

PDR

40-8693

OGLE PETROLEUM INC.

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December 27, 1979

PLEASE DIRECT REPLY TO:

150 North Nichols Avenue
Casper, Wyoming 82601
(307) 266-6456



Land Quality Division
Department of Environmental Quality
Hathaway Building
Cheyenne, Wyoming 82002

and

Uranium Recovery Licensing Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

RE: License to Explore No. 38
Source Material License No.
SUA-1336, Docket No. 40-8693

SUBJECT: Quarterly Report

Gentlemen:

In accordance with the referenced Licenses, Ogle Petroleum Inc. (OPI) herewith presents the Quarterly Report for its pilot (R & D) in-situ uranium solution mining operation in the Bison Basin area of Wyoming. The period covered by this report is August 1, 1979 through October 31, 1979. The submittal of this Report has been delayed in order to receive the analytical water quality data from the commercial laboratory.

1. OPERATIONAL SUMMARY1.1 Mining

As described in the previous Quarterly Report, OPI commenced mining a portion of the one-acre test area on May 1, 1979 using a sodium carbonate/bicarbonate based lixiviant. Oxygen was used as the primary oxidant. Mining operations terminated on July 31, 1979 followed immediately thereafter by the commencement of aquifer restoration activity. During the three-month mining phase, approximately 1,600 pounds of uranium (U_3O_8) were recovered from the ore zone at an average recovery head grade of 82 mg/l and an average flow rate of 19.4 gpm. About 25 aquifer pore volumes were circulated through the production zone.

1.2 Restoration

The groundwater restoration activity commenced in early August and terminated in mid-September. The restoration program consisted of the following:

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Page Two

1. August 1, 1979 thru August 4, 1979: The addition of leaching chemicals to the lixiviant ceased; however, the fluids continued to be circulated through the wellfield and the processing plant to lower the concentration of uranium.
2. August 5, 1979 thru August 9, 1979: One aquifer pore volume, approximately 115,000 gallons, was pumped from the wellfield to the evaporation pond after routing the fluid through the processing plant to remove uranium.
3. August 10, 1979 thru September 14, 1979: Fluids from the recovery wells were routed to a reverse osmosis (R. O.) unit. The clean water (permeate) from the R. O. unit was reinjected at the wellfield. The concentrated brine (reject) from the R. O. unit was discharged to the evaporation pond.

During the 36-day restoration period, the circulation of approximately eight aquifer pore volumes through the R. O. unit and the wellfield reduced the concentration of all chemical species tested to less than baseline values or drinking water standards with the exception of total carbonate which does not have a drinking water standard. Tables 1 through 5 present the restoration phase analytical water quality data.

Utilization of an R. O. unit to achieve aquifer restoration was very successful at OPI's Bison Basin R & D project. The average split between permeate and brine for the 36-day period was 38% (38% of the inflow was rejected to the evaporation pond as brine). This relatively high split reflects typical startup adjustments and operator familiarization. The split improved as the restoration effort continued, reducing to 27% during the last 14 days of operation. OPI is confident that, based on the knowledge gained during the R & D period, a split of 10% to 20% will be achievable with a commercially-sized R. O. unit containing membranes specifically designed for the Bison Basin operation. These membranes will have higher reject capacity and use larger pump pressures, thereby reducing the percent of inflow rejected to the evaporation ponds as brine.

Metallurgical calculations indicated that approximately 153 additional pounds of uranium (U_3O_8) were recovered during the restoration phase of the project.

1.3 Post Restoration

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The post restoration phase of the pilot project which started on September 15, 1979 consists of the monthly sampling of the five restoration sampling wells (see Figure 1 for location) in order to assess the water quality stability of the restored orebody aquifer. The analytical results of the first and second monthly post restoration water quality monitoring events are also presented in Tables 1 through 5.

The post restoration water quality sampling program will continue for a total of six months from the date restoration was completed. A physical problem with one of the restoration sampling wells has caused OPI to modify the post restoration sampling program. Well 303-6-P 7 (see Figure 1 for location) has a pump stuck in it such that it is difficult and time consuming to obtain a water sample. Because of this problem and the fact that Well 303-6-P 7 is not one of the two critical restoration sampling wells, OPI has discontinued the monthly sampling of Well 303-6-P 7 until the anticipated final round of post restoration sampling on or about March 15, 1980.

Review of the post restoration values indicate that calcium and bicarbonate concentrations are unusually high in Well 303-6-P 31. In the case of calcium, it is even higher than that observed during the mining phase. These high values are thought to be a result of the precipitation of calcium bicarbonate in the vicinity of the well bore that may have occurred while injecting leaching fluids during the mining phase. Apparently, the precipitate is now solubilizing and resulting in uncharacteristically high values for calcium and bicarbonate. While these two ions are not toxic, it is considered quite unusual and will be investigated further. This same phenomenon does not appear to be happening on the recovery side of the wellfield as evidenced by the water quality data from Well 303-6-P 22.

2. AVERAGE FLOW RATES TO THE PLANT

The average flow rates to the processing plant during the reporting period are as follows:

02-01 thru 08-09-79	17.9 gpm
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3. AVERAGE FLOW RATES TO THE R. O. UNIT

The average flow rates to the R. O. unit during the reporting period are as follows:

08-10 thru 08-31-79	17.3 gpm
09-01 thru 09-14-79	19.6 gpm
09-15 thru 10-31-79	0 gpm

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4. AVERAGE FLOW RATES TO THE EVAPORATION POND

The average flow rates to the evaporation pond during the reporting period are as follows:

08-01 thru 08-04-79	1.2 gpm
08-05 thru 08-09-79	13.3 gpm
08-10 thru 08-31-79	7.1 gpm
09-01 thru 09-14-79	5.3 gpm
09-15 thru 10-31-79	0 gpm

5. TOTAL NUMBER OF GALLONS INJECTED AND RECOVERED

The total number of gallons injected and recovered at the wellfield during the reporting period are as follows:

	<u>Gallons Injected</u>	<u>Gallons Recovered</u>
08-01 thru 08-04-79	101,952	108,864
08-05 thru 08-09-79	27,506	123,267
08-10 thru 08-31-79	299,696	524,624
09-01 thru 09-14-79	288,677	395,525
09-15 thru 10-31-79	<u>0</u>	<u>0</u>
TOTAL	717,831	1,152,280
DIFFERENCE	434,449	

6. WASTE VOLUMES GENERATED AND WASTE CONCENTRATIONS

6.1 Waste Volumes

The total volume of liquid waste effluent discharged to the evaporation pond during the reporting period is tabulated below:

	<u>Source</u>	<u>Volume (Gallons)</u>
08-01 thru 08-04-79	Processing Plant Bleed	6,780
08-05 thru 08-09-79	Aquifer Pore Volume Transfer	95,907
08-10 thru 09-14-79	R. O. Unit Reject (Brine)	331,752
09-15 thru 10-31-79	None	<u>0</u>
TOTAL		434,439

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6.2 Waste Concentrations

6.2.1 Processing Plant Bleed

PARAMETER*	CONCENTRATIONS (mg/l unless otherwise indicated)		
	Sample Date (06-01-79)	Sample Date (07-06-79)	Sample Date (08-03-79)
pH (pH units)	7.9	6.8	
Specific Conductivity (micromhos/cm)	7150	7400	5525
Ammonia (as N)	- 0.1	0.18	
Nitrate (as N)	64	170	
Nitrite (as N)	-0.01	0.6	
Bicarbonate	708	891	
Carbonate	0	0	
Calcium	255	189	
Chloride	1570	1950	
Boron	- 1.0	- 1.0	
Fluoride	0.35	0.28	
Magnesium	49	57	
Potassium	27	21	
Sodium	1644	1648	
Sulfate	1850	470	925
Aluminum	-0.05	1.29	
Arsenic	0.09	0.02	-0.01
Barium	-0.05	-0.05	
Cadmium	-0.002	-0.02	
Chromium	-0.01	-0.01	
Copper	-0.01	0.06	
Iron	0.18	0.12	
Lead	-0.05	-0.05	
Manganese	0.15	10.08	
Mercury	-0.001	-0.001	
Nickel	-0.04	0.11	
Selenium	-0.01	-0.01	-0.01
Zinc	0.06	0.30	
Total Dissolved Solids	5278	4966	4084
Molybdenum	-0.05	-0.05	
Vanadium	-0.05	-0.05	
Uranium	32.0	21.0	6.40
Radium-226 (pCi/l)	75.6±3.22	240±4.97	492±8
Thorium-230 (pCi/l)	25.2±11.2	2.38±1.20	

*In accordance with NRC License SUA-1336, only those parameters underlined require analyses and reporting.

-Means not detected at level indicated.

6.2.2 Reverse Osmosis Unit Bleed

PARAMETER	AVERAGE CONCENTRATION
	(mg/l unless otherwise indicated)
Calcium	75
Sodium	1000
Chloride	600
Uranium	0 to 10
Sulfate	4500
Total Carbonate	400
Specific Conductance (micromhos/cm)	9000
pH (pH units)	7

7. EXCURSION MONITOR WELL ANALYTICAL RESULTS

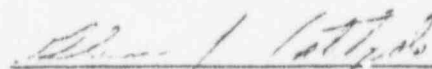
The excursion detection monitoring program was discontinued at the end of the mining phase on July 31, 1979 which was also the last day of the previous reporting period. All the data, however, from the excursion detection monitoring program were not available from the commercial laboratory at the time the last Quarterly Report was submitted. Therefore, the excursion detection monitoring data for the entire mining phase are included with this Report in both tabular form (Tables 6 through 11) and in graphical form (Attachment I). The locations of the six excursion monitor wells are shown on Figure 1 (Wells 303-6-M 1 through 303-6-M 6).

8. EXCURSION MONITOR WELL WATER LEVELS

As required by the referenced Licenses, OPI measured the depth to the water surface in each excursion monitor well every time the wells were sampled. These measurements were taken prior to pumping the well for the water quality sample collection. The results of these water surface measurements are presented in Attachment II.

Sincerely,

OGLE PETROLEUM INC.


Glenn J. Catchpole, Project Manager

GJC:jm
Attachments
CC: NRC, Region IV
Oak Ridge National Laboratories

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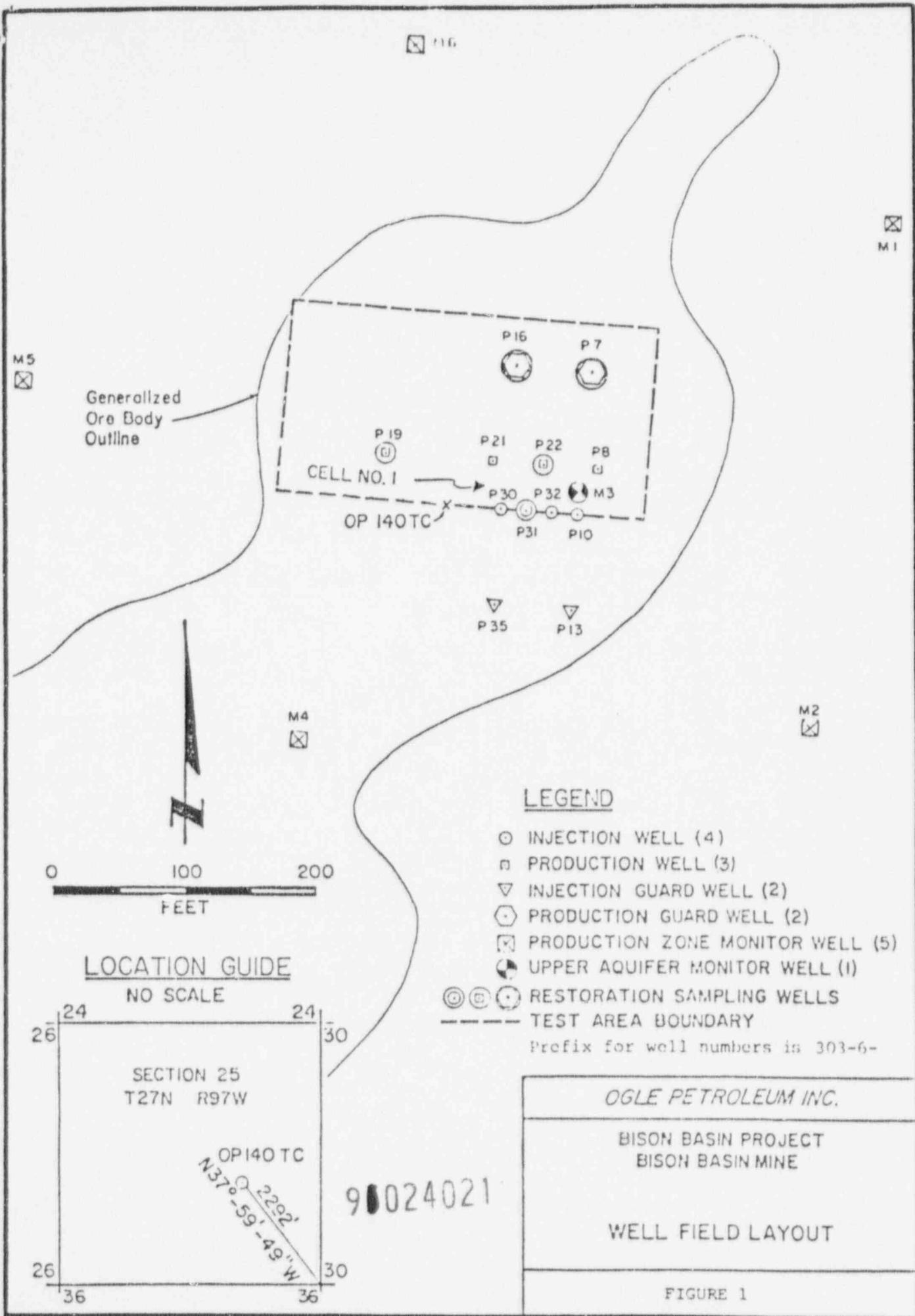


TABLE 1

RESTORATION INFORMATION
WELL 303-6-P 7

(Units: mg/l unless otherwise indicated)

PARAMETER	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Round	Sample Round	Sample Round	Sample Round	Baseline Mean	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round
	Number 1	Number 2	Number 3	Number 4		Number 1	Number 2	Number 3	Number 4	Number 5	Number 6	Number 7	Number 8
	09-03-78	09-28-78	10-12-78	10-23-78		08-05-79	09-05-79	10-05-79	11-05-79				
pH (pH units)	9.2	9.5	9.8	9.7	9.5	8.1	9.2	8.6	7.9				
Total Dissolved Solids	1358	1612	1400	1486	1464	137*	1372	1458	1350				
Specific Conductivity (micromhos/cm)	1770	1785	1775	1750	1770	1725	1725	1725	1725				
Ammonia (as N)	0.25	0.07	0.22	2.0	0.64	- 0.1	0.62	-0.10	- 0.1				
Nitrate (as N)	-0.01	0.03	-0.01	0.26	0.08	-0.01	0.02	0.01	0.03				
Nitrite (as N)	-0.01	-0.01	-0.01	-0.01	-0.01	0.10	-0.01	0.02	-0.01				
Bicarbonate	98	85	73	61	79	110	61	85	110				
Carbonate	24	36	36	36	33	0	36	24	0				
Calcium	28	12	18	18	19	40	35	37	26				
Chloride	34	32	34	36	34	36	26	30	30				
Boron	- 1.0	- 1.0			- 1.0			- 1.0					
Fluoride	1.05	1.20			1.13			0.91					
Magnesium	4	4	3	2	3	0	9	2	8				
Potassium	8	13	9	10	10	11	10	8	7				
Sodium	414	489	437	465	449	410	434	436	459				
Sulfate	800	975	850	900	881	860	616	826	890				
Aluminum	-0.05	-0.05			-0.05			-0.05					
Arsenic	-0.01	-0.01			-0.01			-0.01	-0.01				

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	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Round Number 1 09-03-78	Sample Round Number 2 09-28-78	Sample Round Number 3 10-12-78	Sample Round Number 4 10-23-78	Baseline Mean	Sample Round Number 1 08-05-79	Sample Round Number 2 09-05-79	Sample Round Number 3 10-05-79	Sample Round Number 4 11-05-79	Sample Round Number 5	Sample Round Number 6	Sample Round Number 7	Sample Round Number 8
RADIUM													
Barium	-0.05	-0.05			-0.05			-0.05					
Strontium	-0.002	-0.002			-0.002			-0.002					
Calcium	-0.01	-0.01			-0.01			-0.01					
Copper	-0.01	-0.01			-0.01			-0.01					
Iron	0.02	-0.01	-0.01	-0.01	0.01	0.01	0.01	0.01	0.26				
Lead	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05				
Manganese	-0.01	-0.01			-0.01			-0.01					
Mercury	-0.001	-0.001			-0.001			-0.001					
Nickel	-0.04	-0.04			-0.04			-0.04					
Selenium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01				
Zinc	-0.01	-0.01	-0.01	-0.01	-0.01	0.06	0.06	0.07	0.07				
Vanadium	-0.05	-0.05			-0.05			-0.05					
Chromium	-0.05	-0.05			-0.05			-0.05					
Strontium	-0.001	-0.001	-0.001	-0.001	-0.001	0.006	0.003	-0.001	0.056				
Radium-226 (pCi/l)	7.1±0.3	10.2±0.3	2.2±0.4	1.4±0.3	5.23	3.7±0.4	2.0±0.32						
Radium-230 (pCi/l)	2.8±1.7	14.6±5.0	0.6±0.7	2.5±1.2	5.13								

NOTES: Mining terminated on July 31, 1979. Restoration started on August 5, 1979 and terminated on September 14, 1979.

Blank space indicates analysis of parameter not required (except Radium-226 which requires additional time for analysis).

- means not detected at level indicated.

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TABLE 2

RESTORATION INFORMATION
WELL 303-6-P 16

(Units: mg/l unless otherwise indicated)

PARAMETER	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Round Number 1 09-13-78	Sample Round Number 2 09-28-78	Sample Round Number 3 10-19-78	Sample Round Number 4 10-28-78	Baseline Mean	Sample Round Number 1 08-05-79	Sample Round Number 2 09-05-79	Sample Round Number 3 10-05-79	Sample Round Number 4 11-05-79	Sample Round Number 5	Sample Round Number 6	Sample Round Number 7	Sample Round Number 8
pH (pH units)	9.3	9.2	9.0	9.4	9.2	8.3	8.5	8.6	8.0				
Total Dissolved Solids	1458	1620	1338	1526	1485	1272	1350	1442	1310				
Specific Conductivity (micromhos/cm)	1740	1850	1750	1785	1781	1800	1725	1615	1925				
Ammonia (as N)	0.12	0.10	0.15	2.9	0.82	0.25	0.44	-0.10	- 0.1				
Nitrate (as N)	0.16	0.39	-0.01	0.33	0.22	0.02	0.02	-0.01	0.02				
Nitrite (as N)	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.02	-0.01				
Bicarbonate	98	85	98	85	91	85	122	146	115				
Carbonate	36	36	36	48	39	24	12	0	0				
Calcium	32	25	29	29	29	51	38	30	34				
Chloride	36	30	30	30	31	28	30	38	32				
Boron	- 1.0	- 1.0			- 1.0			- 1.0					
Fluoride	0.80	1.20			1.0			1.03					
Magnesium	4	6	5	3	4	3	1	6	8				
Potassium	7	11	8	9	9	11	9	7	6				
Sodium	429	485	320	433	417	425	417	433	434				
Sulfate	830	1000	770	870	867	806	759	804	817				
Aluminum	-0.05	-0.05			-0.05			-0.05					
Arsenic	-0.01	-0.01			-0.01			-0.01	-0.01				

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TABLE 2 (con't)

WELL 335-6-P 16

Page 2 of 2

PARAMETER	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Found	Sample Round	Sample Round	Sample Round	Baseline	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round
	Number 1 09-13-78	Number 2 09-28-78	Number 3 10-19-78	Number 4 10-28-78	Mean	Number 1 08-05-79	Number 2 09-05-79	Number 3 10-05-79	Number 4 11-05-79	Number 5	Number 6	Number 7	Number 8
Barium	-0.05	-0.05			-0.05			-0.05					
Cadmium	-0.002	-0.002			-0.002			-0.002					
Chromium	-0.01	-0.01			-0.01			-0.01					
Copper	-0.01	-0.01			-0.01			-0.01					
Iron	0.02	-0.01	0.13	-0.01	0.04	0.03	0.01	0.01	0.07				
Lead	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05				
Manganese	-0.01	-0.01			-0.01			-0.01					
Mercury	-0.001	-0.001			-0.001			-0.001					
Nickel	-0.04	-0.04			-0.04			-0.04					
Selenium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01				
Zinc	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01				
Molybdenum	-0.05	-0.05			-0.05			-0.05					
Vanadium	-0.05	-0.05			-0.05			-0.05					
Uranium	-0.001	-0.001	-0.001	-0.001	-0.001	0.007	0.003	-0.01	0.002				
Radium-226 (pCi/l)	10.5±0.4	7.0±0.3	8.7±0.4	12.1±0.3	9.58	5.4±0.4	7.17±0.55						
Thorium-230 (pCi/l) *	1.4±1.2	6.6±2.9	1.0±0.7	0±0.5	3.00								

NOTES: Mining terminated on July 31, 1979. Restoration started on August 5, 1979 and terminated on September 14, 1979.

