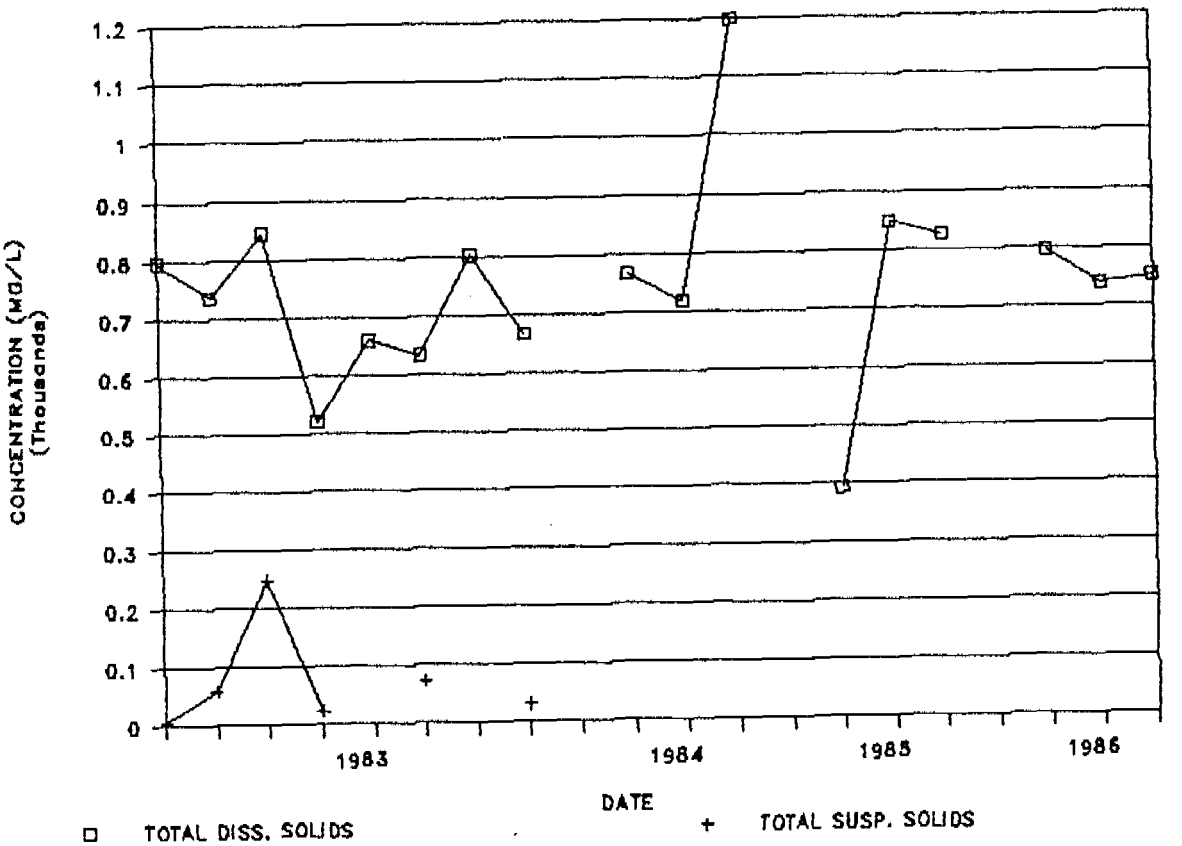

FLOW – SITE–047A
FLOW (CFS)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1983
1984
1985
1986
DATE


FLOW – SITE–047A
FLOW (CFS)
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1987
1988
1989
1990
DATE

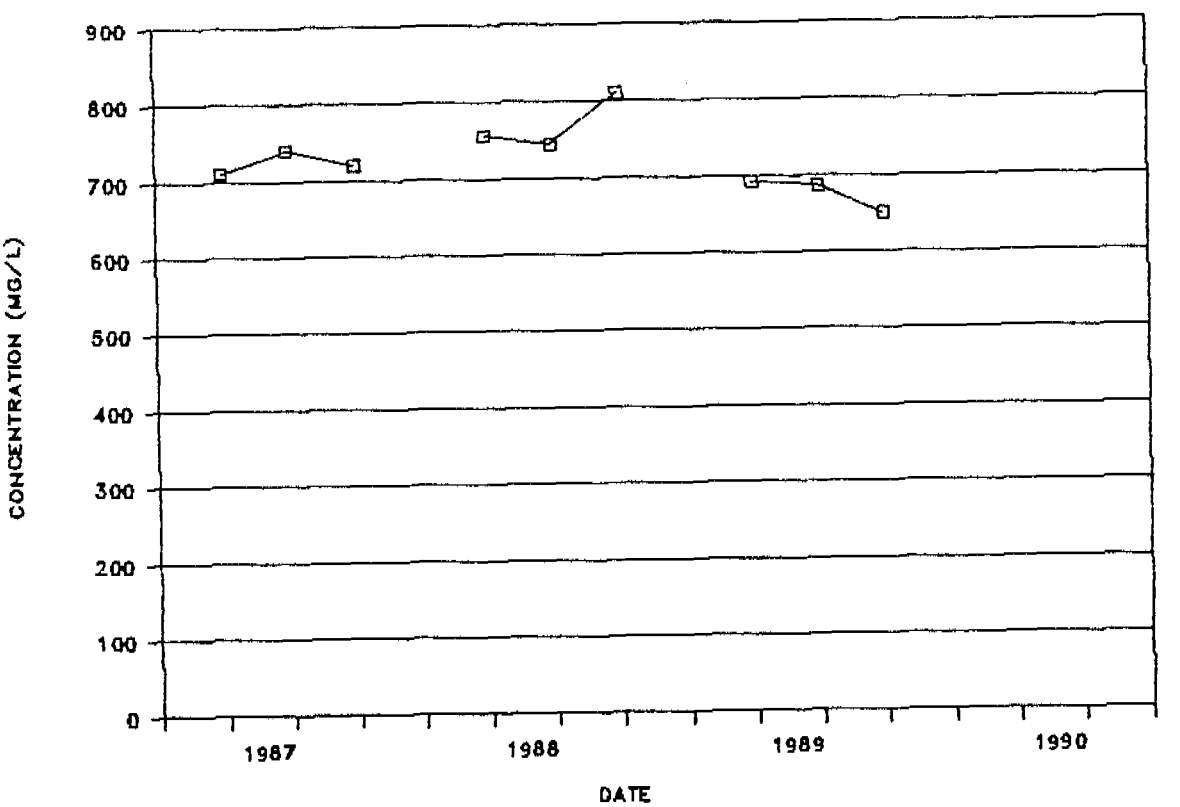

pH - SITE-047A
pH (SU)
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
DATE

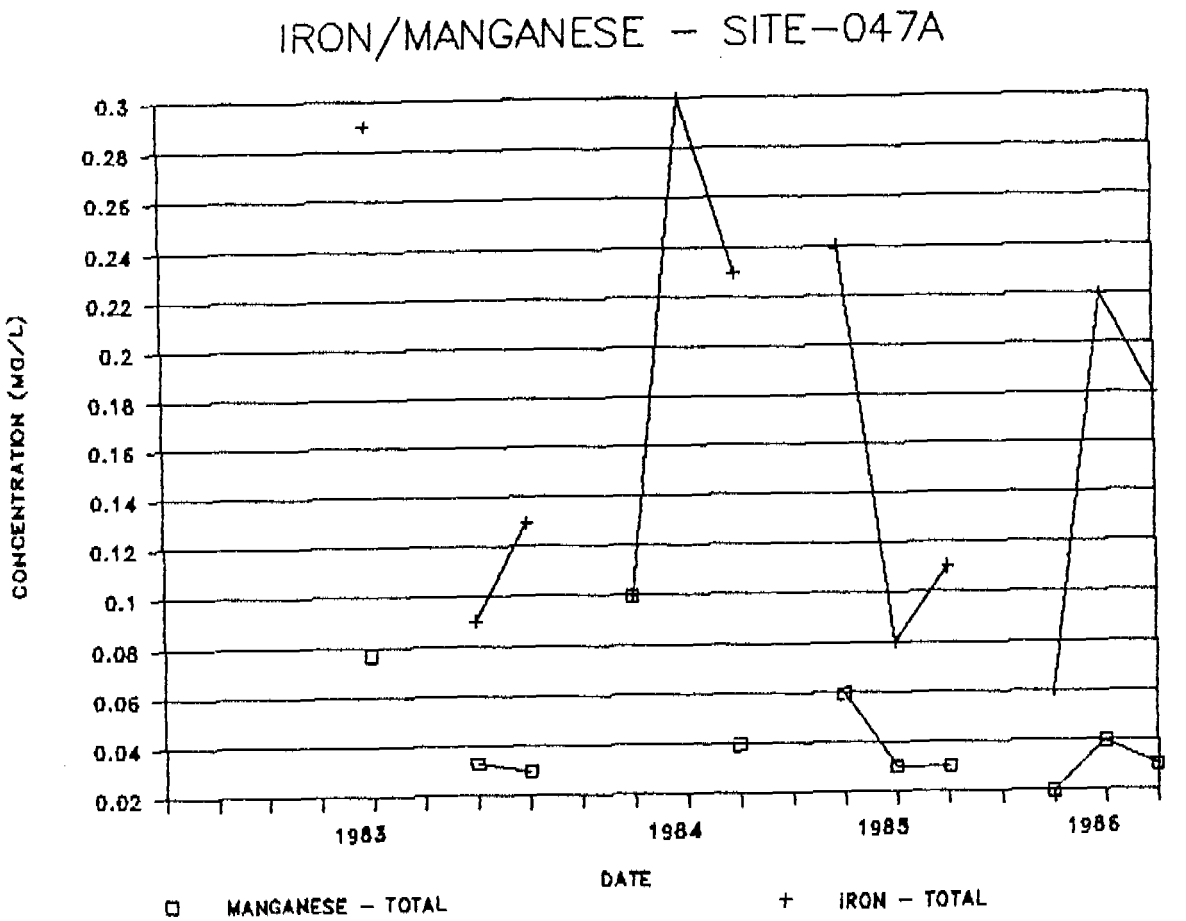

pH - SITE-047A
pH (SU)
8
7
6
5
4
3
2
1
0
1987
1988
1989
1990
DATE

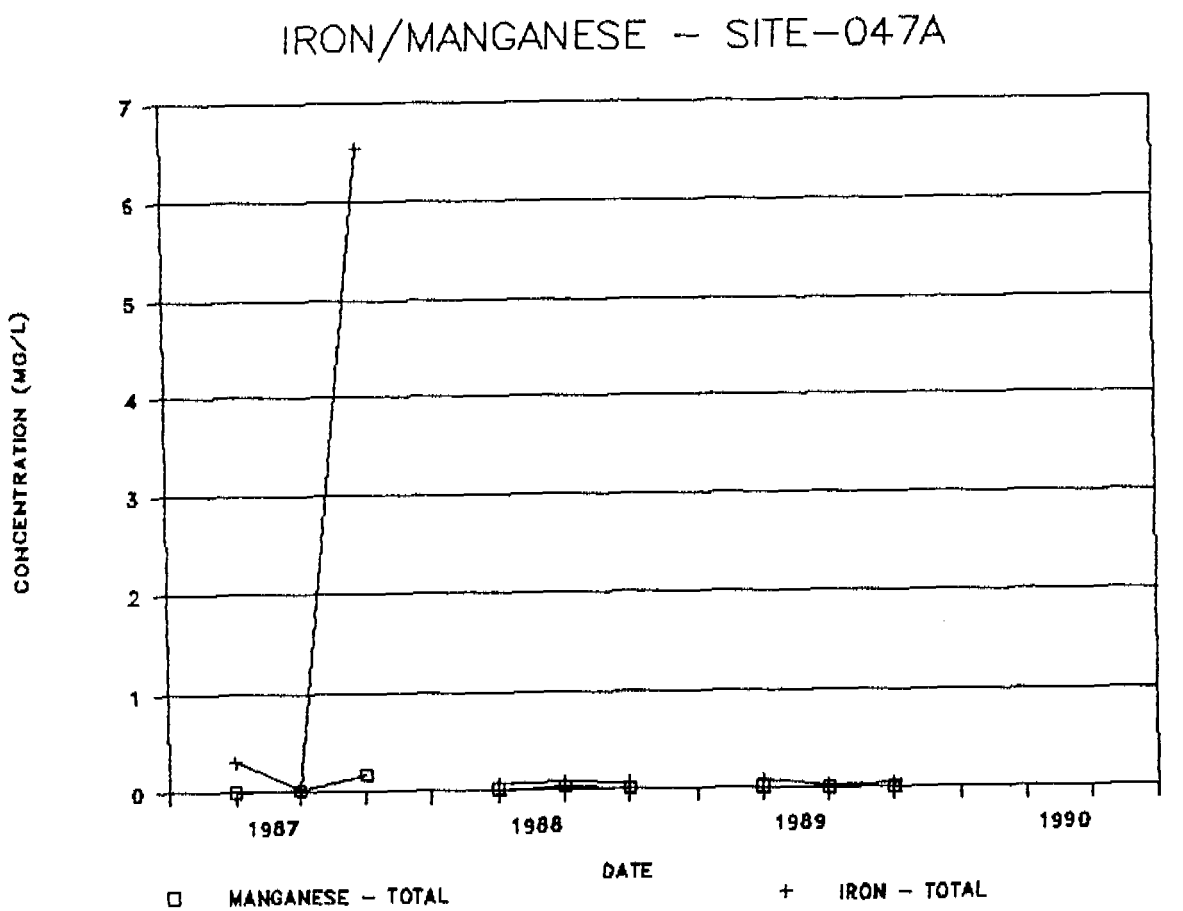
SOLIDS - SITE-047A



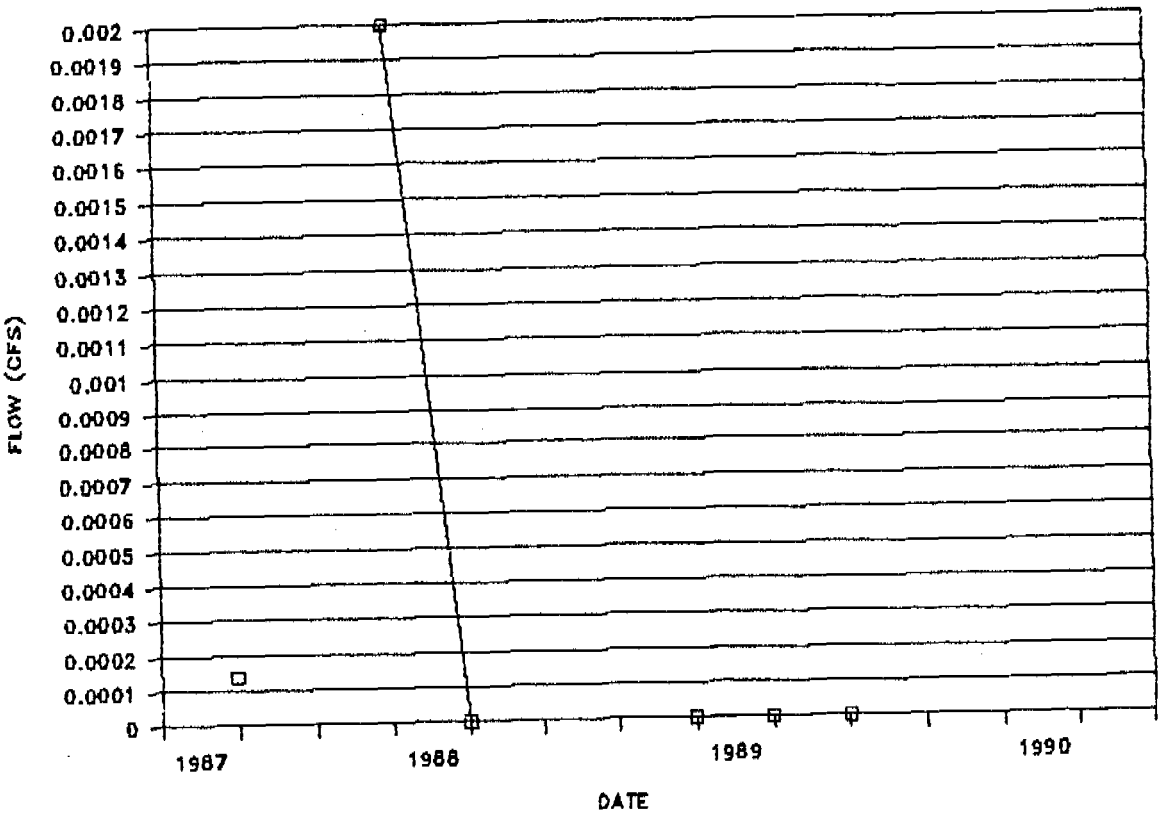
TOTAL DISS. SOLIDS - SITE-047A



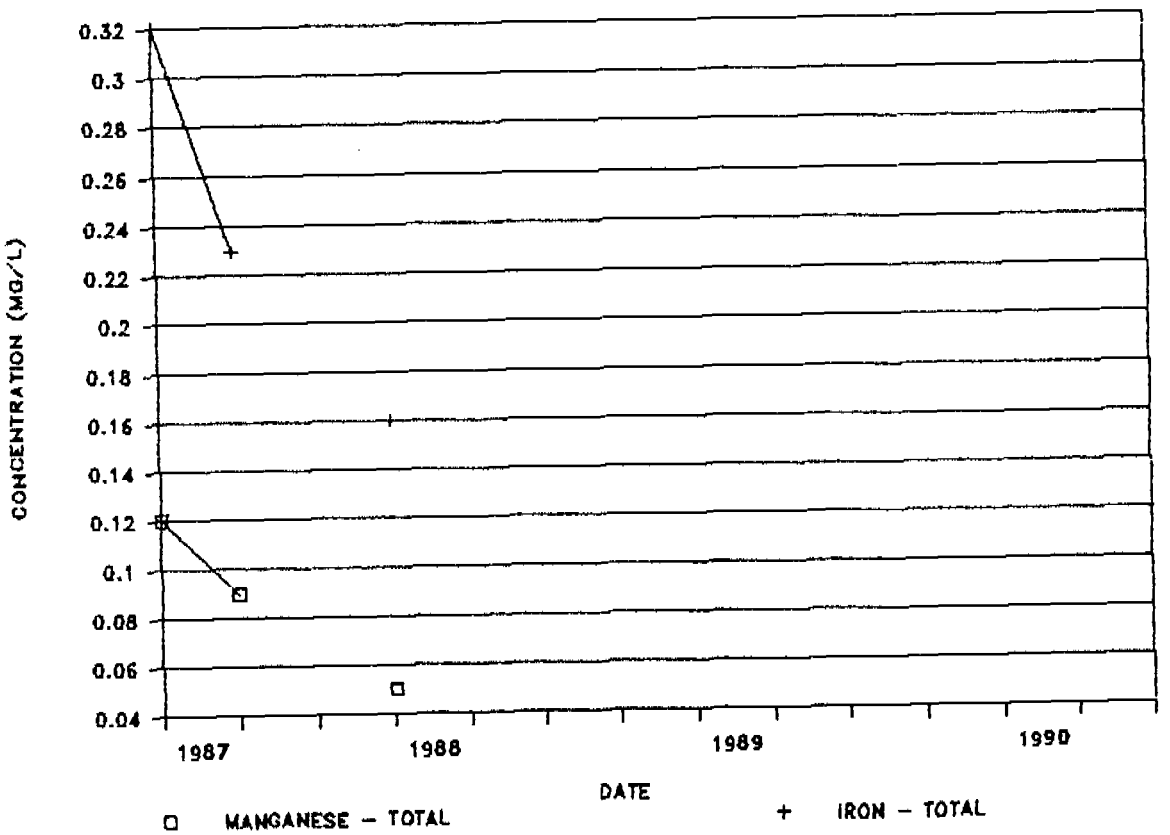

IRON/MANGANESE - SITE-047A
CONCENTRATION (MG/L)
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL


IRON/MANGANESE - SITE-047A
CONCENTRATION (MG/L)
7
6
5
4
3
2
1
0
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