Blank space indicates analysis of parameter not required.

- means not detected at level indicated.

*Mean Baseline based on Sample Rounds 1, 2, and 3.

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TABLE 3

RESTORATION INFORMATION
WELL 303-6-P 19

(Units: mg/l unless otherwise indicated)

PARAMETER	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Round Number 1 09-03-78	Sample Round Number 2 09-28-78	Sample Round Number 3 10-12-78	Sample Round Number 4 10-24-78	Baseline Mean	Sample Round Number 1 08-05-79	Sample Round Number 2 09-05-79	Sample Round Number 3 10-05-79	Sample Round Number 4 11-05-79	Sample Round Number 5	Sample Round Number 6	Sample Round Number 7	Sample Round Number 8
pH (pH units)	11.3	11.4	10.1	10.8	10.9	8.4	8.6	8.8	8.0				
Total Dissolved Solids	1348	1560	1462	1520	1472	1314	1418	1560	1640				
Specific Conductivity (micromhos/cm)	2080	1750	2100	1850	1945	1800	1800	1900	1825				
Ammonia (as N)	0.25	0.10	0.18	2.2	0.68	0.24	0.44	-0.10	- 0.1				
Nitrate (as N)	0.16	0.37	-0.01	0.23	0.19	-0.01	0.04	0.03	0.03				
Nitrite (as N)	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01				
Bicarbonate *	0	0	31	0	31	85	122	98	93				
Carbonate	24	36	24	24	27	24	24	12	0				
Calcium	49	62	56	31	49	56	26	32	34				
Chloride	52	40	40	32	41	30	28	22	24				
Boron	- 1.0	- 1.0			- 1.0			- 1.0					
Fluoride	1.09	1.05			1.07			0.70					
Magnesium**	0	0	0	0	0	3	5	8	17				
Potassium	14	16	11	10	13	11	10	9	10				
Sodium	441	442	447	448	444	416	434	500	508				
Sulfate	820	960	900	950	907	807	774	1013	1075				
Aluminum	-0.05	-0.05			-0.05			-0.05					
Arsenic	-0.01	-0.01			-0.01			-0.01	-0.01				

*Mean Baseline value based on Sample Round 3, analytical error suspected in Rounds 1, 2, and 4.

**Analytical error also suspected for Magnesium during the baseline period.

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PARAMETER	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Round Number 1 09-03-78	Sample Round Number 2 09-28-78	Sample Round Number 3 10-12-78	Sample Round Number 4 10-24-78	Baseline Mean	Sample Round Number 1 08-05-79	Sample Round Number 2 09-05-79	Sample Round Number 3 10-05-79	Sample Round Number 4 11-05-79	Sample Round Number 5	Sample Round Number 6	Sample Round Number 7	Sample Round Number 8
Barium	-0.05	-0.05			-0.05			-0.05					
Cadmium	-0.002	-0.002			-0.002			-0.002					
Chromium	-0.01	-0.01			-0.01			-0.01					
Copper	-0.01	-0.01			-0.01			-0.01					
Iron	0.02	-0.01	-0.01	-0.01	0.01	-0.01	0.01	0.01	0.08				
Lead	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05				
Manganese	-0.01	-0.01			-0.01			-0.01					
Mercury	-0.001	-0.001			-0.001			-0.001					
Nickel	-0.04	-0.04			-0.04			-0.04					
Selenium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Zinc	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.02				
Molybdenum	-0.05	-0.05			-0.05			-0.05					
Vanadium	-0.05	-0.05			-0.05			-0.05					
Titanium	0.004	-0.001	-0.001	-0.001	0.002	0.07	0.008	-0.001	0.006				
Barium-226 (pCi/l)	18.0±0.3	9.5±0.3	14.5±0.4	7.4±0.3	12.35	17.2±1.1	9.98±0.66						
Thorium-230 (pCi/l) *	0±0.5	6.1±3.1	2.0±1.3	7.6±2.5	5.23								

NOTES: Mining terminated on July 31, 1979. Restoration started on August 5, 1979 and terminated on September 14, 1979.

Blank space indicates analysis of parameter not required.

- means not detected at level indicated.

*Baseline Mean value based on Sample Rounds 2, 3, and 4.

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TABLE 4

RESTORATION INFORMATION
WELL 303-6-P 22

(Units: mg/l unless otherwise indicated)

PARAMETER	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Round	Sample Round	Sample Round	Sample Round	Baseline Mean	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round
	Number 1	Number 2	Number 3	Number 4		Number 1	Number 2	Number 3	Number 4	Number 5	Number 6	Number 7	Number 8
	09-12-78	10-06-78	10-19-78	10-28-78		08-05-79	09-05-79	10-05-79	11-05-79				
pH (pH units)	9.5	9.5	10.6 [#]	10.7	10.1	7.8	7.0	8.2	7.9				
Total Dissolved Solids	1486	1499	1612	1812	1602	2842	1192	1476	1530				
Specific Conductivity (microhos/cm)	1850	1900	2100	2125	1994	3850	1725	1775	1775				
Ammonia (as N)	0.10	0.20	0.19	2.9	0.85	0.21	0.41	-0.10	- 0.1				
Nitrate (as N)	-0.01	-0.01	-0.01	0.07	0.03	0.04	0.03	0.03	0.03				
Nitrite (as N)	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01				
Bicarbonate*	61	61	0	0	61	683	293	159	163				
Carbonate	18	36	24	36	28	0	0	0	0				
Calcium	29	29	39	41	34	112	47	46	43				
Chloride	36	30	28	30	31	394	68	30	52				
Boron	- 1.0	- 1.0			- 1.0			- 1.0					
Fluoride	0.70	0.98			0.84			0.81					
Magnesium	4	6	4	3	4	40	2	9	12				
Potassium	10	9	10	11	10	19	9	8	8				
Sodium	437	468	490	493	472	841	379	471	508				
Sulfate	880	965	1040	1100	996	394	532	914	944				
Aluminum	-0.05	-0.05			-0.05			-0.05					
Arsenic	-0.01	-0.01			-0.01			-0.01	-0.01				

*Mean Baseline value based on Sample Rounds 1 and 2, analytical error suspected in Rounds 3 and 4.

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PARAMETER	BASELINE VALUES				RESTORATION AND POST RESTORATION VALUES							
	Sample Round Number 1 09-12-78	Sample Round Number 2 10-06-78	Sample Round Number 3 10-19-78	Sample Round Number 4 10-28-78	Baseline Mean	Sample Round Number 1 08-05-79	Sample Round Number 2 09-05-79	Sample Round Number 3 10-05-79	Sample Round Number 4 11-05-79	Sample Round Number 5	Sample Round Number 6	Sample Round Number 7
Barium	-0.05	-0.05			-0.05			-0.05				
Bismuth	-0.002	-0.002			-0.002			-0.002				
Cadmium	-0.01	-0.01			-0.01			-0.01				
Copper	-0.01	-0.01			-0.01			-0.01				
Iron	0.02	-0.01	0.10	-0.01	0.04	0.01	0.01	0.01	0.05			
Lead	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05			
Manganese	-0.01	-0.01			-0.01			-0.01				
Mercury	-0.001	-0.001			-0.001			-0.001				
Nickel	-0.04	-0.04			-0.04			-0.04				
Selenium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01			
Zinc	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01	-0.01	0.01			
Molybdenum	-0.05	-0.05			-0.05			-0.05				
Tellurium	-0.05	-0.05			-0.05			-0.05				
Cadmium	-0.001	-0.001	-0.001	-0.001	-0.001	2.70	0.105	0.145	0.115			
Barium-226 (pCi/l)	23.7±0.4	8.3±0.3	21.0±0.4	29.6±0.3	20.65	182.6±4.4	1.94±0.28					
Thorium-230 (pCi/l) *	0±0.5	1.4±1.1	5.8±2.2	0±0.5	3.60							

NOTES: Mining terminated on July 31, 1979. Restoration started on August 5, 1979 and terminated on September 14, 1979.

Blank space indicates analysis of parameter not required.

- means not detected at level indicated.

*Baseline Mean value based on Sample Rounds 2 and 3.

TABLE 5

RESTORATION INFORMATION

WELL 303-6-P 31

(Units: mg/l unless otherwise indicated)

PARAMETER	BASELINE VALUES					RESTORATION AND POST RESTORATION VALUES							
	Sample Round	Sample Round	Sample Round	Sample Round	Baseline Mean	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round	Sample Round
	Number 1 09-12-78	Number 2 09-26-78	Number 3 10-20-78	Number 4 10-28-78		Number 1 08-05-79	Number 2 09-05-79	Number 3 10-05-79	Number 4 11-05-79	Number 5	Number 6	Number 7	Number 8
PH (pH units)	9.2	8.8	8.8	8.8	8.9	7.6	7.0	7.6	7.4				
Total Dissolved Solids	1428	1336	1402	1606	1443	3282	85	822	1340				
Specific Conductivity (micromhos/cm)	1750	1825	1770	1750	1774	4350	115	1115	1700				
Ammonia (as N)	0.10	0.15	0.14	1.8	0.55	0.19	-0.01	-0.10	- 0.1				
Nitrate (as N)	0.26	-0.01	0.05	0.15	0.14	0.10	0.04	0.03	0.02				
Nitrite (as N)	-0.01	-0.01	-0.01	-0.01	-0.01	0.04	-0.01	-0.01	-0.01				
Bicarbonate	104	104	110	98	104	830	37	207	242				
Carbonate	30	18	24	24	24	0	0	0	0				
Calcium	36	31	31	31	32	112	2	107	195				
Chloride	34	32	34	34	33	590	24	56	84				
Boron	- 1.0	- 1.0			- 1.0			- 1.0					
Fluoride	0.80	0.98			0.89			0.63					
Magnesium	3	8	6	4	5	21	0	10	15				
Potassium	7	7	8	8	7	20	1	3	3				
Sodium	424	406	452	456	434	1146	23	152	238				
Sulfate	820	810	840	940	852	1067	0	359	675				
Aluminum	-0.05	-0.05			-0.05			-0.05					
Arsenic	-0.01	-0.01			-0.01			0.056	0.02				

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TABLE 5 (con't)
WILL 323-6-P 31

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PARAMETER	BASELINE VALUES				Baseline Mean	RESTORATION AND POST RESTORATION VALUES							
	Sample Round Number 1	Sample Round Number 2	Sample Round Number 3	Sample Round Number 4		Sample Round Number 1	Sample Round Number 2	Sample Round Number 3	Sample Round Number 4	Sample Round Number 5	Sample Round Number 6	Sample Round Number 7	Sample Round Number 8
	09-12-78	09-26-78	10-20-78	10-28-78		08-05-79	09-05-79	10-05-79	11-05-79				
Barium	-0.05	-0.05			-0.05								
Cadmium	-0.002	-0.002			-0.002								
Chromium	-0.01	-0.01			-0.01								
Copper	-0.01	-0.01			-0.01								
Iron	0.02	-0.01	0.05	-0.01	0.02	0.01	0.01	0.24	1.30				
Lead	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05				
Manganese	-0.01	-0.01			-0.01			0.15					
Mercury	-0.001	-0.001			-0.001			-0.001					
Nickel	-0.04	-0.04			-0.04			-0.04					
Selenium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01				
Zinc	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.08	0.08				
Molybdenum	-0.05	-0.05			-0.05			-0.05					
Vanadium	-0.05	-0.05			-0.05			-0.005					
Uranium	-0.001	0.005	0.011	-0.001	0.005	1.45	0.011	0.500	0.590				
Radium-226 (pCi/l)	419.3±0.4	335±0.3	296±0.3	291±0.3	335.3	834.4±9.1	5.05±0.53						
Thorium-230 (pCi/l)	6.7±2.3	10.0±4.6	4.0±1.5	0.5±0.7	5.30								

NOTES: Mining terminated on July 31, 1979. Restoration started on August 5, 1979 and terminated on September 14, 1979.

Blank space indicates analysis of parameter not required.

- means not detected at level indicated.

MONITOR WELL 303-6-M 1
OPERATIONAL WATER QUALITY DATA

PARAMETER	BASELINE MEAN	UPPER CONTROL LIMIT	SAMPLE ROUND 1 Collected 5-15-79	SAMPLE ROUND 2 Collected 6-01-79	SAMPLE ROUND 3 Collected 6-13-79	SAMPLE ROUND 4 Collected 6-26-79	SAMPLE ROUND 5 Collected 7-10-79	SAMPLE ROUND 6 Collected 7-24-79	SAMPLE ROUND 7 Collected 8-07-79
*pH (pH units)	9.6	11.6	10.3	9.5	8.0	8.5	9.5	9.2	8.8
Total Dissolved Solids				1680		1330		1316	
*Specific Conductance	1860	2232	1775	1825	1825	1750	1785	1750	1775
*Ammonia (as N) (mhos/cm)	0.31	0.37	0.31	0.38	0.32	0.31	0.1	- 0.1	- 0.1
Nitrate (as N)				1.5		4.0		0.03	
Nitrite (as N)				-0.01		-0.01		-0.01	
Carbonate	32	38	48	36	24	24		24	19
Bicarbonate	67	80	- 1	37	49	37		24	46
*Carbonate + Bicarbonate	99	118	49	73	73	61	73	48	65
Calcium			22	12	14	14		17	
*Chloride	44	53	38	40	36	30	32	32	34
Boron				- 1.0		- 1.0		- 1.0	
Fluoride				1.1		1.2		0.064	
Magnesium				4	6	6		9	
Potassium				9	9	9		9	
*Sodium	441	529	434	443	430	438	434	420	436
*Sulfate	845	1014	815	795	800	851	812	825	805
Aluminum				0.10		-0.05		-0.05	
Arsenic				-0.01		-0.01		-0.01	
Barium				-0.05		-0.05		-0.05	
Cadmium				-0.002		-0.002		-0.002	
Chromium				-0.01		-0.01		-0.01	
Copper				-0.01		-0.01		-0.01	
Iron				0.01		0.01		-0.01	
Lead				-0.05		-0.05		-0.05	
Manganese				-0.01		-0.01		-0.01	
Mercury				-0.001		-0.001		-0.001	
Nickel				-0.04		-0.04		-0.04	
Selenium				-0.01		-0.01		-0.01	
Zinc				-0.01		0.02		-0.01	
Molybdenum				-0.05		-0.05		-0.05	
Vanadium						0.05		-0.05	
*Uranium	0.004	1.004	0.006	0.001	0.002	0.002	0.007	0.001	0.003
Radium 226 (pCi/l)	1.13				1.71±0.28	3.36±0.63		1.17±0.25	
Thorium 230 (pCi/l)	2.40				8.32±2.29	4.51±4.55		8.78±3.17	

NOTES: All values in mg/l except as otherwise noted.

- Means not detected at levels indicated.

* Excursion Parameters.

TABLE 6

90024032

MONITOR WELL 303-6-M 2
OPERATIONAL WATER QUALITY DATA

PARAMETER	BASELINE MEAN	UPPER CONTROL LIMIT	SAMPLE ROUND 1 Collected 5-15-79	SAMPLE ROUND 2 Collected 6-01-79	SAMPLE ROUND 3 Collected 6-12-79	SAMPLE ROUND 4 Collected 6-26-79	SAMPLE ROUND 5 Collected 7-10-79	SAMPLE ROUND 6 Collected 7-24-79	SAMPLE ROUND 7 Collected 8-07-79
*pH (pH units)	10.3	12.3	9.1	8.5	8.5	8.4	8.8	8.8	8.7
Total Dissolved Solids				1508		1370		1354	
*Specific Conductance	1875	2250	1775	1820	1850	1775	1785	1750	1850
*Ammonia (as N) (mhos/cm)	1.1	1.3	0.24	- 0.1	- 0.1	0.12	0.1	-0.01	- 0.1
Nitrate (as N)				1.5		5.6		0.03	
Nitrite (as N)				-0.01		-0.01		-0.01	
Carbonate	44	53	24	12	24	24		24	22
Bicarbonate	15	18	85	110	85	61		85	95
*Carbonate + Bicarbonate	109	131	109	122	109	85	109	109	117
Calcium			32	27	28	27		21	
*Chloride	44	53	40	38	36	30	30	34	32
Boron				- 1.0		- 1.0		- 1.0	
Fluoride				1.0		1.3		0.66	
Magnesium				7	7	9		6	
Potassium				8	8	8		8	
*Sodium	450	540	428	429	434	417	430	417	436
*Sulfate	802	962	827	880	810	809	823	833	850
Aluminum				0.09		-0.05		-0.05	
Arsenic				-0.01		-0.01		-0.01	
Barium				-0.05		-0.05		-0.05	
Cadmium				-0.002		-0.002		-0.002	
Chromium				-0.01		-0.01		-0.01	
Copper				-0.01		-0.01		-0.01	
Iron				0.01		0.03		-0.01	
Lead				-0.05		-0.05		-0.05	
Manganese				-0.01		-0.01		-0.01	
Mercury				-0.001		-0.001		-0.001	
Nickel				-0.04		-0.04		-0.04	
Selenium				-0.01		-0.01		-0.01	
Zinc				-0.01		0.02		-0.01	
Molybdenum				-0.05		-0.05		-0.05	
Vanadium				-0.05		-0.05		-0.05	
*Uranium	0.001	1.001	0.007	-0.001	0.002	-0.001	0.002	-0.001	0.003
Radium 226 (pCi/l)	2.75				5.58±0.51	2.54±0.42		2.36±0.29	
Thorium 230 (pCi/l)	6.19				9.01±5.25	1.80±2.49		0.43±0.99	

NOTES: All values in mg/l except as otherwise noted.

- Means not detected at levels indicated.

* Excursion Parameters.

TABLE 7

90024033

MONITOR WELL 303-6-M 3
OPERATIONAL WATER QUALITY DATA

PARAMETER	BASELINE MEAN	UPPER CONTROL LIMIT	SAMPLE ROUND 1 Collected 5-15-79	SAMPLE ROUND 2 Collected 5-30-79	SAMPLE ROUND 3 Collected 6-13-79	SAMPLE ROUND 4 Collected 6-27-79	SAMPLE ROUND 5 Collected 7-10-79	SAMPLE ROUND 6 Collected 7-24-79	SAMPLE ROUND 7 Collected 8-07-79
*pH (pH units)	8.4	10.4	8.6	8.4	8.2	8.3	8.1	8.1	8.1
Total Dissolved Solids	1866			1946		1818		1804	
*Specific Conductance	2225	2670	2275	2250	2325	2225	2350	2250	2225
*Ammonia (as N) (mhos/cm)	1.13	1.37	0.24	- 0.1	- 0.1	0.14	0.1	- 0.1	- 0.1
Nitrate (as N)				1.9		3.6		0.03	
Nitrite (as N)				-0.01		-0.01		-0.01	
Carbonate	12	14	12	24	12	12		0	0
Bicarbonate	98	118	85	73	85	85		110	110
*Carbonate + Bicarbonate	110	132	97	97	97	97	110	110	110
Calcium			59	55	56	56		61	
*Chloride	18	22	24	22	22	16	16	16	16
Boron				- 1.0		- 1.0		- 1.0	
Fluoride				1.2		1.2		0.70	
Magnesium				18		18		17	
Potassium				10		10		11	
*Sodium	532	638	532	496	518	505	532	500	548
*Sulfate	1209	1451	1179	1210	1185	1160	1194	1165	1175
Aluminum				0.11		-0.05		-0.05	
Arsenic				-0.01		-0.01		-0.01	
Barium				-0.05		-0.05		-0.05	
Cadmium				-0.002		-0.002		-0.002	
Chromium				-0.01		-0.01		-0.01	
Copper				-0.01		-0.01		-0.01	
Cobalt				0.02		0.03		0.09	
Lead				-0.05		-0.05		-0.05	
Manganese				-0.01		-0.01		-0.01	
Mercury				-0.001		-0.001		-0.01	
Nickel				-0.04		-0.04		-0.04	
Selenium				-0.01		-0.01		-0.01	
Zinc				-0.01		-0.01		-0.01	
Molybdenum				-0.05		-0.05		-0.05	
Vanadium				-0.05		-0.05		-0.05	
*Uranium	- .001	1.001	.002	0.004	-0.001	-0.001	0.004	0.003	0.002
Radium 226 (pCi/l)	1.44				1.39±0.27	0.75±0.29		5.47±0.46	
Thorium 230 (pCi/l)	5.78				72.1±22.9	11.26±8.49		8.26±3.95	

NOTES: All values in mg/l except as otherwise noted.
 - Means not detected at levels indicated.
 * Excursion Parameters.

TABLE 8

MONITOR WELL 303-6-M 4
OPERATIONAL WATER QUALITY DATA

PARAMETER	BASELINE MEAN	UPPER CONTROL LIMIT	SAMPLE ROUND 1 Collected 5-15-79	SAMPLE ROUND 2 Collected 5-30-79	SAMPLE ROUND 3 Collected 6-12-79	SAMPLE ROUND 4 Collected 6-27-79	SAMPLE ROUND 5 Collected 7-10-79	SAMPLE ROUND 6 Collected 7-24-79	SAMPLE ROUND 7 Collected 8-07-79
*pH (pH units)	9.4	11.4	9.5	9.1	8.8	8.7	8.8	8.7	8.5
Total Dissolved Solids				1690		1332		1347	
*Specific Conductance	1712	2054	1800	1785	1800	1750	1785	1825	1850
*Ammonia (as N) (mhos/cm)	2.6	3.1	0.21	0.17	- 0.1	- 0.1	0.1	- 0.1	- 0.1
Nitrate (as N)				1.7		3.5		0.03	
Nitrite (as N)				-0.01		-0.01		-0.01	
Carbonate	28	34	36	25	36	24		24	19
Bicarbonate	81	97	61	85	73	73		85	95
*Carbonate + Bicarbonate	109	131	97	110	109	97	134	109	114
Calcium			24	20	18	21		26	
*Chloride	38	46	40	36	38	29	30	30	28
Boron				- 1.0		- 1.0		- 1.0	
Fluoride				1.3		1.3		0.62	
Magnesium				6		8		7	
Potassium				9		10		9	
Sodium	425	510	429	432	415	417	427	418	436
*Sulfate	778	934	816	880	810	818	789	807	805
Aluminum				0.05		-0.05		-0.05	
Arsenic				-0.01		-0.01		-0.01	
Barium				0.05		-0.05		-0.05	
Cadmium				-0.002		-0.002		-0.002	
Chromium				-0.01		-0.01		-0.01	
Copper				-0.01		-0.01		-0.01	
Iron				0.013		0.05		0.05	
Lead				-0.05		-0.05		-0.05	
Manganese				-0.01		-0.01		-0.01	
Mercury				-0.001		-0.001		-0.001	
Nickel				-0.04		-0.04		-0.04	
Selenium				-0.01		-0.01		-0.01	
Zinc				-0.01		-0.01		-0.01	
Molybdenum				-0.05		-0.05		-0.05	
Vanadium				-0.05		-0.05		-0.05	
*Uranium	0.002	1.002	0.009	0.014	0.008	-0.001	0.010	0.001	0.008
Radium 226 (pCi/l)	79.43				39.7±1.72	83.75±3.01		67.6±2.83	
Thorium 230 (pCi/l)	7.58				99.1±43.1	2.12±2.62		7.56±3.25	

NOTES: All values in mg/l except as otherwise noted.

- Means not detected at levels indicated.

* Excursion Parameters.

TABLE 9

90024035

MONITOR WELL 303-6-M 5
OPERATIONAL WATER QUALITY DATA

PARAMETER	BASELINE MEAN	UPPER CONTROL LIMIT	SAMPLE ROUND 1 Collected 5-15-79	SAMPLE ROUND 2 Collected 6-01-79	SAMPLE ROUND 3 Collected 6-12-79	SAMPLE ROUND 4 Collected 6-26-79	SAMPLE ROUND 5 Collected 7-10-79	SAMPLE ROUND 6 Collected 7-24-79	SAMPLE ROUND 7 Collected 8-07-79
*pH (pH units)	8.8	10.8	9.0	8.6	8.6	8.4	8.6	8.3	8.2
Total Dissolved Solids				1390		1334		1322	
*Specific Conductance (mhos/cm)	1760	2112	1800	1825	1800	1750	1785	1775	1850
*Ammonia (as N)	0.19	0.23	0.20	- 0.1	0.12	- 0.1	0.1	- 0.1	- 0.1
Nitrate (as N)				1.8		4.2		0.02	
Nitrite (as N)				-0.01		-0.01		-0.01	
Carbonate	18	22	12	35	12	12		12	0
Bicarbonate	116	139	110	73	110	98		122	122
*Carbonate + Bicarbonate	134	161	122	109	122	110	122	134	122
Calcium			19	25	25	25		47	
*Chloride	32	38	34	36	34	28	28	32	28
Boron				- 1.0		- 1.0		- 1.0	
Fluoride				1.6		1.3		0.70	
Magnesium				6		7		3	
Potassium				9		9		8	
*Sodium	440	528	438	432	436	417	425	416	425
*Sulfate	802	962	830	810	920	814	832	814	850
Aluminum				0.08		-0.05		-0.05	
Arsenic				-0.01		-0.01		-0.01	
Barium				-0.05		-0.05		-0.05	
Cadmium				-0.002		-0.002		-0.002	
Chromium				-0.01		-0.01		-0.01	
Copper				-0.01		-0.01		-0.01	
Iron				0.01		0.05		0.02	
Lead				-0.05		-0.05		-0.05	
Manganese				-0.01		-0.01		-0.01	
Mercury				-0.001		-0.001		-0.001	
Nickel				-0.04		-0.04		-0.04	
Selenium				-0.01		-0.01		-0.01	
Zinc				-0.01		0.02		-0.01	
Molybdenum				-0.05		-0.05		-0.05	
Vanadium				-0.05		-0.05		-0.05	
*Uranium	0.002	1.002	-0.001	0.003	0.002	0.002	0.006	-0.001	0.010
Radium 226 (pCi/l)	7.05				2.59±0.55	4.48±0.61		4.17±0.39	
Thorium 230 (pCi/l)	5.33				47.3±13.2	17.89±3.39		1.09±1.20	

NOTES: All values in mg/l except as otherwise noted.

- Means not detected at levels indicated.

* Excursion Parameters.

TABLE 10

90024036

MONITOR WELL 303-6-M 6
OPERATIONAL WATER QUALITY DATA

PARAMETER	BASELINE MEAN	UPPER CONTROL LIMIT	SAMPLE ROUND 1 Collected 5-15-79	SAMPLE ROUND 2 Collected 6-01-79	SAMPLE ROUND 3 Collected 6-12-79	SAMPLE ROUND 4 Collected 6-26-79	SAMPLE ROUND 5 Collected 7-10-79	SAMPLE ROUND 6 Collected 7-24-79	SAMPLE ROUND 7 Collected 8-07-79
*pH (pH units)	8.7	10.7	8.7	8.6	8.5	8.4	8.6	8.5	8.3
Total Dissolved Solids				1448		1342		1342	
*Specific Conductance	1792	2150	1800	1900	1850	1725	1800	1800	1825
*Ammonia (as N) (mhos/cm)	0.16	0.19	0.22	- 0.1	0.12	- 0.1	0.1	-0.01	- 0.1
Nitrate (as N)				1.4		4.0		0.02	
Nitrite (as N)				-0.01		-0.01		-0.01	
Carbonate	21	25	12	24	12	48		12	24
Bicarbonate	119	143	122	85	122	37		122	98
*Carbonate + Bicarbonate	140	168	134	109	134	85	122	134	122
Calcium			28	28	29	26		42	
*Chloride	33	40	34	34	32	30	28	30	30
Boron				- 1.0		- 1.0		- 1.0	
Fluoride				1.5		0.80		0.70	
Magnesium				9		9		6	
Potassium				8		8		9	
Sodium	428	514	422	432	426	417	423	428	436
*Sulfate	810	972	832	855	900	820	832	811	810
Aluminum				-0.05		-0.05		-0.05	
Arsenic				-0.01		-0.01		-0.01	
Barium				-0.05		-0.05		-0.05	
Cadmium				-0.002		-0.002		-0.002	
Chromium				-0.01		-0.01		-0.01	
Copper				-0.01		-0.01		-0.01	
Iron				0.01		0.02		0.01	
Lead				-0.05		-0.05		-0.05	
Manganese				-0.01		-0.01		-0.01	
Mercury				-0.001		-0.001		-0.001	
Nickel				-0.04		-0.04		-0.04	
Selenium				-0.01		-0.01		-0.01	
Zinc				-0.01		0.01		-0.01	
Molybdenum				-0.05		-0.05		-0.05	
Vanadium				-0.05		-0.05		-0.05	
*Uranium	0.006	1.006	0.025	0.025	0.025	0.004	0.016	0.003	0.009
Radium 226 (pCi/l)	22.03				3.06±0.67	5.48±0.66		5.66±0.43	
Thorium 230 (pCi/l)	4.73				2.65±1.06	5.01±5.50 (corrected)		0±3.99	

NOTES: All values in mg/l except as otherwise noted.

- Means not detected at levels indicated.

* Excursion Parameters.