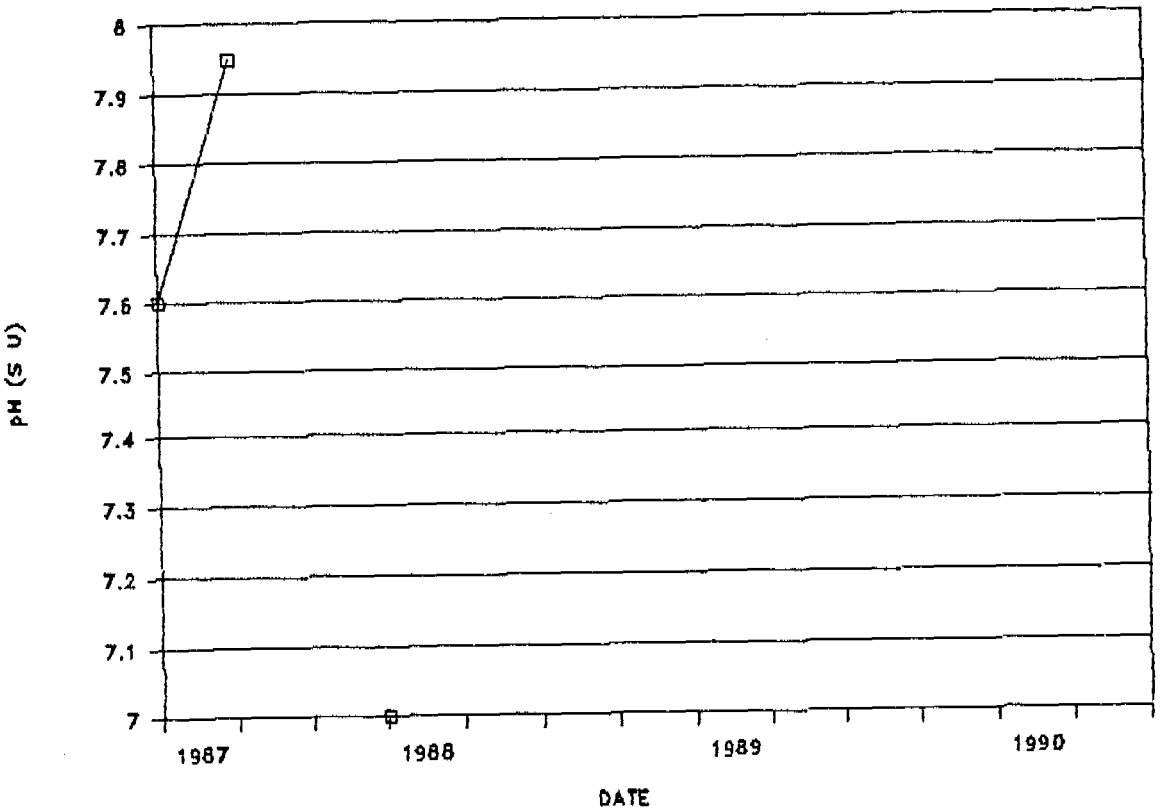
FLOW – SITE–057A



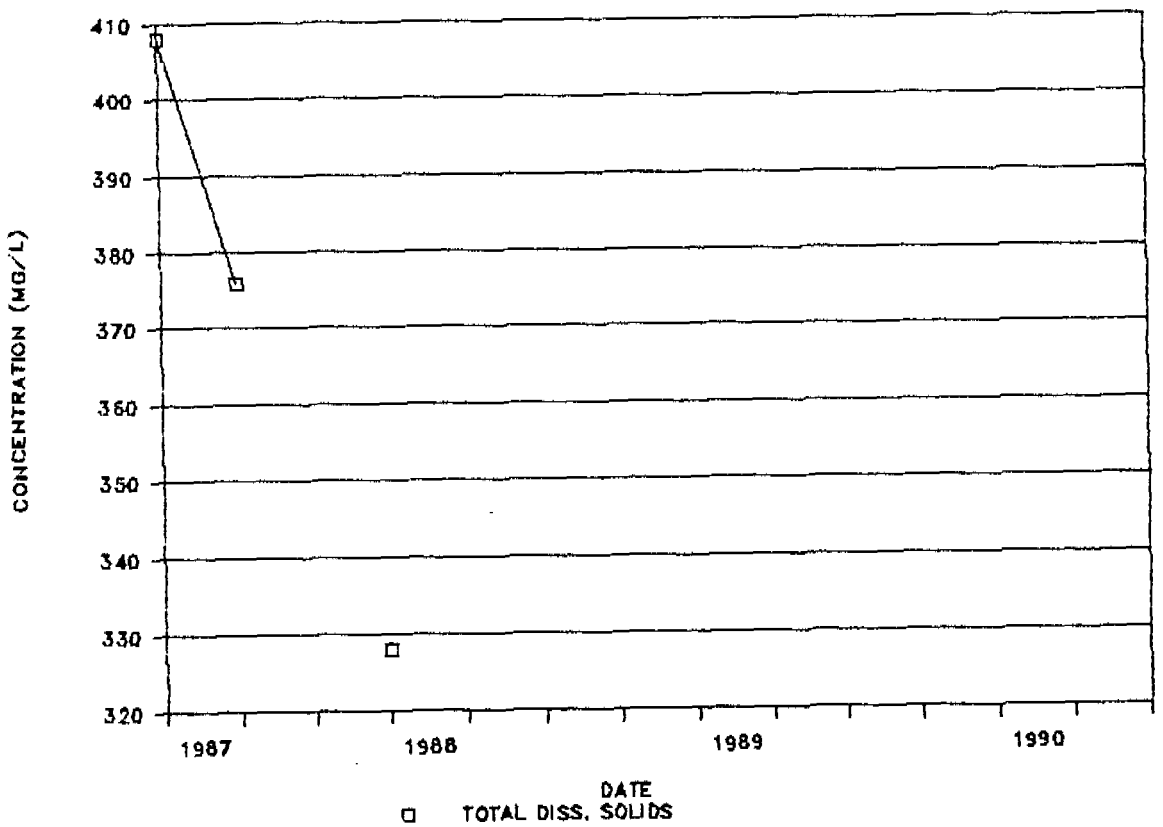
IRON/MANGANESE – SITE–057A

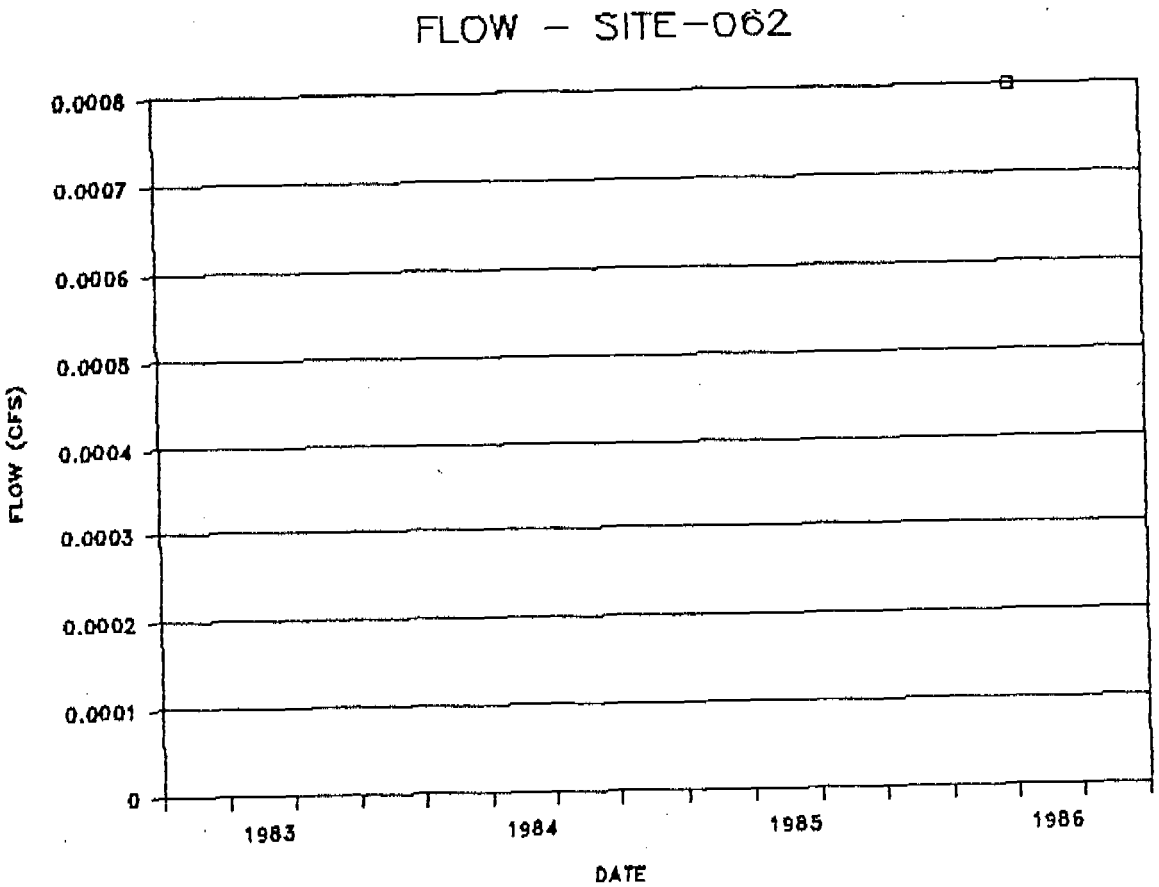


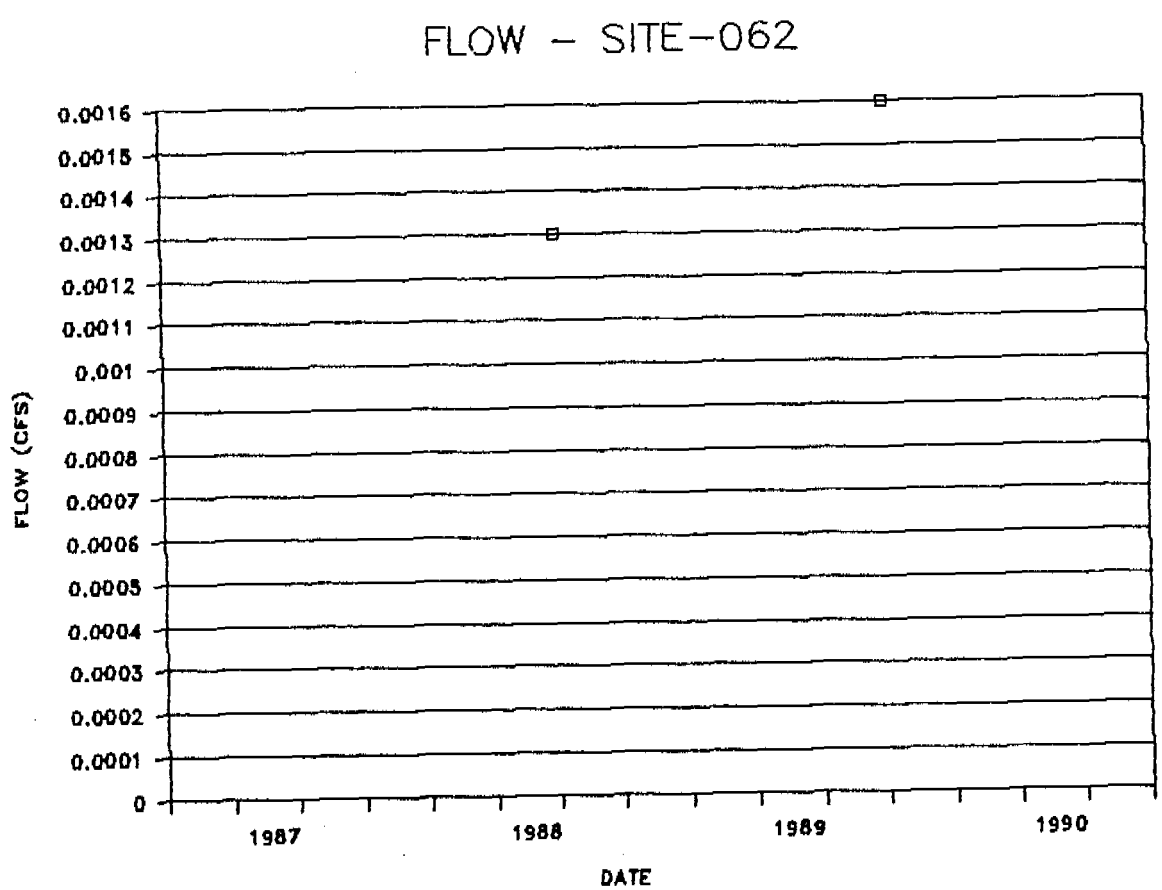
pH – SITE-057A

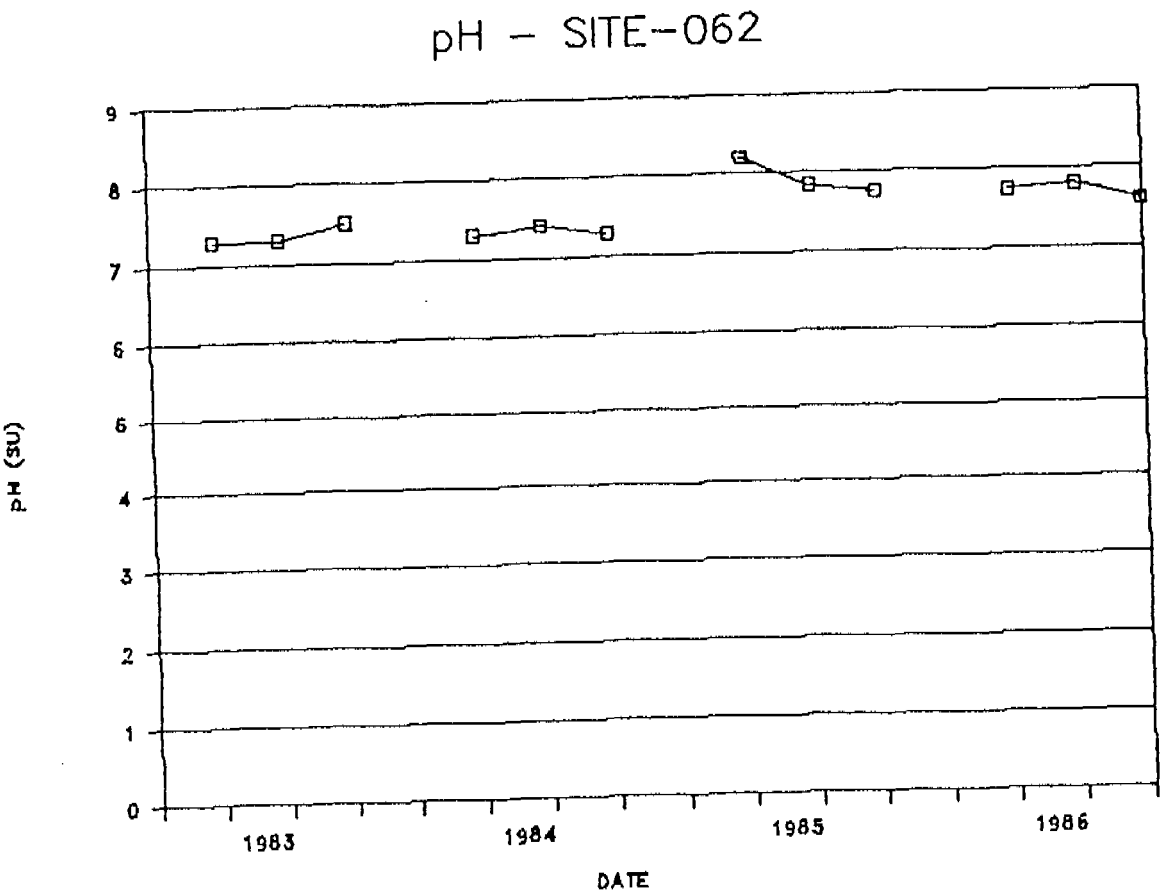


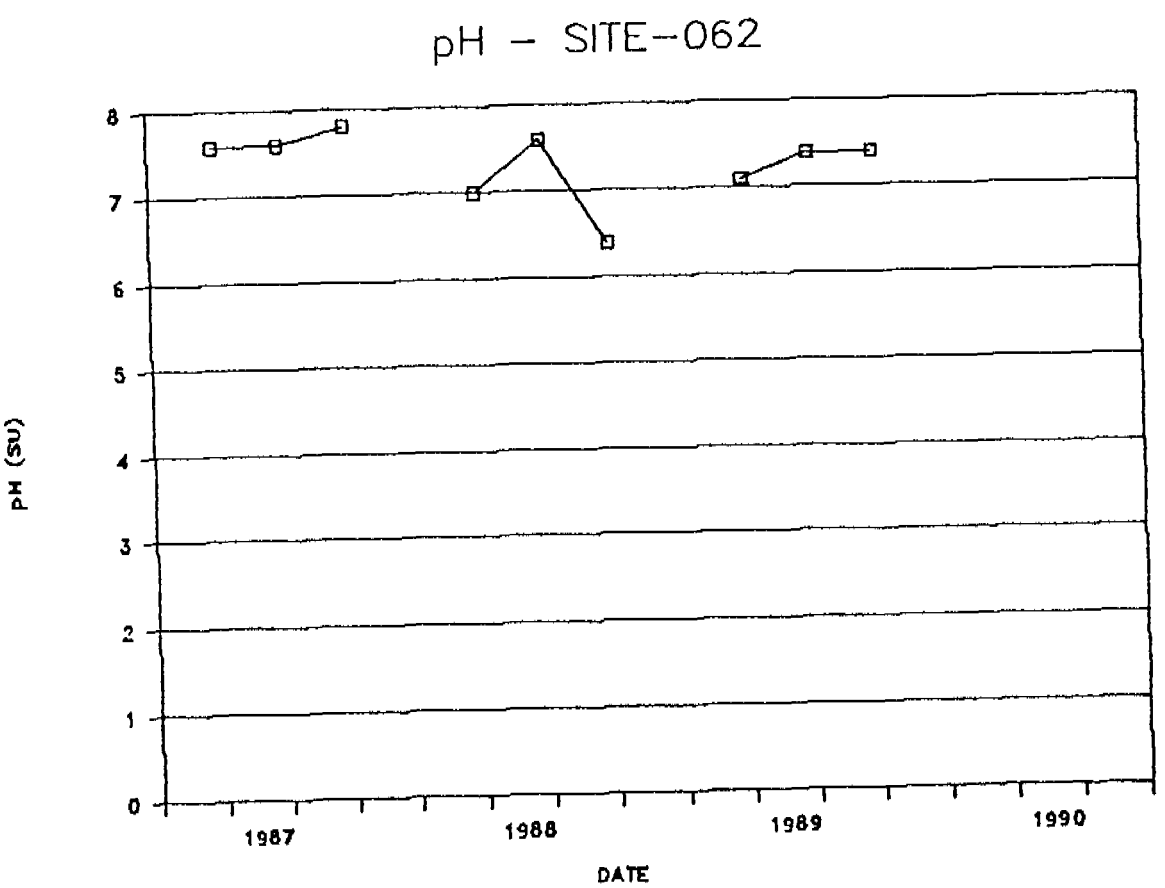
SOLIDS – SITE-057A

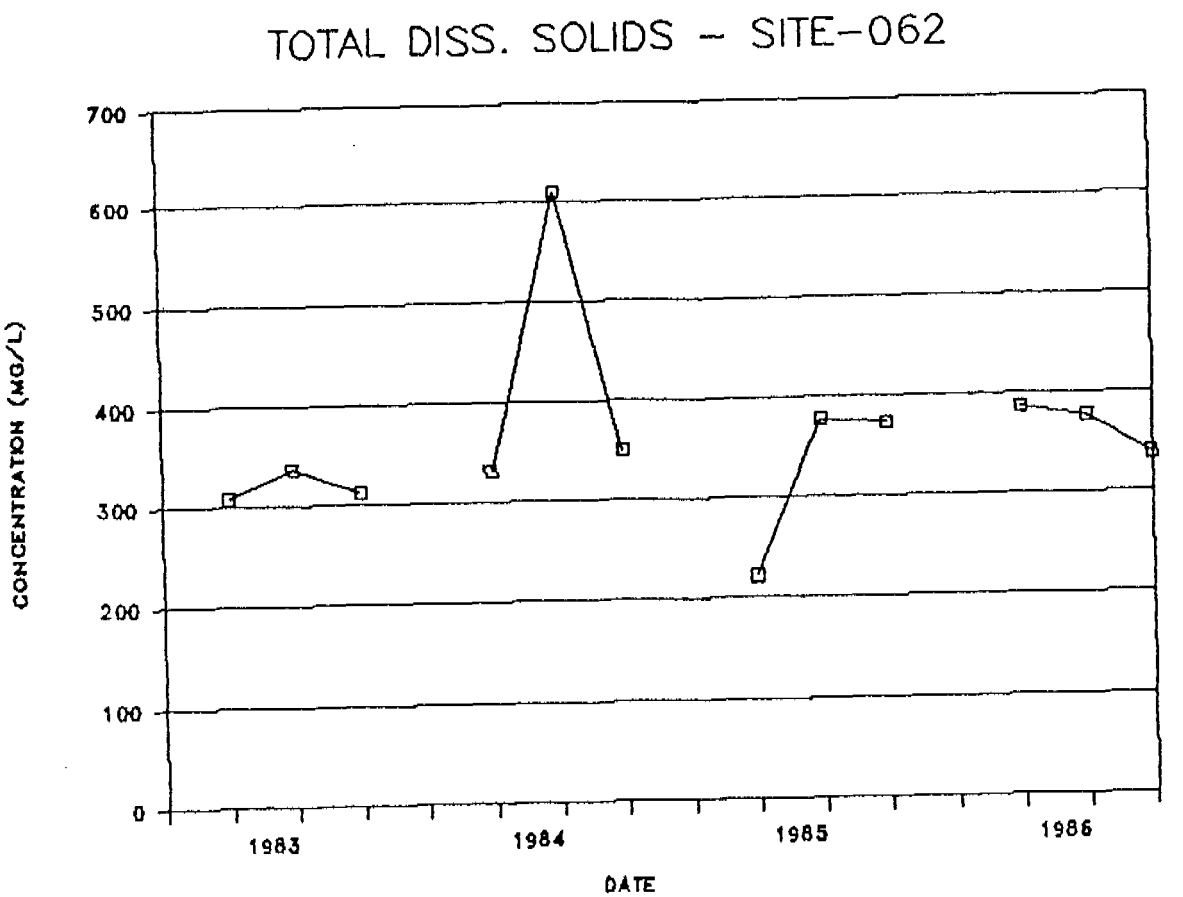


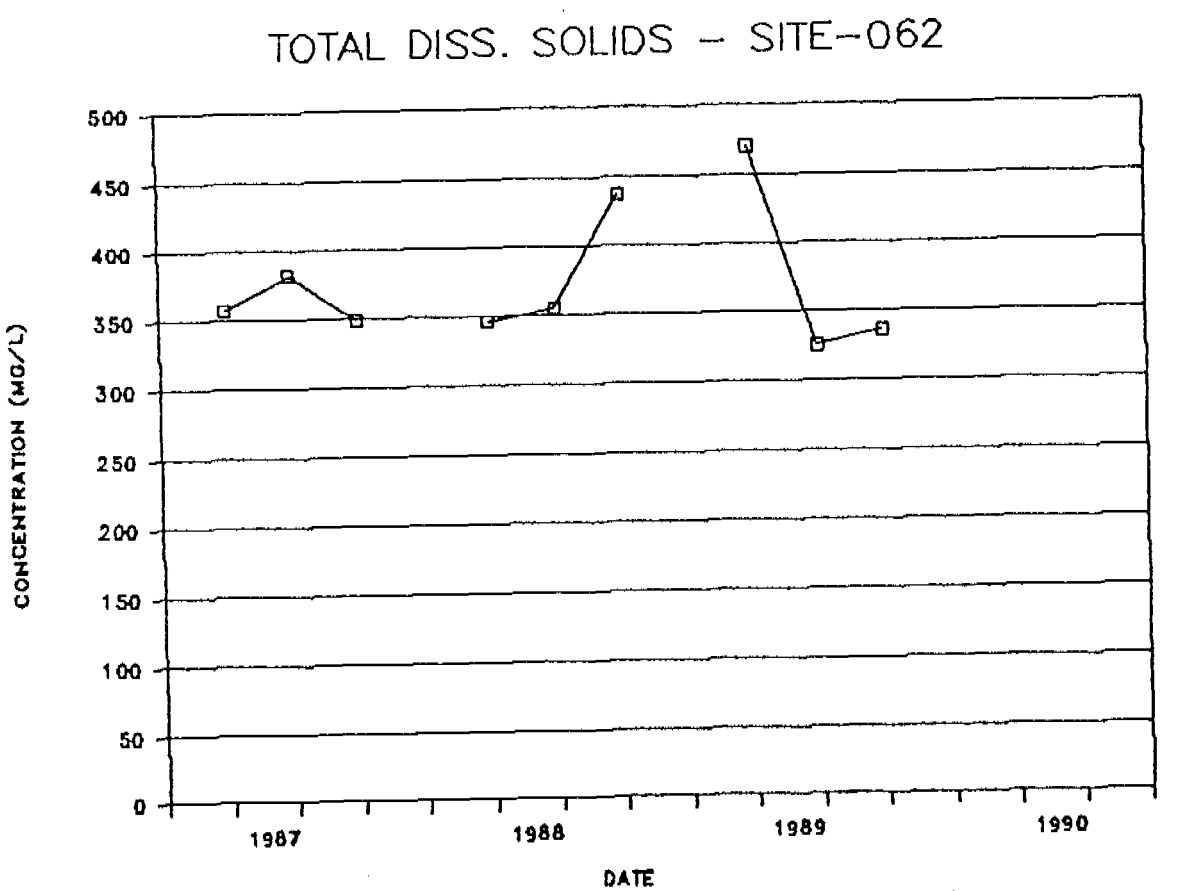

FLOW - SITE-062
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
FLOW (CFS)
1983
1984
1985
1986
DATE

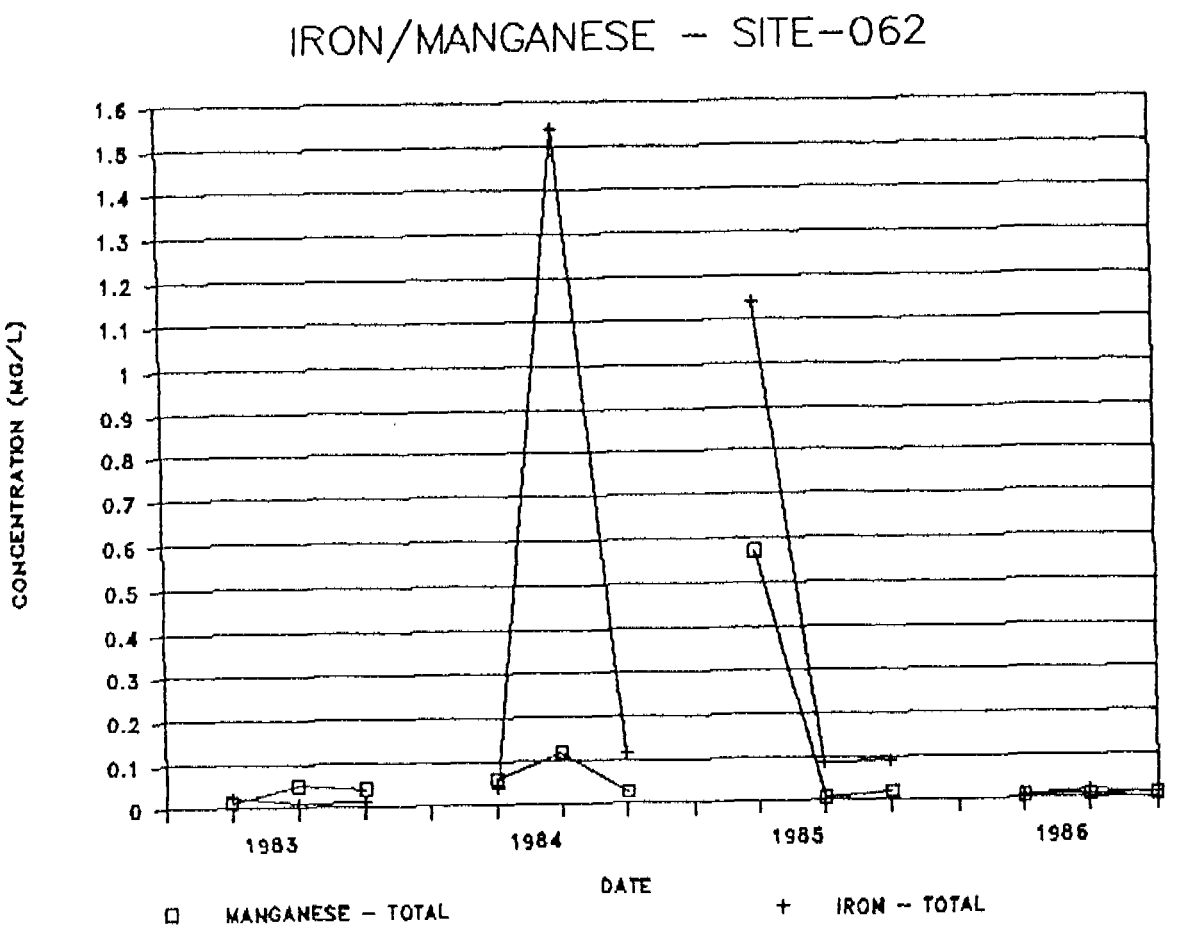

FLOW - SITE-062
0.0016
0.0015
0.0014
0.0013
0.0012
0.0011
0.001
0.0009
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
FLOW (CFS)
1987
1988
1989
1990
DATE

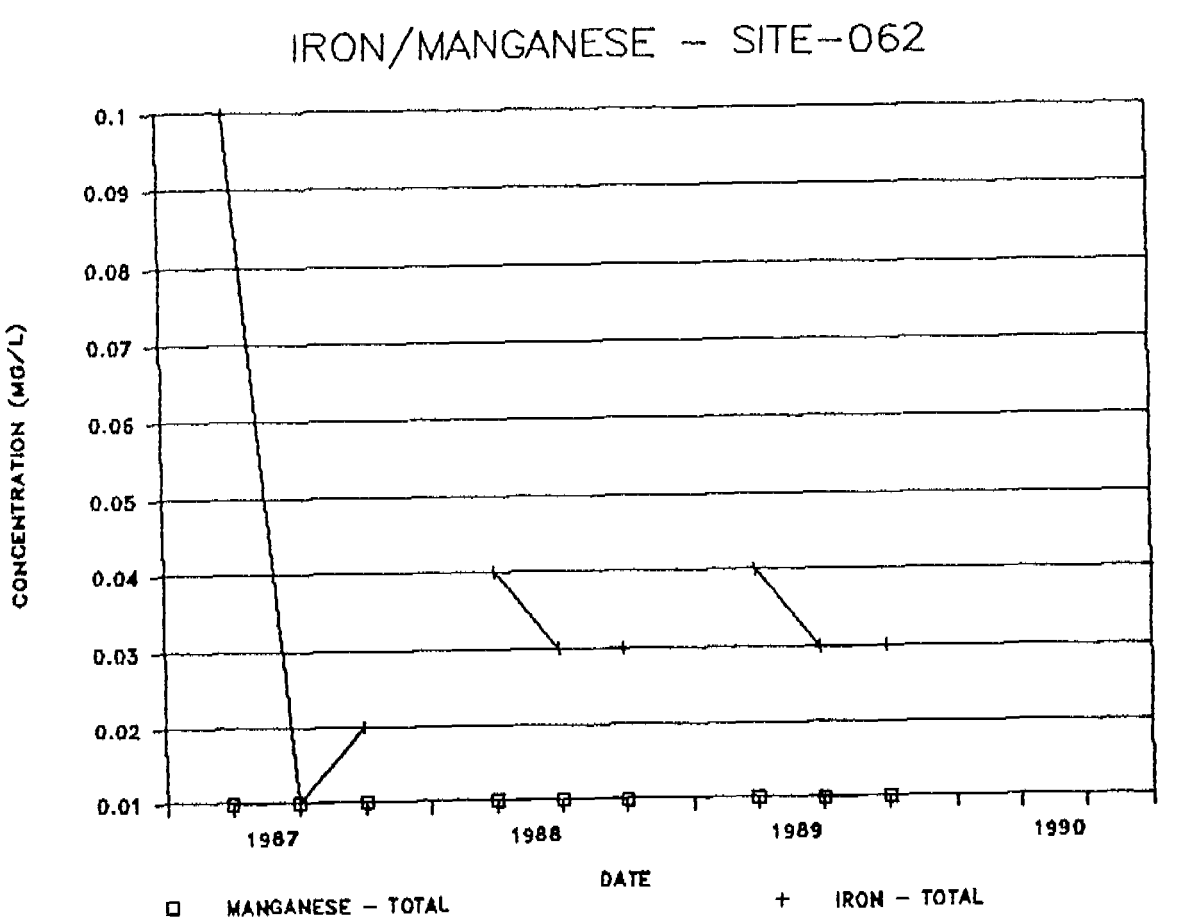

pH - SITE-062
pH (SU)
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
DATE


pH - SITE-062
pH (SU)
8
7
6
5
4
3
2
1
0
1987
1988
1989
1990
DATE

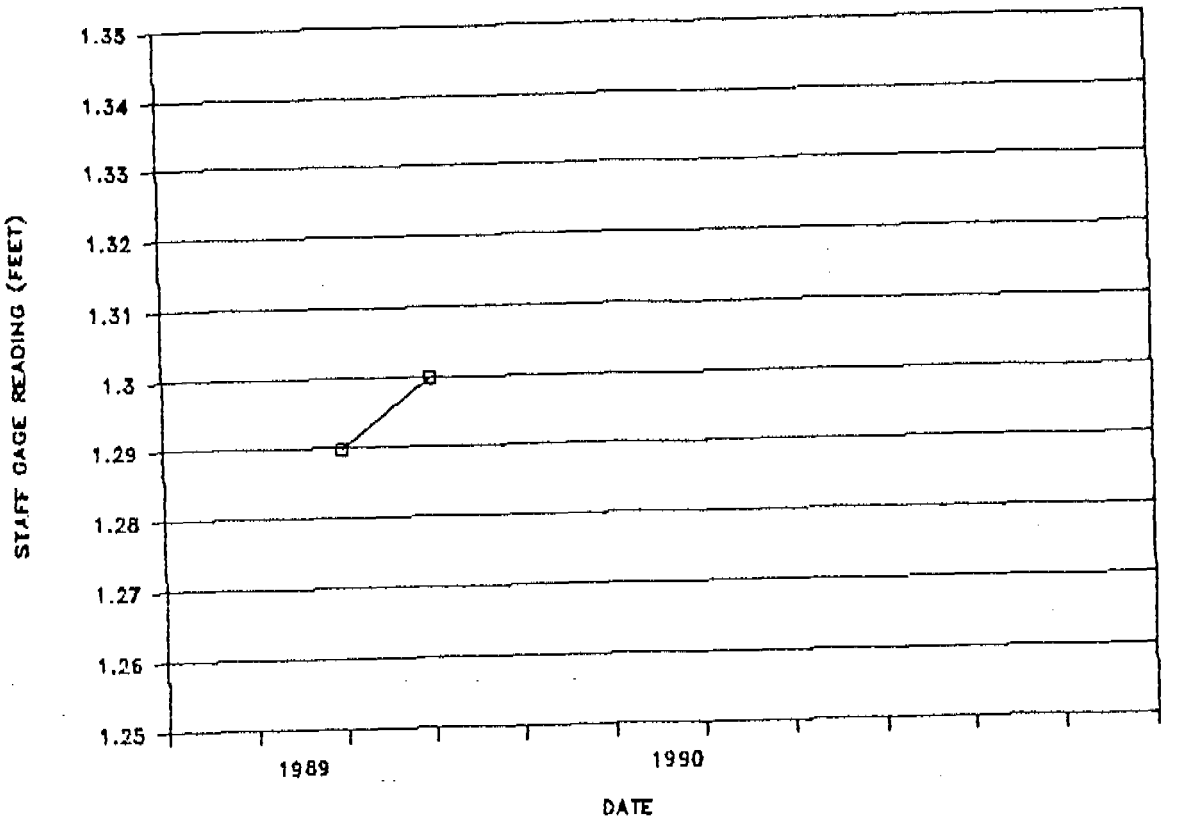

TOTAL DISS. SOLIDS - SITE-062
CONCENTRATION (MG/L)
700
600
500
400
300
200
100
0
1983
1984
1985
1986
DATE


TOTAL DISS. SOLIDS - SITE-062
CONCENTRATION (MG/L)
500
450
400
350
300
250
200
150
100
50
0
1987
1988
1989
1990
DATE

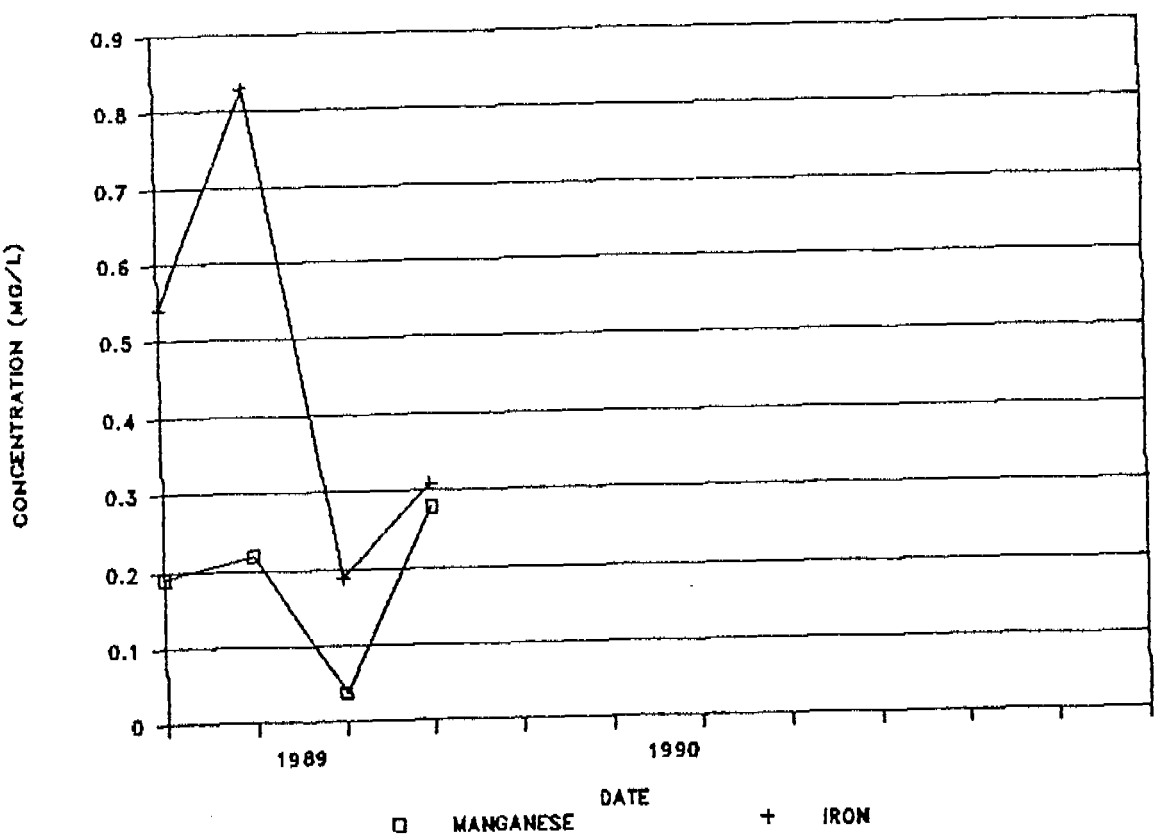

IRON/MANGANESE - SITE-062
CONCENTRATION (MG/L)
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1983
1984
1985
1986
DATE
MANGANESE - TOTAL
IRON - TOTAL


IRON/MANGANESE - SITE-062
CONCENTRATION (MG/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1987
1988
1989
1990
DATE
MANGANESE - TOTAL
IRON - TOTAL

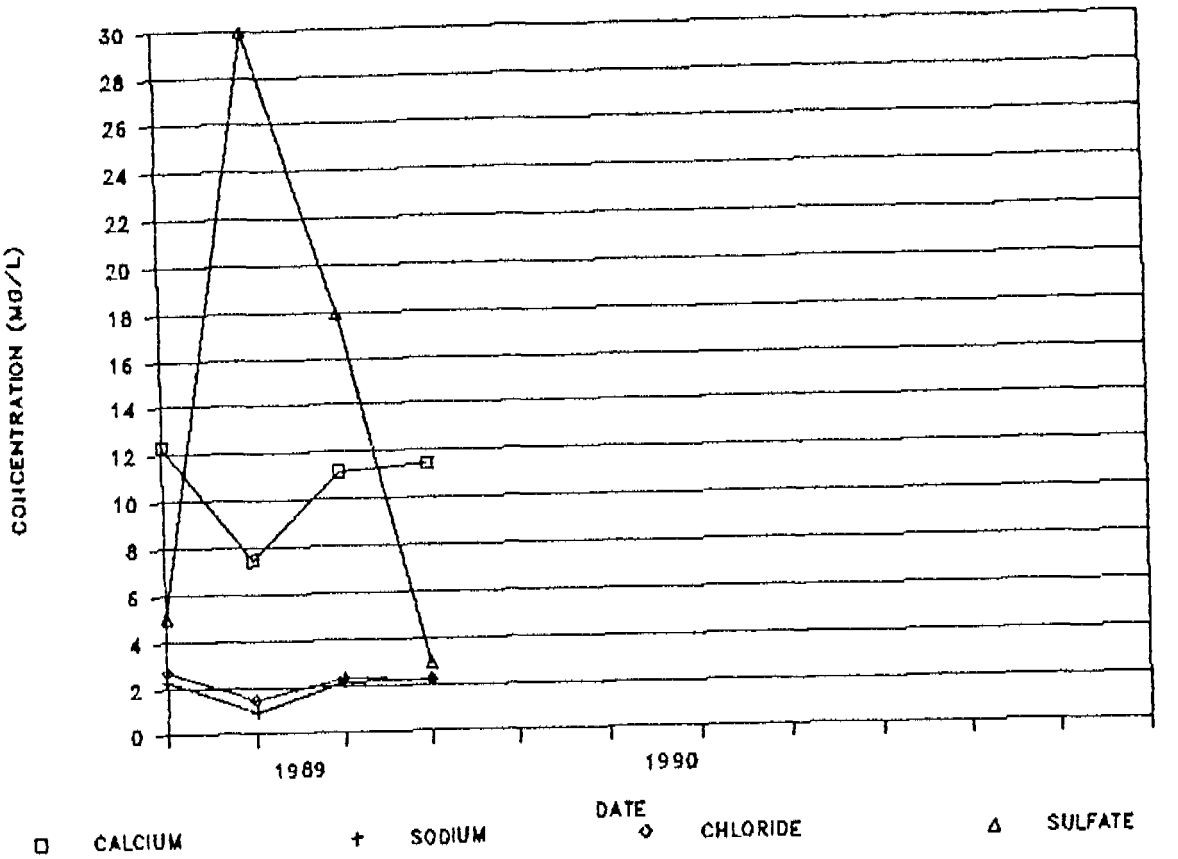
FLOW (STAFF GAGE LEVEL) - SITE-089



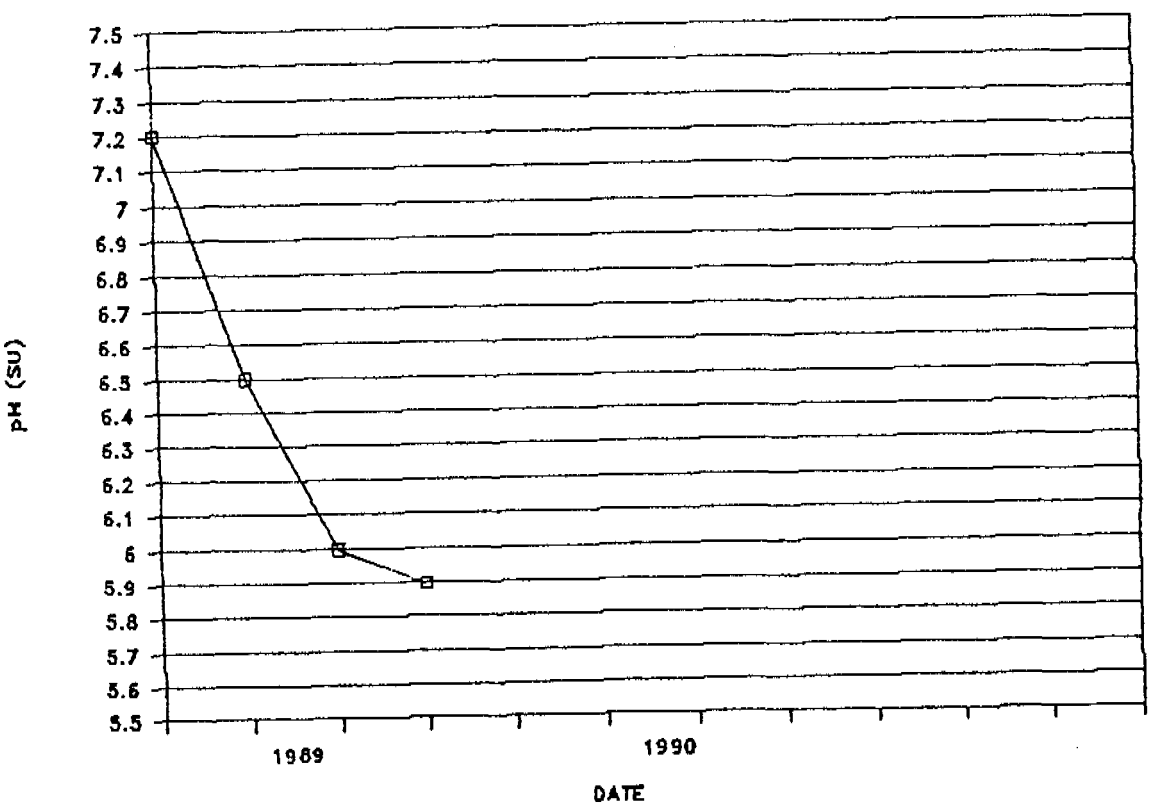
IRON/MANGANESE - SITE-089



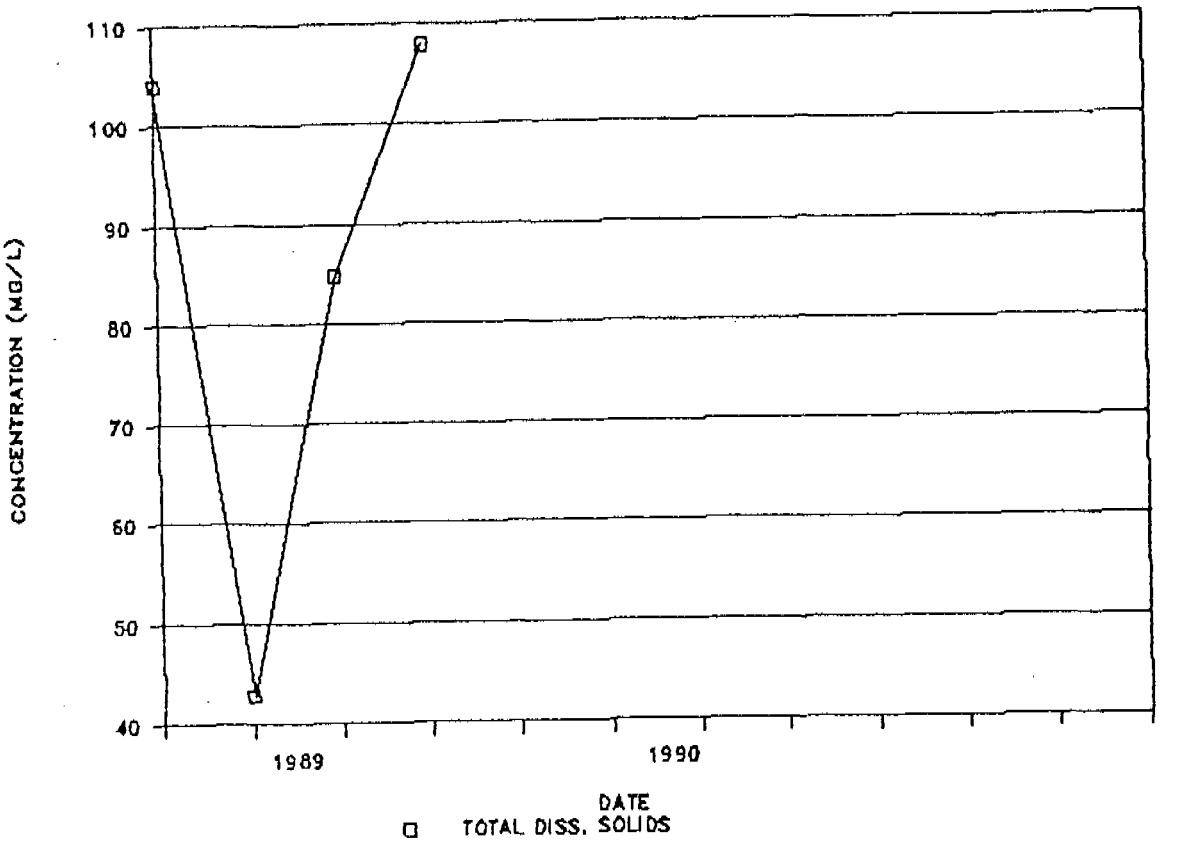
MAJOR IONS - SITE-089

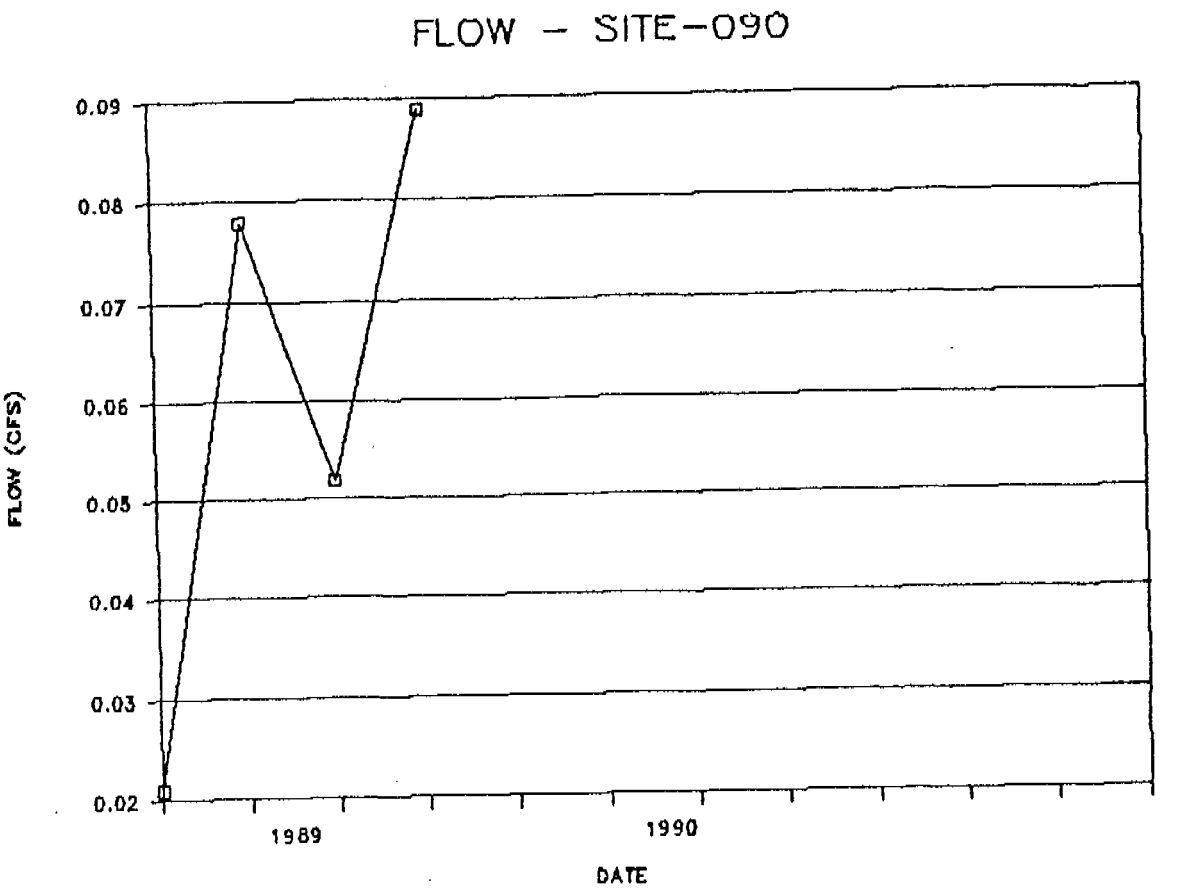


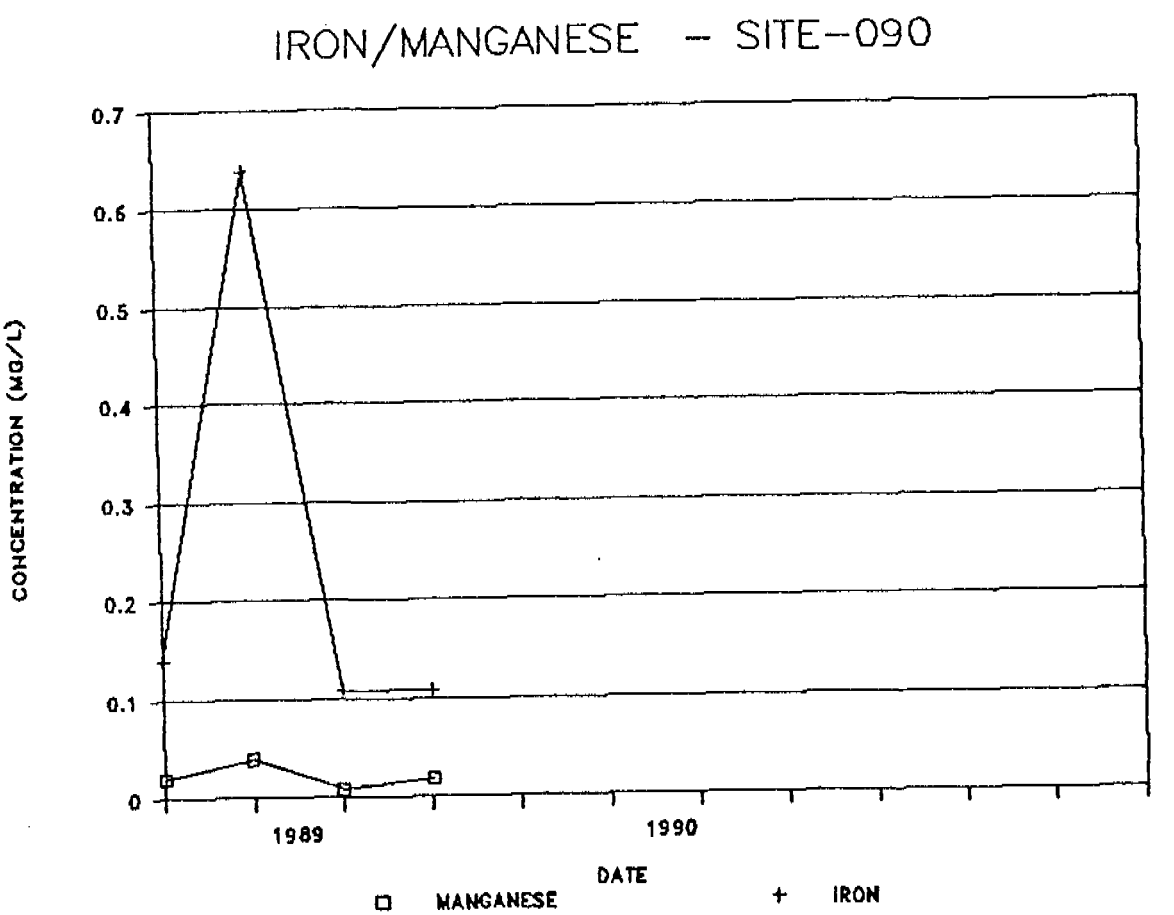
pH - SITE-089



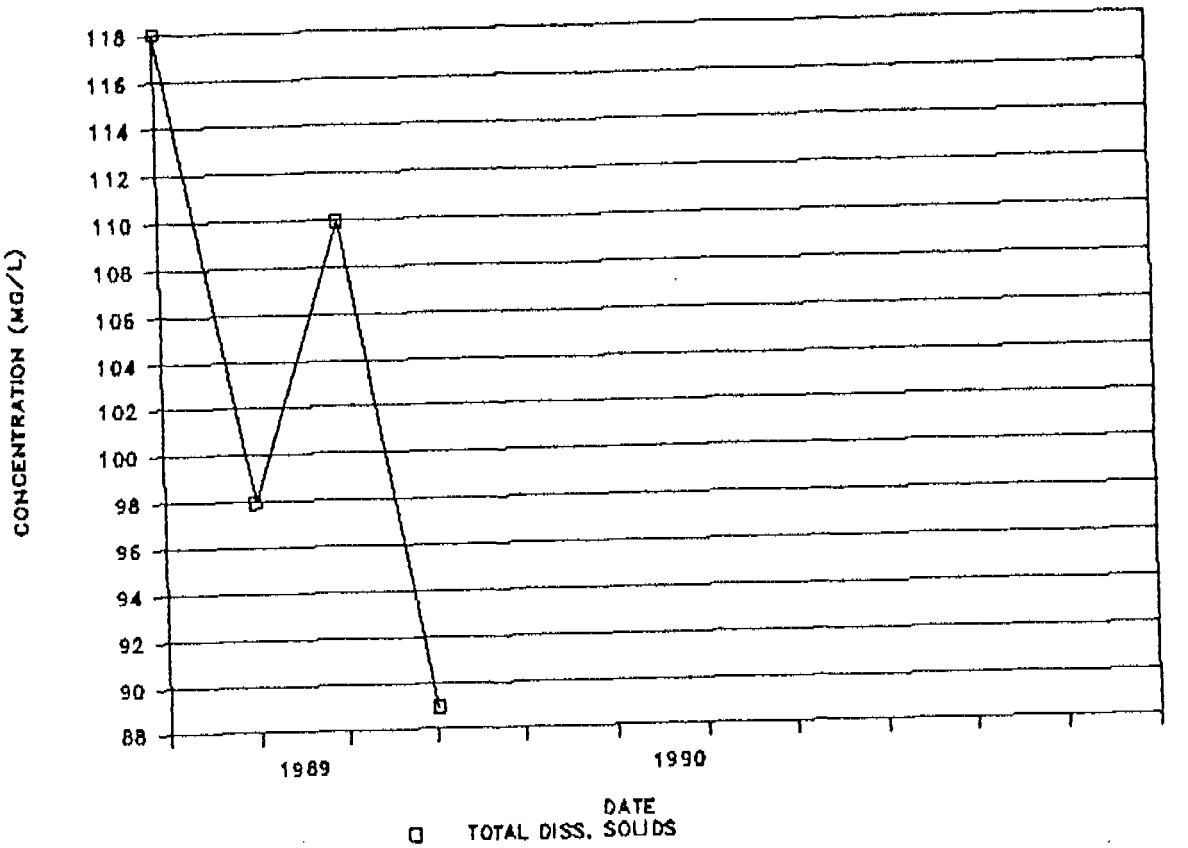
DISSOLVED SOLIDS - SITE--089



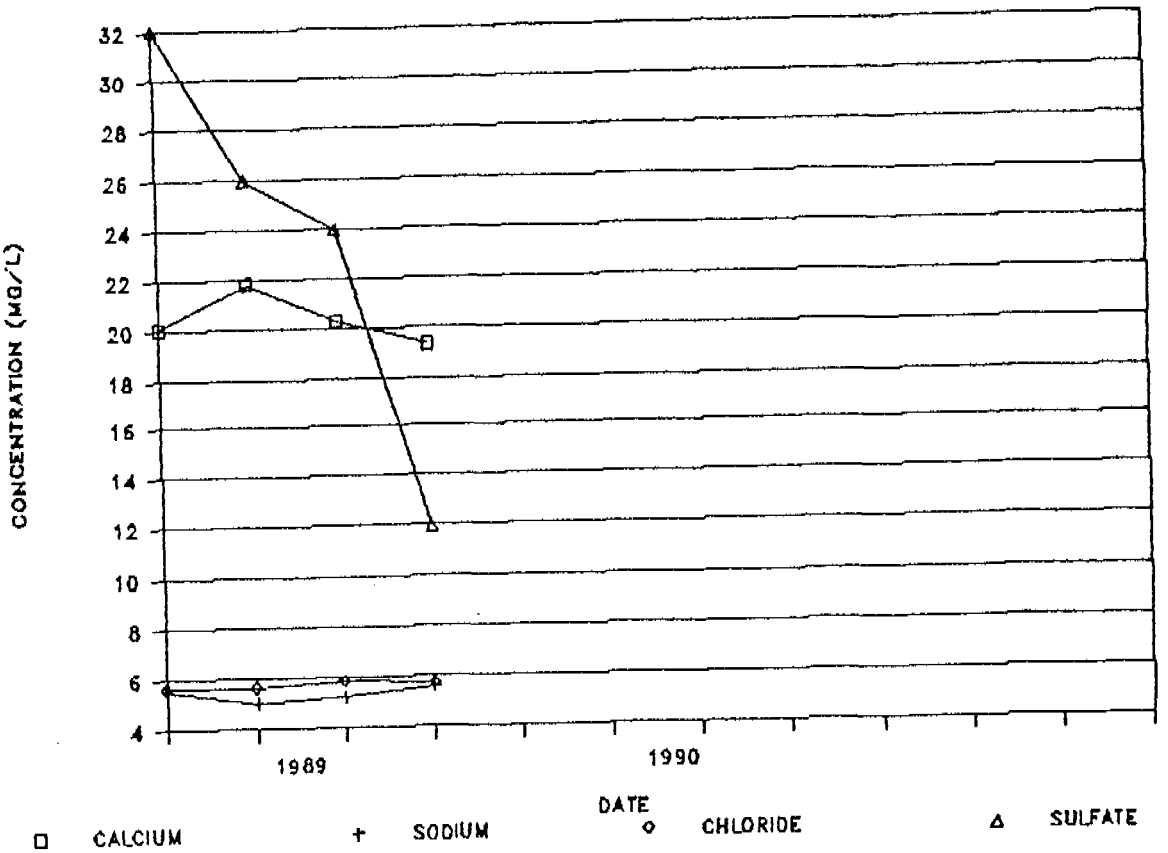

FLOW - SITE-090
FLOW (CFS)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
1989
1990
DATE