TABLE 11

90024037

ATTACHMENT I

EXCURSION MONITOR WELLS
WATER QUALITY DATA

90024038

MONITOR WELL: 303-6-M 1

PH

BASELINE

OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

PH

90024039

2007

9/3/78

9/26/78

10/11/78

10/21/78

5/15/79

6/11/79

6/13/79

6/26/79

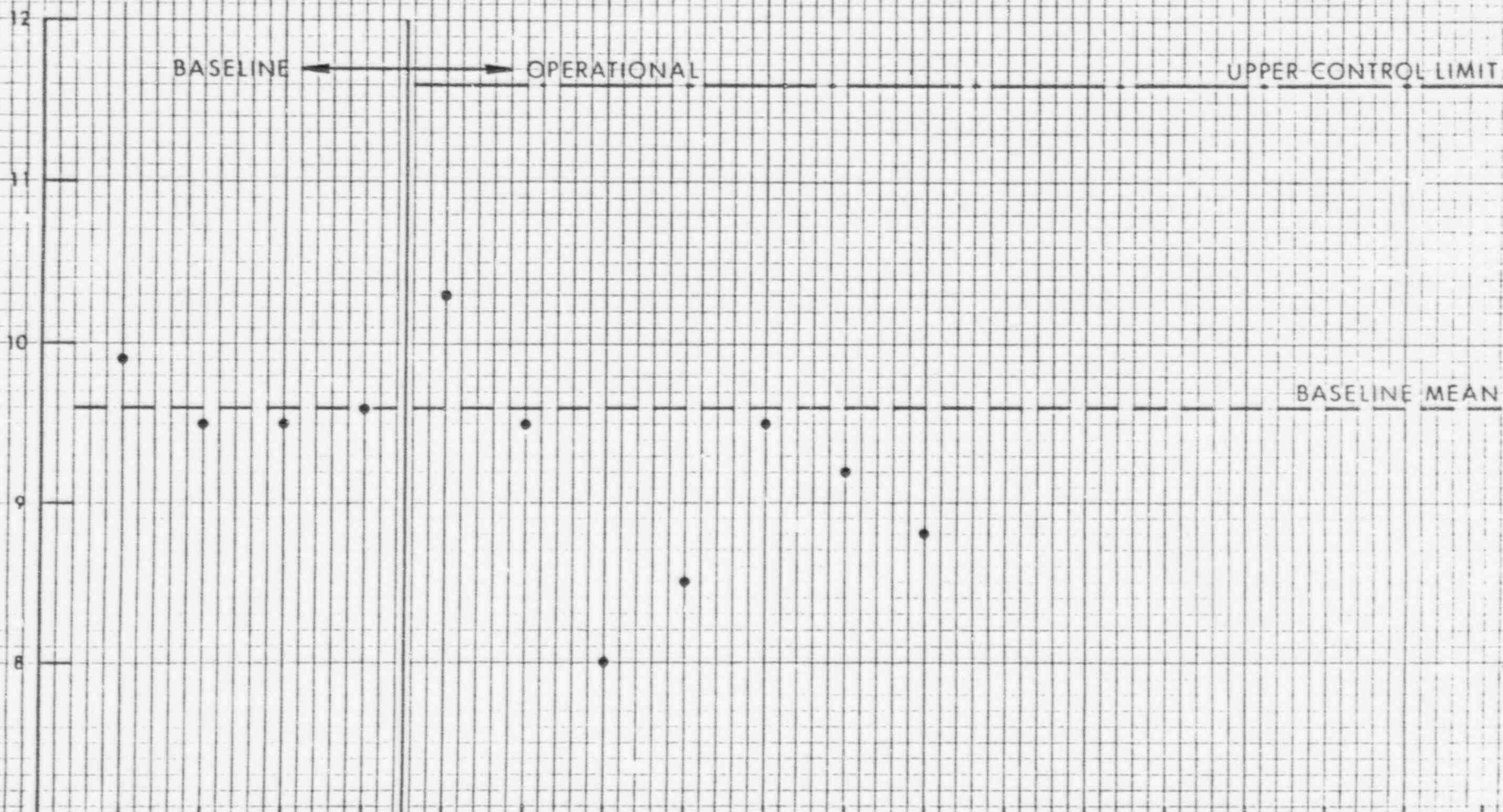
7/10/79

7/24/79

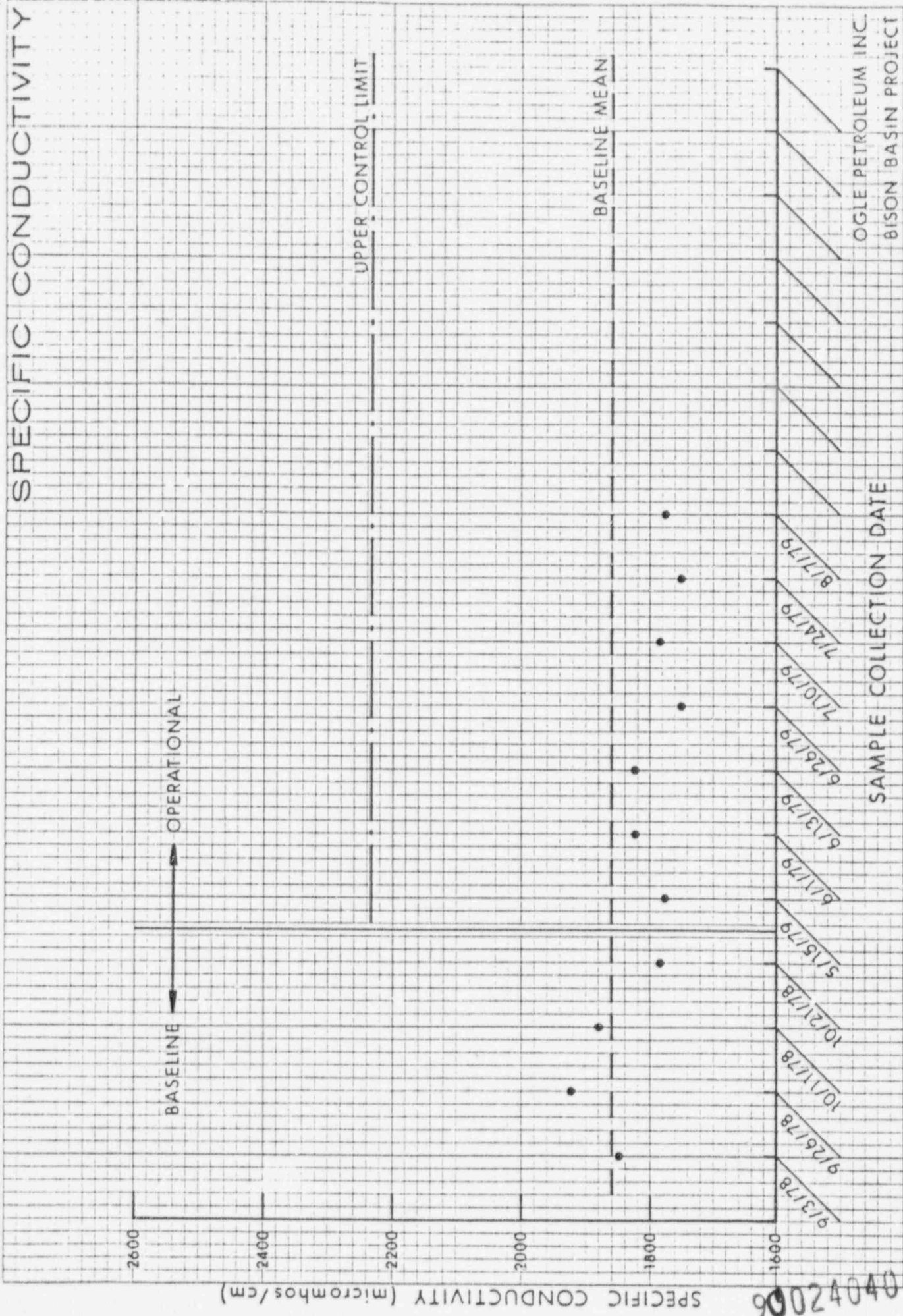
8/7/79

SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT

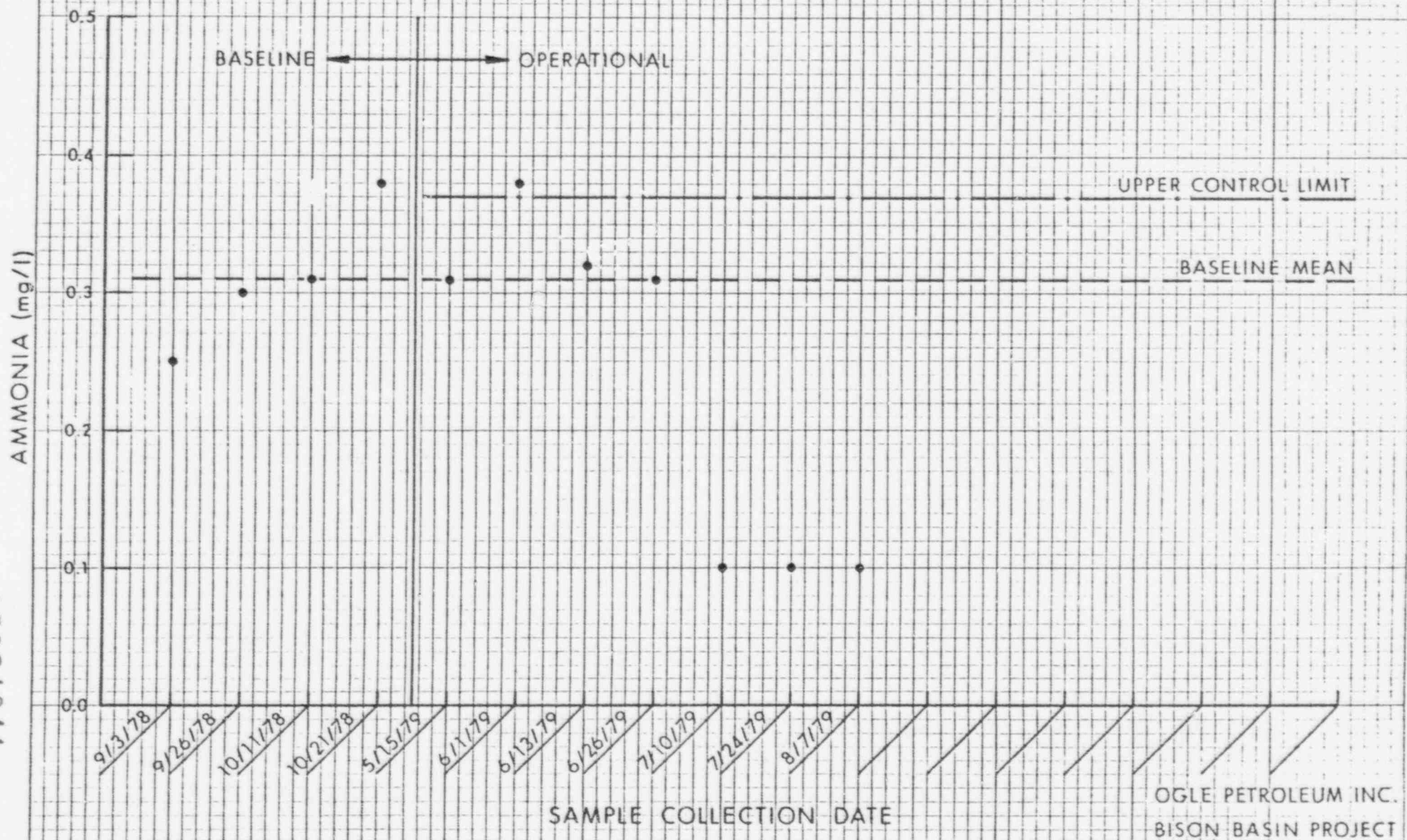


MONITOR WELL: 303-6-M 1



MONITOR WELL: 303-6-M 1

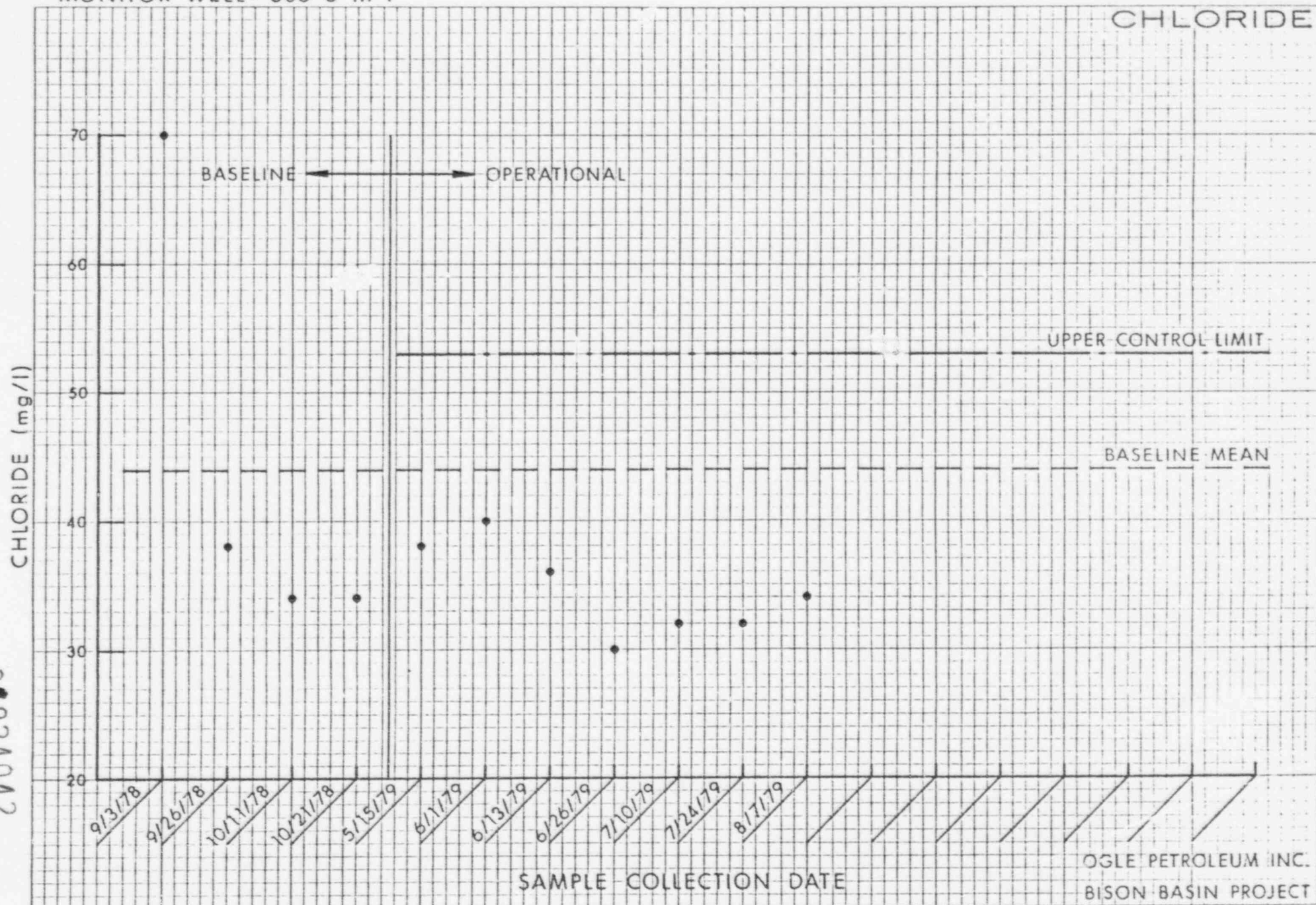
AMMONIA



90024041

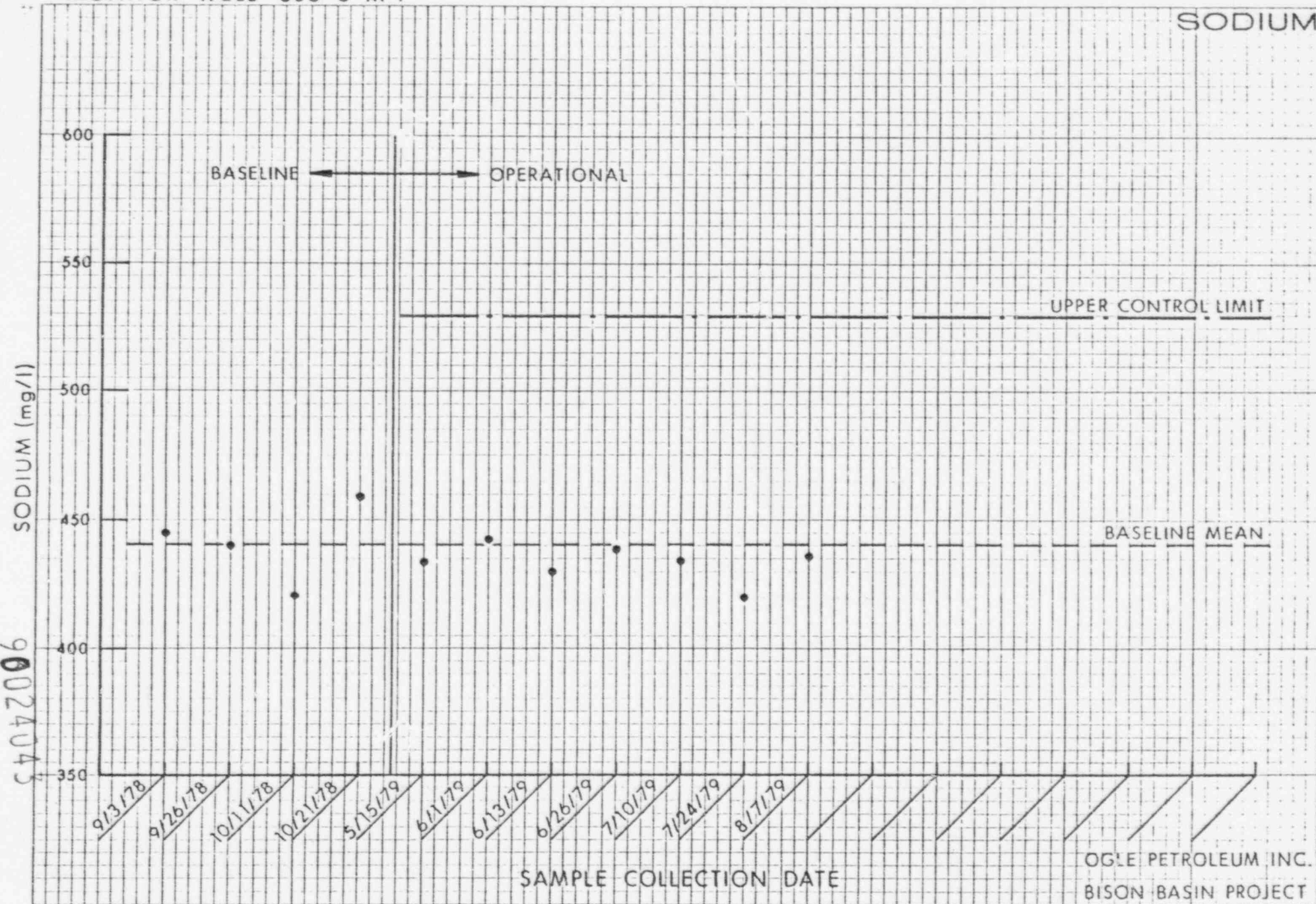
MONITOR WELL: 303-6-M 1

CHLORIDE



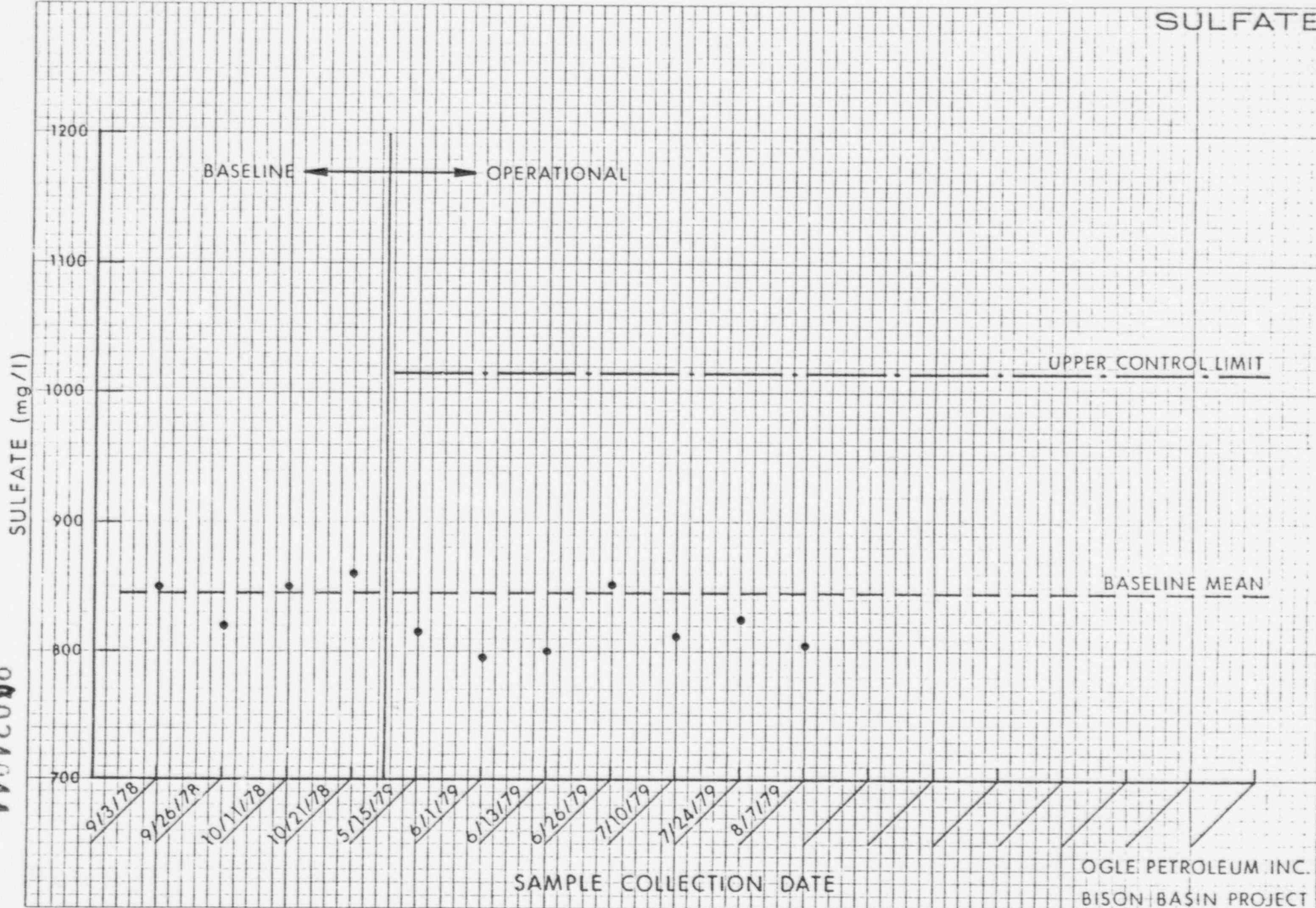
MONITOR WELL: 303-6-M 1

SODIUM



MONITOR WELL: 303-6-M 1

SULFATE



OGLE PETROLEUM INC.
BISON BASIN PROJECT

95024044

MONITOR WELL: 303-6-M 1

URANIUM

NOTE: UPPER CONTROL LIMIT
1.001 mg/l

BASELINE OPERATIONAL

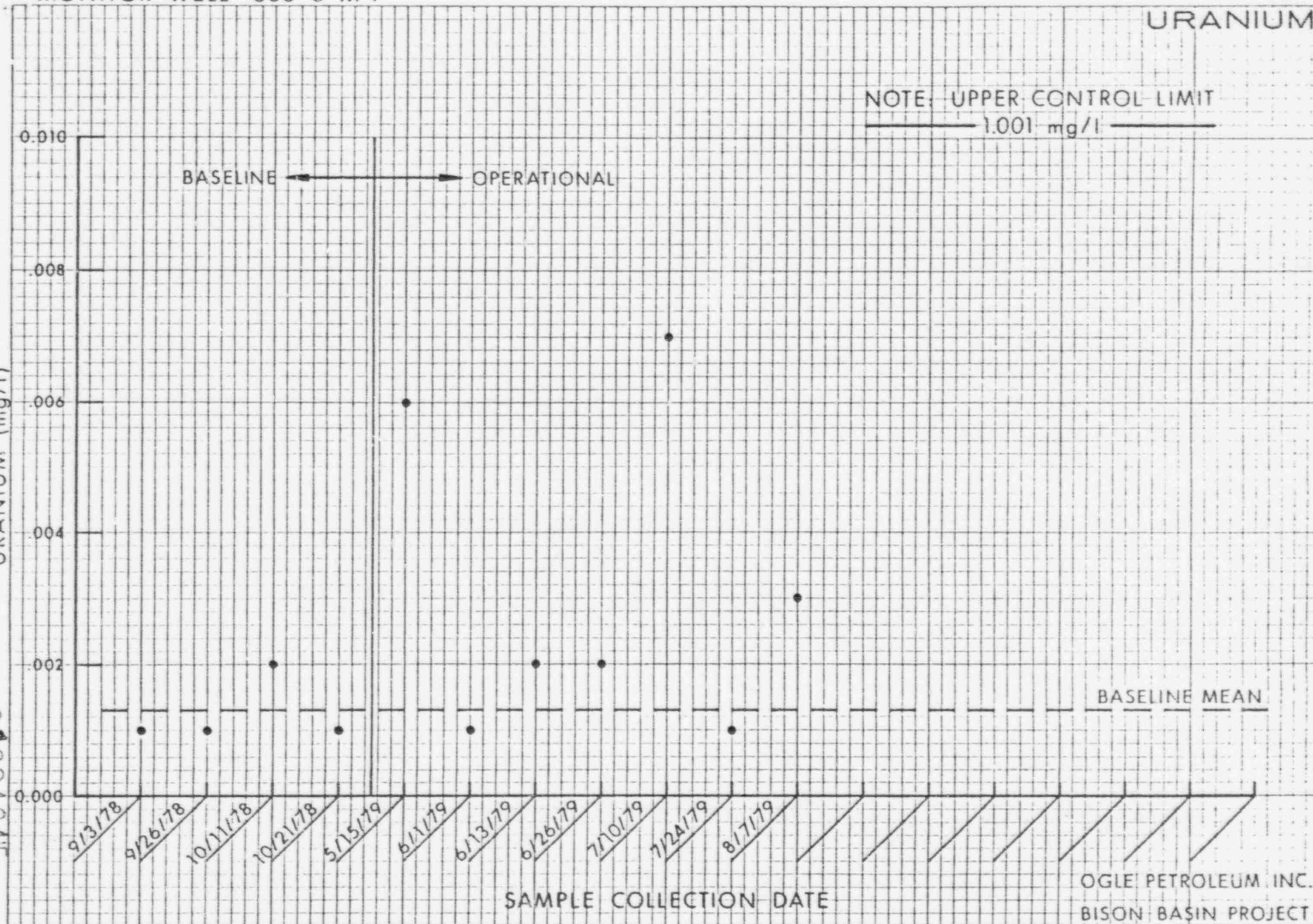
URANIUM (mg/l)

BASELINE MEAN

SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT

90024045



MONITOR WELL: 303-6-M 1

CARBONATE PLUS BICARBONATE

94024046

CARBONATE PLUS BICARBONATE (mg/l)

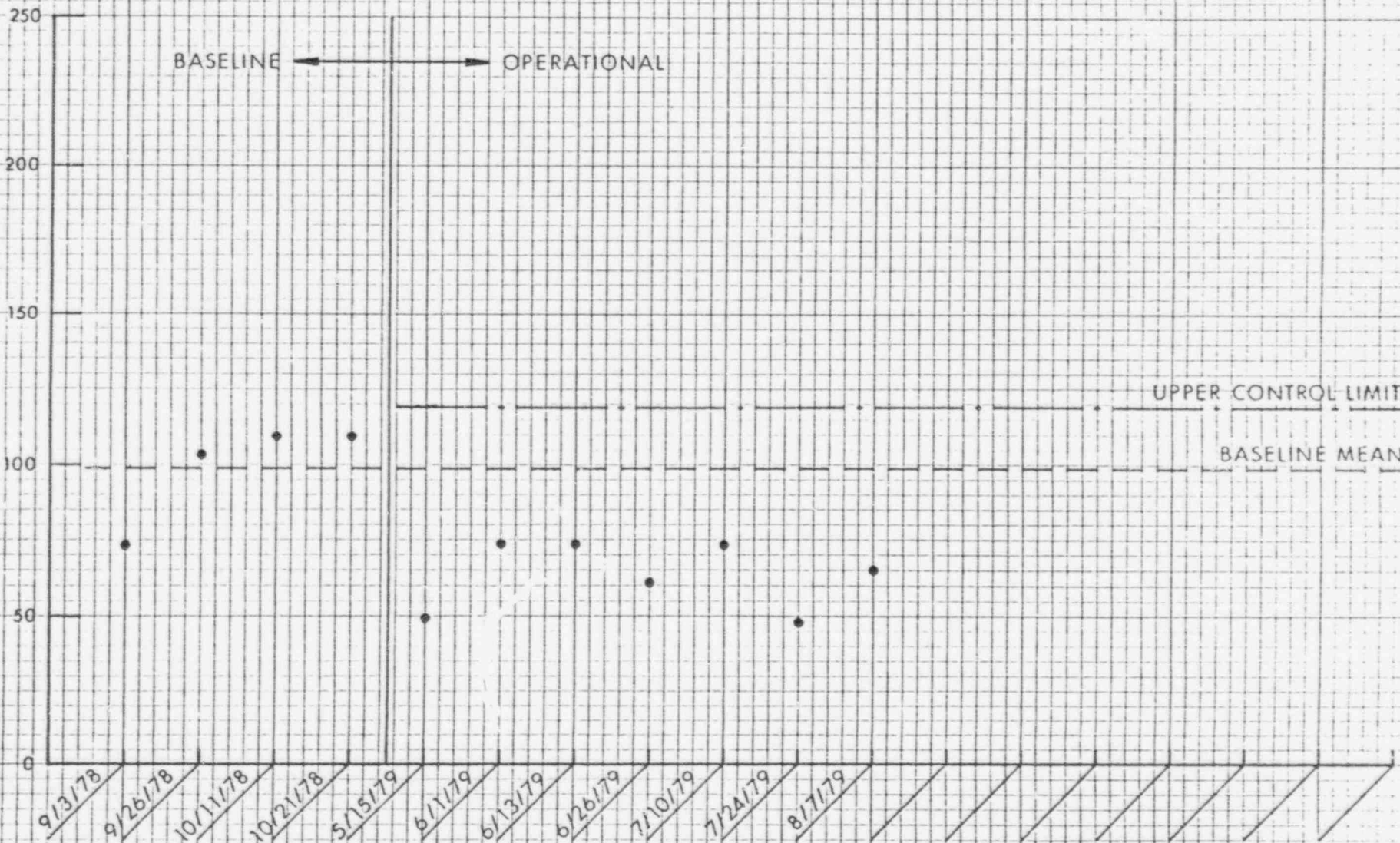
BASELINE OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

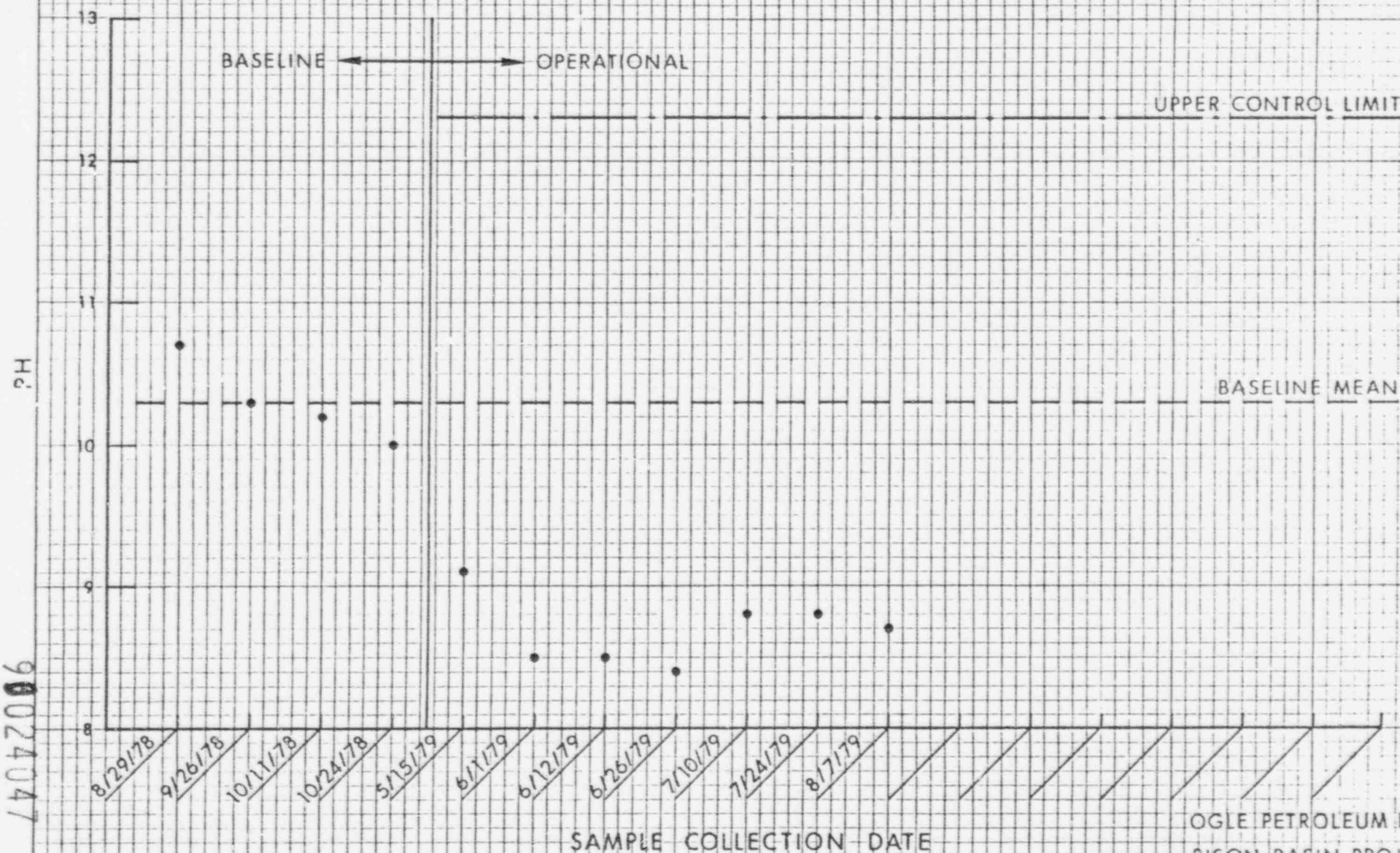
SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT



MONITOR WELL: 303-6-M 2

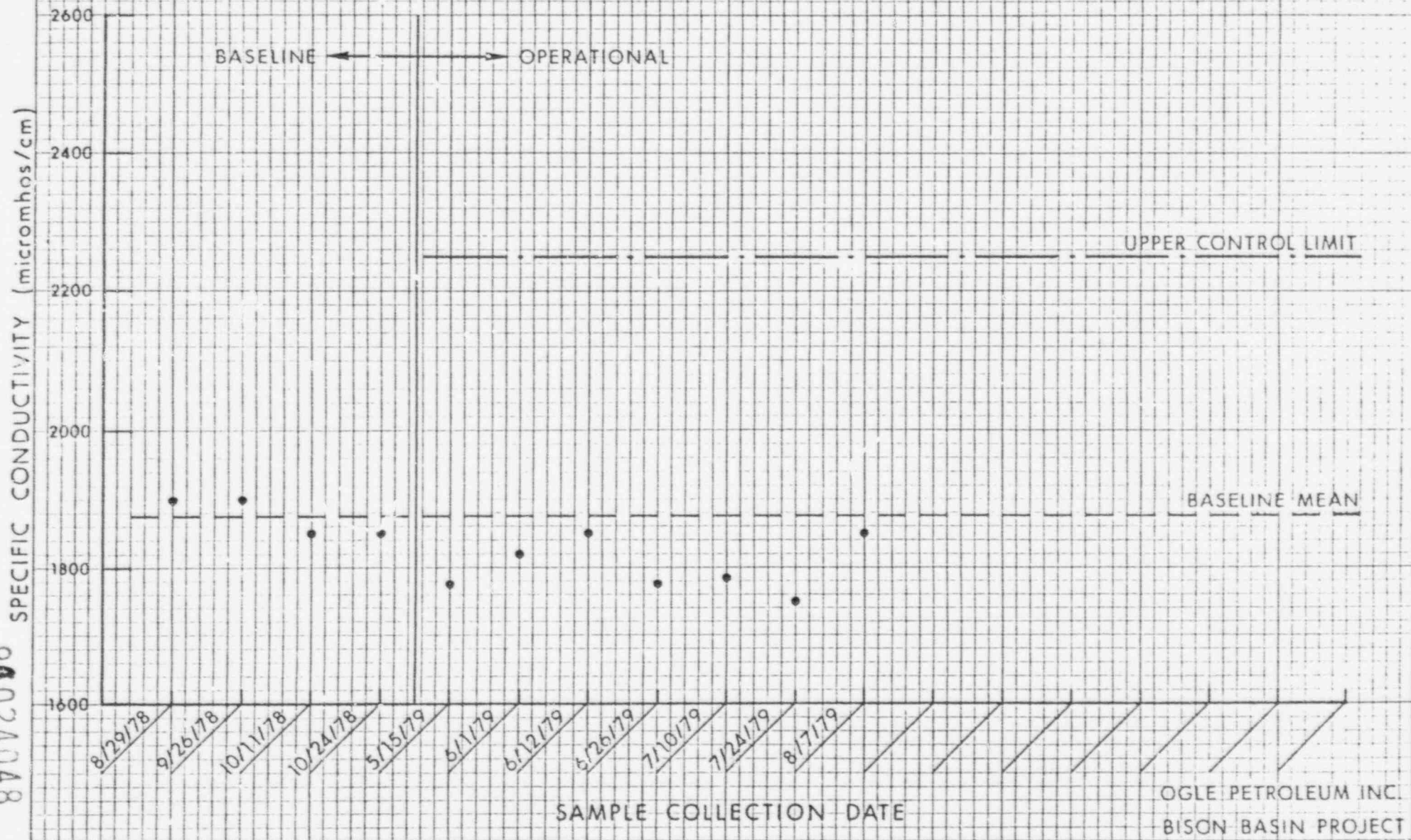
PH



OGLE PETROLEUM INC.
BISON-BASIN PROJECT

MONITOR WELL: 303-6-M2

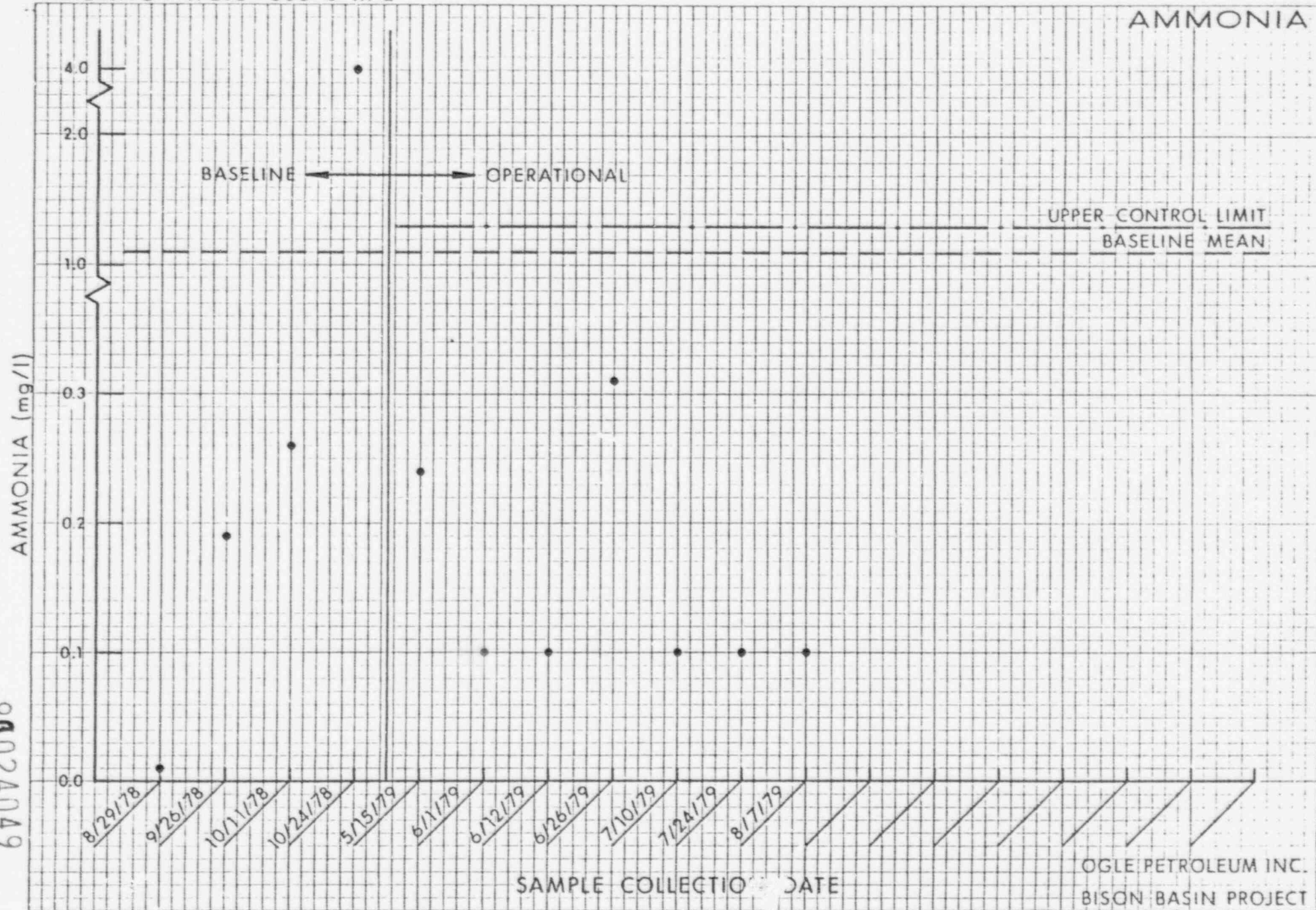
SPECIFIC CONDUCTIVITY



99024048

MONITOR WELL: 303-6-M 2

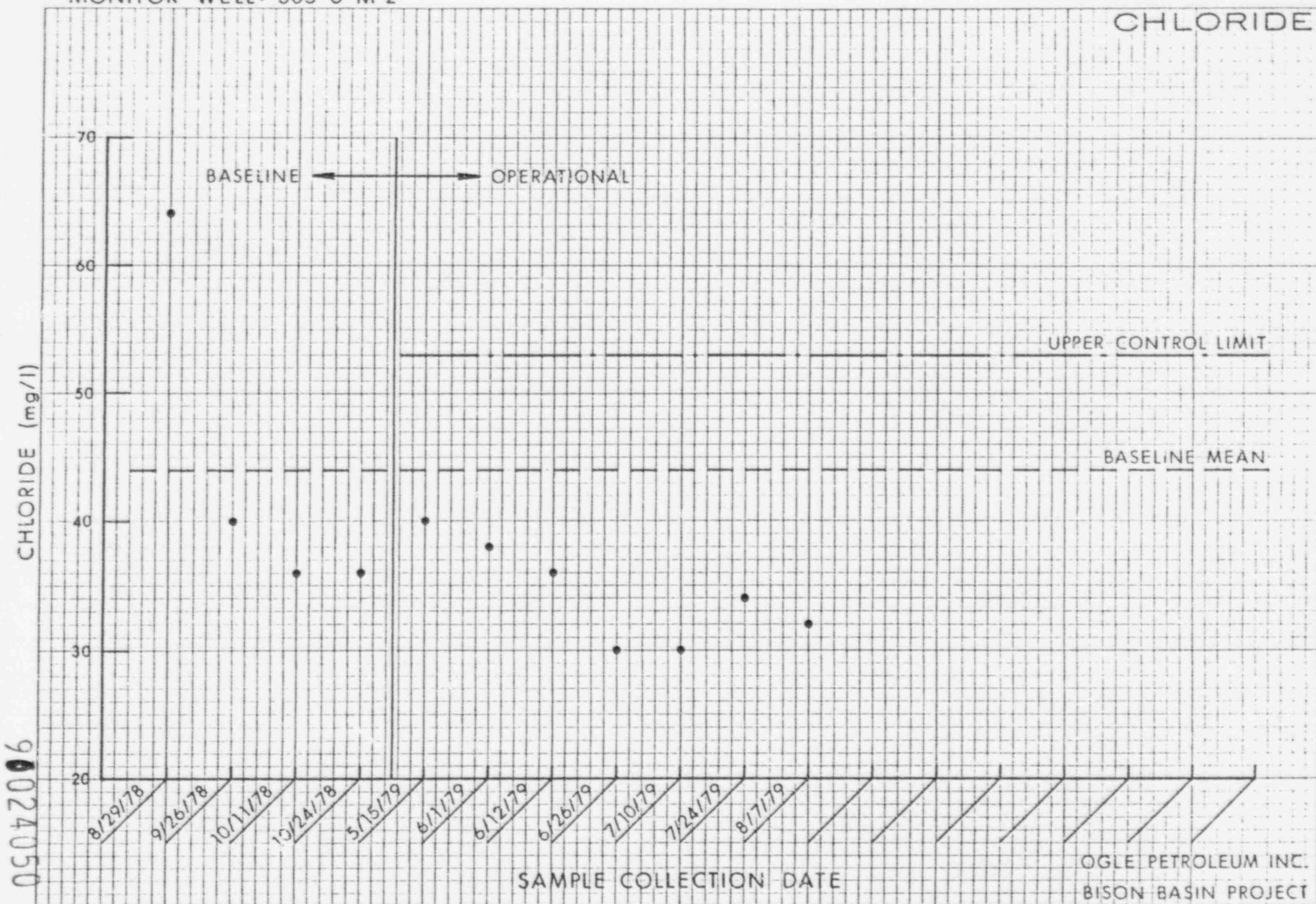
AMMONIA



OGLE PETROLEUM INC.
BISON BASIN PROJECT

90024049

MONITOR WELL: 303-6-M 2



MONITOR WELL: 303-6-M2

SODIUM



OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

90024051

MONITOR WELL: 303-6-M2

SULFATE



OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

2504206

MONITOR WELL: 303-6-M2

URANIUM

NOTE: UPPER CONTROL LIMIT
1.001 mg/l

BASELINE OPERATIONAL

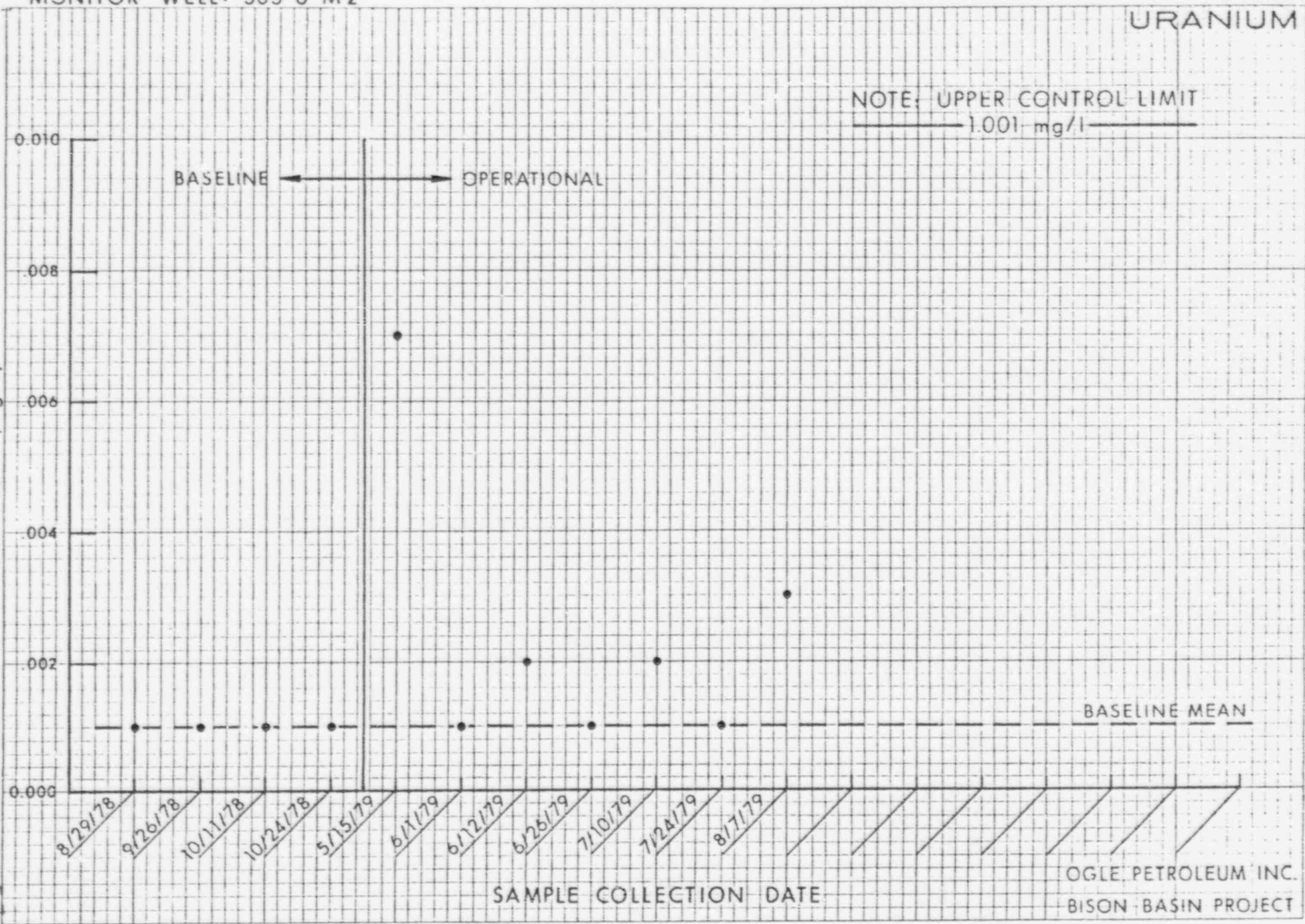
URANIUM (mg/l)

BASELINE MEAN

SAMPLE COLLECTION DATE

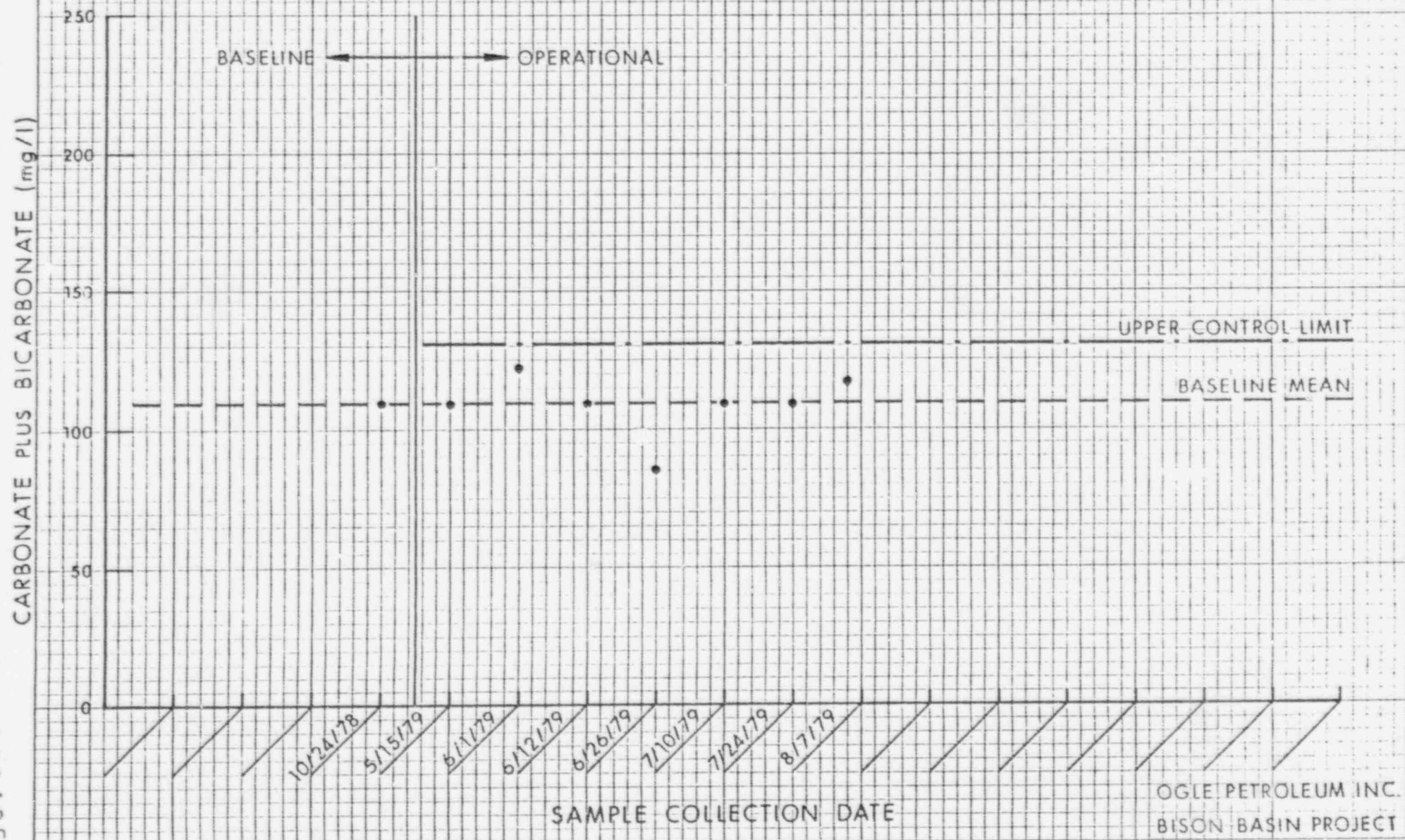
OGLE PETROLEUM INC.
BISON BASIN PROJECT

900241553



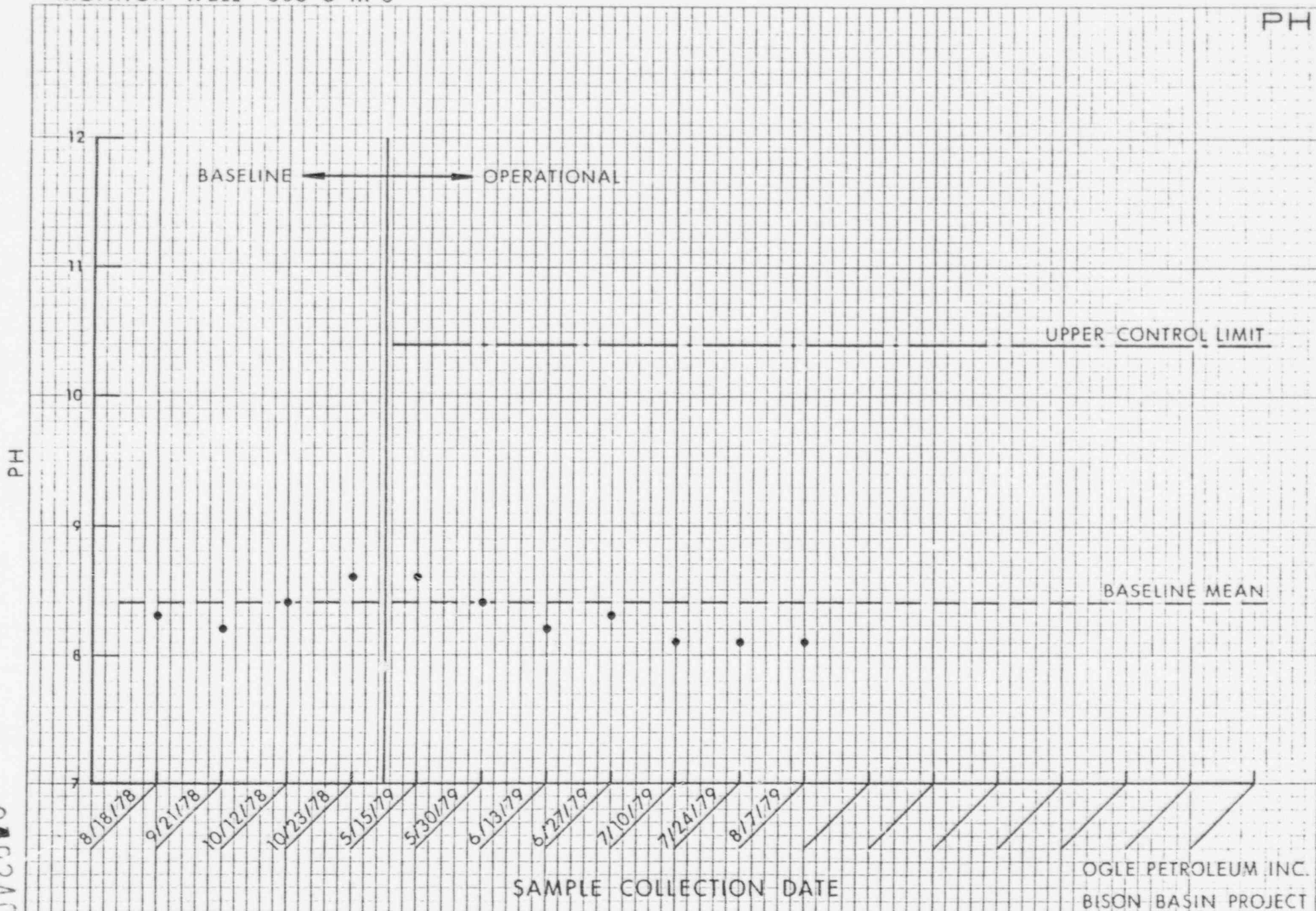
MONITOR WELL: 303-6-M 2

CARBONATE PLUS BICARBONATE



90024054

MONITOR WELL: 303-6-M 3

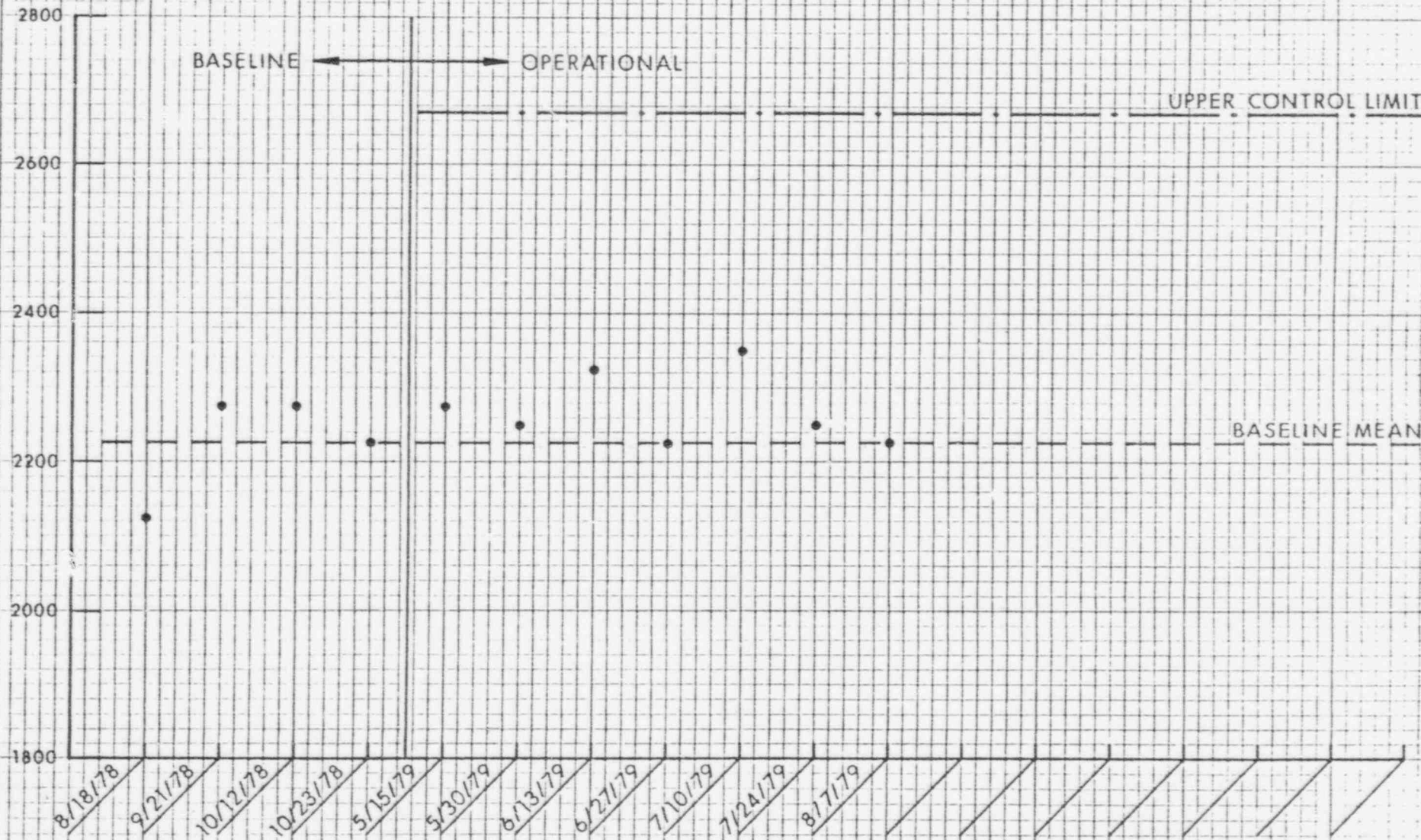


90524055

MONITOR WELL: 303-6-M 3

SPECIFIC CONDUCTIVITY

SPECIFIC CONDUCTIVITY (micromhos/cm)



SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT

96024056

MONITOR WELL: 303-6-M 3

AMMONIA



OGLE PETROLEUM INC.
BISON BASIN PROJECT

1504206

MONITOR WELL: 303-6-M 3

CHLORIDE



OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

90024058

MONITOR WELL: 303-6-M 3

SODIUM

SODIUM (mg/l)

BASELINE ← → OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

90024059

700
650
600
550
500
450

8/18/78

9/21/78

10/12/78

10/23/78

5/15/79

5/30/79

6/13/79

6/27/79

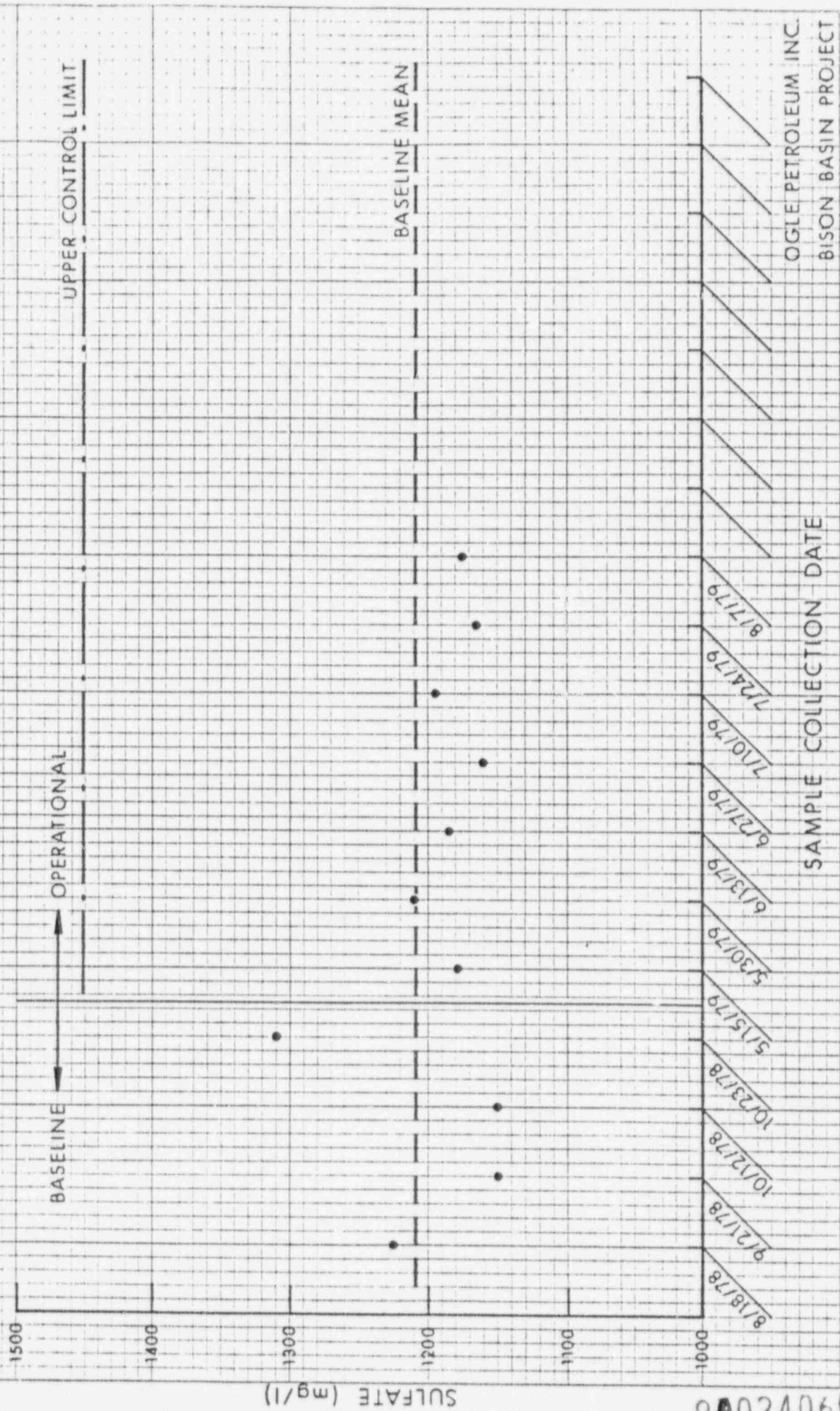
7/10/79

7/24/79

8/7/79

MONITOR WELL: 303-6-M 3

SULFATE



90024060

OGLE PETROLEUM INC.
BISON BASIN PROJECT

MONITOR WELL : 303-6-M 3



90024061

MONITOR WELL: 303-6-M 3

CARBONATE PLUS BICARBONATE

CARBONATE PLUS BICARBONATE (mg/l)