IRON/MANGANESE - SITE-090
CONCENTRATION (MG/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1989
1990
DATE
MANGANESE
IRON

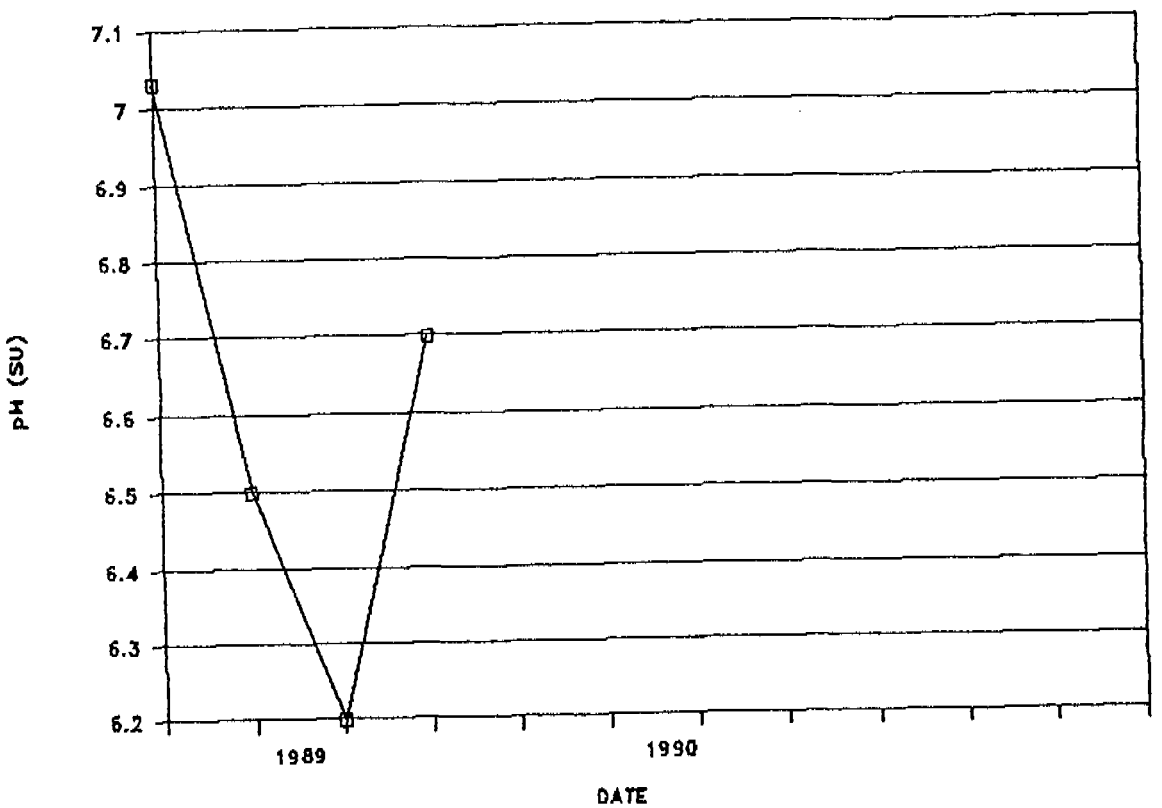
DISSOLVED SOLIDS - SITE-090



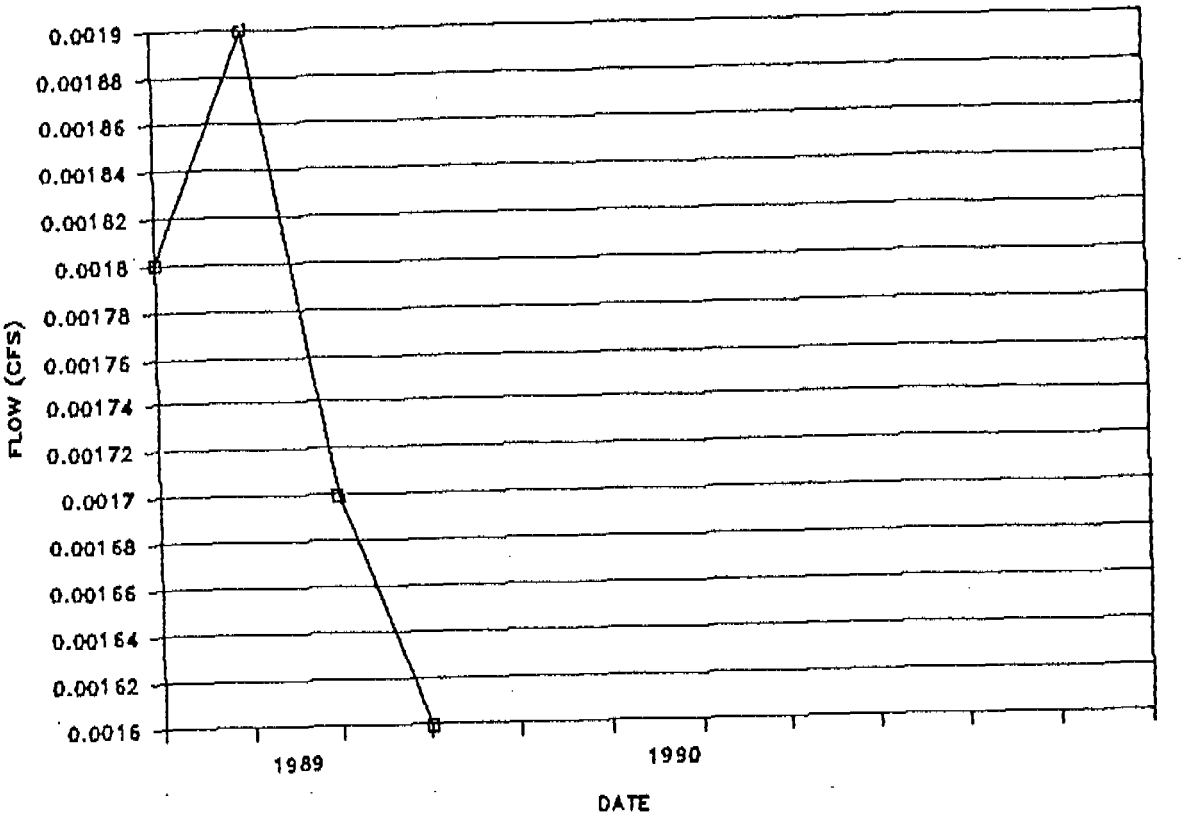
MAJOR IONS – SITE-090



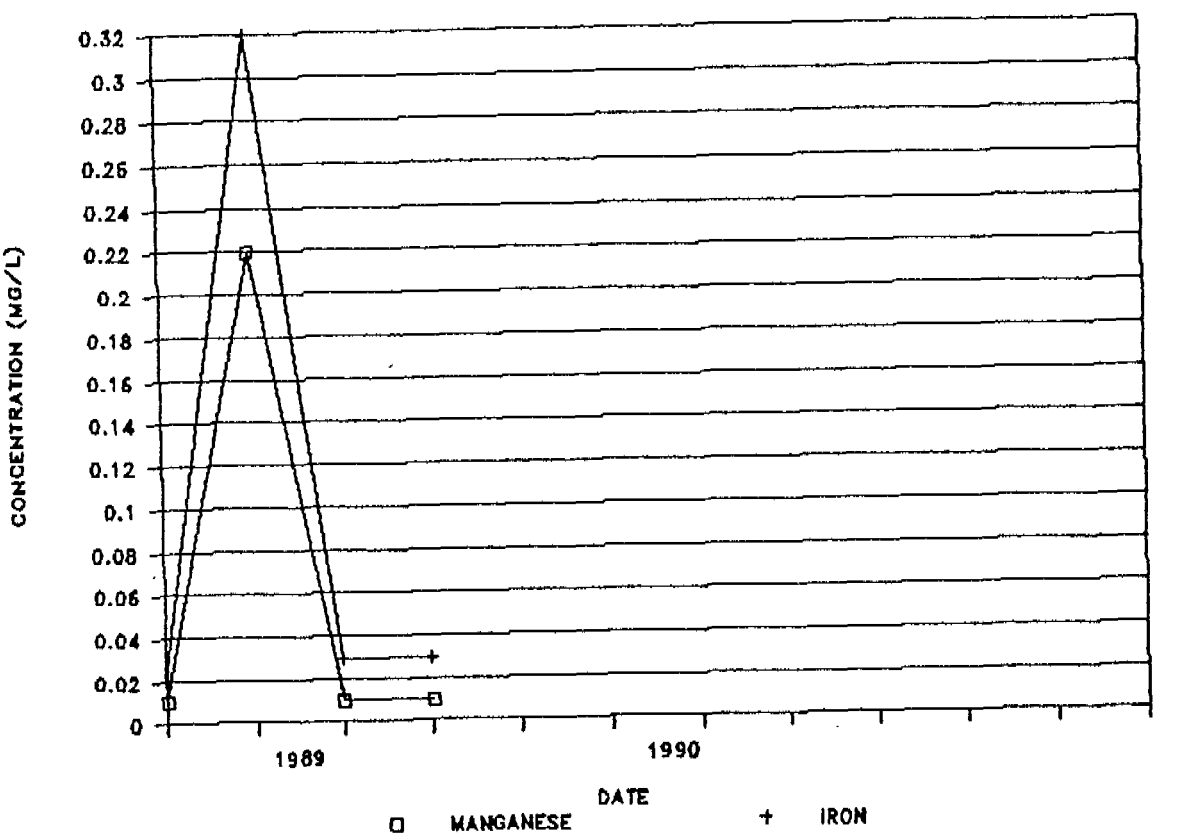
pH – SITE-090



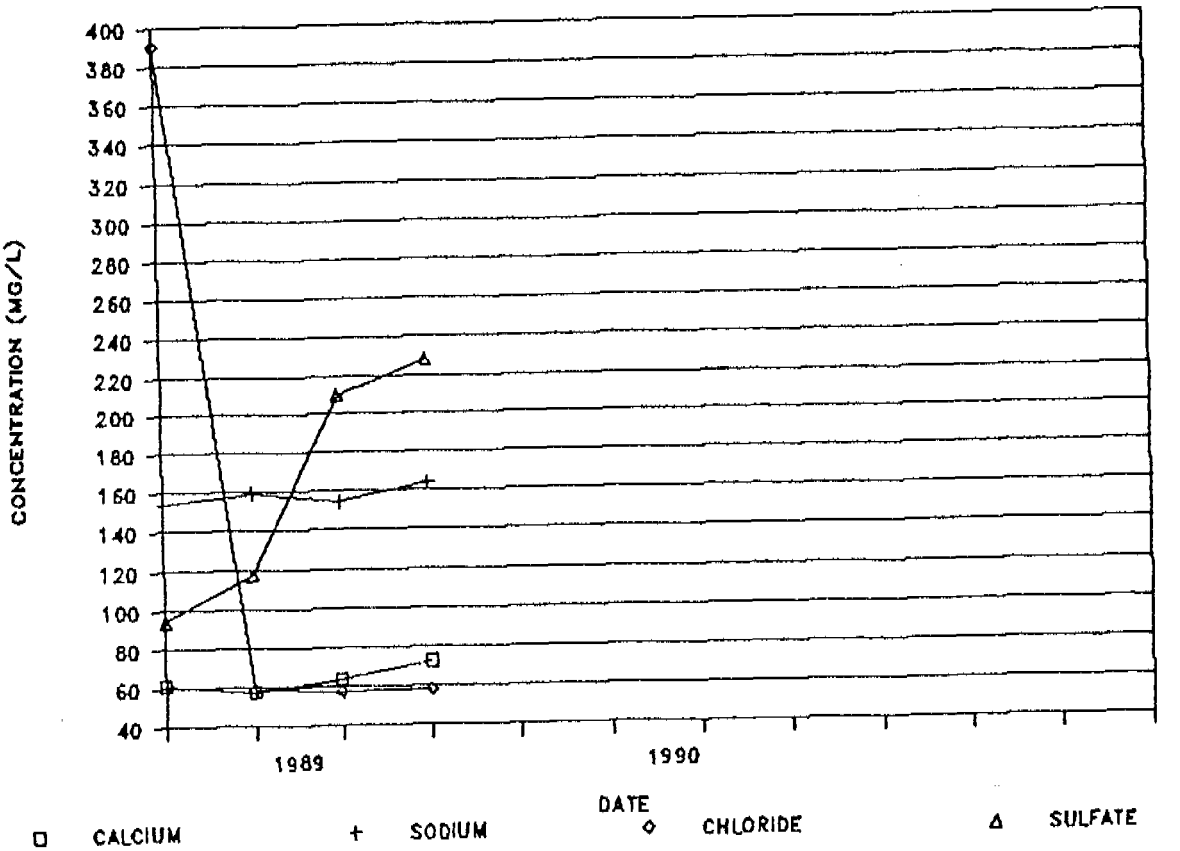
FLOW – SITE–GW–13



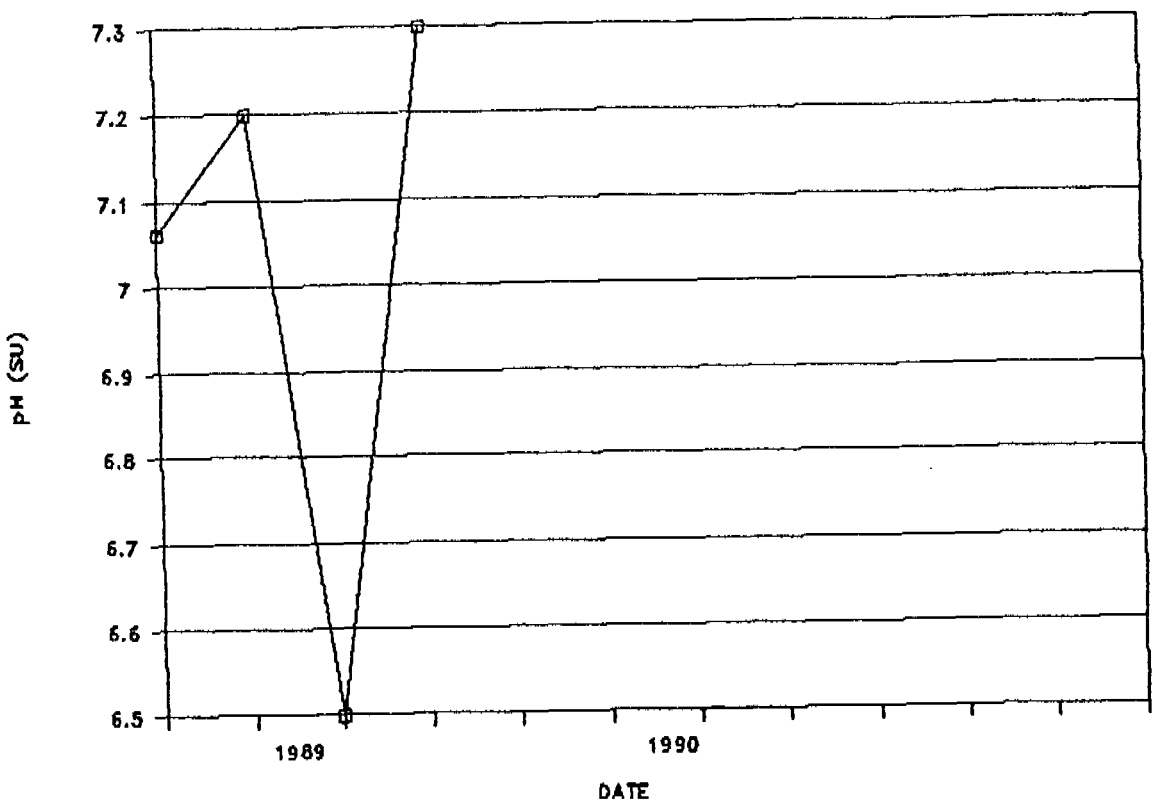
IRON/MANGANESE – SITE–GW–13



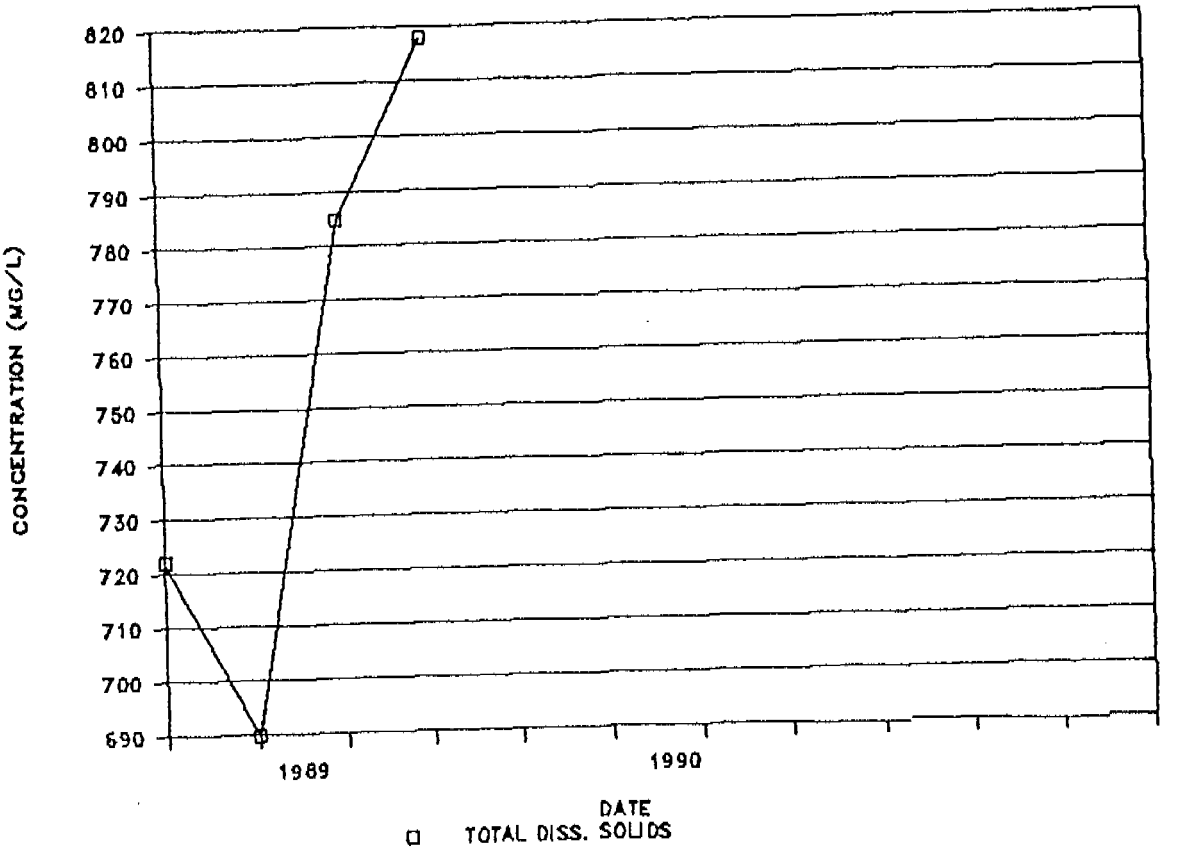
MAJOR IONS – SITE-GW-13



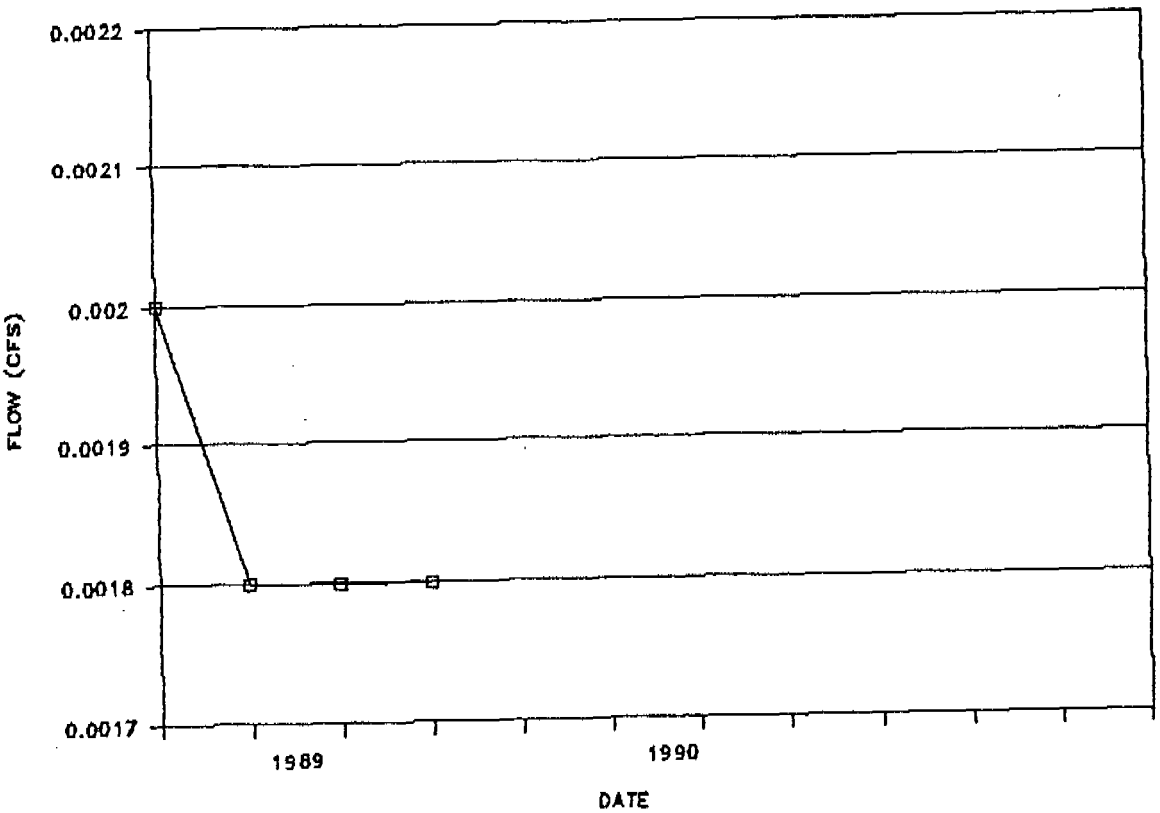
pH – SITE-GW-13



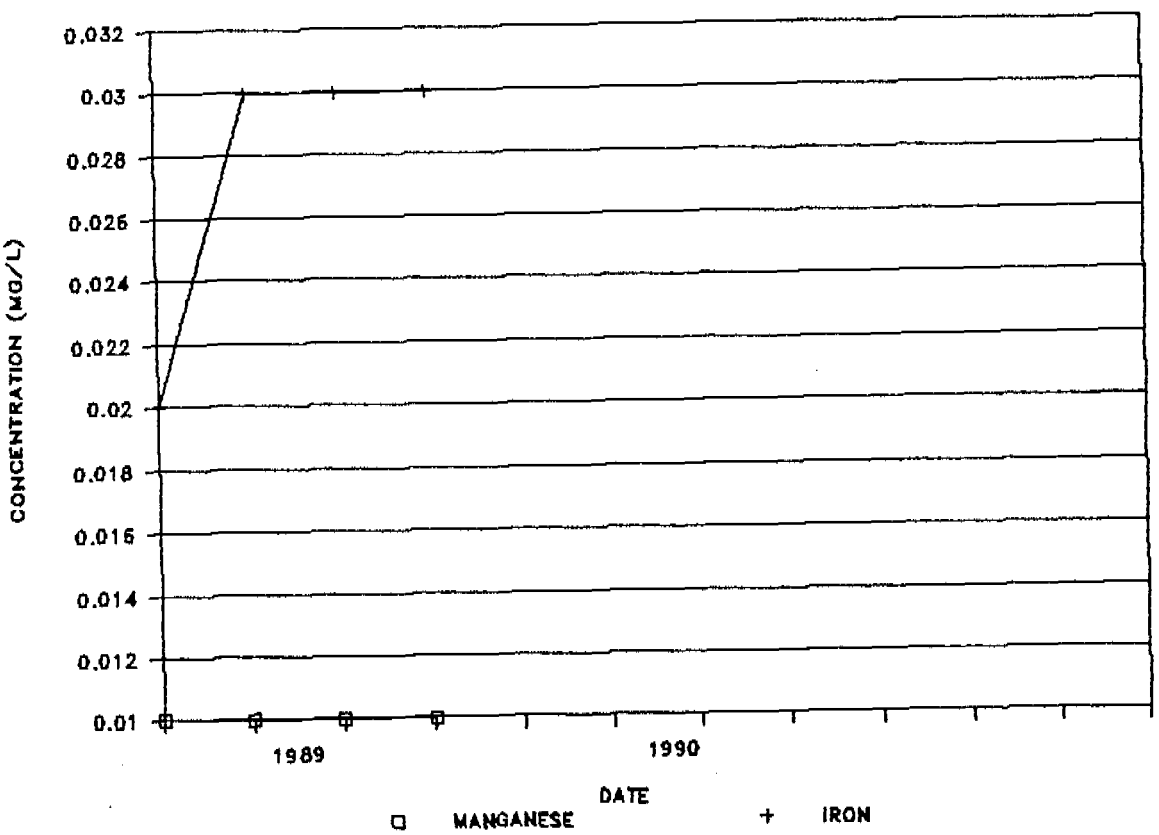
DISSOLVED SOLIDS -- SITE-GW-13



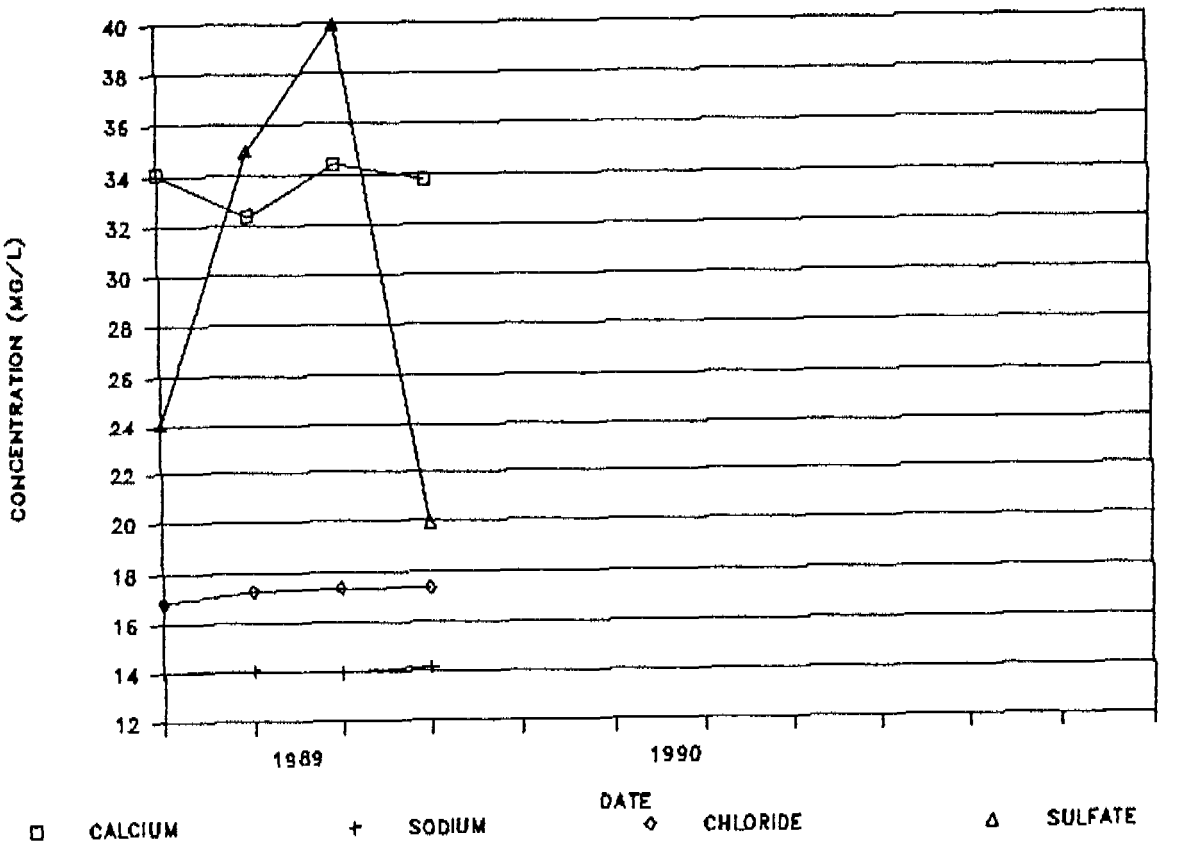
FLOW – SITE GW-21



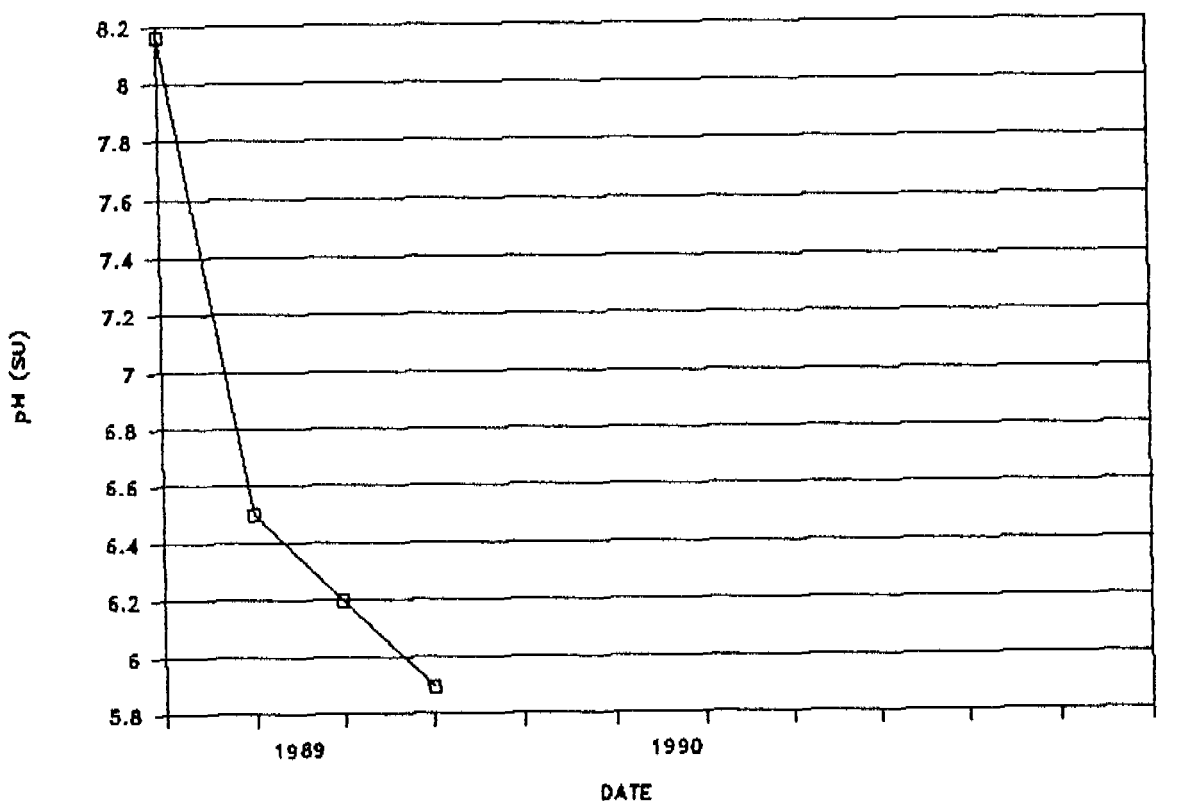
IRON/MANGANESE – SITE GW-21



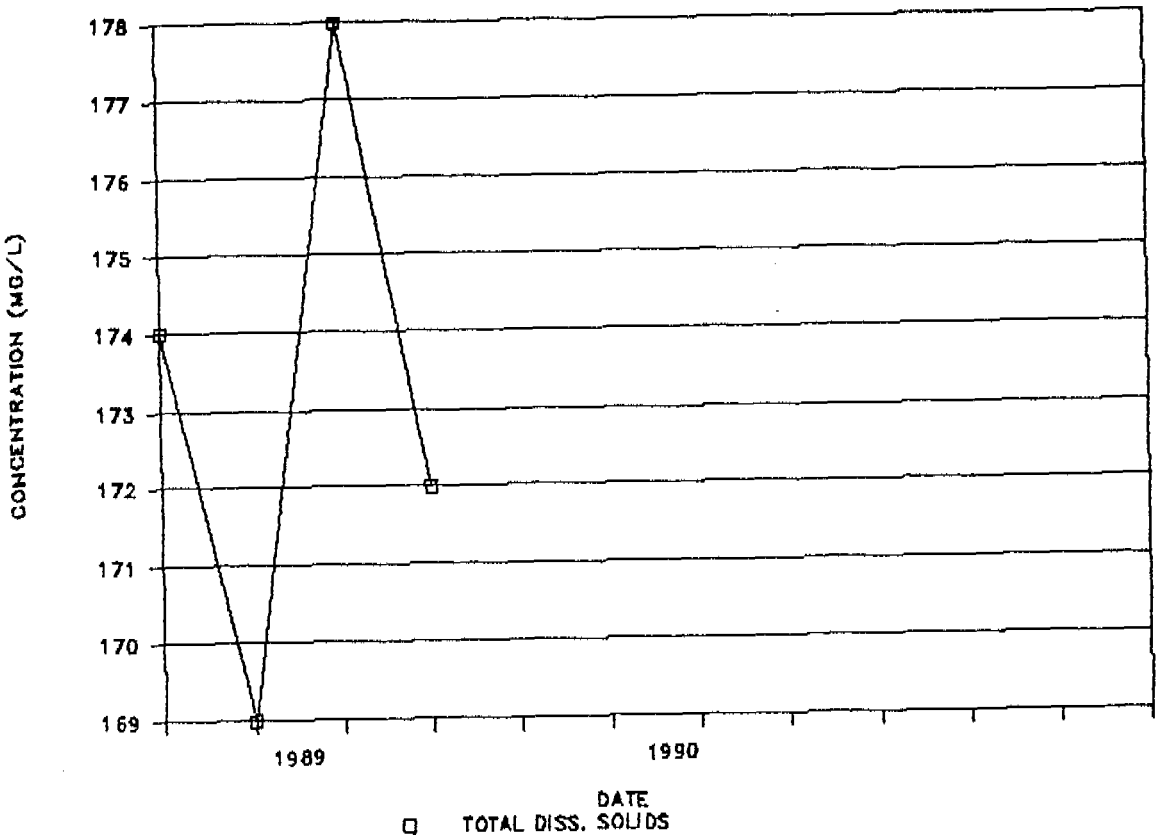
MAJOR IONS – SITE GW-21



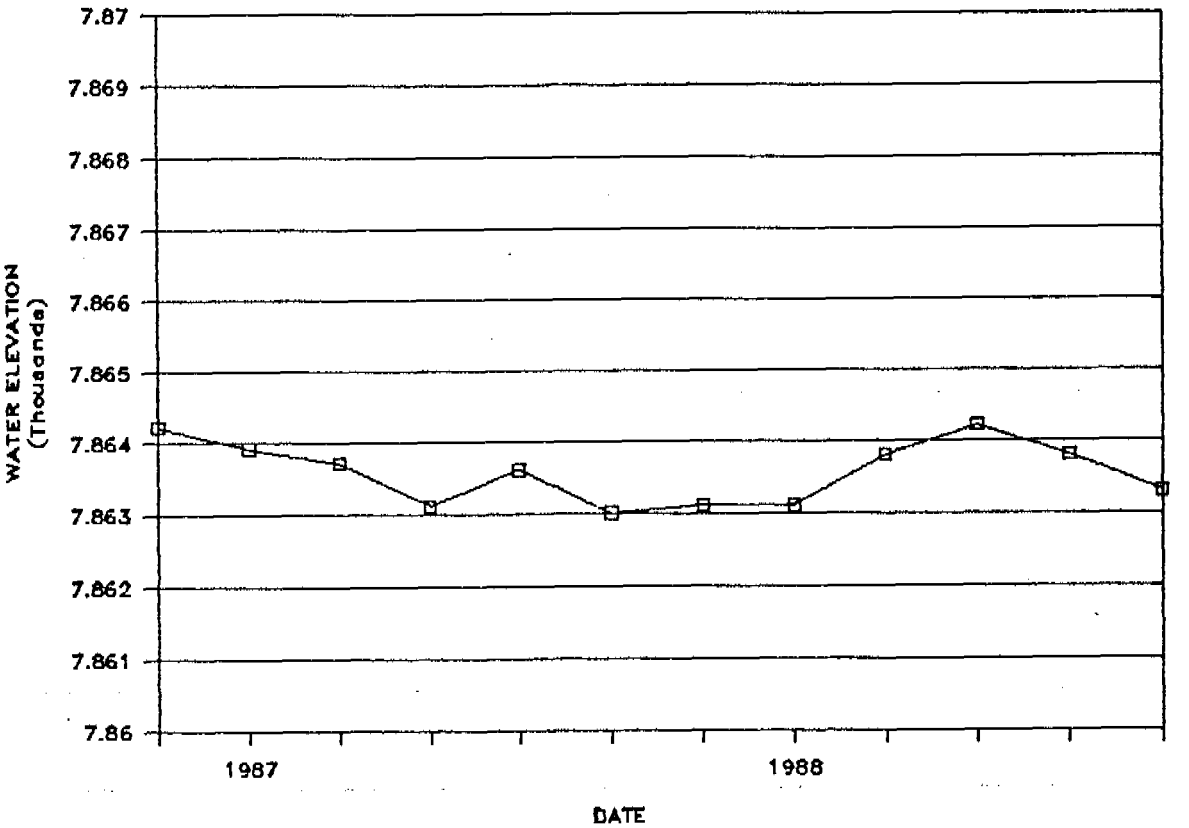
pH – SITE GW-21



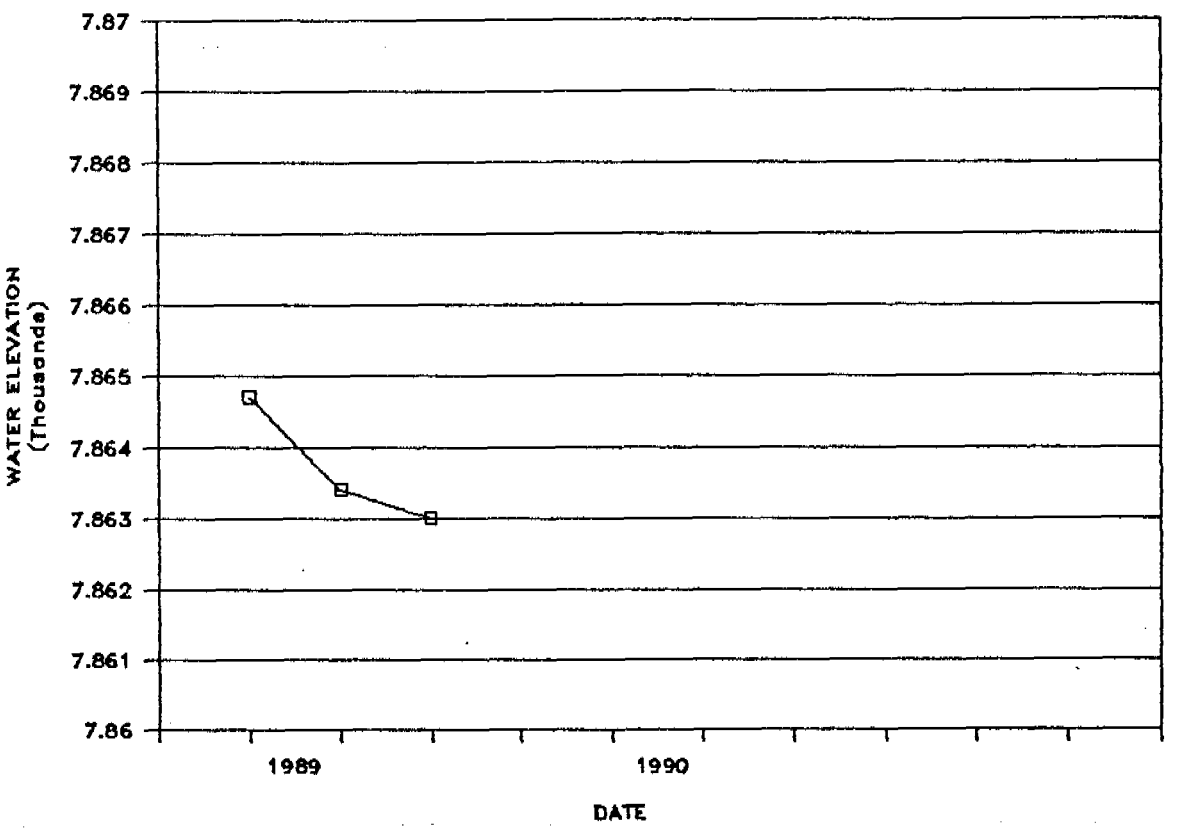