BASELINE ← → OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

20042006
90024062

8/18/78

9/2/78

10/12/78

10/23/78

5/15/79

5/30/79

6/13/79

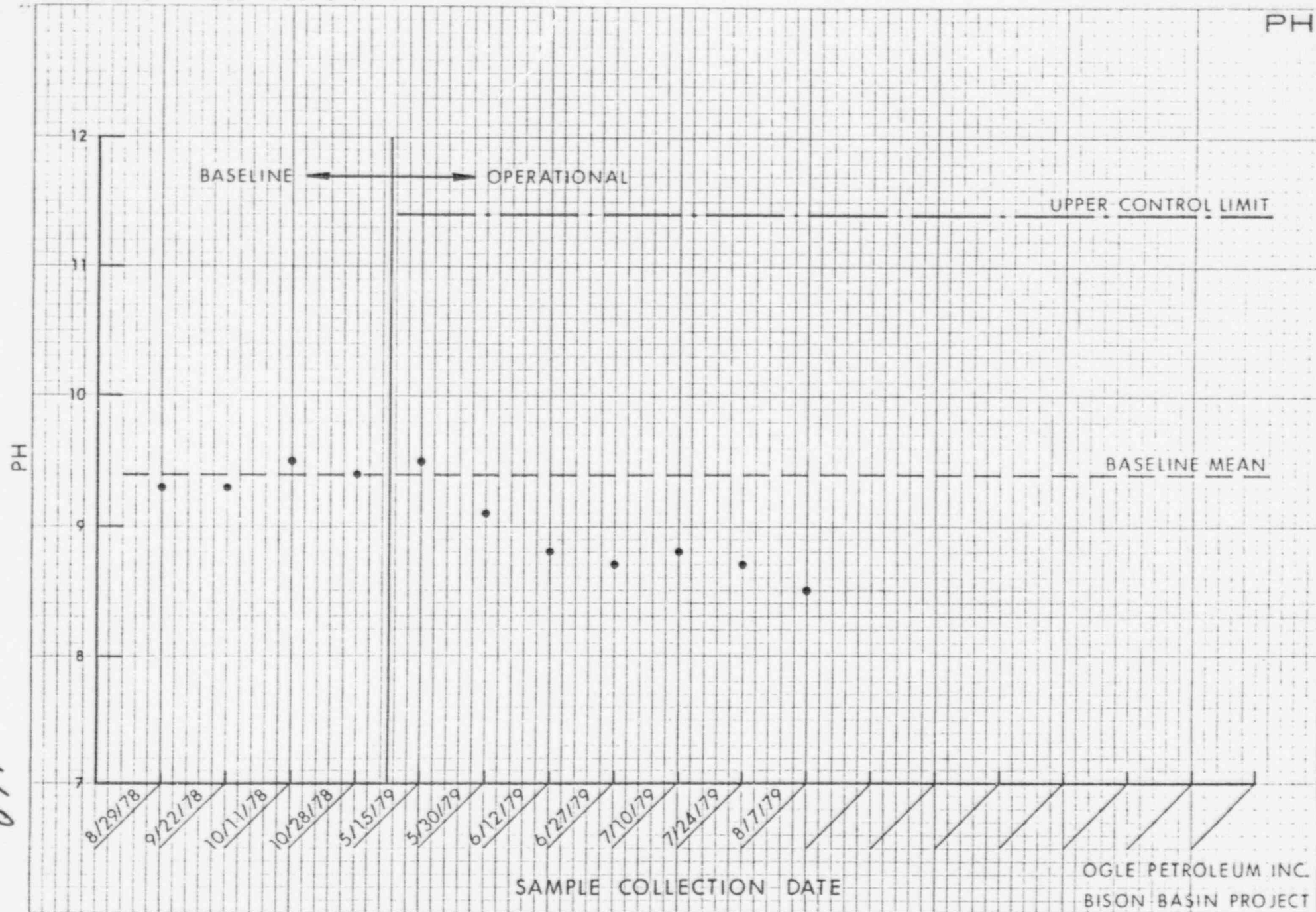
6/27/79

7/10/79

7/24/79

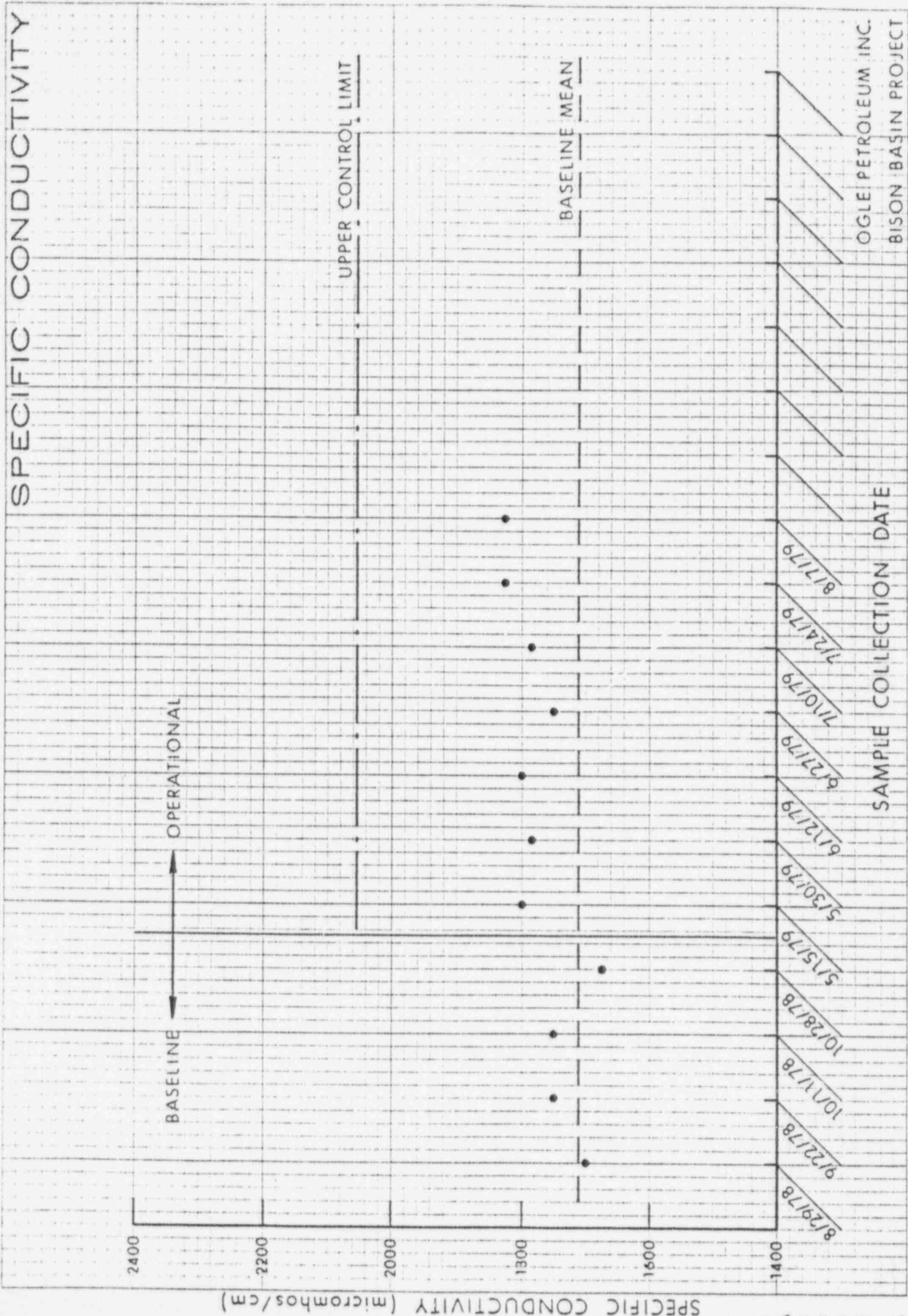
8/7/79

MONITOR WELL: 303-6-M 4



063

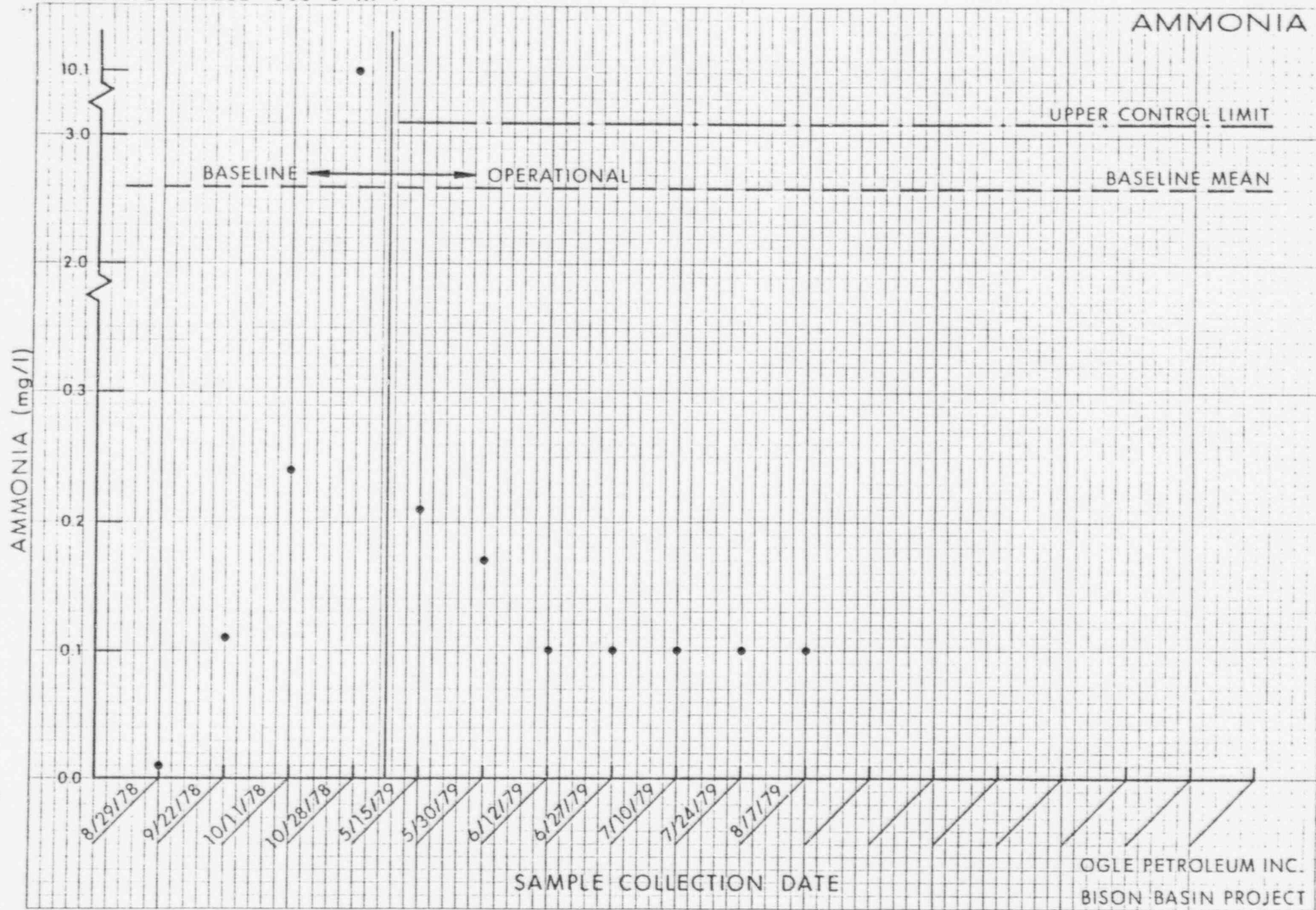
MONITOR WELL: 303-6-M 4



990024064

MONITOR WELL 303-6-M 4

AMMONIA

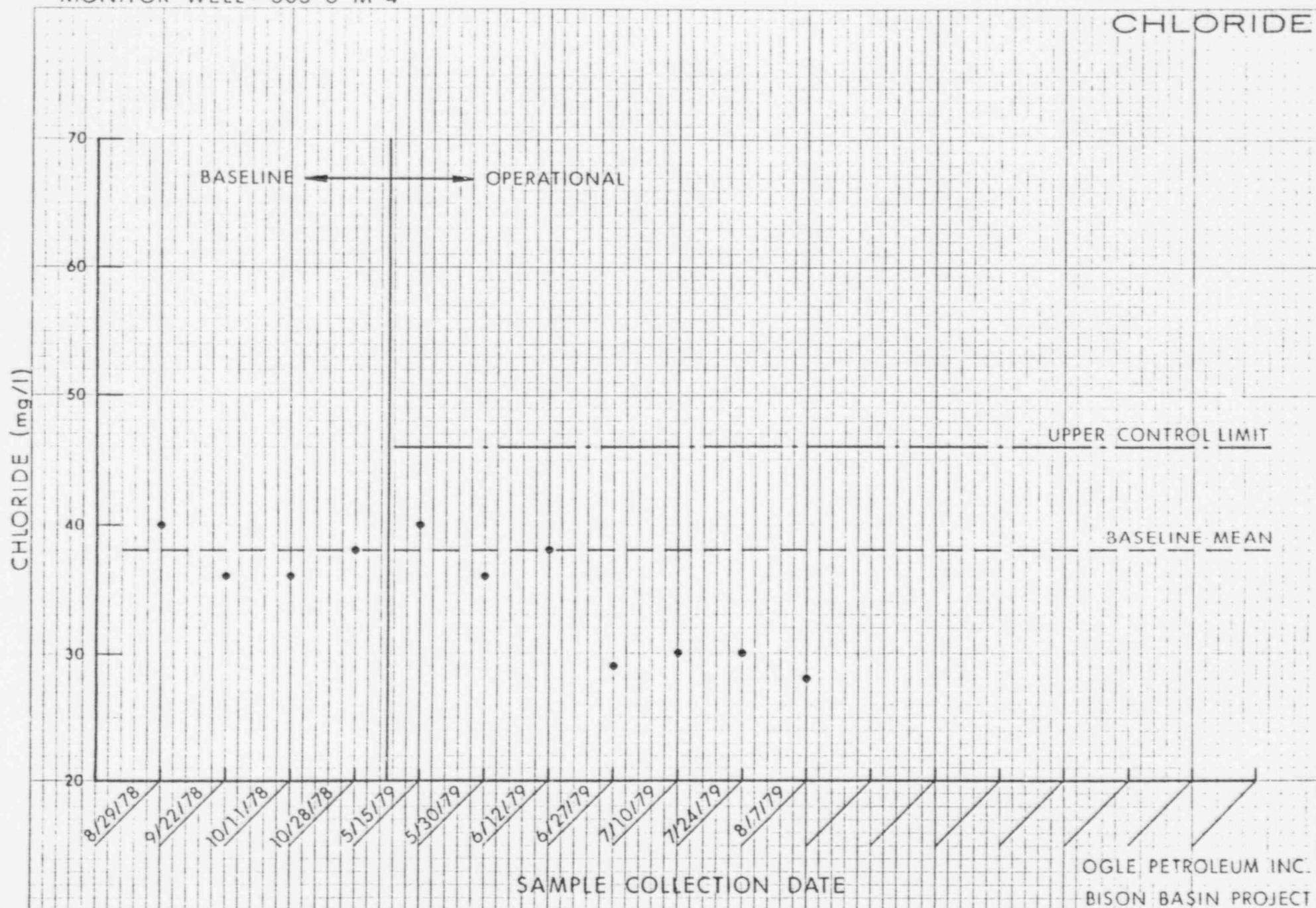


OGLE PETROLEUM INC.
BISON BASIN PROJECT

90024065

MONITOR WELL: 303-6-M 4

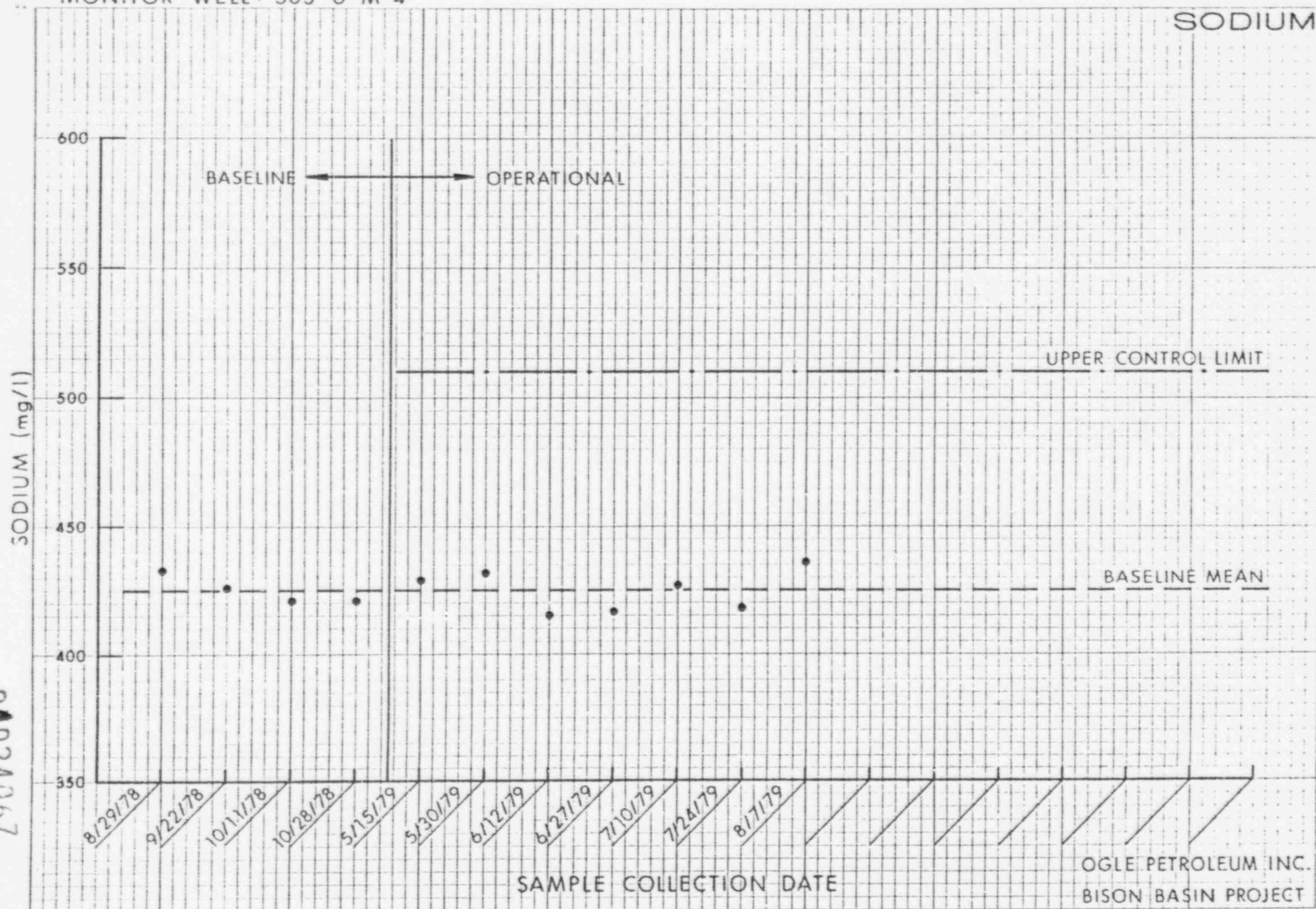
CHLORIDE



90024066

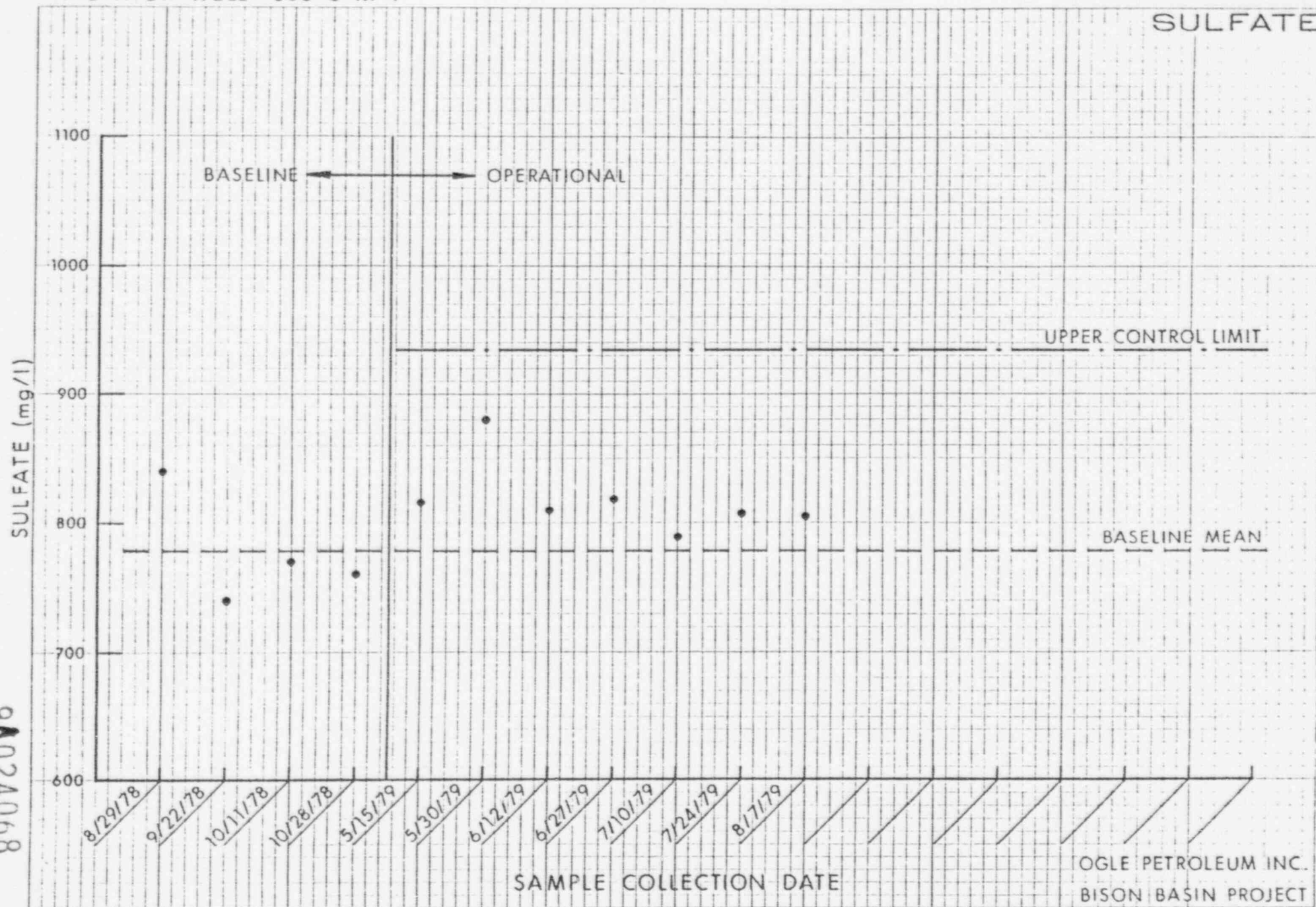
MONITOR WELL: 303-6-M 4

SODIUM