DISSOLVED SOLIDS - SITE GW-21

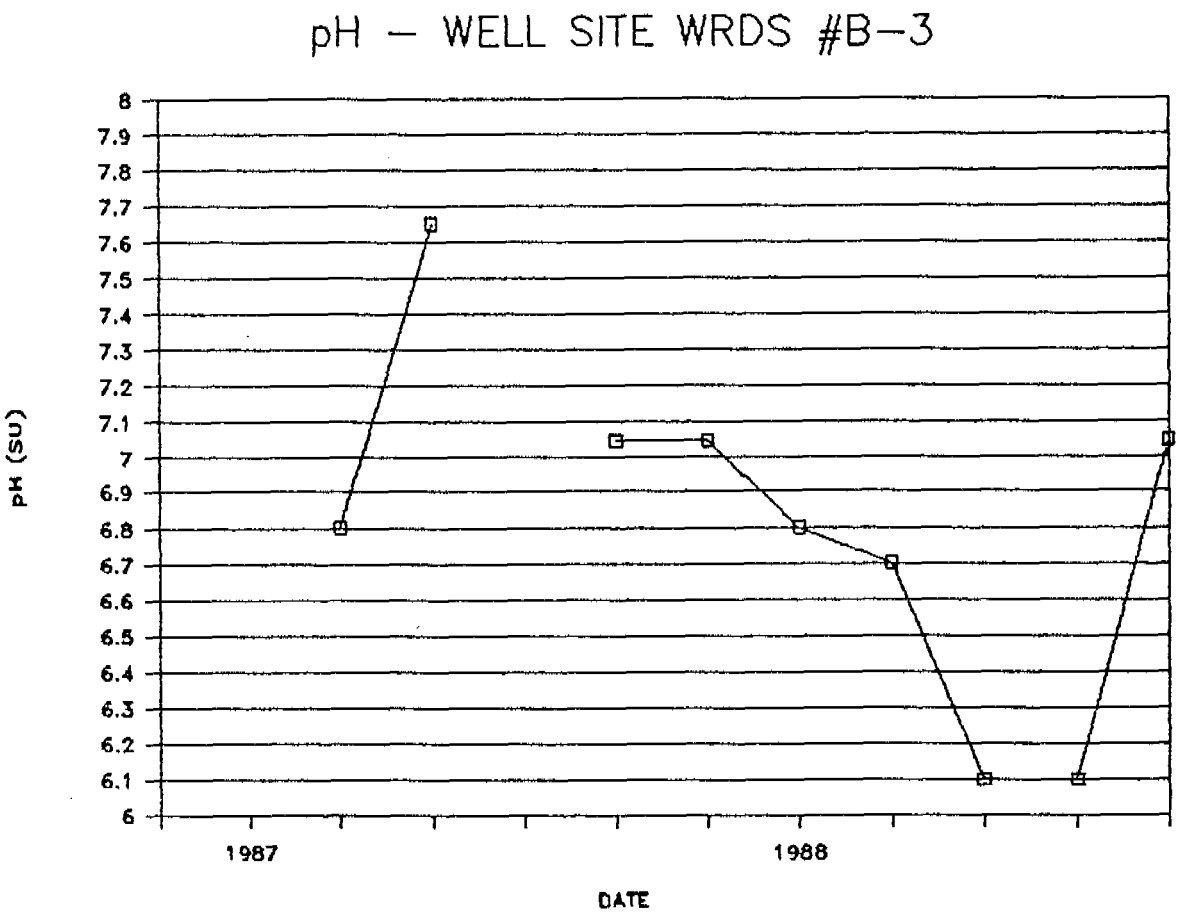


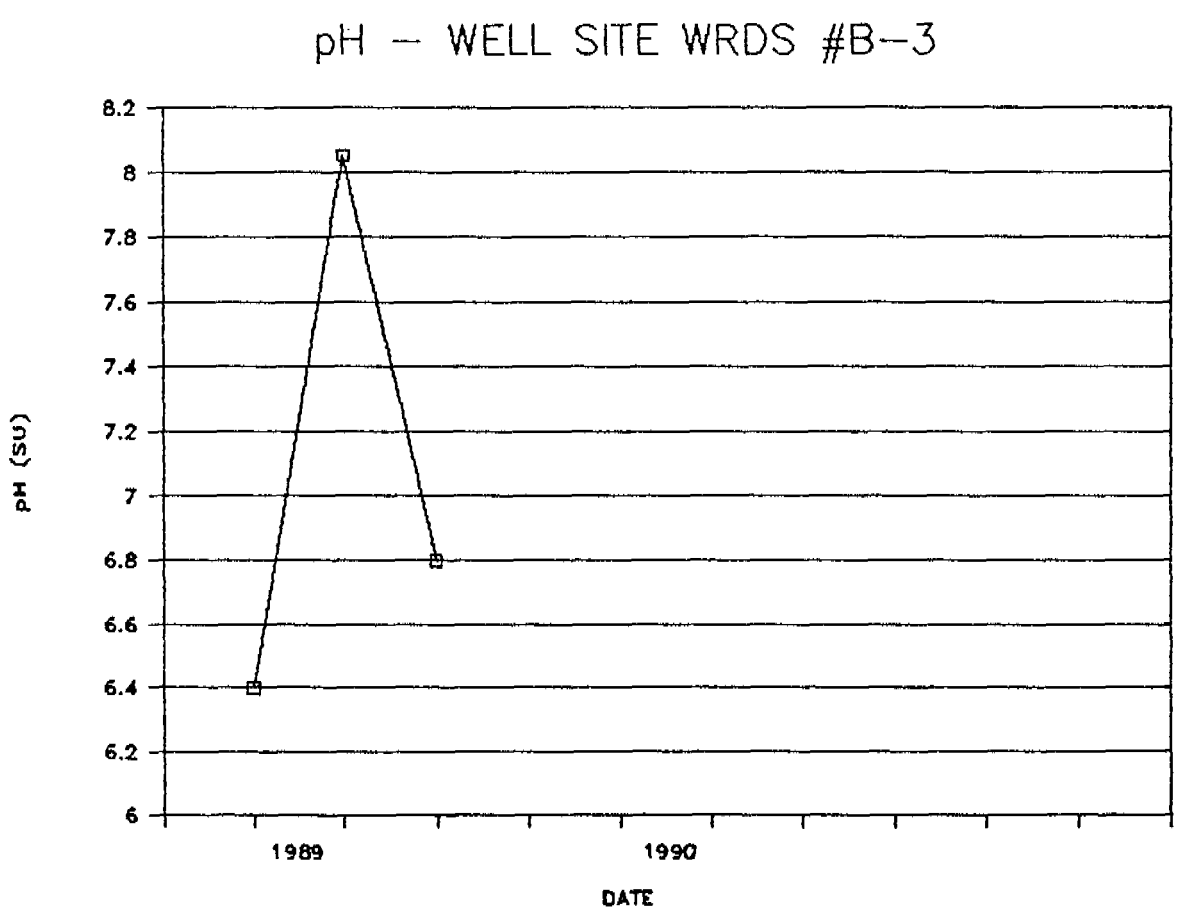
WATER LEVEL – WELL SITE WRDS #B-3



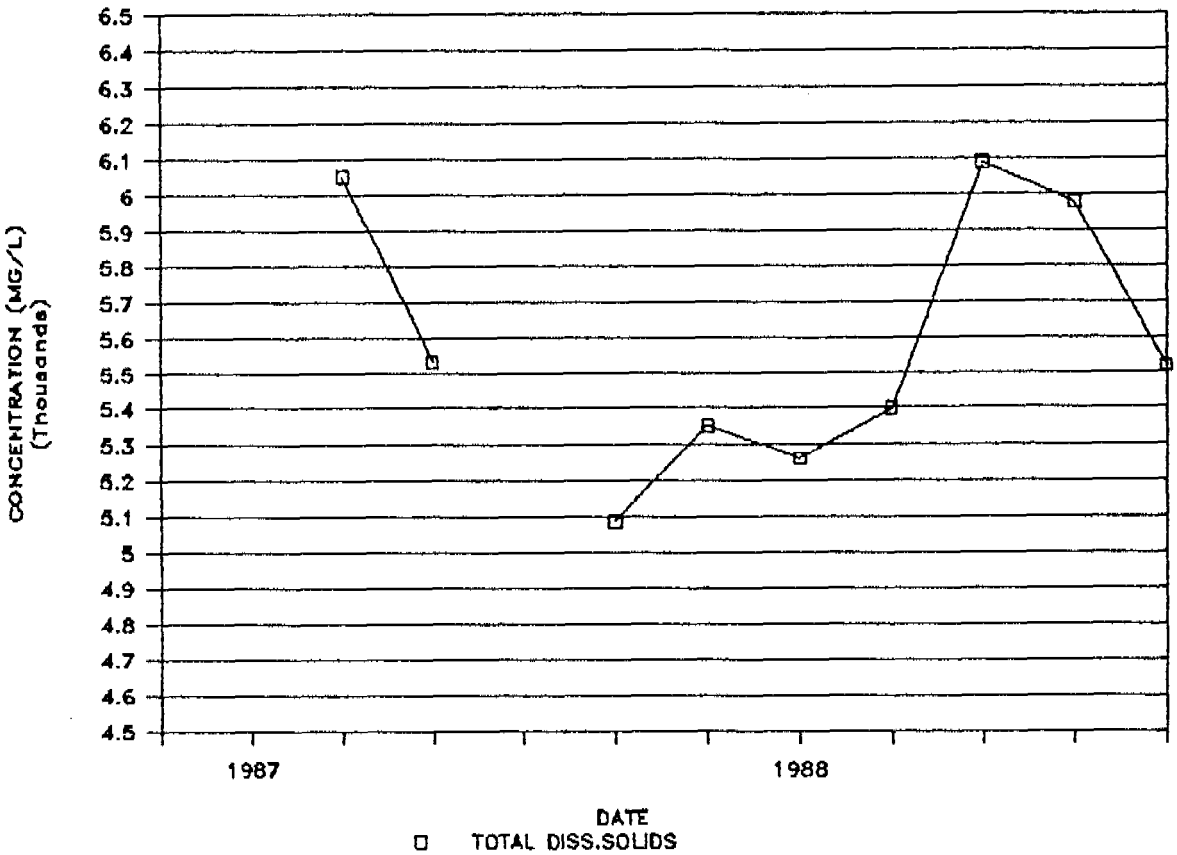
WATER LEVEL – WELL SITE WRDS #B-3



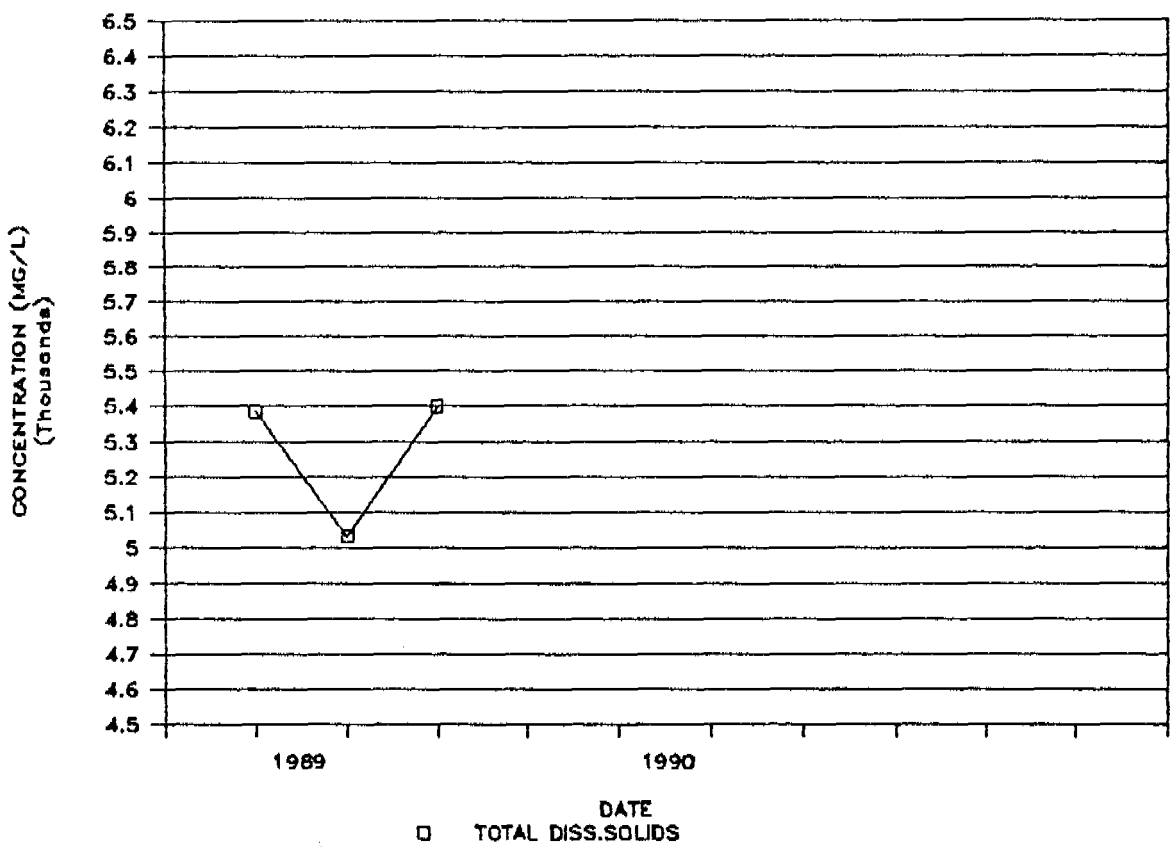

pH – WELL SITE WRDS #B-3
8
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
pH (SU)
1987
1988
DATE

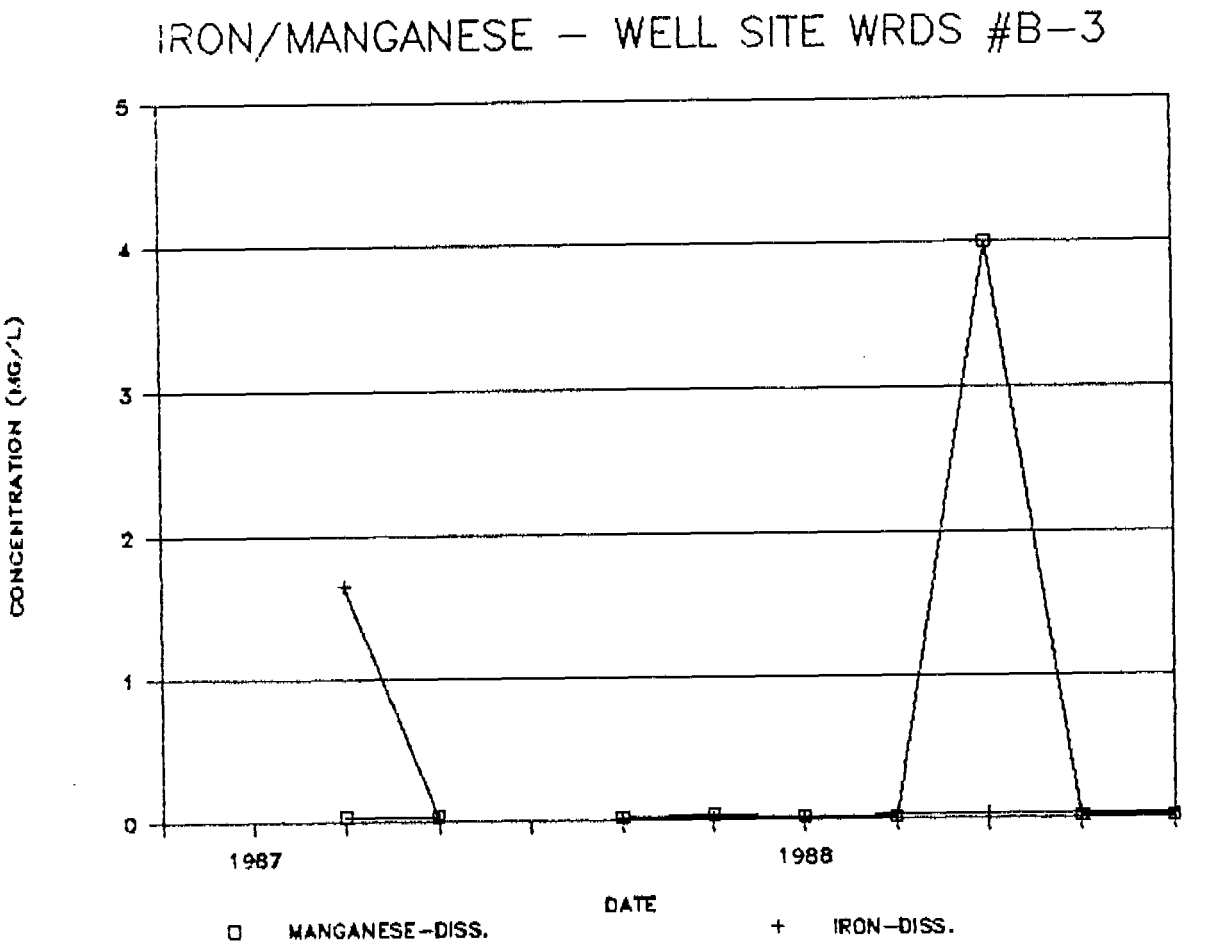

pH – WELL SITE WRDS #B-3
8.2
8
7.8
7.6
7.4
7.2
7
6.8
6.6
6.4
6.2
6
pH (SU)
1989
1990
DATE

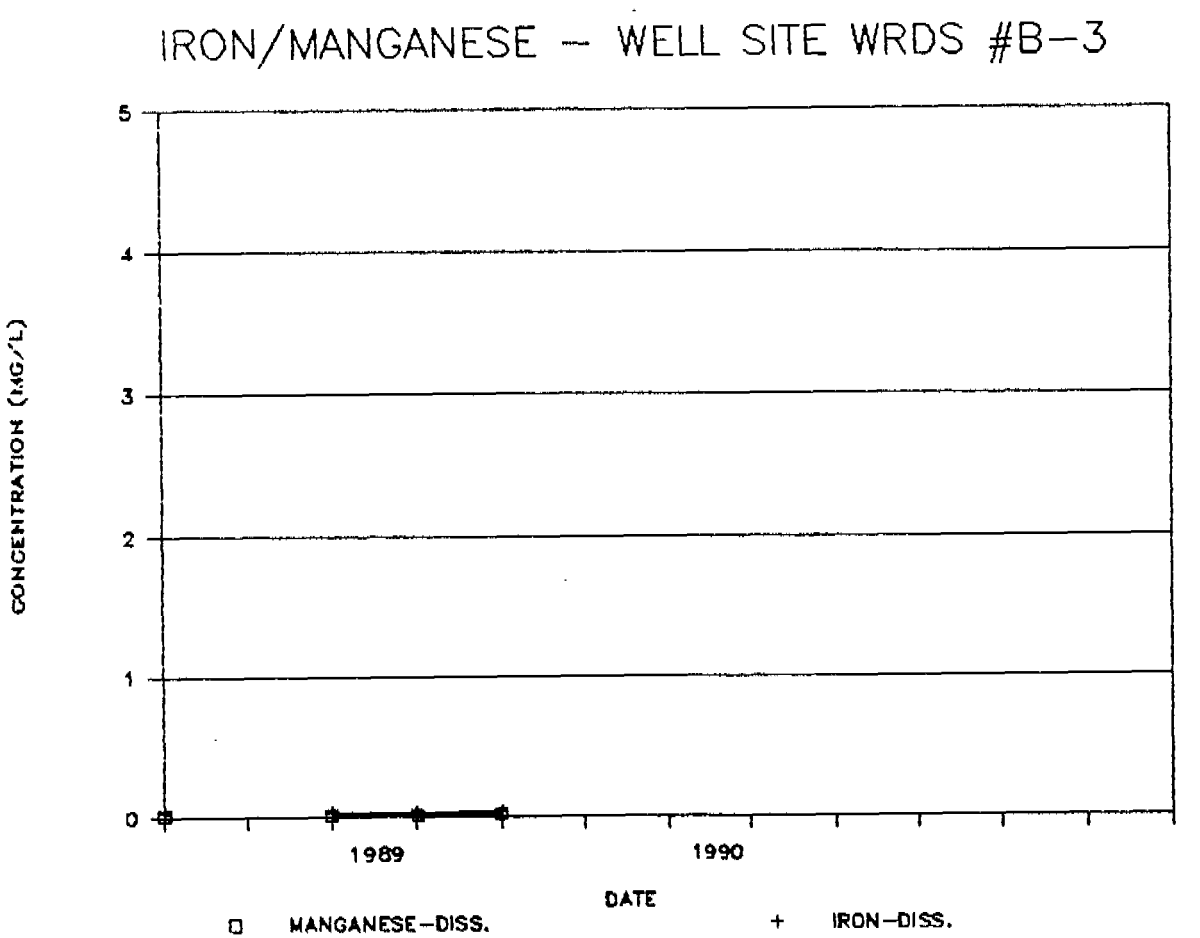
DISSOLVED SOLIDS – WELL SITE WRDS #B-3



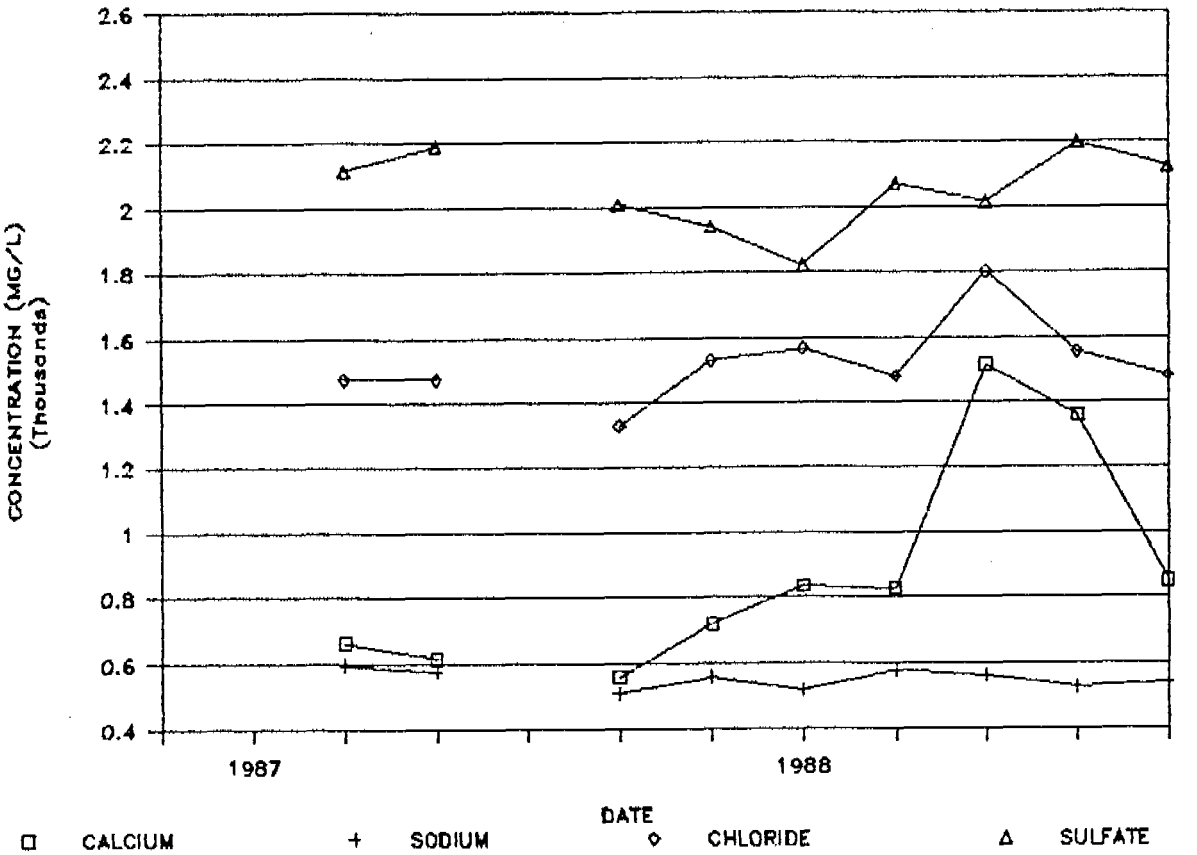
DISSOLVED SOLIDS – WELL SITE WRDS #B-3



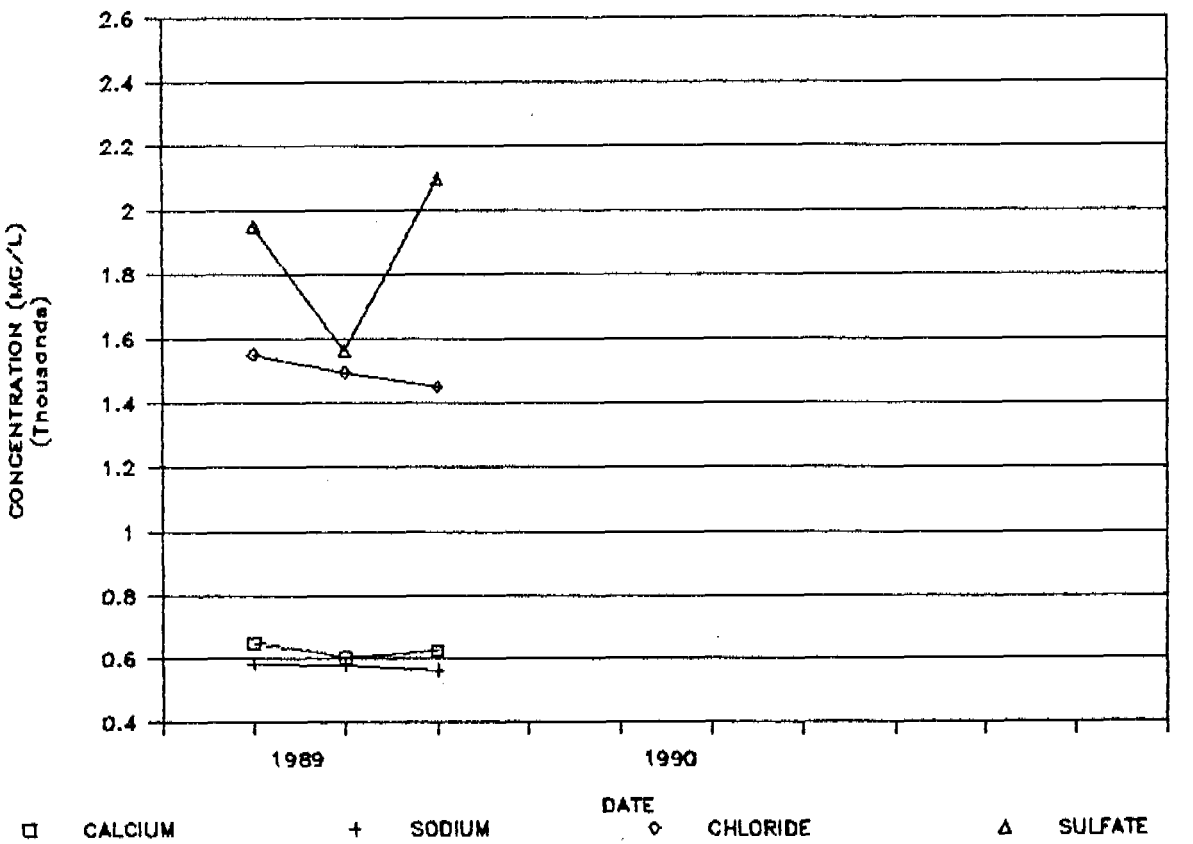

IRON/MANGANESE – WELL SITE WRDS #B-3
CONCENTRATION (MG/L)
5
4
3
2
1
0
1987
1988
DATE
MANGANESE-DISS.
IRON-DISS.


IRON/MANGANESE – WELL SITE WRDS #B-3
CONCENTRATION (MG/L)
5
4
3
2
1
0
1989
1990
DATE
MANGANESE-DISS.
IRON-DISS.

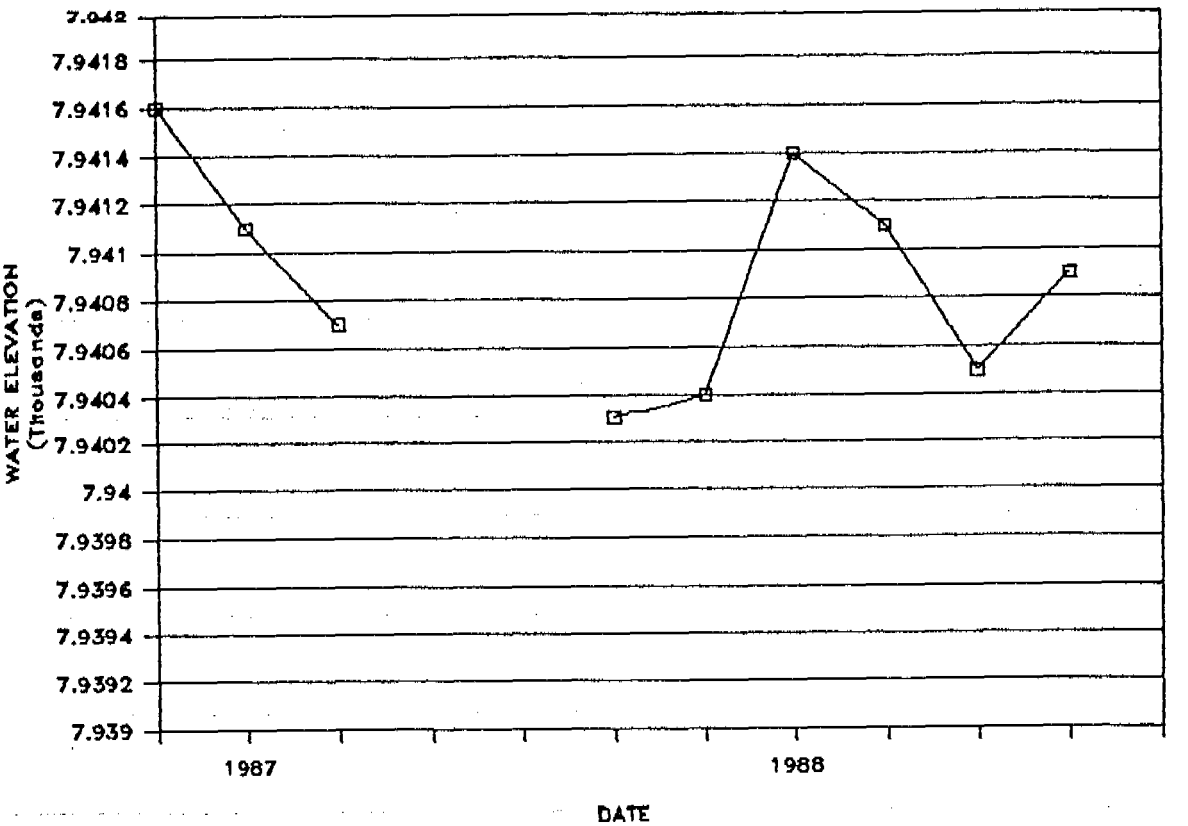
MAJOR IONS – WELL SITE WRDS #B-3



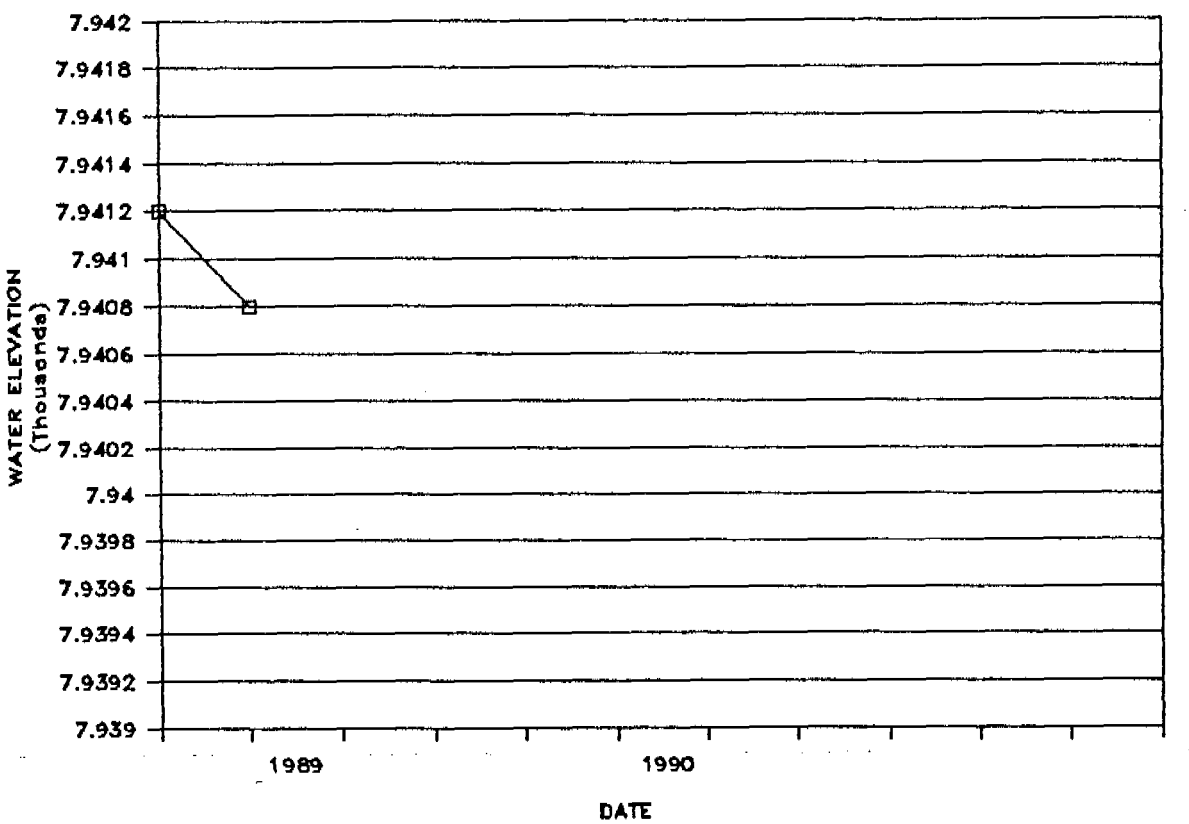
MAJOR IONS – WELL SITE WRDS #B-3



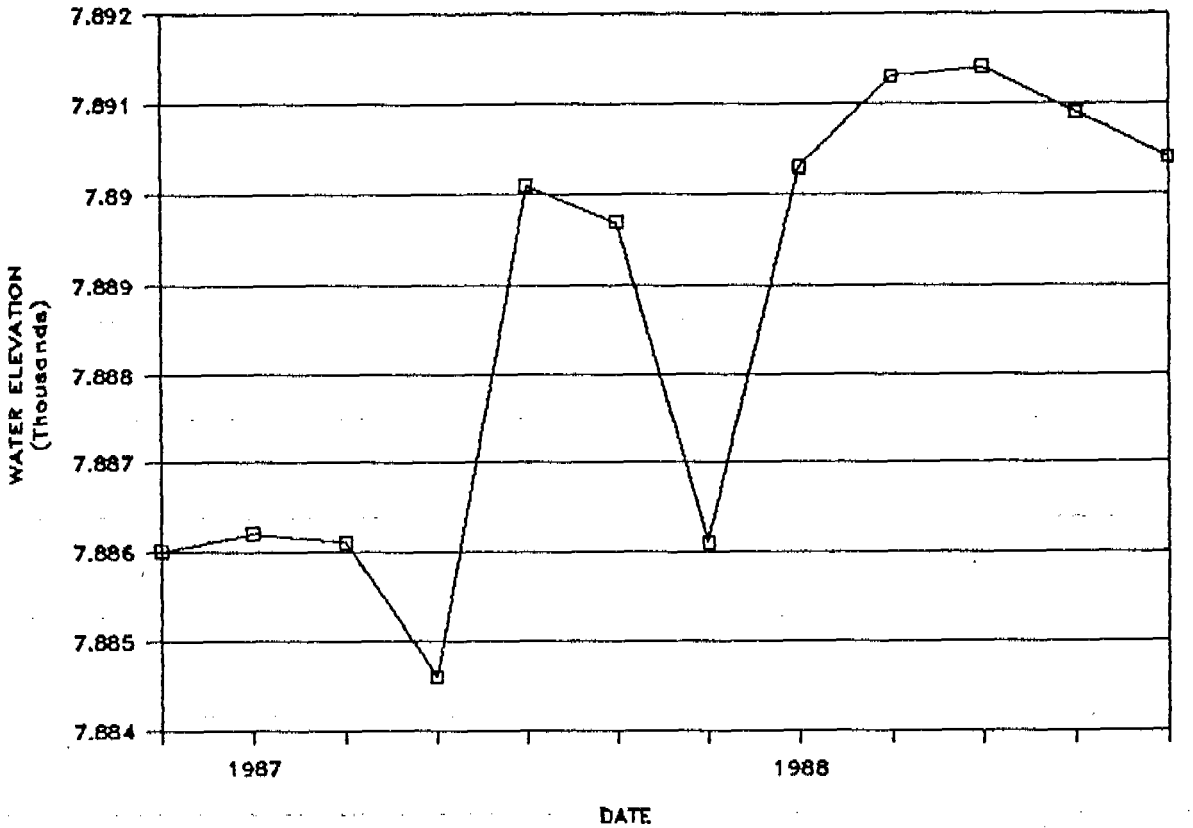
WATER LEVEL – WELL SITE #B-5



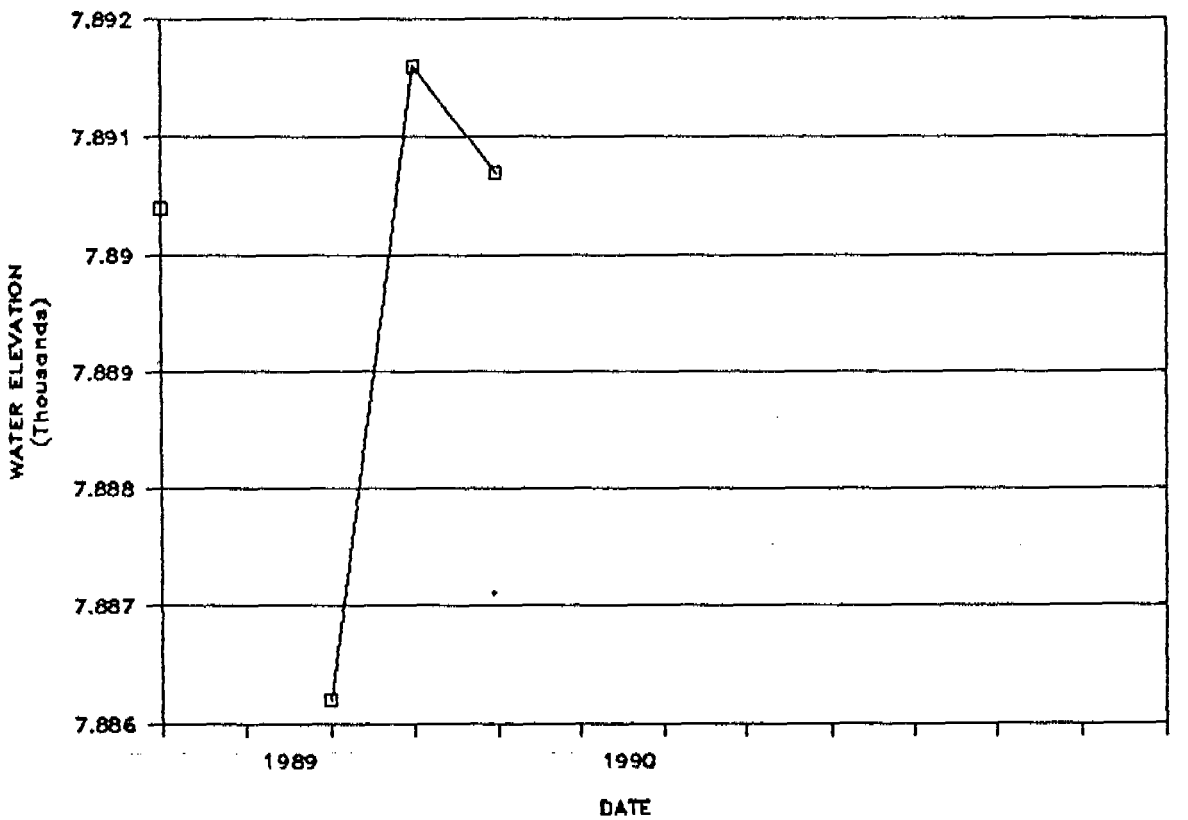
WATER LEVEL – WELL SITE #B-5

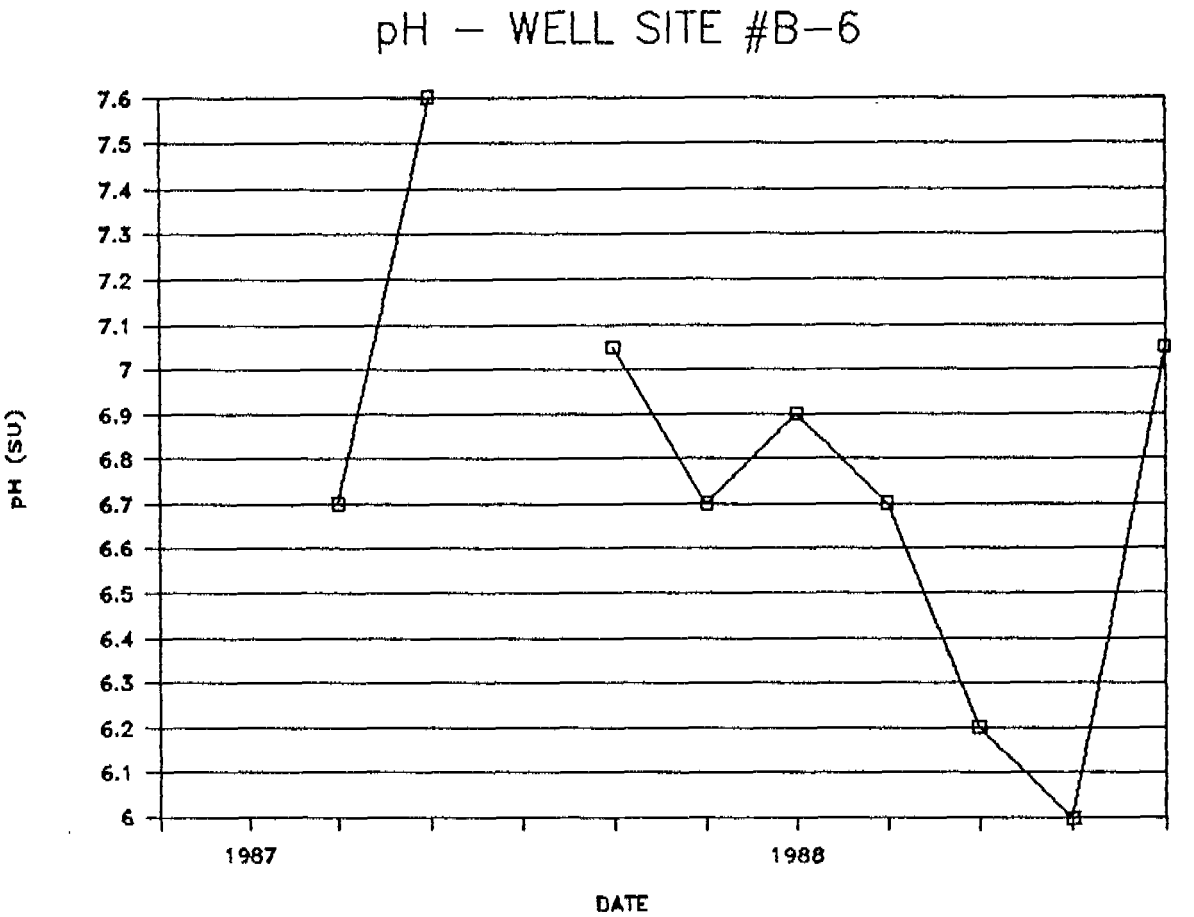


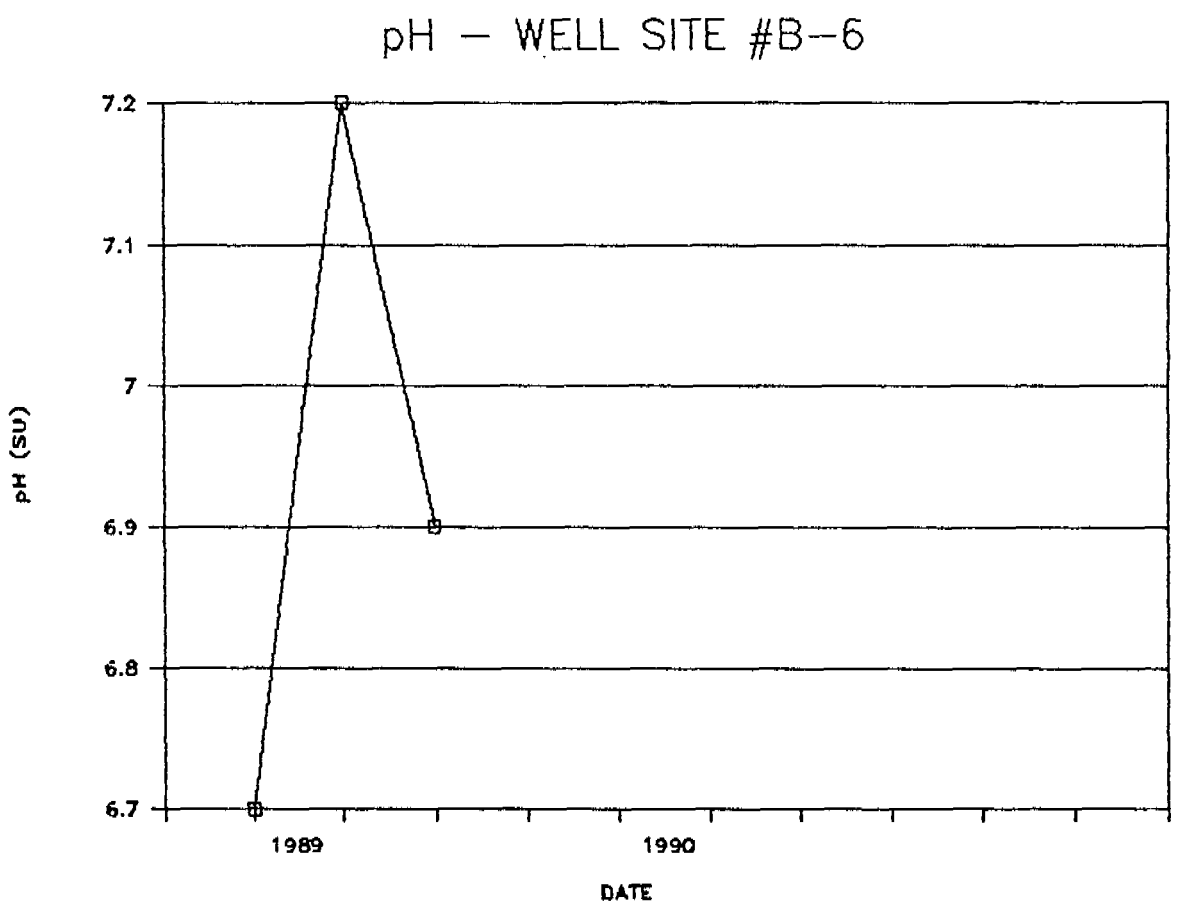
WATER LEVEL – WELL SITE #B–6



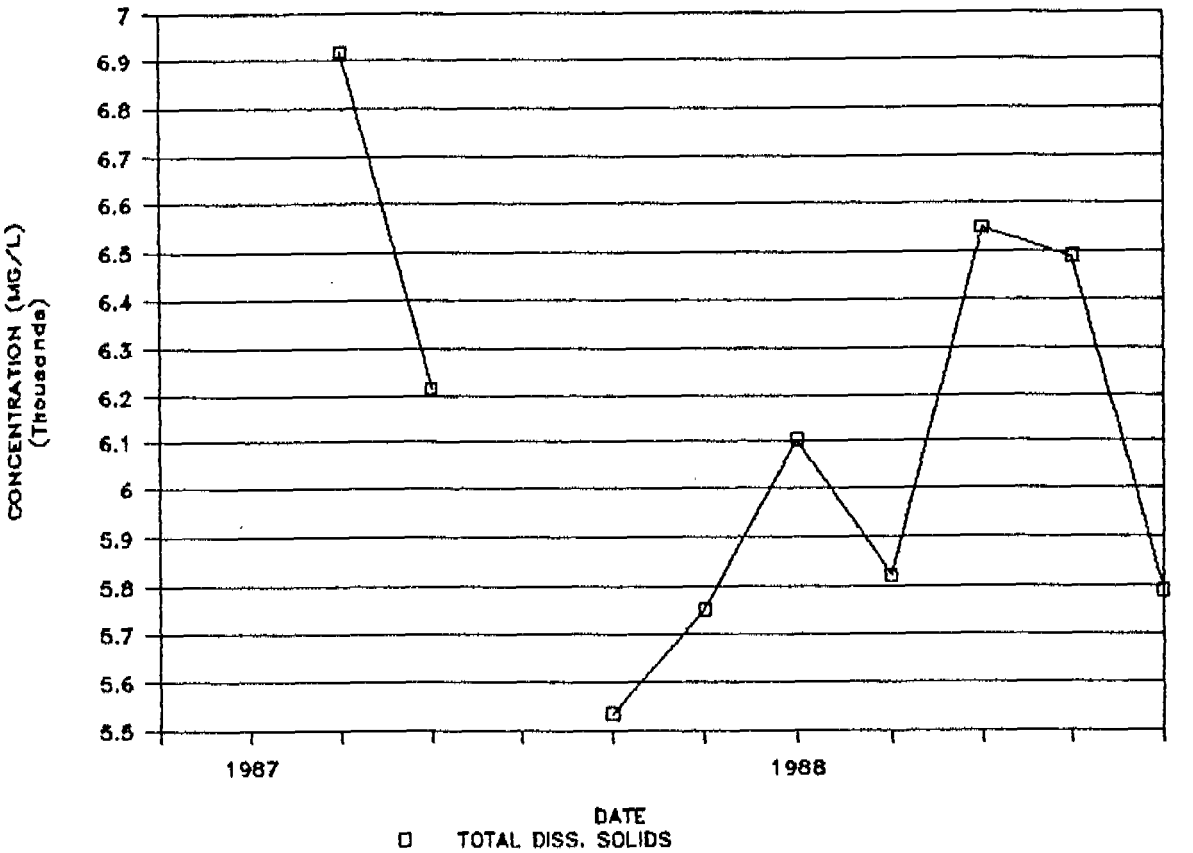
WATER LEVEL – WELL SITE WRDS #B–6



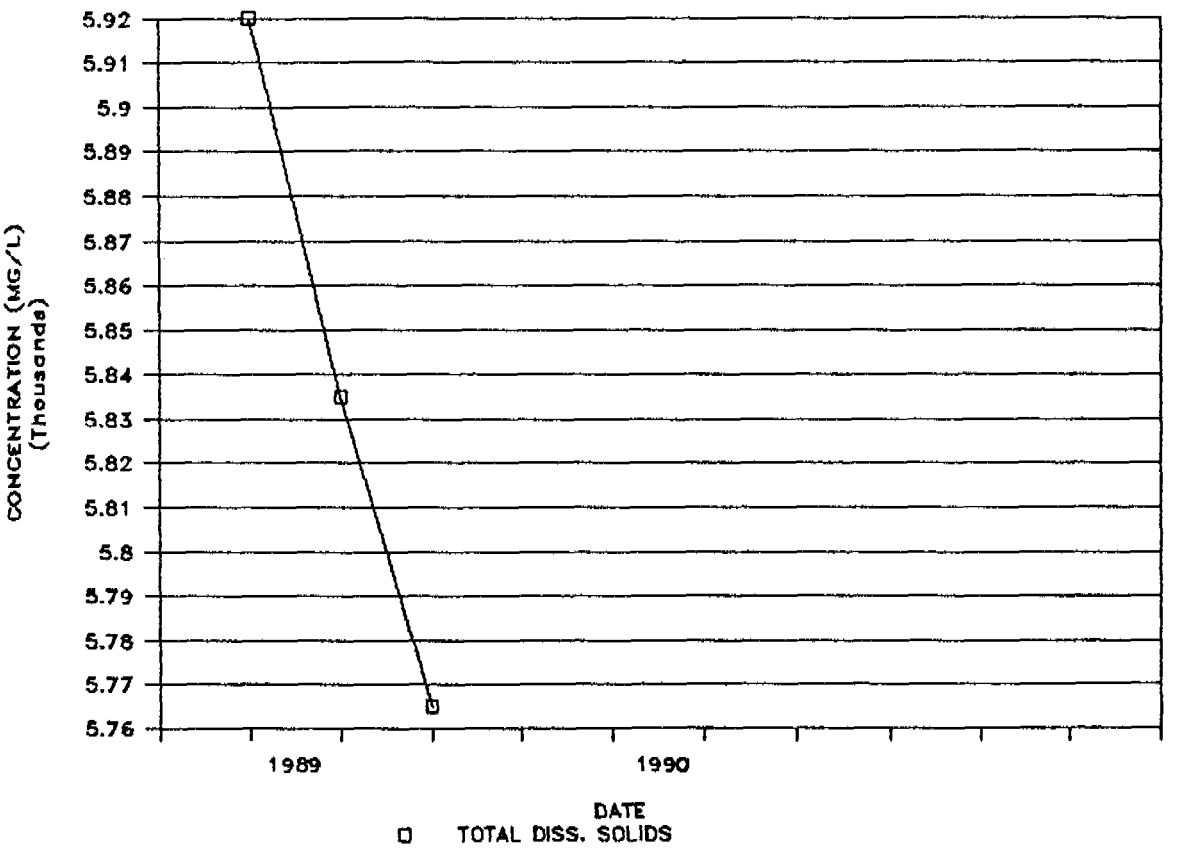

pH – WELL SITE #B-6
7.6
7.5
7.4
7.3
7.2
7.1
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
pH (SU)
1987
1988
DATE


pH – WELL SITE #B-6
7.2
7.1
7
6.9
6.8
6.7
pH (SU)
1989
1990
DATE

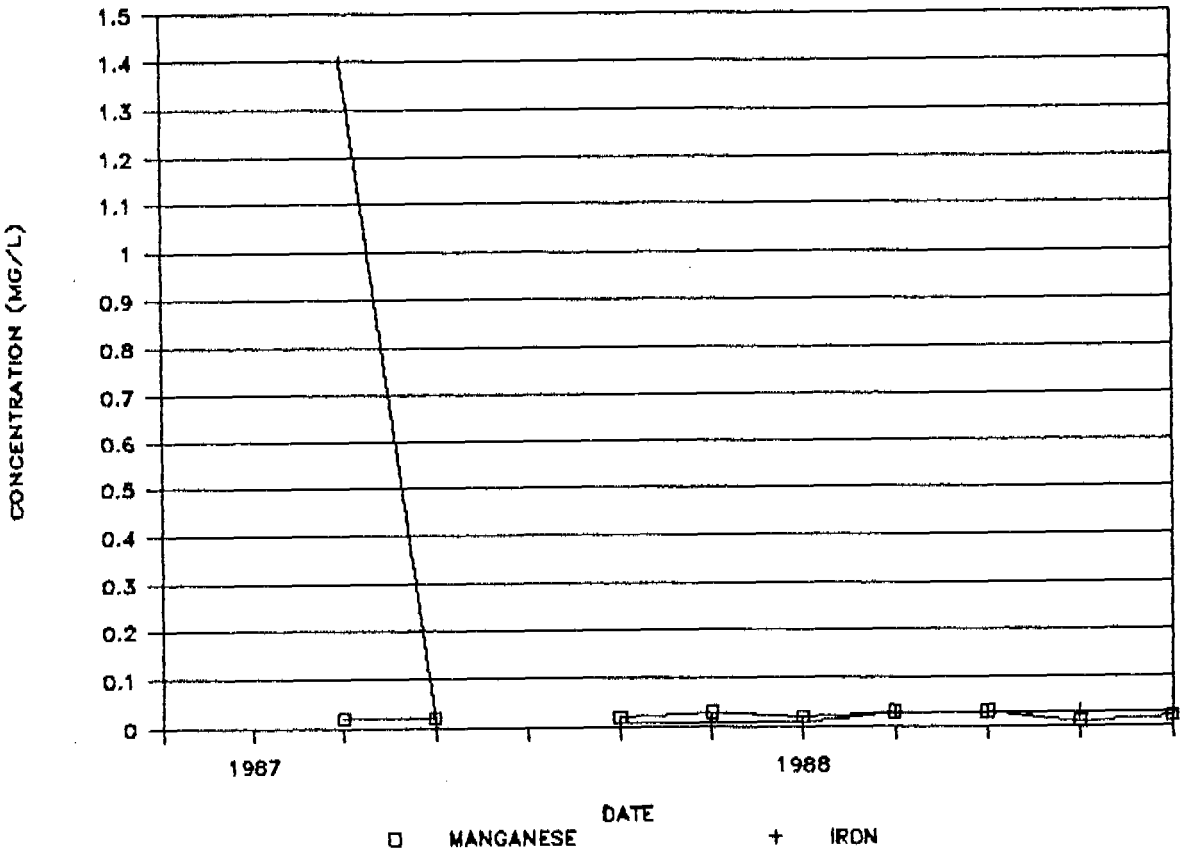
DISSOLVED SOLIDS – WELL SITE #B-6



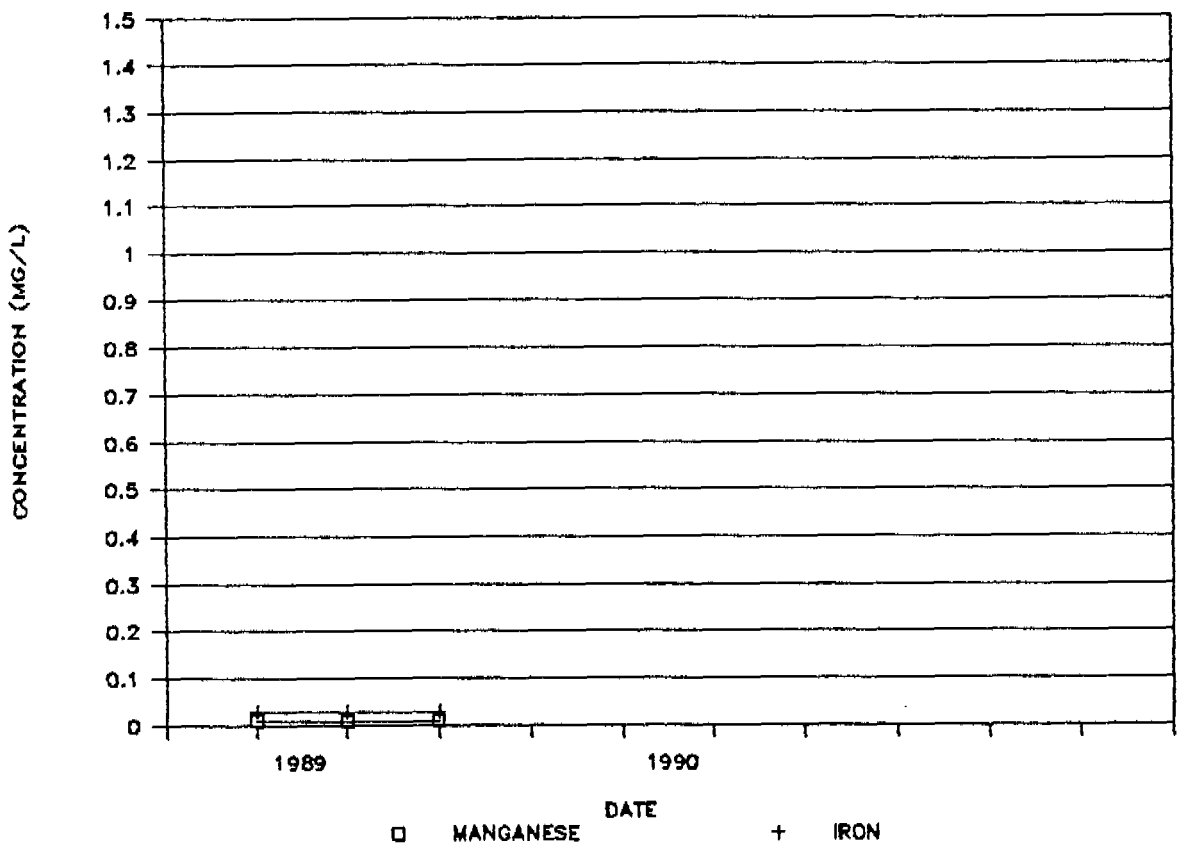
DISSOLVED SOLIDS – WELL SITE #B-6



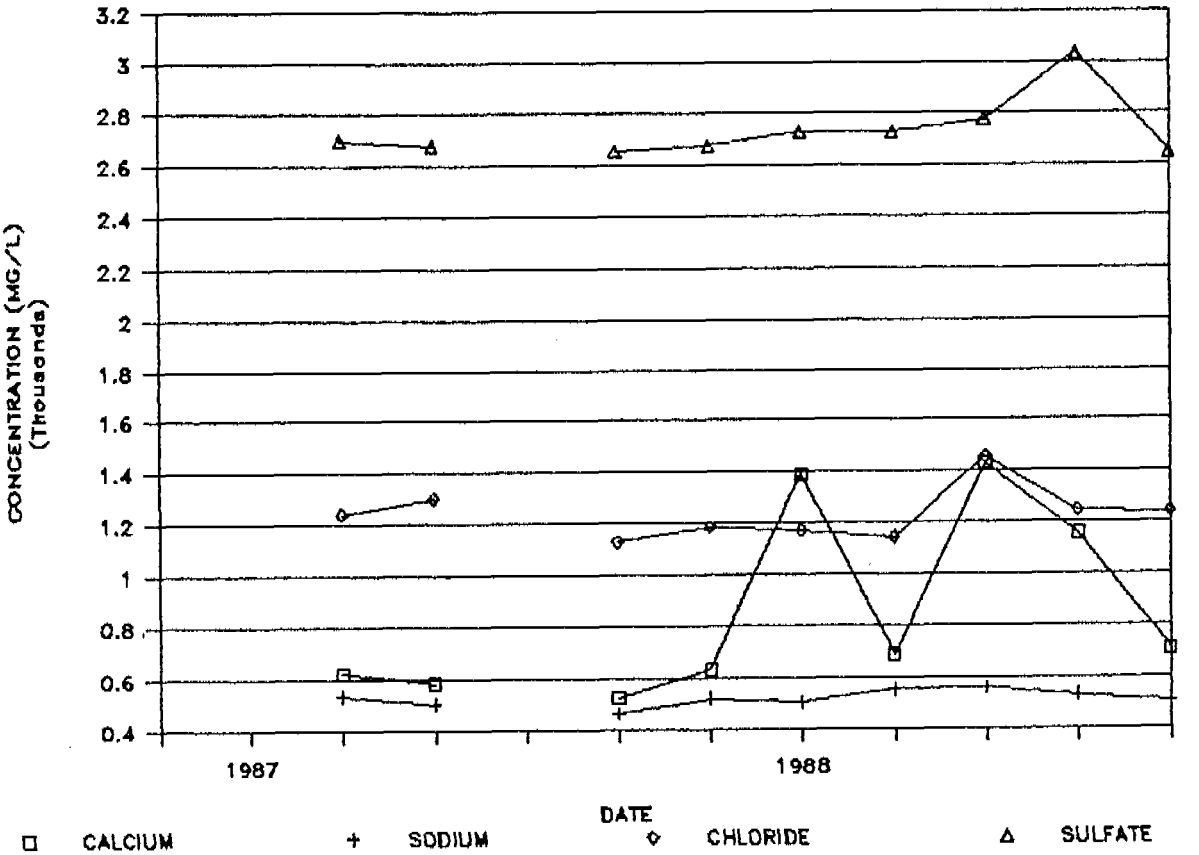
IRON/MANGANESE – WELL SITE #B-6



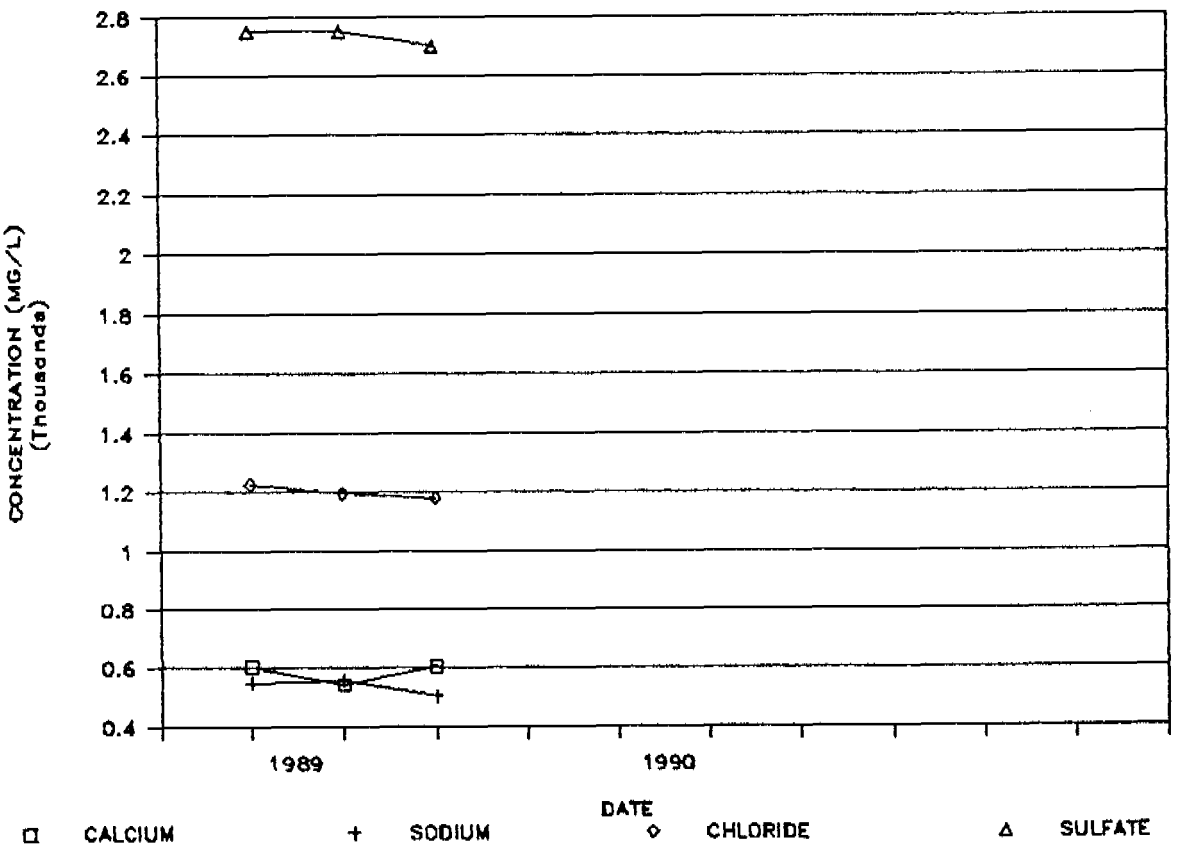
IRON/MANGANESE – WELL SITE #B-6



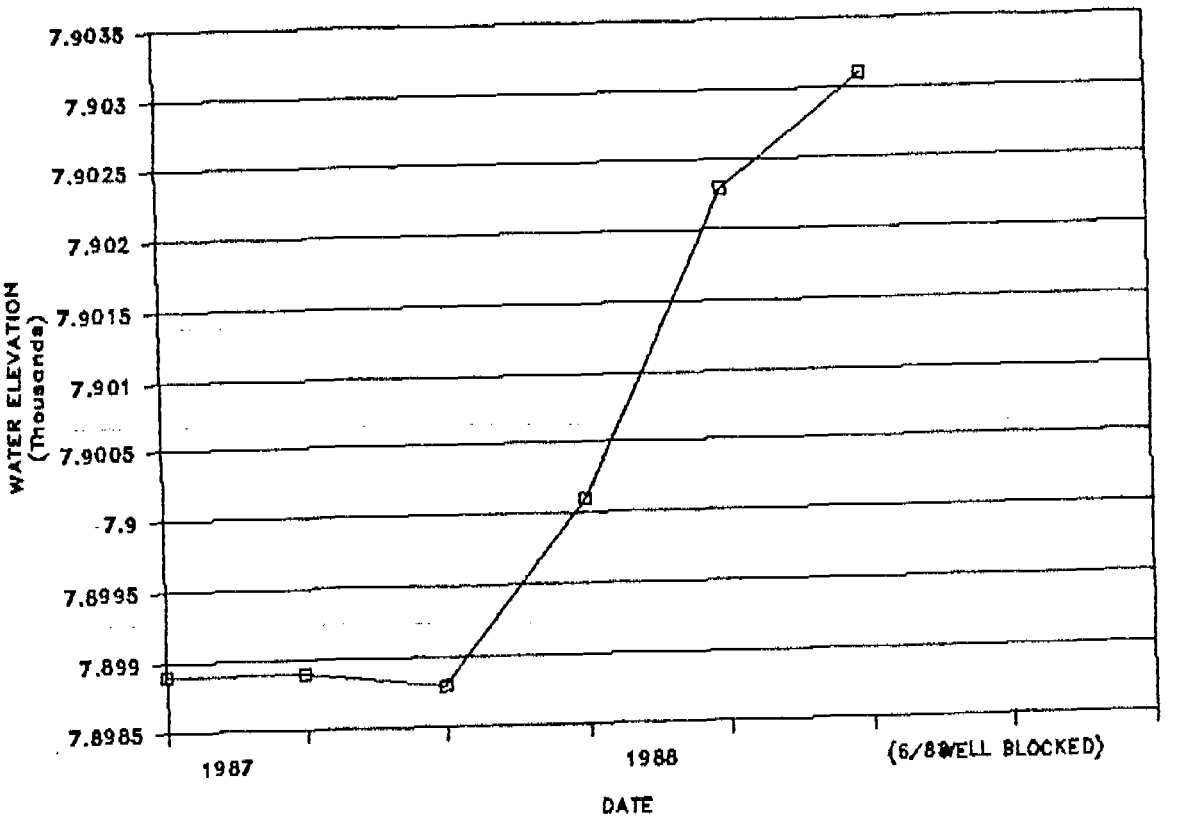
MAJOR IONS – WELL SITE #B-6



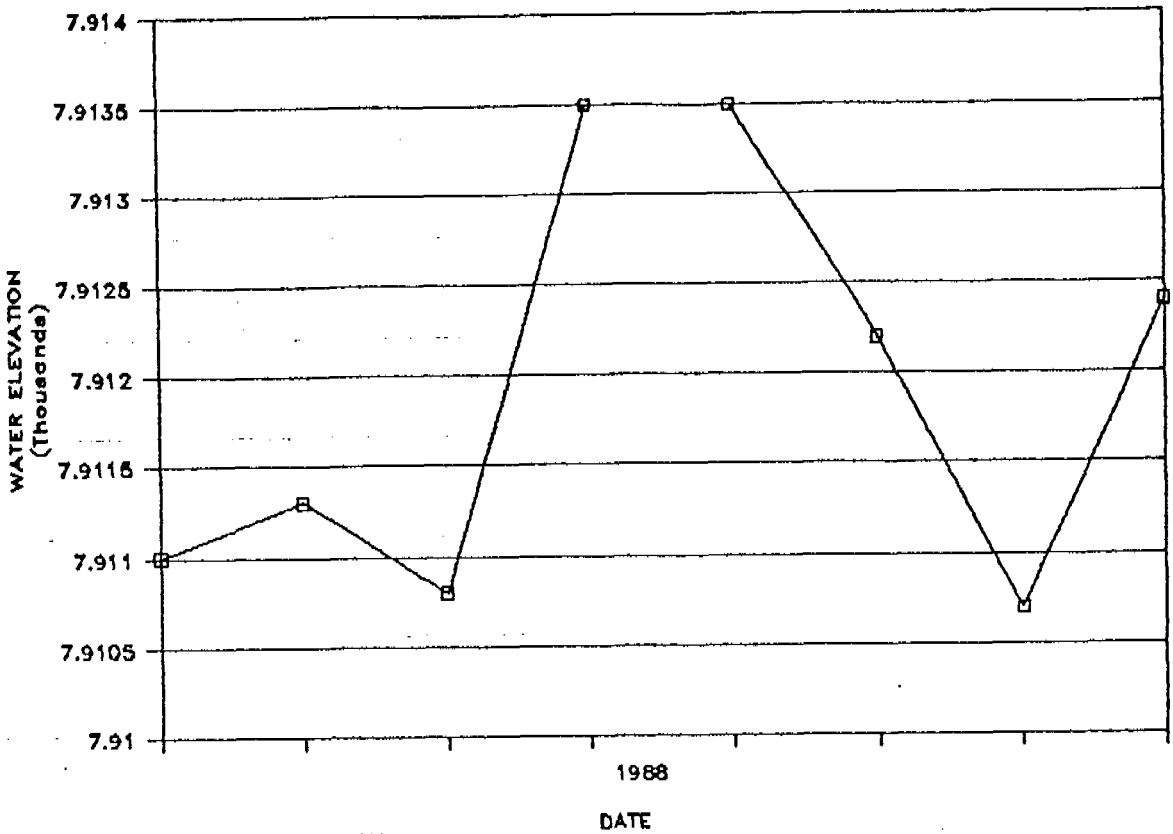
MAJOR IONS – WELL SITE #B-6



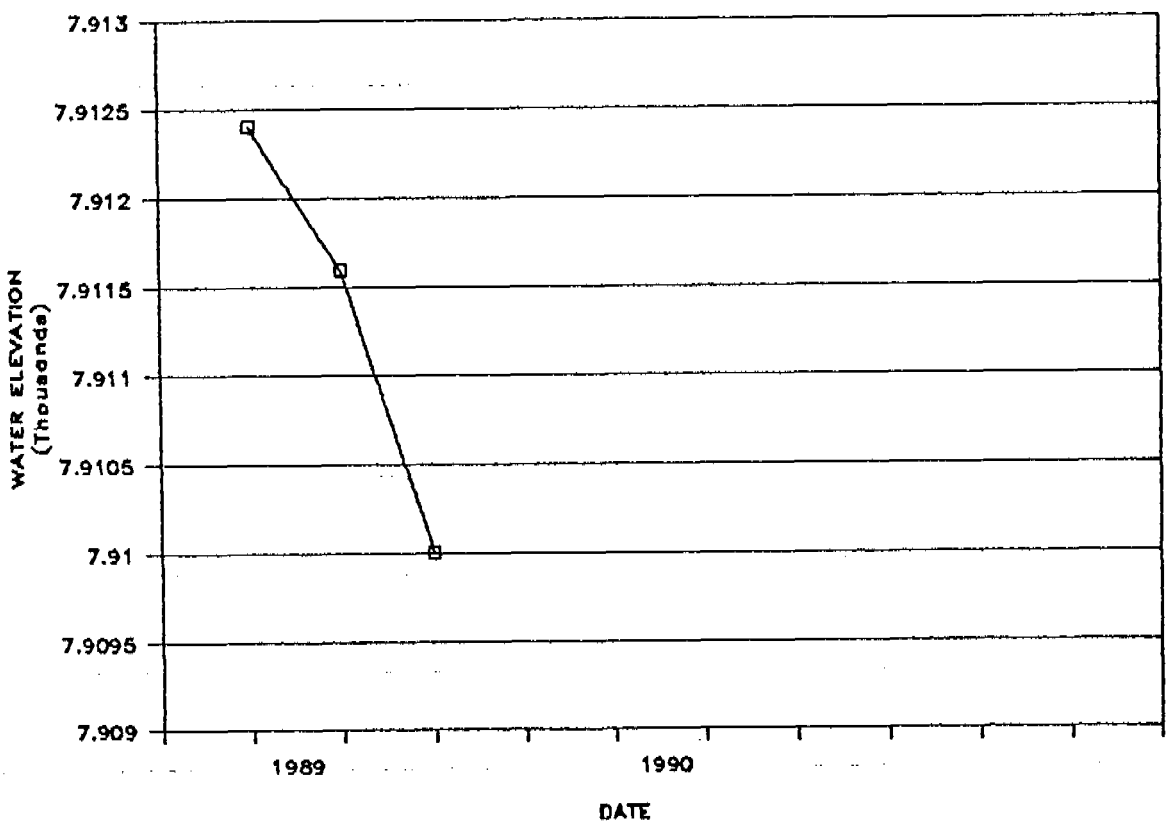
WATER LEVEL – WELL SITE #B-7

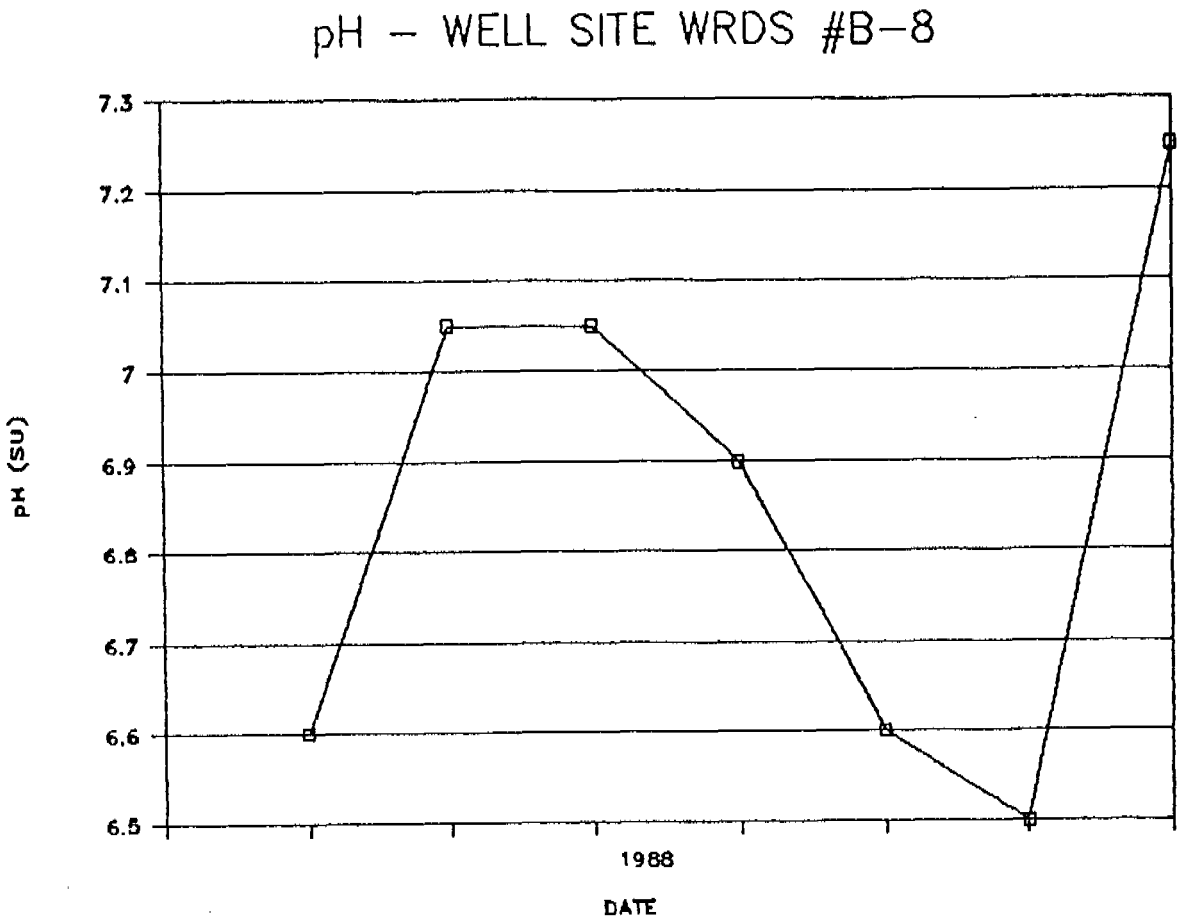


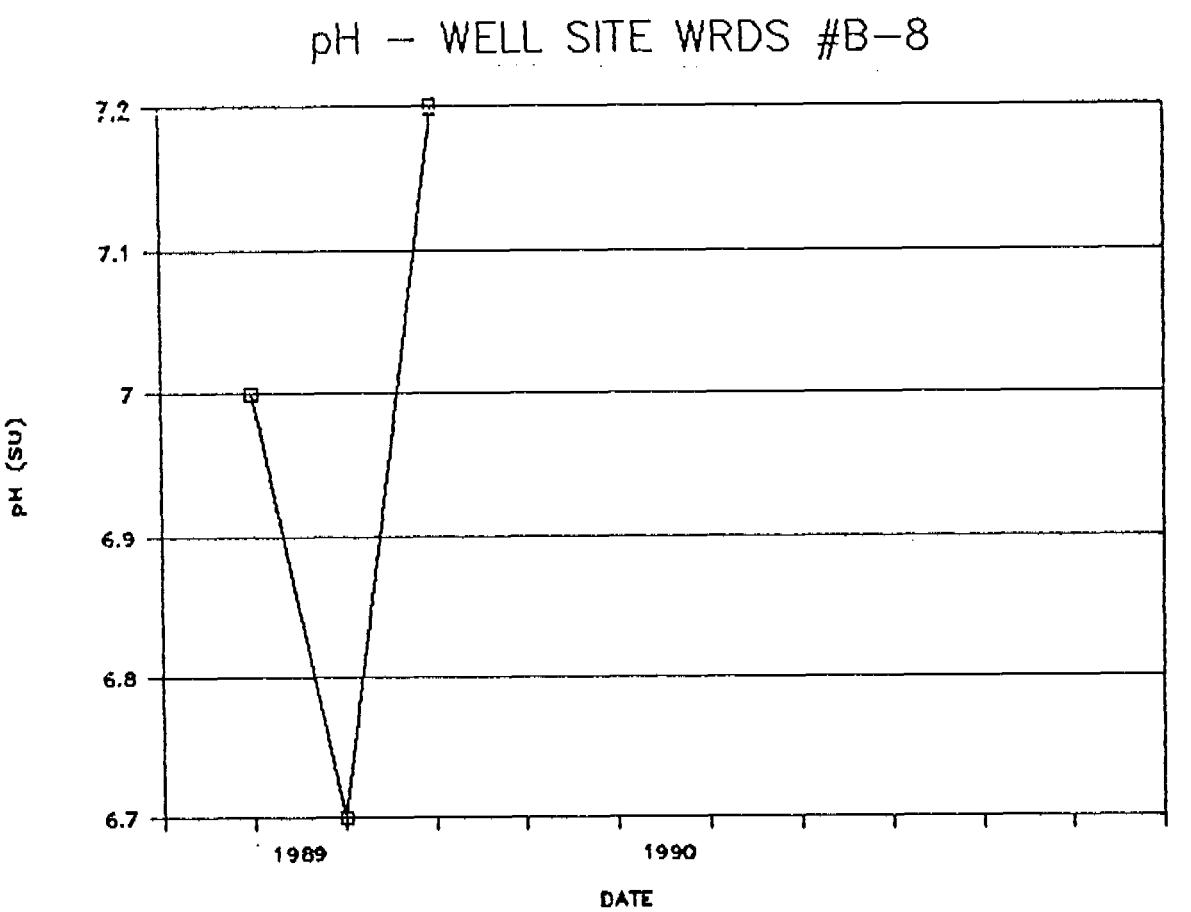
WATER LEVEL – WELL SITE WRDS #B-8

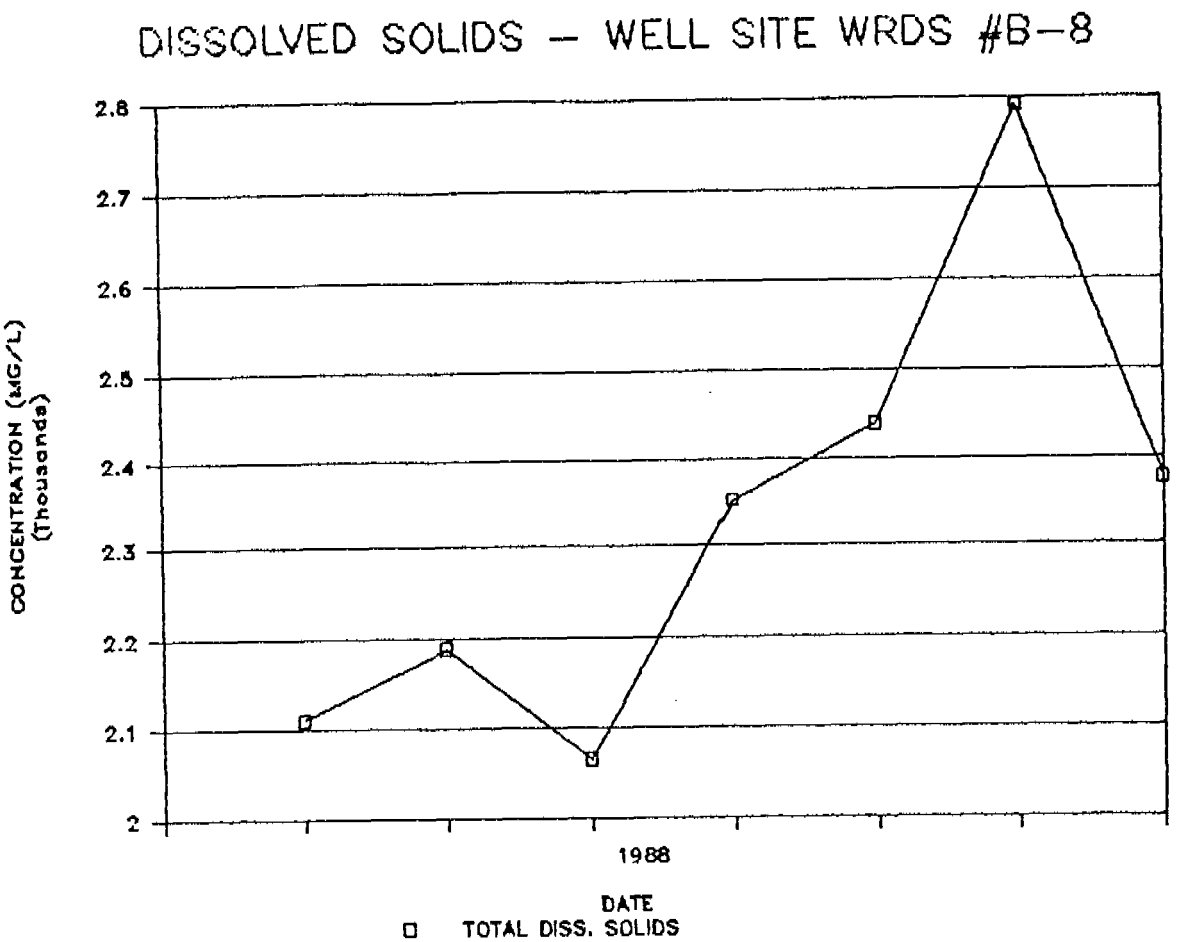


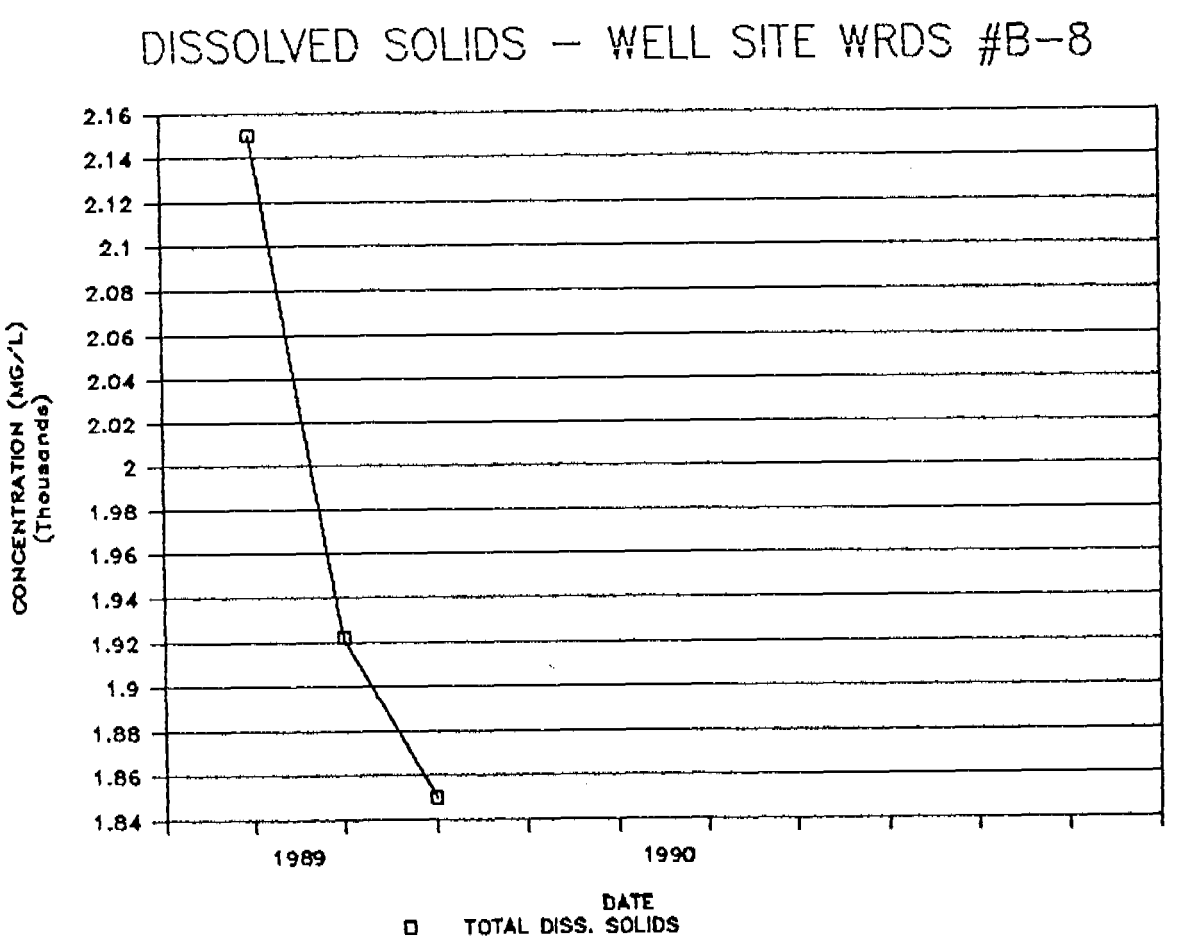
WATER LEVEL – WELL SITE WRDS #B-8



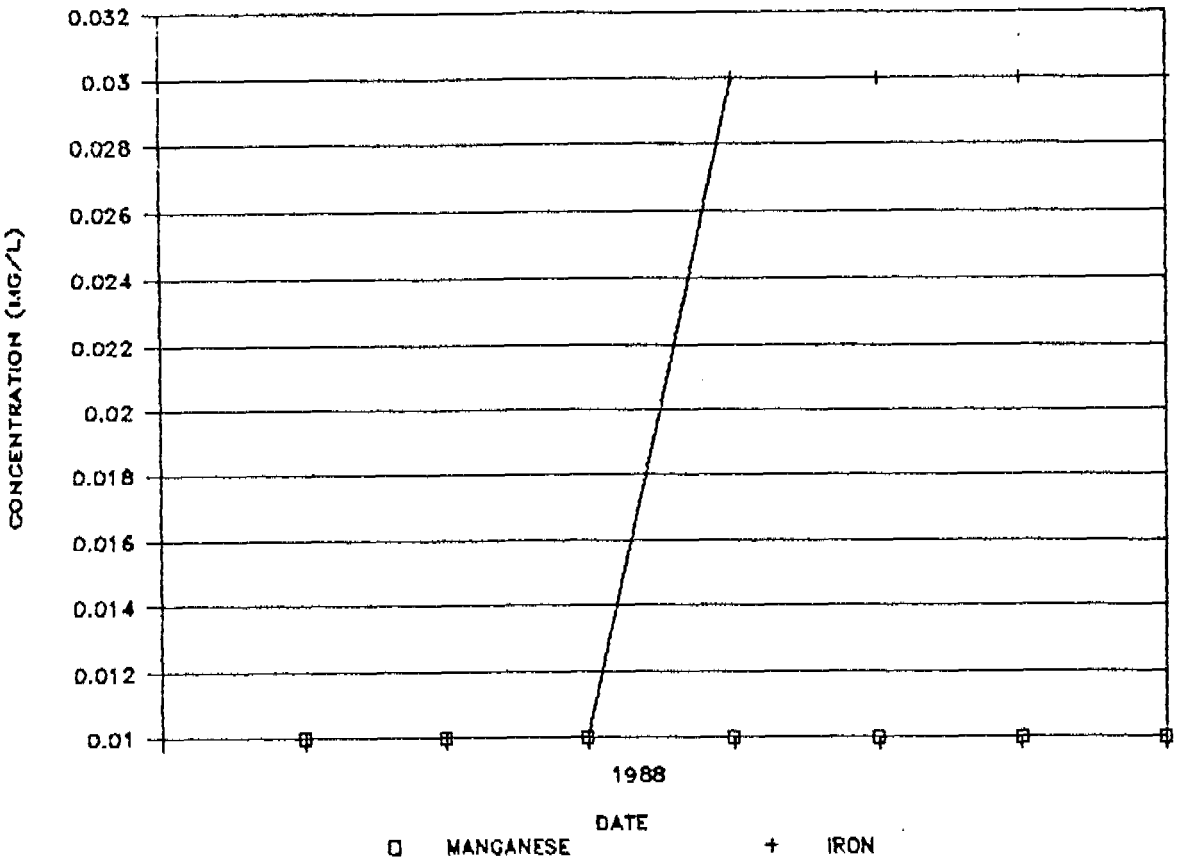

pH – WELL SITE WRDS #B-8
7.3
7.2
7.1
7
6.9
6.8
6.7
6.6
6.5
pH (SU)
1988
DATE


pH – WELL SITE WRDS #B-8
7.2
7.1
7
6.9
6.8
6.7
pH (SU)
1989
1990
DATE

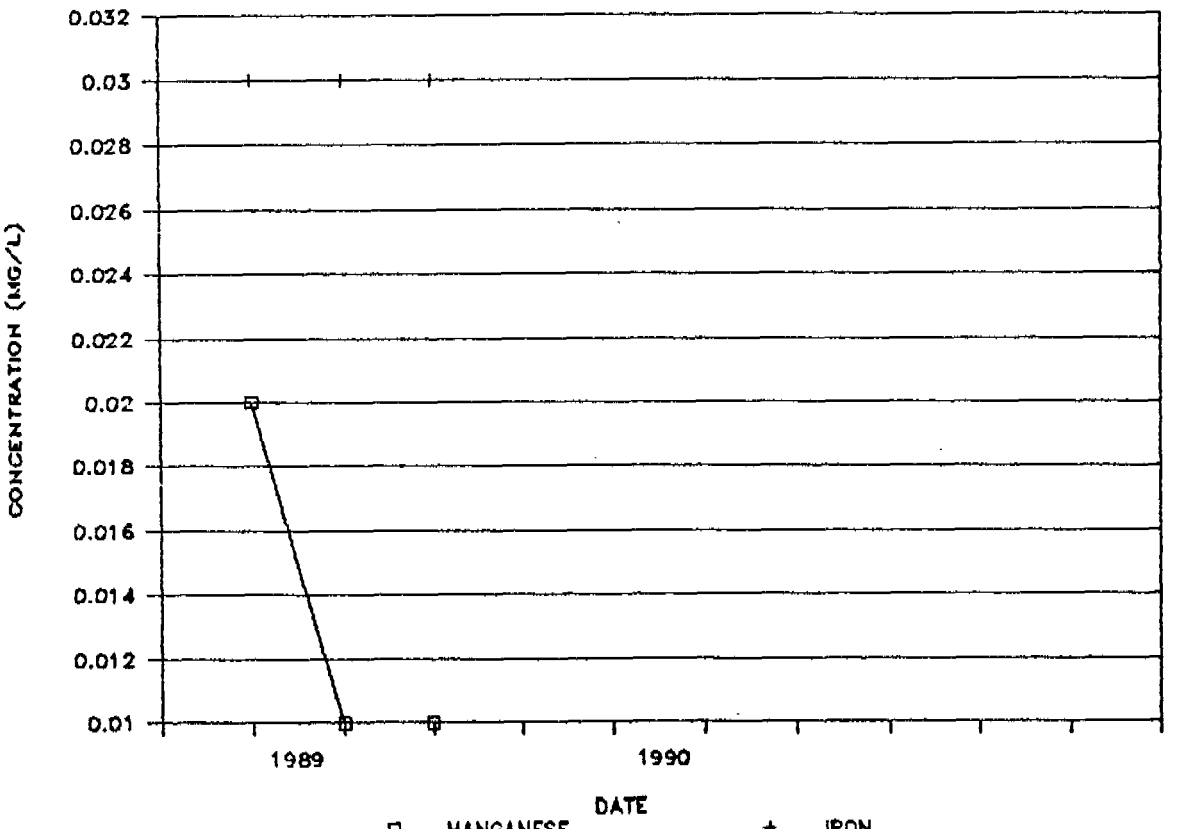

DISSOLVED SOLIDS – WELL SITE WRDS #B-8
CONCENTRATION (MG/L)
(Thousands)
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2
1988
DATE
TOTAL DISS. SOLIDS


DISSOLVED SOLIDS – WELL SITE WRDS #B-8
CONCENTRATION (MG/L)
(Thousands)
2.16
2.14
2.12
2.1
2.08
2.06
2.04
2.02
2
1.98
1.96
1.94
1.92
1.9
1.88
1.86
1.84
1989
1990
DATE
TOTAL DISS. SOLIDS

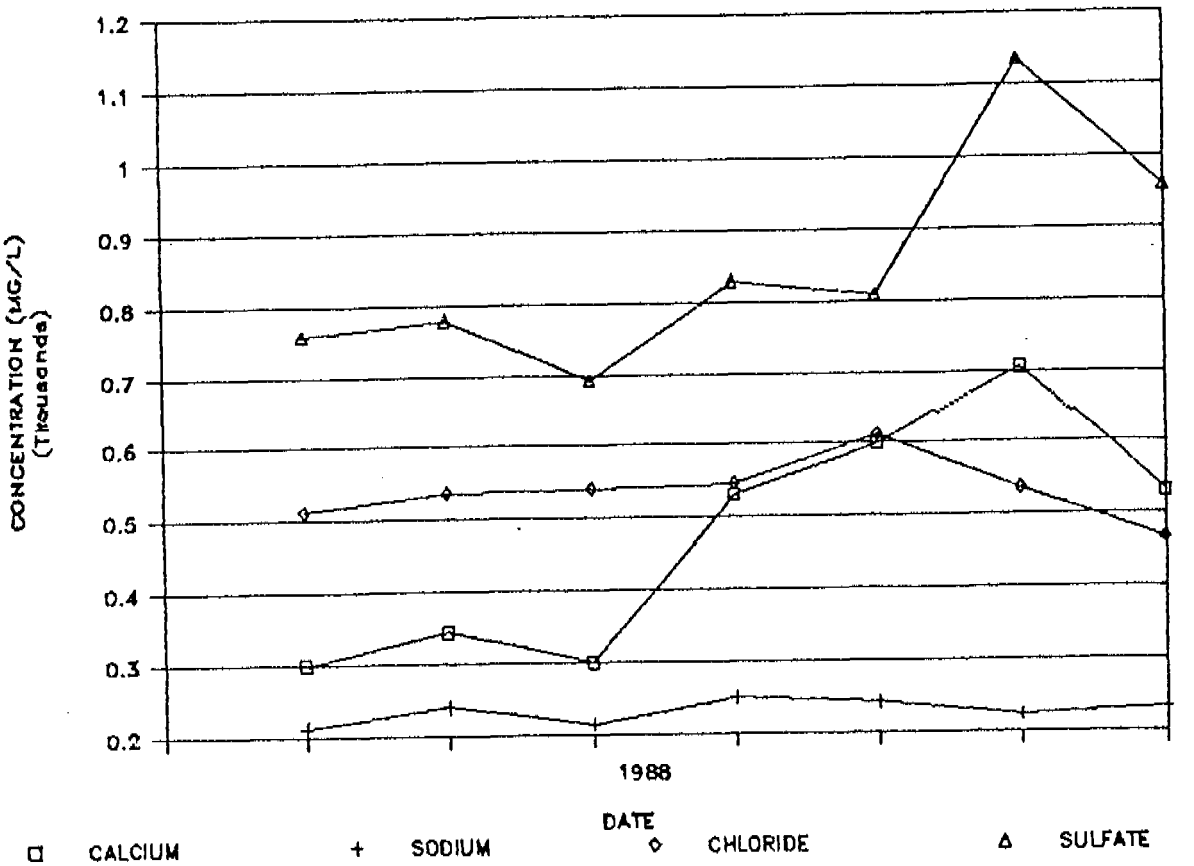
IRON/MANGANESE -- WELL SITE WRDS #B-8



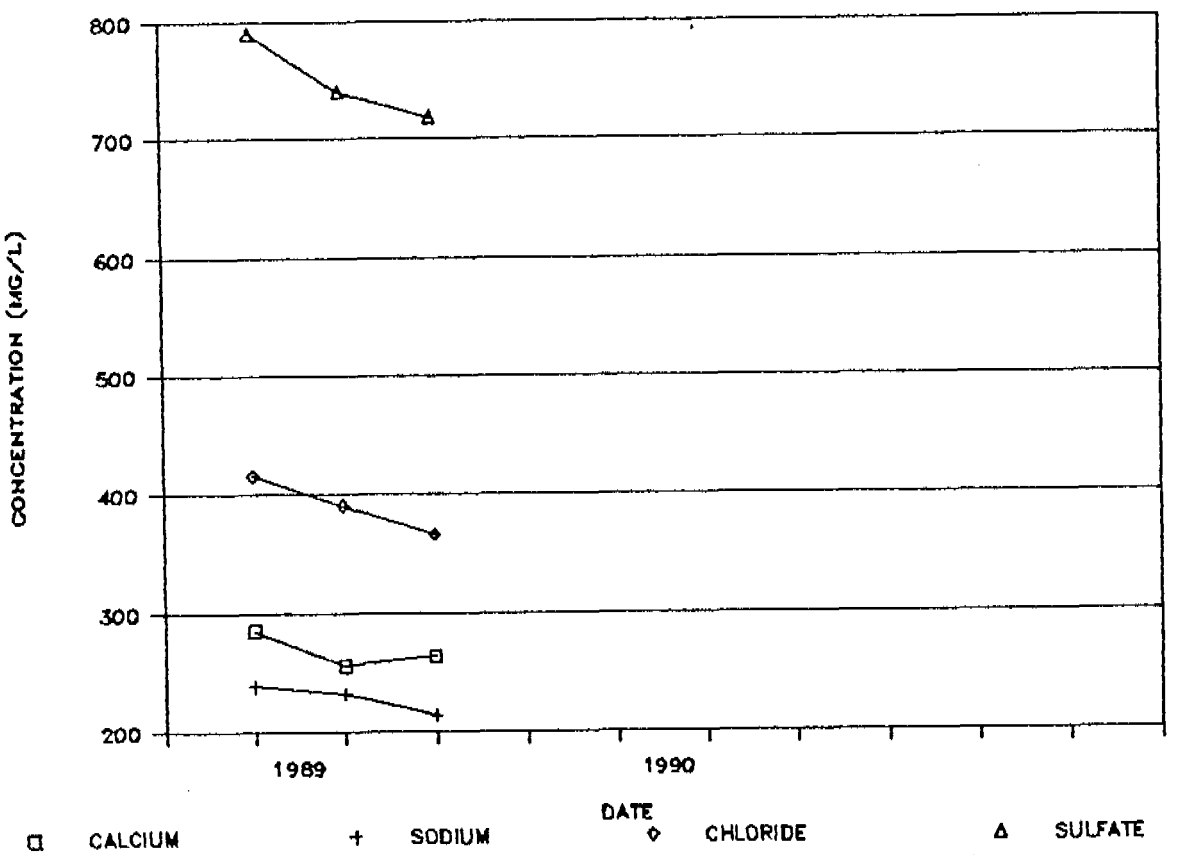
IRON/MANGANESE -- WELL SITE WRDS #B-8



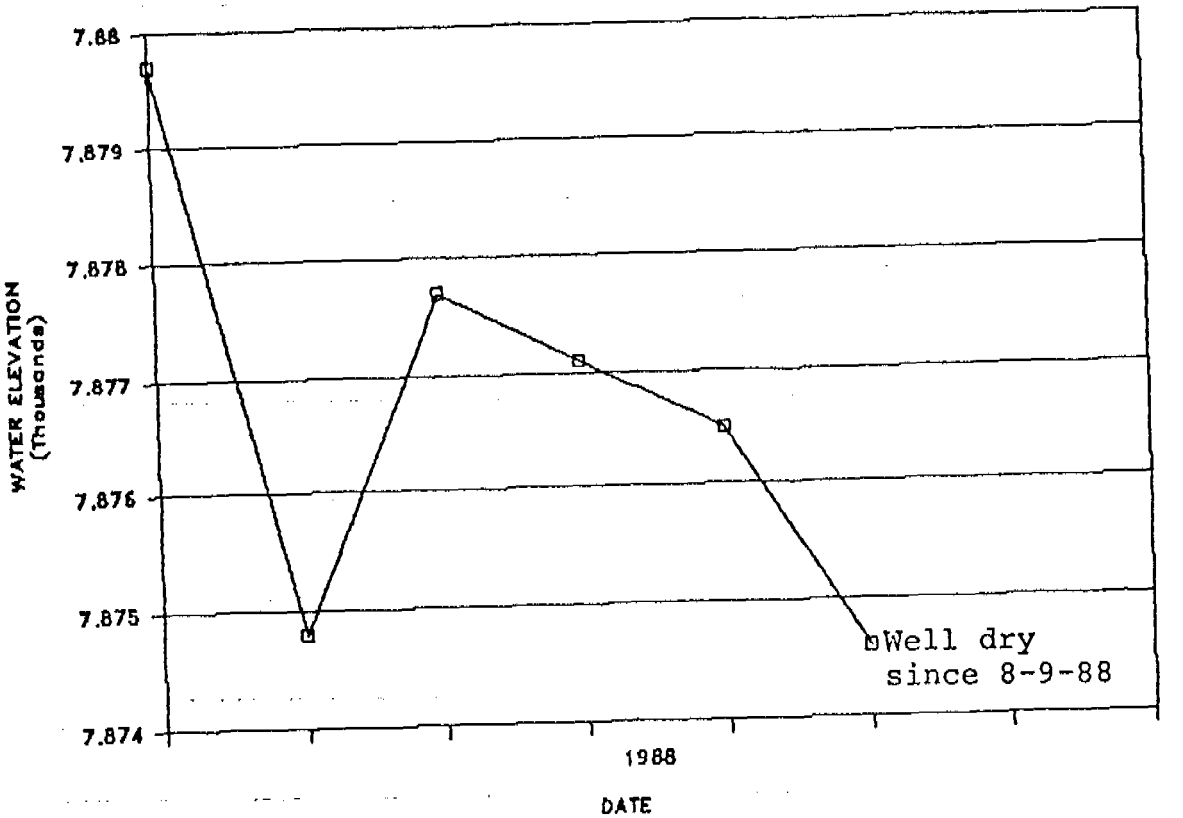
MAJOR IONS – WELL SITE WRDS #B-8



MAJOR IONS – WELL SITE WRDS #B-8



WATER LEVEL – WELL SITE #B-9



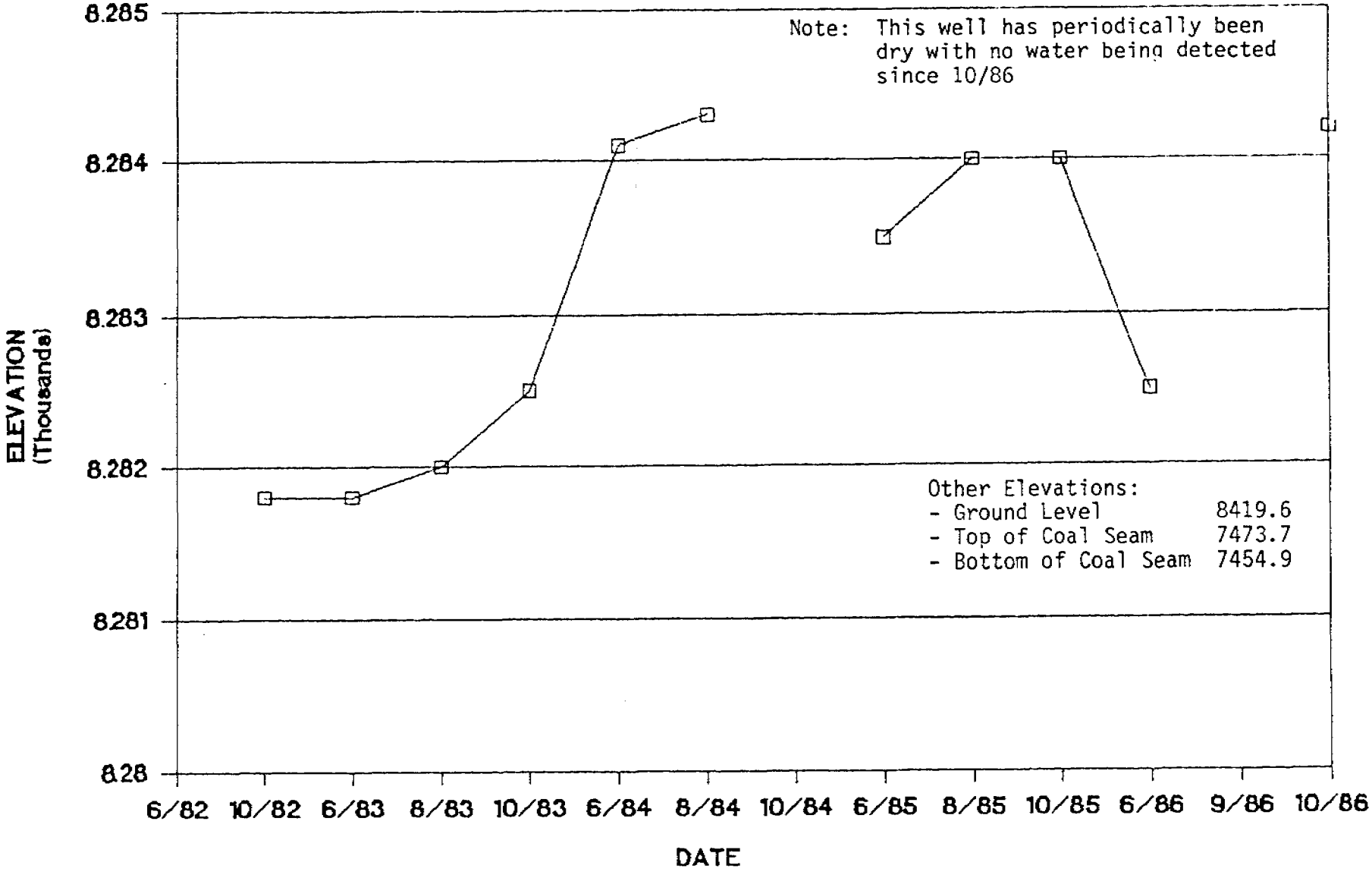
NOTE: The following wells have been dry during the period of record. No graphs are presented for these wells:

77-7
77-9
79-9
79-10
79-12

Quitchupah Tract wells have insufficient data for graphing. Table 6.3, extracted from the M&RP, lists the available well data from this tract.

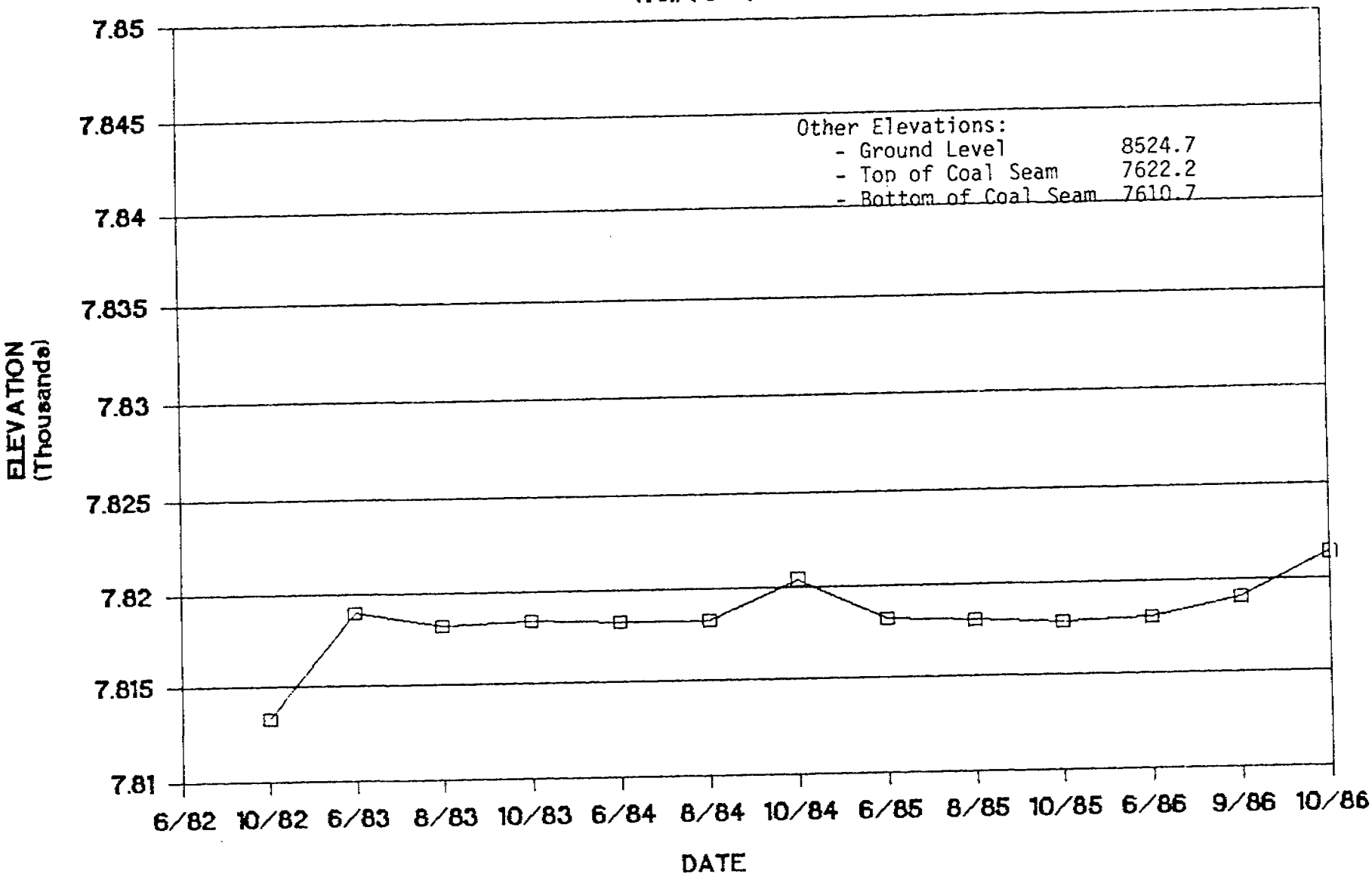
WELL WATER LEVEL 1982 – 1986

Well 77 - 8



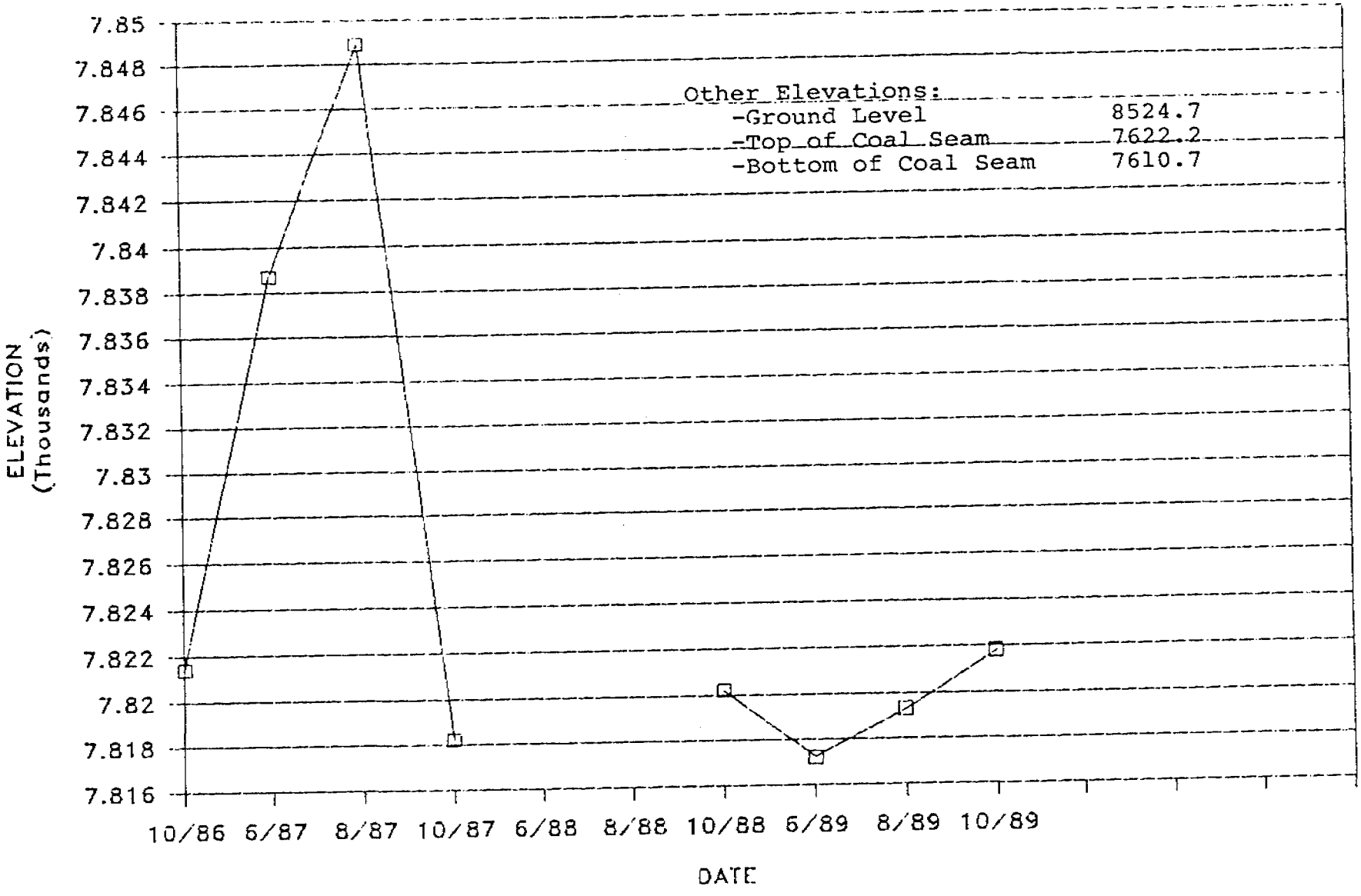
WELL WATER LEVEL 1982 – 1986

Well 79 - 13

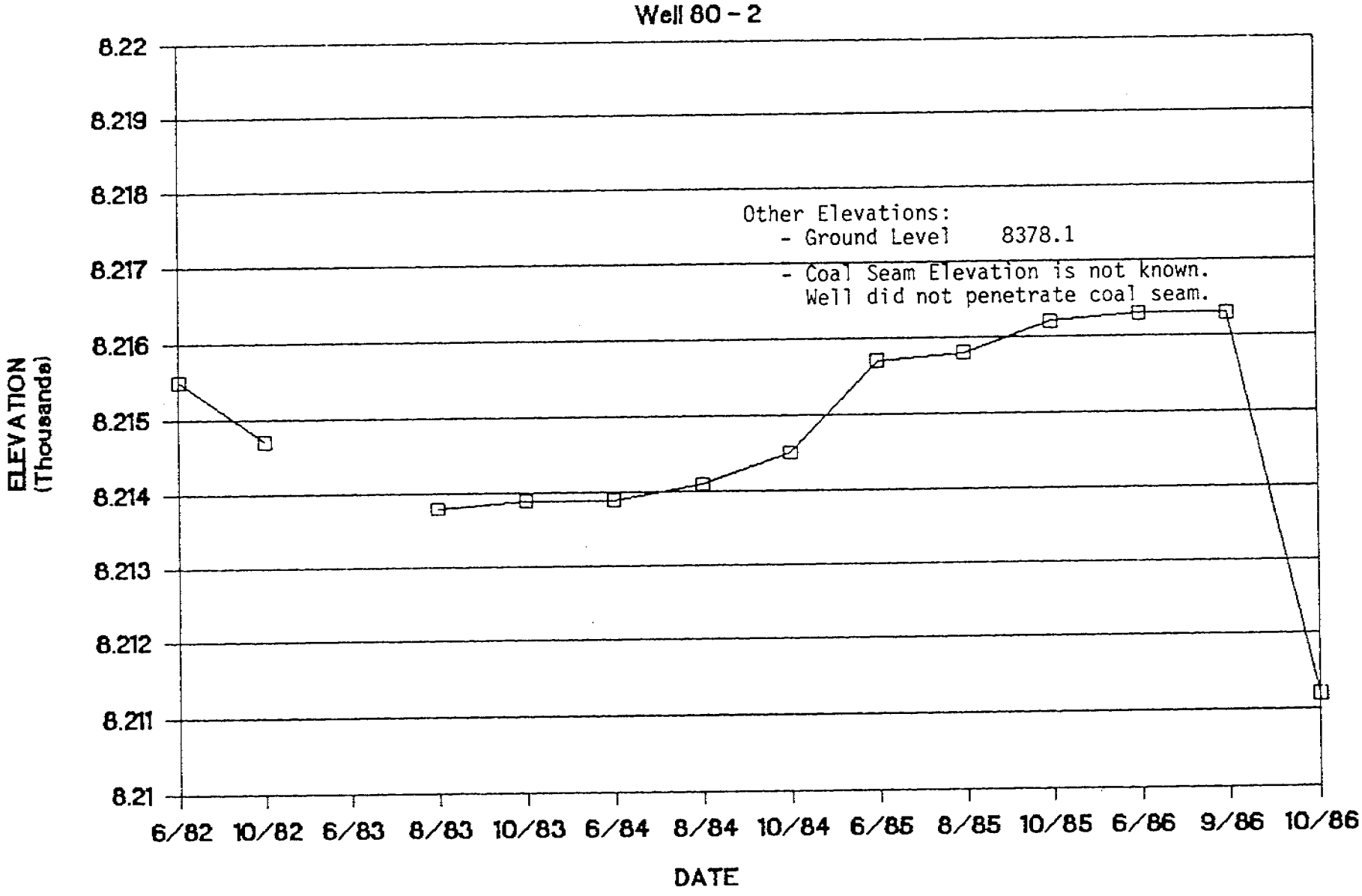


WELL WATER LEVEL 1987 -

Well 79 - 13

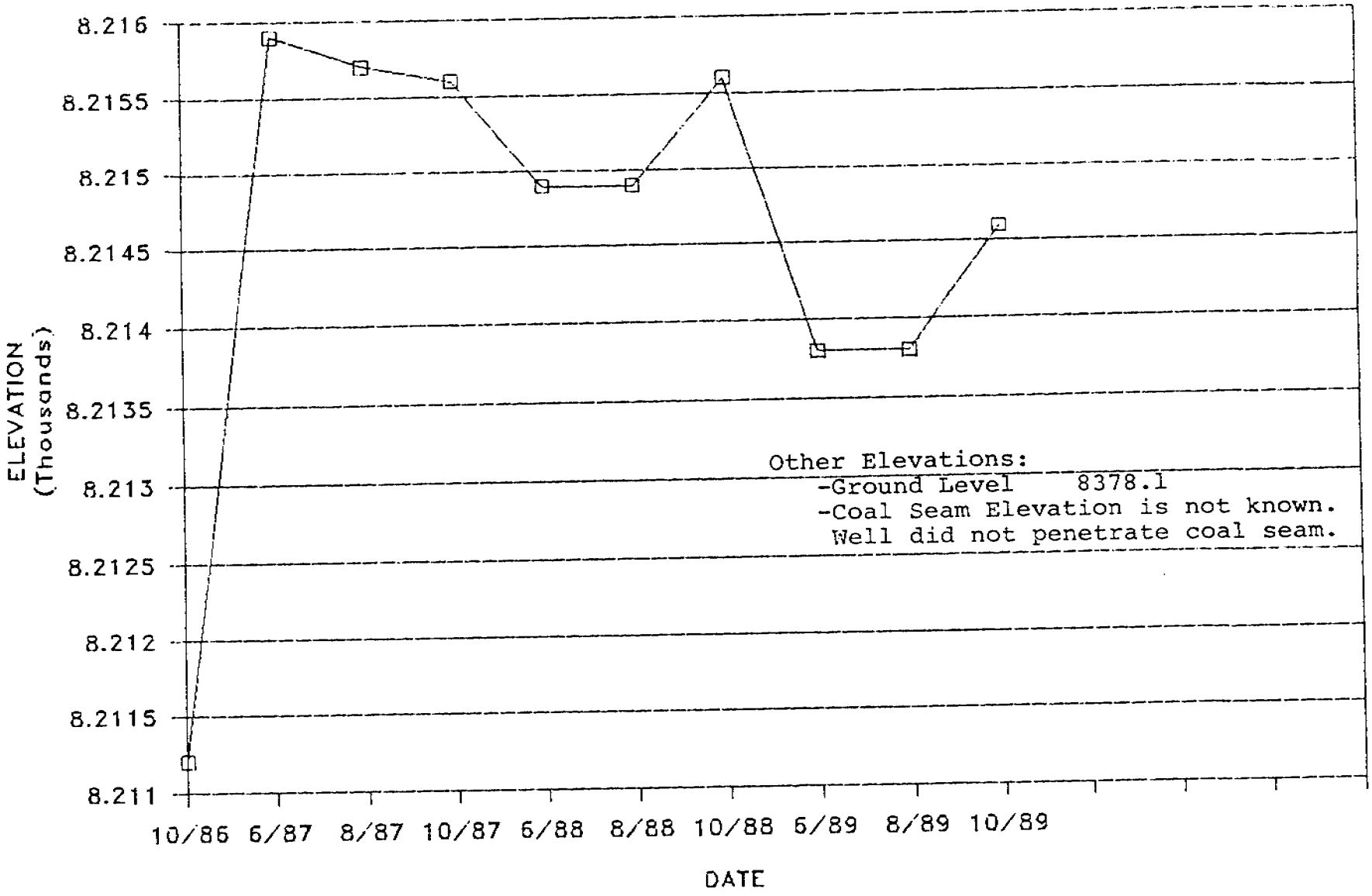


WELL WATER LEVEL 1982 – 1986

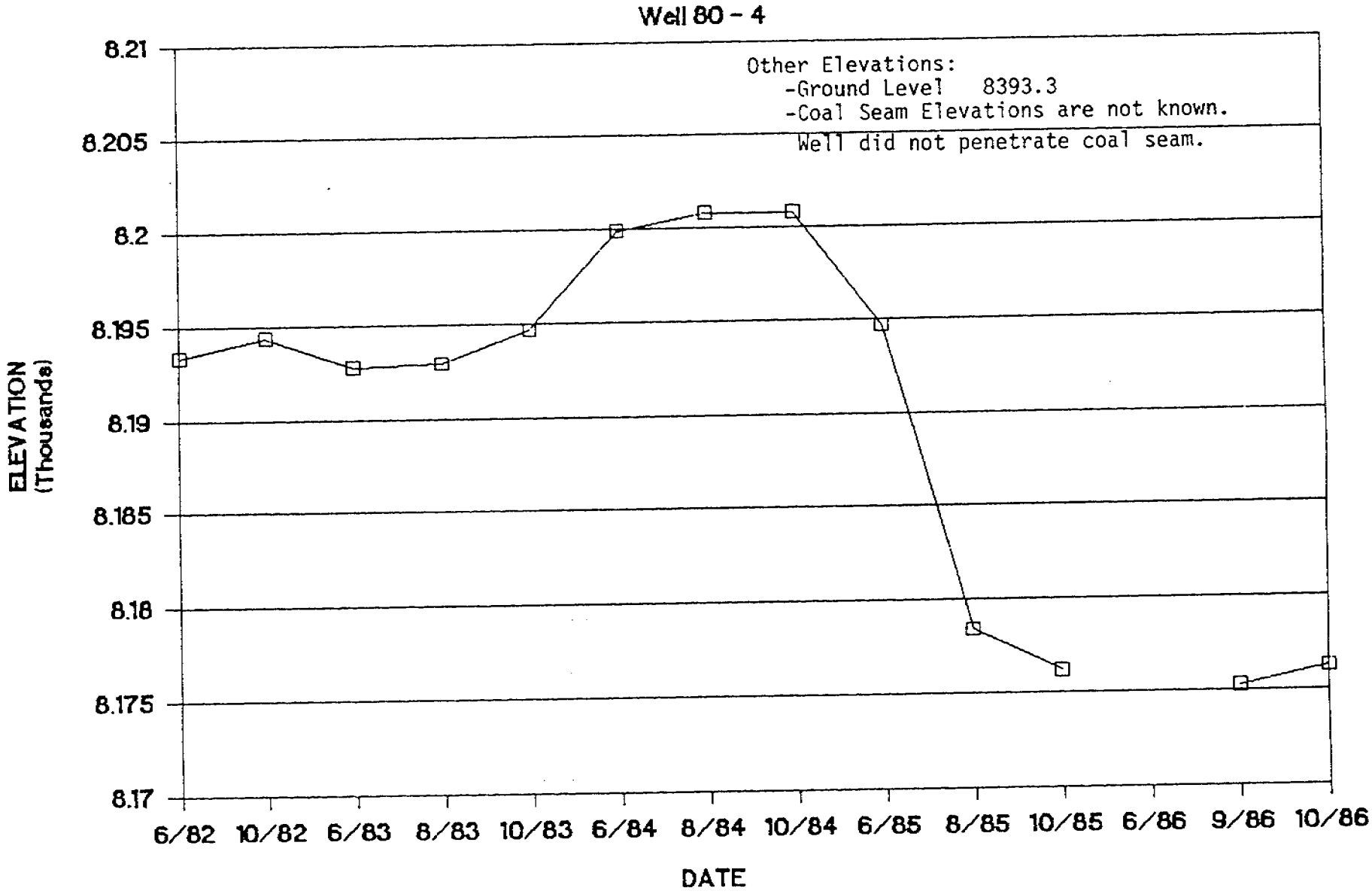


WELL WATER LEVEL 1987 -

Well 80 - 2

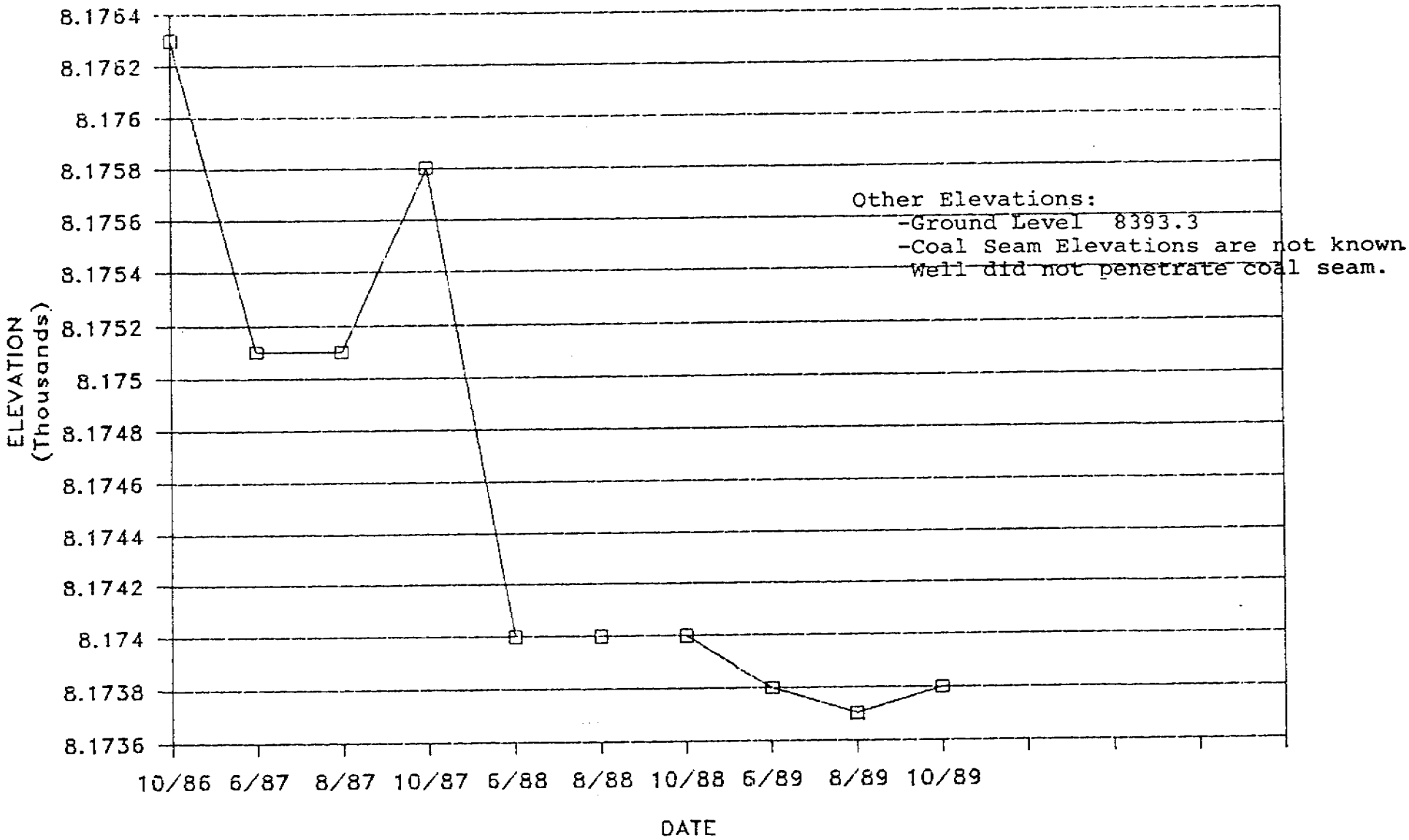


WELL WATER LEVEL 1982 – 1986

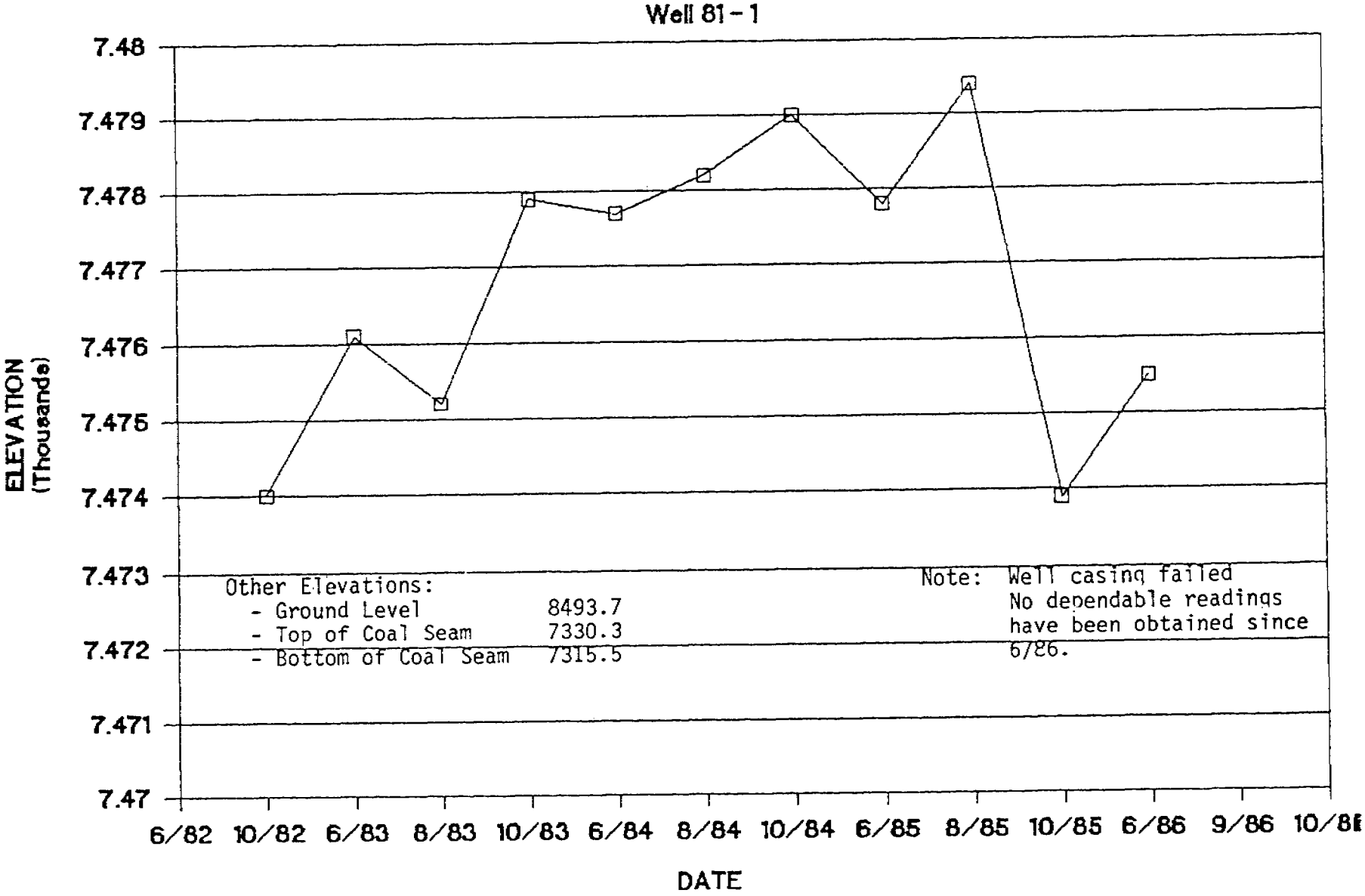


WELL WATER LEVEL 1987 --

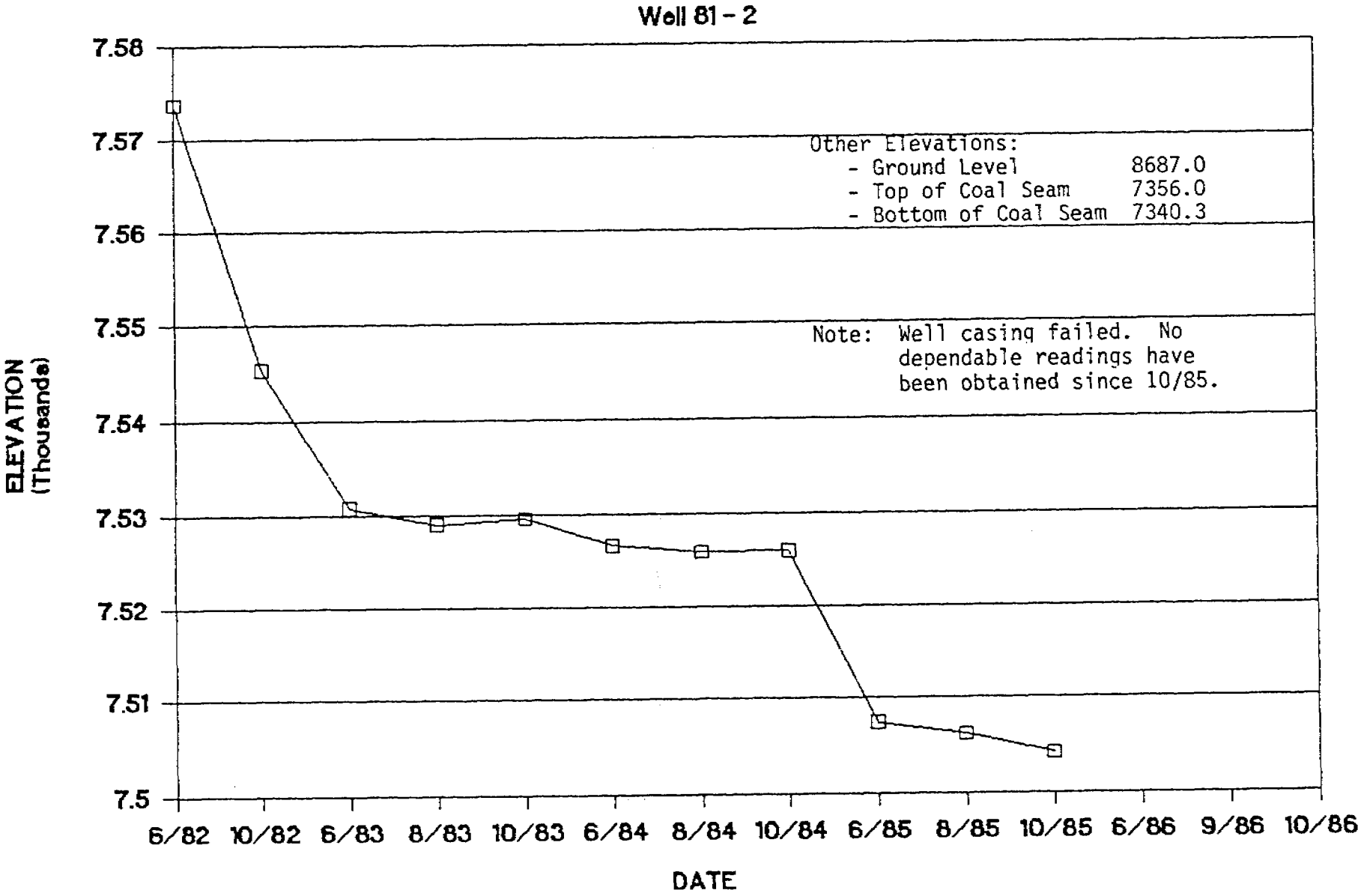
Well 80 - 4



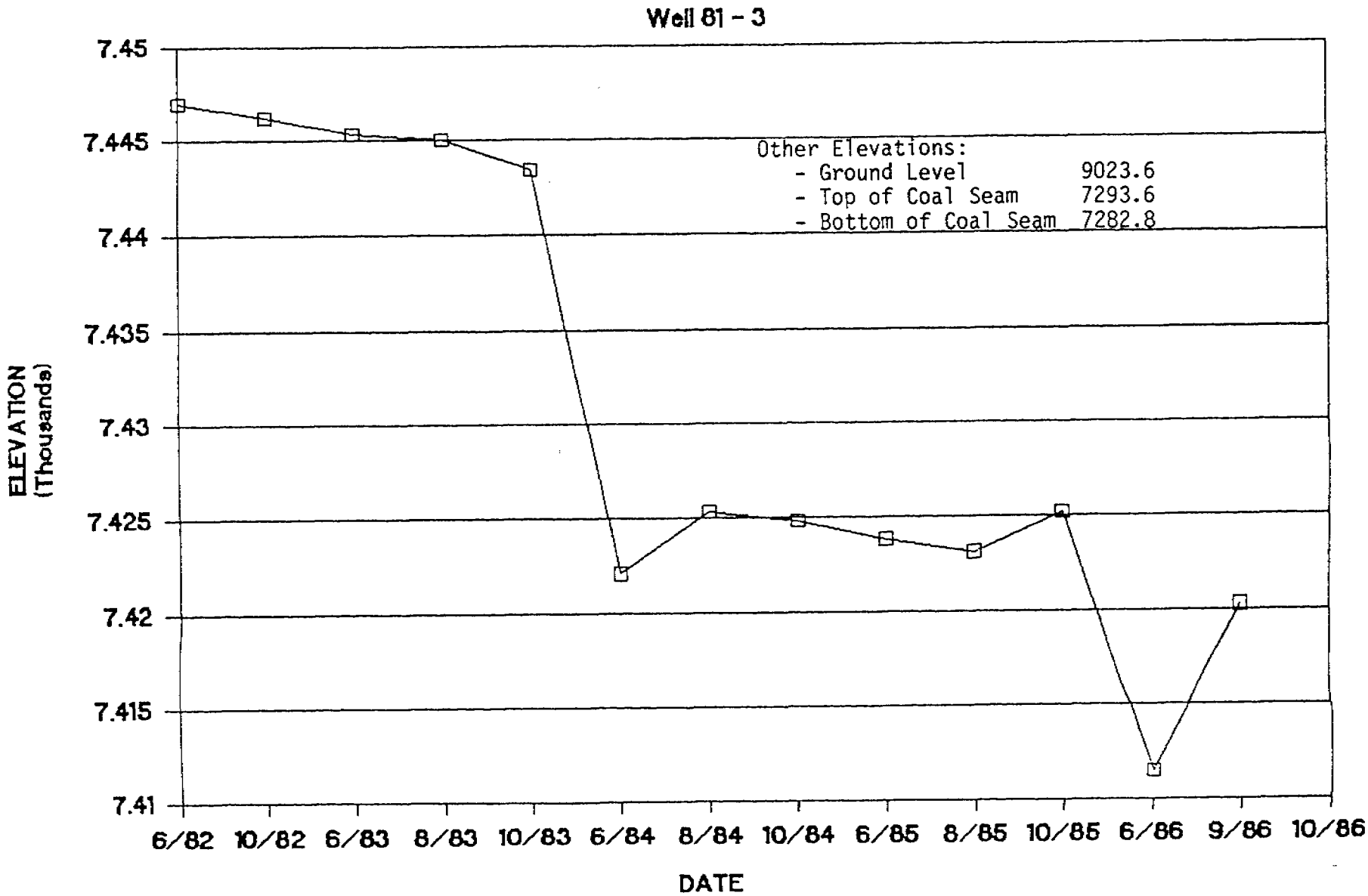
WELL WATER LEVEL 1982 – 1986



WELL WATER LEVEL 1982 – 1986

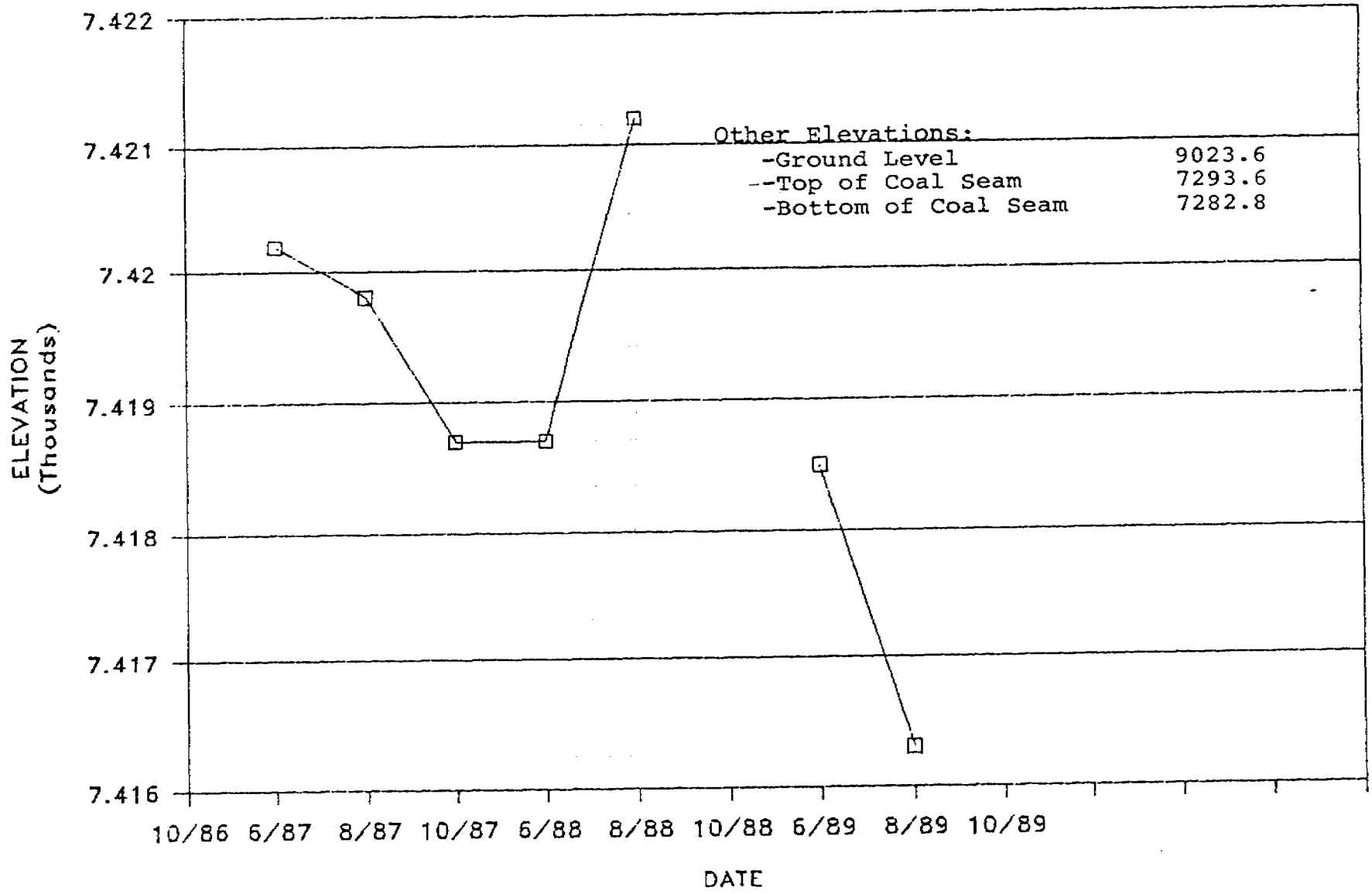


WELL WATER LEVEL 1982 – 1986

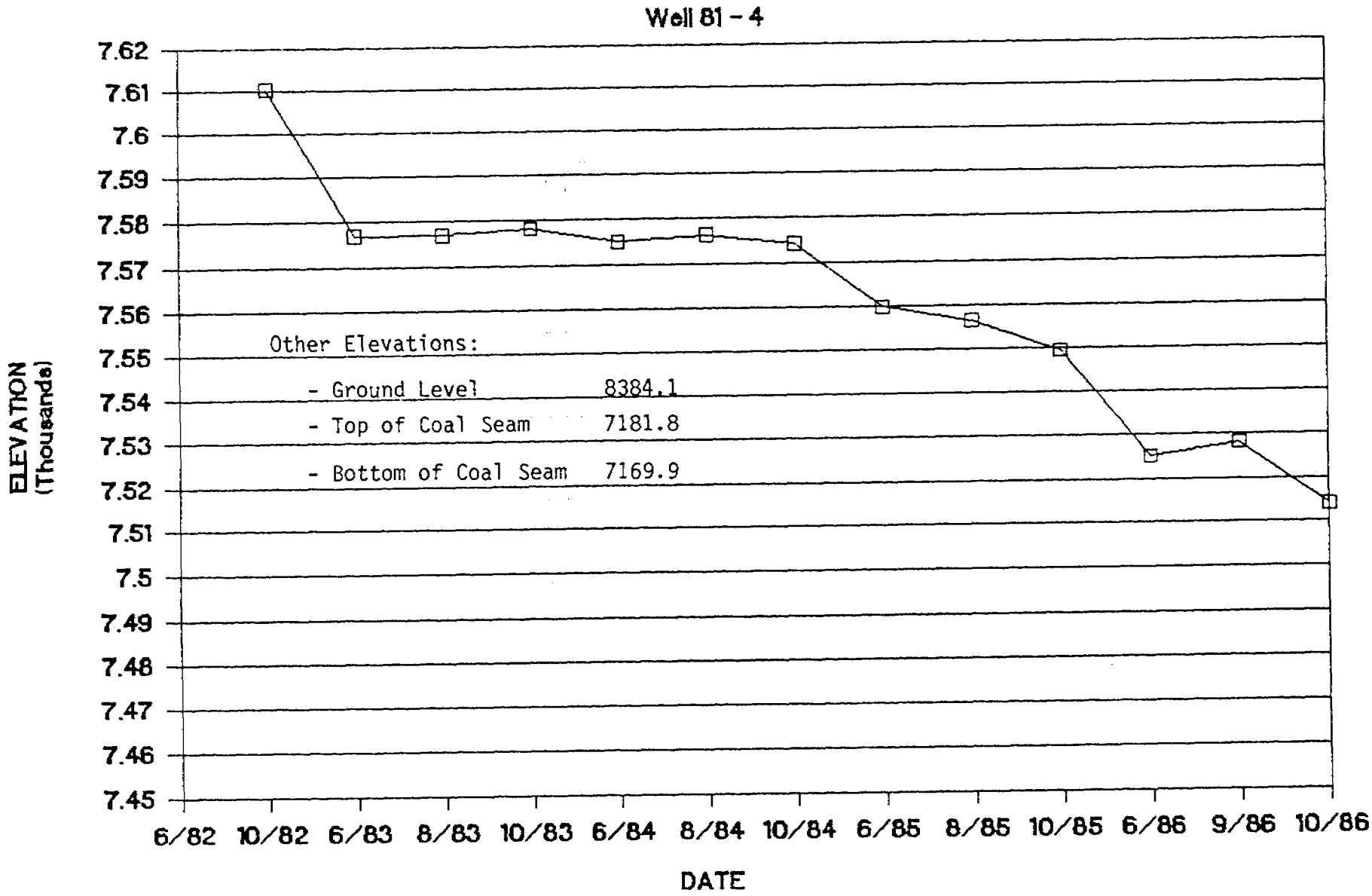


WELL WATER LEVEL 1987 --

Well 81 - 3



WELL WATER LEVEL 1982 – 1986



WELL WATER LEVEL 1987 –

Well 81 – 4

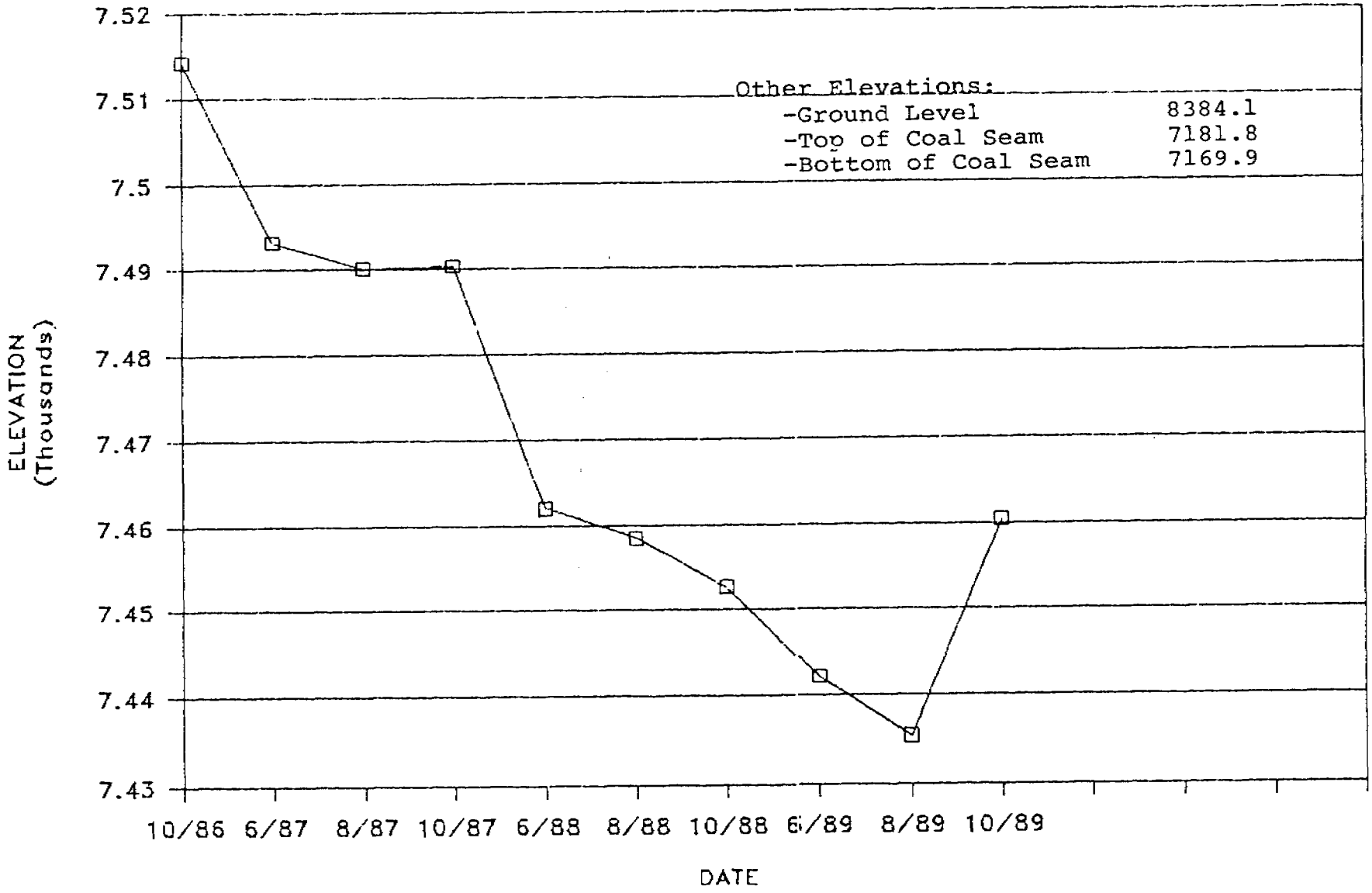


TABLE 6.3

PIEZEOMETRIC SURFACE DATA SEPTEMBER 29, 1989

DRILL HOLE	DEPTH OF WELL	AQUIFER	LITHOLOGY	PERFORATED INTERVAL	SURFACE ELEVATION	DEPTH TO WATER TABLE	ELEVATION OF WATER
89-16-1	1065	LOWER BLACKHAWK	C,SS *	923-983	8374	739	7635
89-21-1	1012	LOWER BLACKHAWK	SS,C,SLTST,SH	893-953	8390	762	7628
89-20-2	1022	LOWER BLACKHAWK	SS,C,SLTST	895-955	8359	712	7647
89-18-1	1300	LOWER BLACKHAWK	C,SS,SLTST	1206-1266	8404	984	7420
89-16-1W	160	CASTLEGATE	SS	74-134	8374	DRY	-
89-20-2W	170	CASTLEGATE	SS	87-147	8359	145	8214
89-18-1W	431	CASTLEGATE	SS	351-411	8404	DRY	-

*

C COAL
SH SHALE
SLTST SILTSTONE
SS SANDSTONE

TABLE 7.
CHARACTERISTICS OF OBSERVATION WELLS ON SUFCO LEASEHOLD
(Revised March 19, 1988)

Obs. Well No.	Location*	State Plane Coordinates E	State Plane Coordinates N	Total Drilled Depth (FT)	Elevation Casing Top	Height of Casing Above Ground (PT)	Elevation of Mineable Portion of Coal Seam Top	Elevation of Mineable Portion of Coal Seam Bottom	Total Depth Measured (FT)	Total Depth Cased (FT)	Casing I.D. (IN)	Perfor-ations (FT)	Formation Monitored
US-77-7	21S05E31ABC	2,028,518	223,508	1220	8495	0.8	7439.0	7427.3	294	-	1¼	-	-
US-77-8	22S05E6BB	2,028,084	220,500	1140	8422	2.4	7473.7	7454.9	NM	160	1¼	110	Castlegate
US-77-9	21S04E36DBB	2,025,143	220,497	1075	8379	0.9	7426.2	7413.1	NM	100	1¼	75	Upper Blackhawk/ Lower Castlegate
US-79-9	22S05E8BB	2,031,597	214,483	970	8540	1.4	7681.2	7669.3	860	860	2	20	U-Hia Coal
US-79-10	22S05E8AC	2,033,631	214,904	990	8552	2.2	7692.3	7682.1	885	880	2	20	U-Hia Coal
US-79-12	22S05E5CAD	2,033,162	216,563	990	8521	1.8	7641.7	7628.3	860	860	2	20	U-Hia Coal
US-79-13	22S05E5CB	2,032,049	217,332	1010	8526	1.3	7622.2	7610.7	705	705	2	20	Sandstone in Blackhawk
US-80-2	21S04E36CDA	2,024,178	219,317	207	8380	1.85	Did Not Reach Coal		200.7	200	4	40	Castlegate
US-80-4	21S04E36DAC	2,026,289	220,441	242	8394	0.65	Did Not Reach Coal		243.6	240	4	40	Castlegate
US-81-1	21S05E30CB	2,027,432	227,245	1300	8496	2.3	7330.3	7315.5	1015	1300	2	20	U-Hia Coal
US-81-2	21S04E25DCD	2,025,717	224,246	1460	8689	2.0	7356.0	7340.3	1157	1460	2	20	U-Hia Coal
US-81-3	21S04E25CCC	2,022,086	223,677	1980	9027	3.4	7293.6	7282.8	1581	1940	6 (0-760 ft.) 2 (760-1940 ft.)	20	U-Hia Coal
US-81-4	21S04E25BBB	2,022,814	228,700	1300	8388	3.9	7181.8	7169.9	803	1300	4½	20	U-Hia Coal

Source: Coastal tes Energy Company

SUFCO CLIMATOLOGICAL SUMMARY - 1986

YEAR 1986	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL SUMMARY
TEMPERATURE -F													
-MAX							84	87	80	62	52	43	87
-MIN							40	47	29	23	8	-1	-1
-AVE HIGH							76.1	80.4	61.7	51.9	40.5	33.8	57.4
-AVE LOW							48.6	52.5	38.4	32.1	24.3	16.7	35.4
PRECIPITATION													
-TOTAL							1.86	1.80	1.47	1.05	1.34	0.18	7.7
-NO DAYS .01 IN +							10	12	9	5	7	5	48.0
SNOW COVER													
-MAX DEPTH							0	0	1	5.5	2.5	1	5.5

PERIOD OF RECORD SUMMARY

TEMPERATURE -F													
-MAX							84	87	80	62	52	43	87
-MIN							40	47	29	23	8	-1	-1
-AVE HIGH							76.1	80.4	61.7	51.9	40.5	33.8	
-AVE LOW							48.6	52.5	38.4	32.1	24.3	16.7	
PRECIPITATION (AVE BY MONTH & YEAR)													
-TOTAL							1.86	1.80	1.47	1.05	1.34	0.18	15.4
-NO DAYS .01 IN +							10	12	9	5	7	5	96.0
SNOW COVER (MAX BY MONTH & YEAR)													
-MAX DEPTH							0	0	1	5.5	2.5	1	5.5

KWW 02-Feb-90

SUFCO CLIMATOLOGICAL SUMMARY - 1987

YEAR 1987	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL SUMMARY
TEMPERATURE -F													
-MAX	50	50	50	70	73	83	85	83	80	73	51	52	85
-MIN	-6	1	7	21	30	39	40	38	35	30	8	-11	-11
-AVE HIGH	30.1	34.3	37.1	55.4	59.6	73.8	74.3	72.4	70.2	60.0	38.6	29.3	52.9
-AVE LOW	11.9	15.8	19.7	31.5	38.5	47.0	49.8	48.1	41.4	36.7	23.2	11.6	31.3
PRECIPITATION													
-TOTAL	0.99	0.82	1.49	0.45	2.45	0.59	2.21	1.38	0.65	1.78	1.56	1.41	23.48
-NO DAYS .01 IN +	11	12	8	6	20	7	11	9	5	7	12	11	119
SNOW COVER													
-MAX DEPTH	5	6.25	13	4	0	0	0	0	0	0	1	9	13

PERIOD OF RECORD SUMMARY

TEMPERATURE -F													
-MAX	50	50	50	70	73	83	85	87	80	73	52	52	87
-MIN	-6	1	7	21	30	39	40	38	29	23	8	-11	-11
-AVE HIGH	30.1	34.3	37.1	55.4	59.6	73.8	75.2	76.4	66.0	56.0	39.6	31.6	
-AVE LOW	11.9	15.8	19.7	31.5	38.5	47.0	49.2	50.3	39.9	34.4	23.8	14.2	
PRECIPITATION (AVE BY MONTH & YEAR)													
-TOTAL	0.99	0.82	1.49	0.45	2.45	0.59	2.04	1.59	1.06	1.42	1.45	0.79	19.44
-NO DAYS .01 IN +	11	12	8	6	20	7	10.5	10.5	7	6	9.5	8	107.5
SNOW COVER (MAX BY MONTH & YEAR)													
-MAX DEPTH	5	6.25	13	4	0	0	0	0	1	5.5	2.5	9	13

KWW 02-Feb-90

SUFCO CLIMATOLOGICAL SUMMARY - 1988

YEAR 1988	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL SUMMARY
TEMPERATURE -F													
-MAX	44	50	59	68	76	88	86	83	79	74	59	52	88
-MIN	-4	4	5	19	20	31	49	42	27	26	4	-4	-4
-AVE HIGH	28.9	37.6	45.7	50.9	60.1	75.3	80.5	77.4	66.2	62.9	40.4	31.9	54.8
-AVE LOW	10.9	18.3	19.5	30.9	34.5	47.7	53.5	50.6	40.1	37.6	22.2	13.8	31.6
PRECIPITATION													
-TOTAL	1.58	0.10	1.12	1.98	0.73	0.50	1.78	2.31	1.24	1.05	0.91	1.35	14.65
-NO DAYS .01 IN +	13	5	13	10	10	6	6	7	5	6	11	13	105
SNOW COVER													
-MAX DEPTH	7	1	3	2	0.5	0	0	0	0	0	2	11	11

PERIOD OF RECORD SUMMARY

TEMPERATURE -F													
-MAX	50	50	59	70	76	88	86	87	80	74	59	52	88
-MIN	-4	4	5	19	20	31	49	42	27	26	4	-4	-4
-AVE HIGH	29.5	36.0	41.4	53.2	59.9	74.6	77.0	76.7	66.0	58.3	39.8	31.7	
-AVE LOW	11.4	17.1	19.6	31.2	36.5	47.4	50.6	50.4	40.0	35.5	23.2	14.0	
PRECIPITATION (AVE BY MONTH & YEAR)													
-TOTAL	1.29	0.46	1.31	1.22	1.59	0.55	1.95	1.83	1.12	1.29	1.27	0.98	17.84
-NO DAYS .01 IN +	12.0	8.5	10.5	8.0	15.0	6.5	9.0	9.3	6.3	6.0	10.0	9.7	106.7
SNOW COVER (MAX BY MONTH & YEAR)													
-MAX DEPTH	7	6.25	13	4	0.5	0	0	0	1	5.5	2.5	11	13

KWW 02-Feb-90

SUFCO CLIMATOLOGICAL SUMMARY - 1989

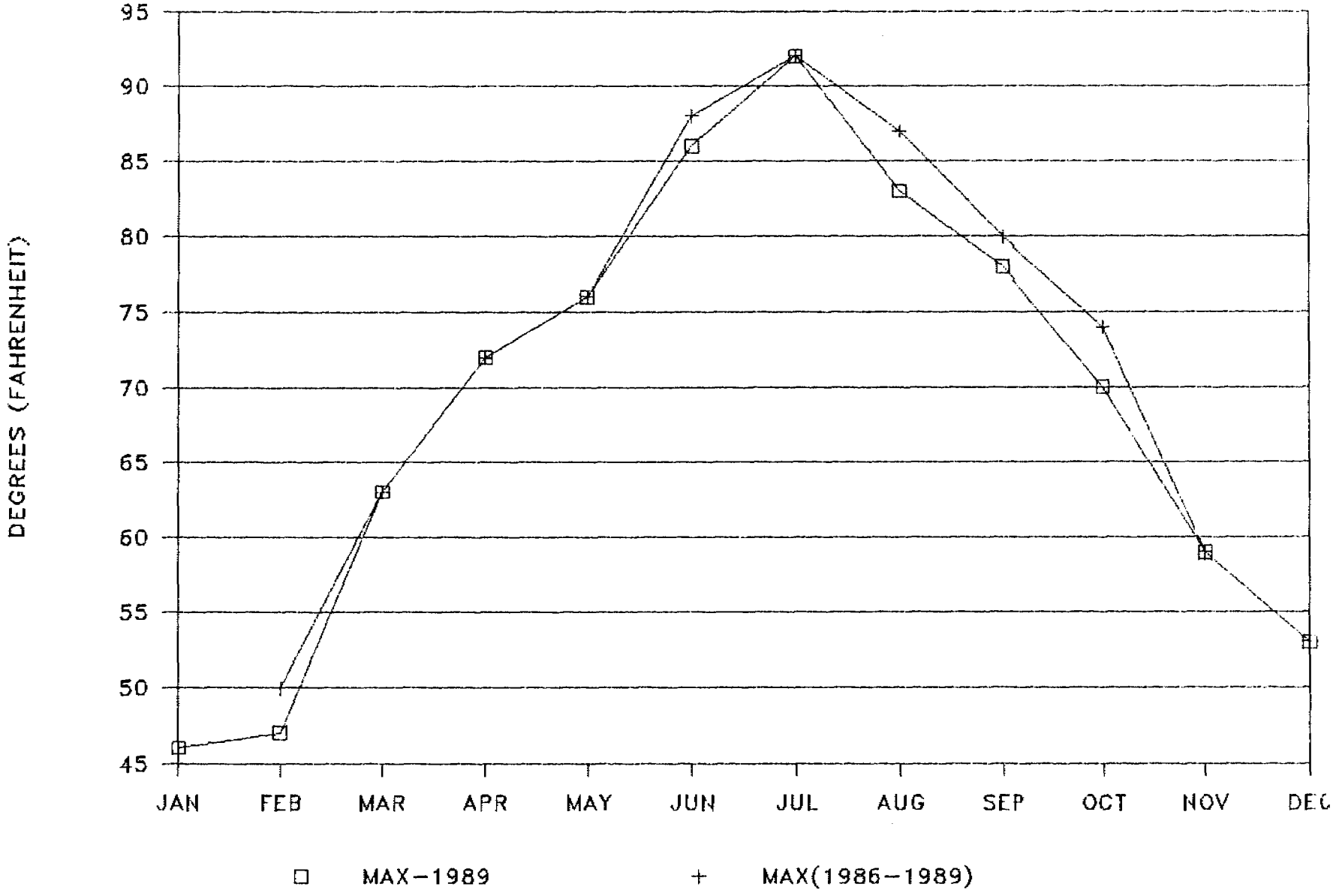
YEAR 1989	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL SUMMARY
TEMPERATURE -F													
-MAX	46	47	63	72	76	86	92	83	78	70	59	53	92
-MIN	-3	-19	4	22	26	33	45	34	32	13	8	8	-19
-AVE HIGH	28.2	30.5	47.7	56.9	62.4	70.8	81.3	73.8	70.0	57.4	46.5	36.1	55.1
-AVE LOW	8.5	13.3	26.7	34.2	36.5	43.9	53.3	48.9	43.4	31.6	26.3	18.1	32.1
PRECIPITATION													
-TOTAL	0.84	0.81	1.38	0.29	1.11	0.40	1.35	1.82	0.89	0.20	0.06	0.70	9.85
-NO DAYS .01 IN +	8	5	8	3	7	4	6	11	5	3	1	3	64
SNOW COVER													
-MAX DEPTH	7	8	2	0	0	0	0	0	0	7	5	2	8

PERIOD OF RECORD SUMMARY

TEMPERATURE -F													
-MAX	50	50	63	72	76	88	92	87	80	74	59	53	92
-MIN	-6	-19	4	19	20	31	40	34	27	13	4	-11	-19
-AVE HIGH	29.1	34.1	43.5	54.4	60.7	73.3	78.1	76.0	67.0	58.1	41.5	32.8	
-AVE LOW	10.4	15.8	22.0	32.2	36.5	46.2	51.3	50.0	40.8	34.5	24.0	15.1	
PRECIPITATION (AVE BY MONTH & YEAR)													
-TOTAL	1.14	0.58	1.33	0.91	1.43	0.50	1.80	1.83	1.06	1.02	0.97	0.91	13.92
-NO DAYS .01 IN +	10.7	7.3	9.7	6.3	12.3	5.7	8.3	9.8	6.0	5.3	7.8	8.0	84.0
SNOW COVER (MAX BY MONTH & YEAR)													
-MAX DEPTH	7	8	3	2	0.5	0	0	0	1	7	5	11	13

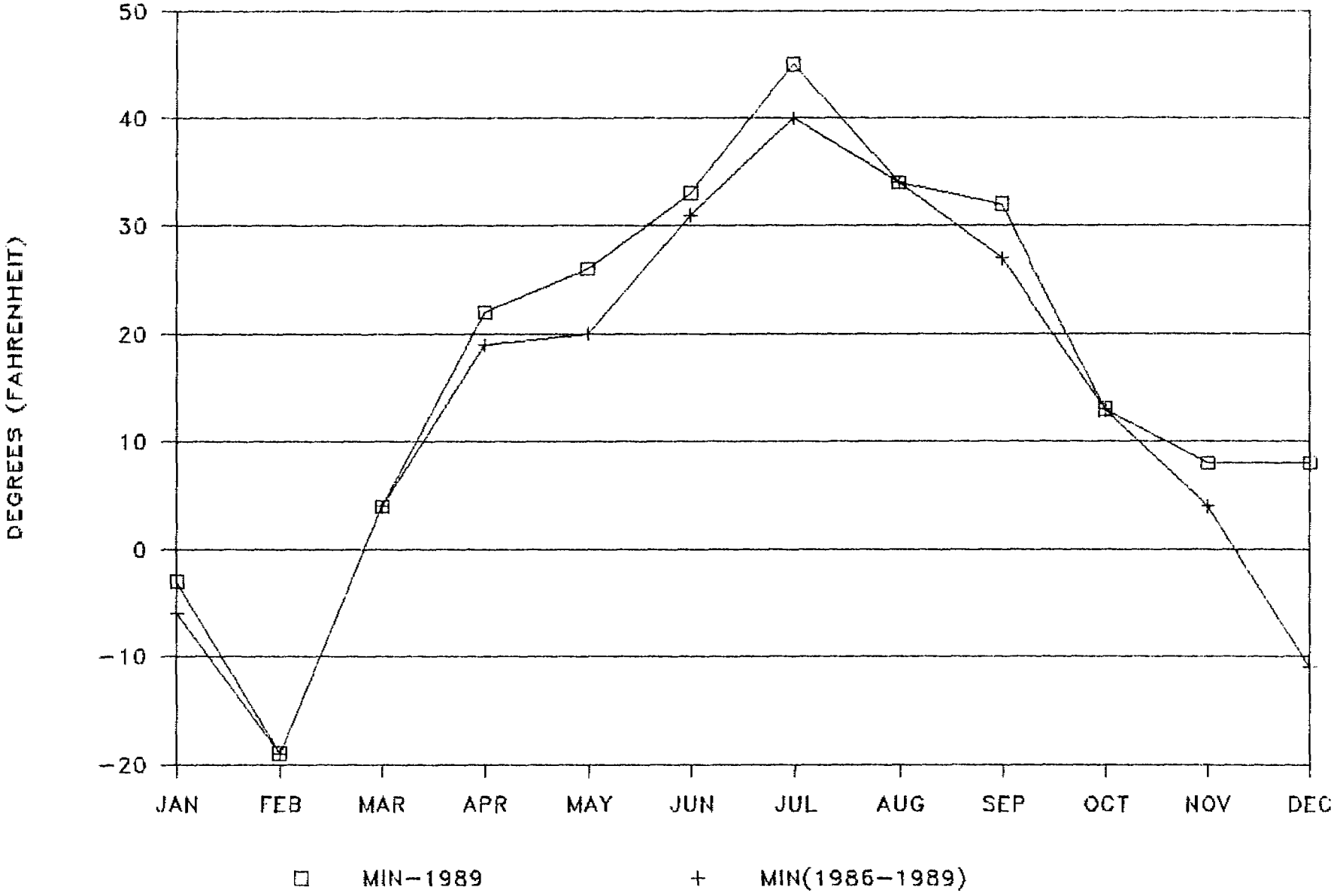
MAXIMUM TEMPERATURES

SUFCO WEATHER STATION



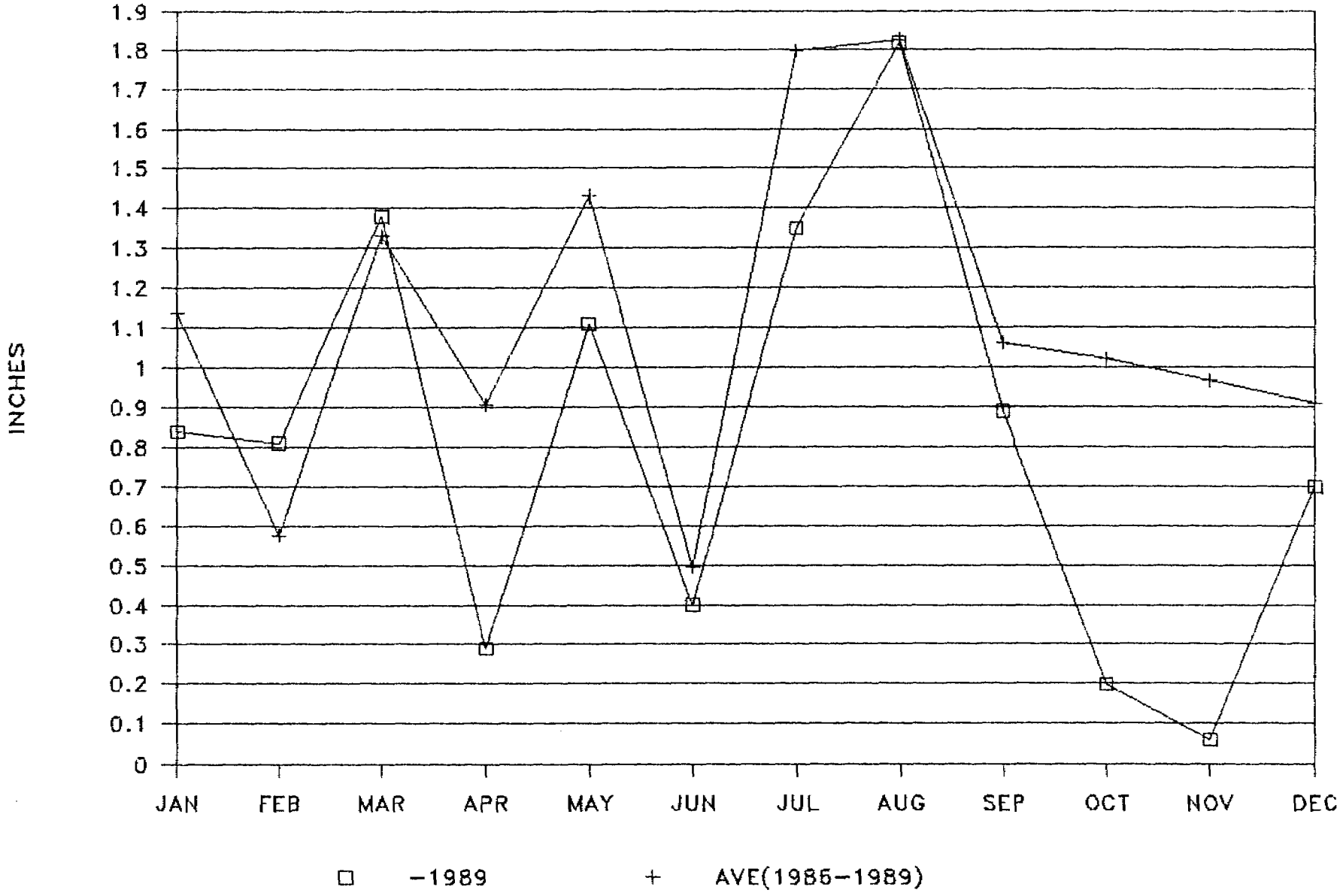
MINIMUM TEMPERATURES

SUFCO WEATHER STATION



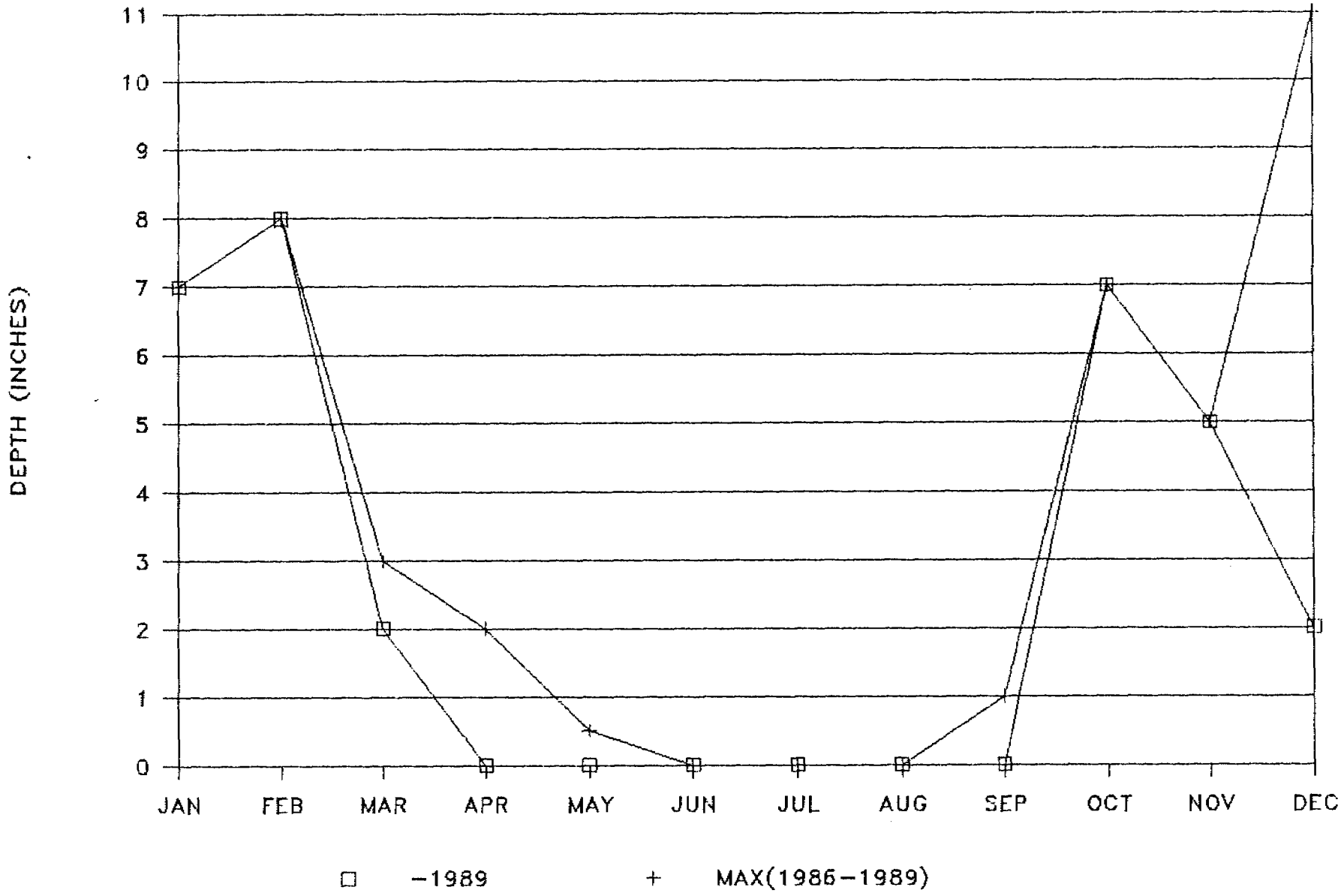
TOTAL PRECIPITATION

SUFCO WEATHER STATION



MAXIMUM SNOW COVER

SUFCO WEATHER STATION



1989 SUBSIDENCE REPORT

SOUTHERN UTAH FUEL COMPANY

MINE NO. 1

by

JOHN BLACK

CHIEF SURVEYOR

INTRODUCTION

The 1989 subsidence report is an update of previous subsidence information obtained since 1976. A photogrammetric survey was initiated in 1985 for subsidence monitoring. Surface elevations were determined by photogrammetric methods during 1989 and compared to the 1985 base elevations. Differences in elevation, indicating subsidence, were contoured and used to modify the subsidence maps.

Two maps accompany this report. Map 1 is a current mine map with the subsidence map superimposed and Map 2 is the main subsidence map. Map 2 shows the surface control monuments, overburden contours, subsidence contours, and surface tension cracks.

1989 SUBSIDENCE

The 1989 subsidence map (Map 2) was updated using the results from photogrammetric monitoring. There are nine separate subsidence areas shown on the map. A brief description of each follows.

Area 1
No movement has been detected in this area since 1985 indicating that this block has probably stabilized. Maximum subsidence varies from eight feet on the eastern end to four feet on the western end. Mining ceased in this area in 1979.

Area 2
No movement has been detected in this block since 1985. Seam recovery was moderate with maximum subsidence of two feet. Mining ceased in this area in 1984.

Area 3
No movement has been detected in this area since 1986. Seam recovery was moderate with subcritical areas which caused some slower residual subsidence. Maximum subsidence is still two feet. Mining ceased in this area in 1983.

Area 4
No change from 1988 was detected. This area may be stabilizing. Seam recovery was good with maximum subsidence to date of five feet. Mining ceased in this area in 1985.

Area 5
No movement has been detected in this block since 1984. Seam recovery was good with maximum subsidence of five feet. Mining ceased in this area in 1981.

Area 6
Subsidence in this area has expanded since 1988. The coal seam was recovered with a longwall system. Maximum subsidence to date is seven feet. This occurred outside the escarpment in

the 300 feet thick overburden. This escarpment area is being subsided as part of an experimental mining study approved by the Division and the USFS. Longwall mining concluded in mid 1989. Recovery of entry system pillars between areas 5 and 6 will continue in 1990.

Area 7
No further subsidence was detected here this year. The coal seam was only first-mined (partial extraction) but the support pillars have apparently failed from the north towards the south. The subsidence contours are only approximate in the northern end because of a lack of baseline data; i.e. some subsidence had occurred before the 1985 photogrammetric monitoring began. The southern end now shows seven feet of subsidence. Mining ceased here in 1984.

Area 8
This is an active subsidence area with changes since 1988. The area of five feet subsidence has expanded slightly. Maximum subsidence to date is five feet. Seam recovery was good. Mining temporarily ceased in 1988 with additional mining planned for 1990.

Area 9
This is a new subsidence area. The coal is being recovered with a longwall system. Maximum subsidence to date is one foot. Active mining will continue through 1990.

DRAW ANGLE SURVEYS

No new draw angle data is available for 1989. The areas where draw angle monitoring monuments are installed (Areas 6 and 8) are still actively subsiding. These monuments will be used once the areas begin to stabilize to calculate local draw angles.

TENSION CRACKS

No new tension cracks were located during 1989.

SUMMARY

Southern Utah Fuel Company's 1989 subsidence report is a continuation of a subsidence monitoring program established in 1978. The program was modified to use photogrammetric monitoring methods beginning in 1985. Areas 1, 2, 3, 4, 5, and 8 had been monitored using conventional surveying techniques prior to initiation of the photogrammetric program. Subsidence has expanded in areas 6 and 8. The new area 9 has begun to subside. Areas 3 and 7 may have stabilized in 1987. Area 4 may have stabilized last year. Because areas 1 and 2 have appeared to be stable since 1985 and area 5 since 1984, continued monitoring of these three areas will be excluded from the program.

JB:jad

Enclosures

WKS
2/6/90

Revegetation Success Monitoring

The 5 East ventilation portal was sealed and reclaimed in September 1989. This single entry breakout in the NE 1/4 of SEC 5, T22S, R5E was sealed and reclaimed according to the Mining and Reclamation Plan and applicable MSHA regulations. Soil material was stored outside the portal. Timbering was removed and a bulkhead was then erected in the portal. A second bulkhead was erected 10 feet back from the portal entrance. Aqua-lite, a light weight concrete product, was then pumped between the two bulkheads forming a seal from inside the mine. Sand and gravel was then pneumatically stowed against the Aqua-lite plug for a distance of 40 feet down the entry in the mine. A concrete block seal was then erected in front of the sand and gravel. Reclamation activities included manually placing the previously stockpiled topsoil over the outside bulkhead to a depth of 12 inches and grading it to blend in with the surrounding slope. The area was then reseeded using the approved seed mix and covered with biodegradable excelsior matting to minimize erosion while the vegetation becomes established.

WKS:jad