MONITOR WELL: 303-6-M 4

SULFATE

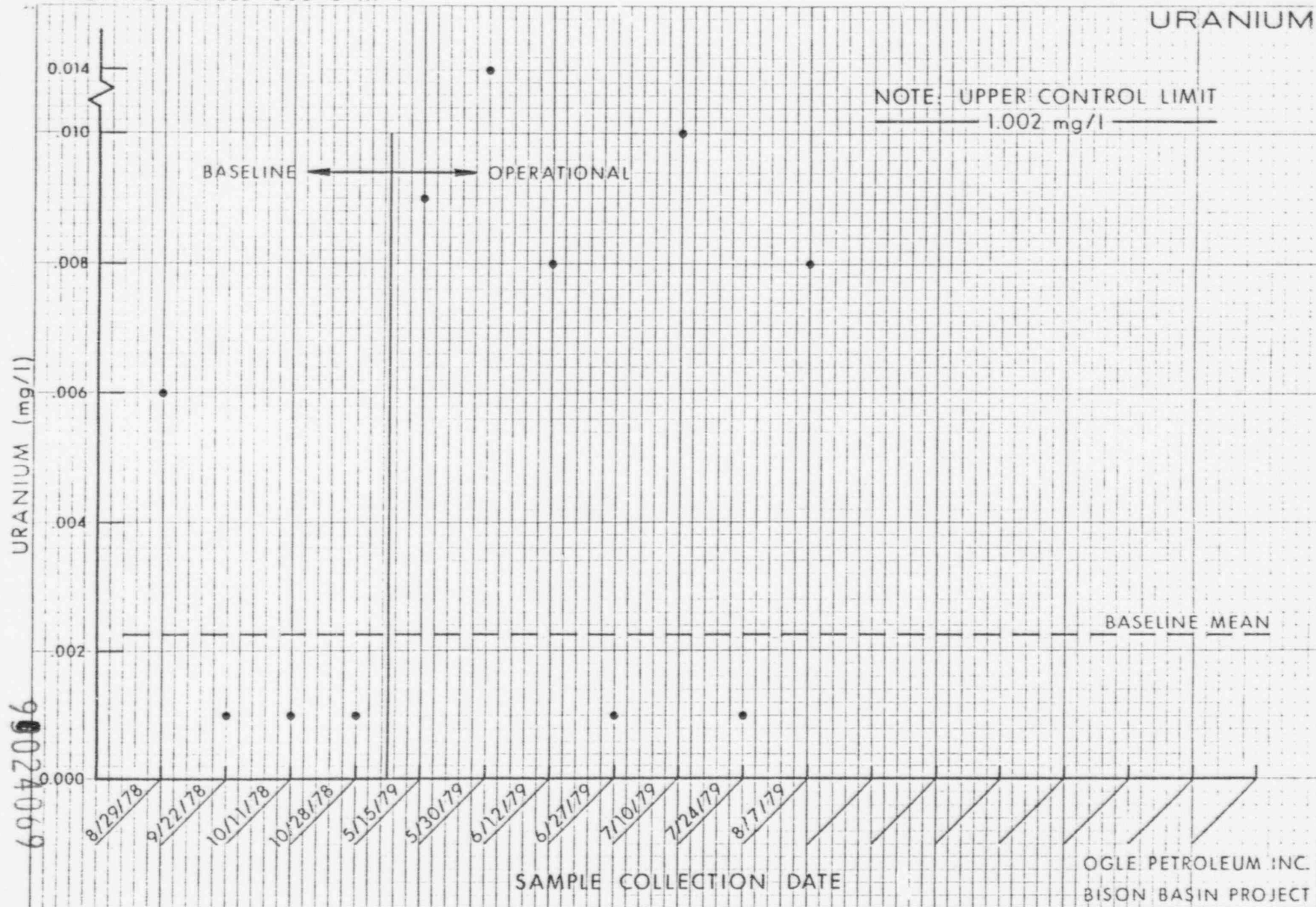


OGLE PETROLEUM INC.
BISON BASIN PROJECT

96024068

MONITOR WELL: 303-6-M 4

URANIUM



MONITOR WELL: 303-6-M 4

CARBONATE PLUS BICARBONATE

CARBONATE PLUS BICARBONATE (mg/l)

BASELINE OPERATIONAL

UPPER CONTROL LIMIT

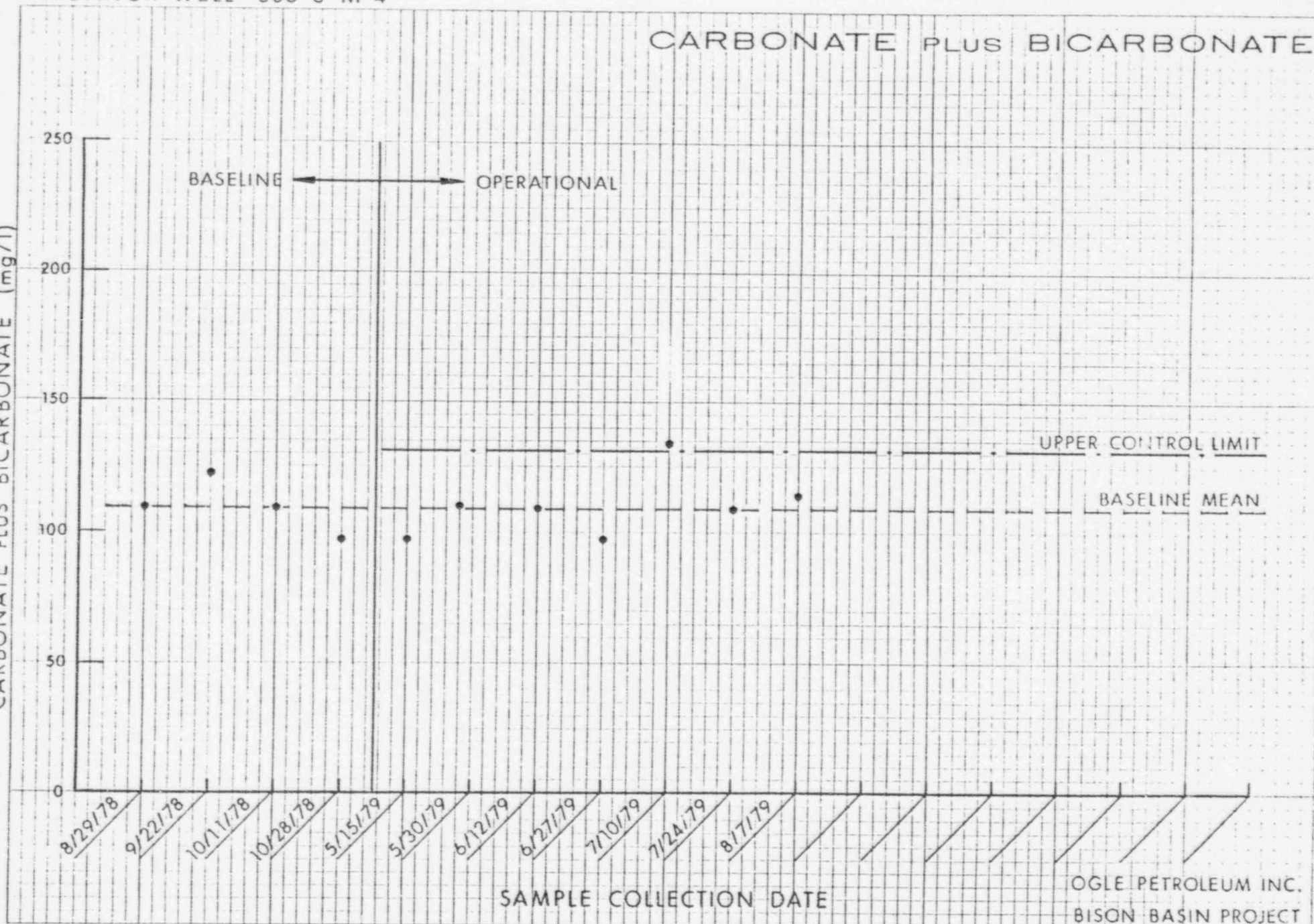
BASELINE MEAN

8/29/78 9/22/78 10/11/78 10/28/78 5/15/79 5/30/79 6/12/79 6/27/79 7/10/79 7/24/79 8/7/79

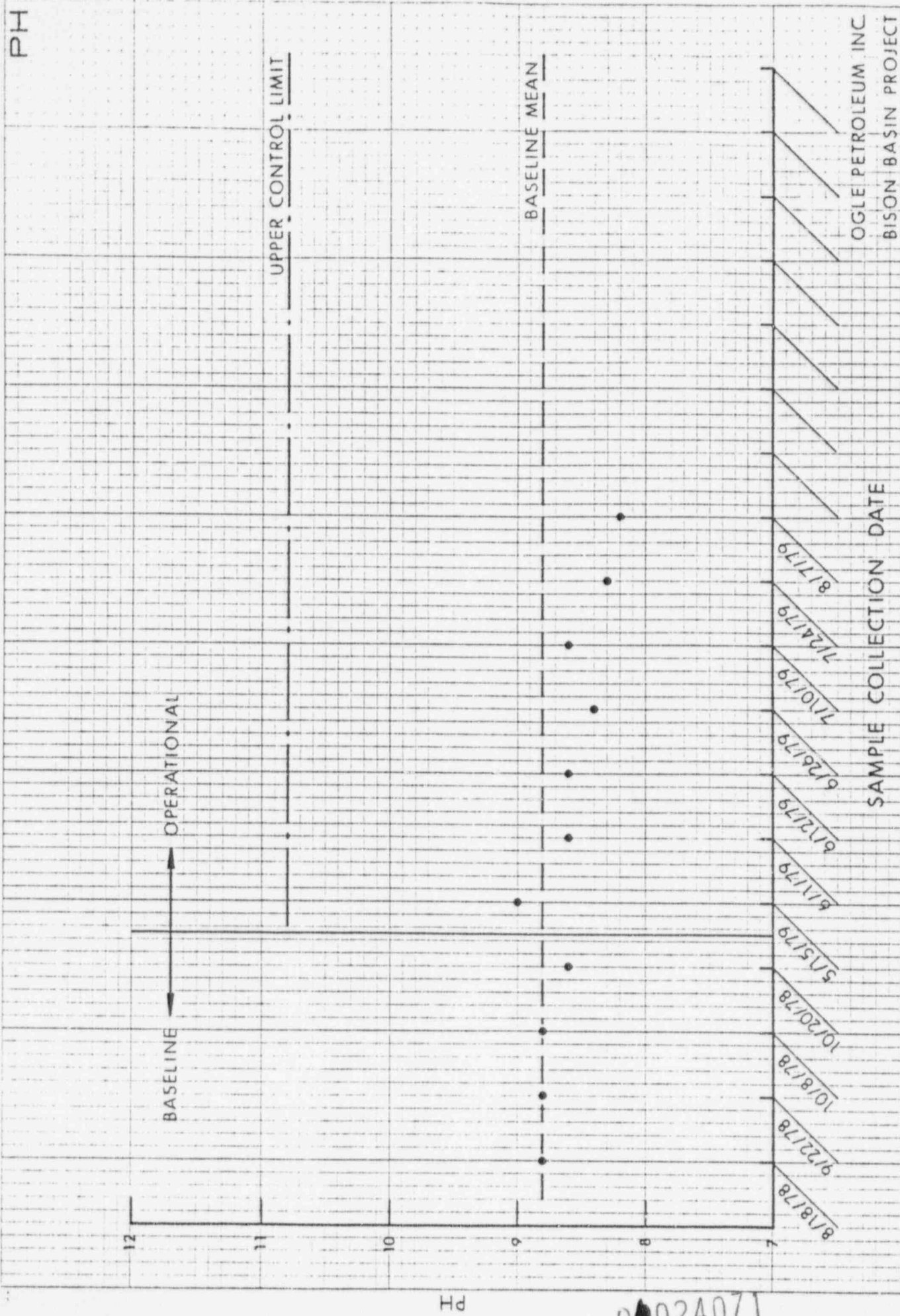
SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT

96024070



MONITOR WELL: 303-6-M 5

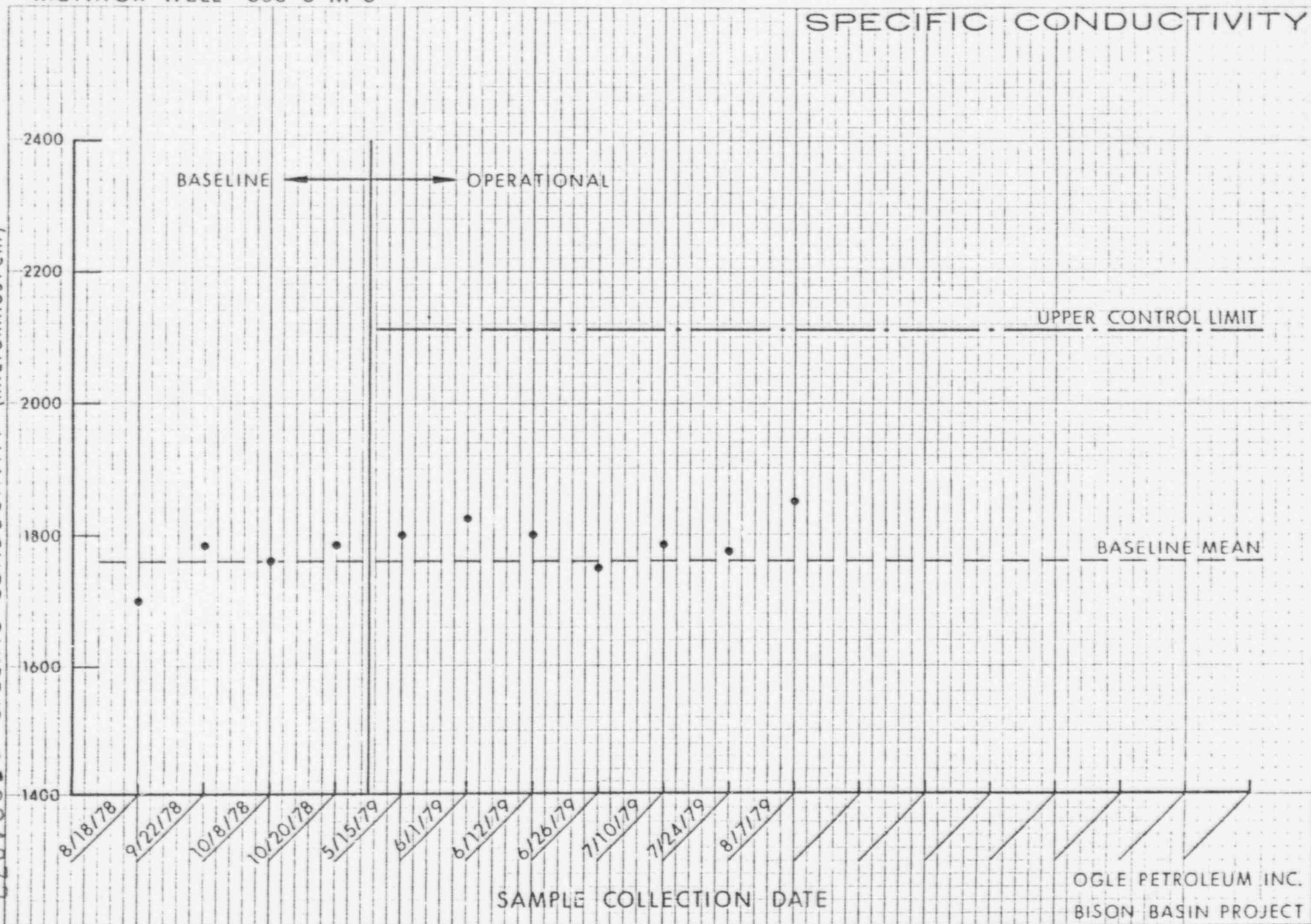


60024071

MONITOR WELL: 303-6-M 5

SPECIFIC CONDUCTIVITY

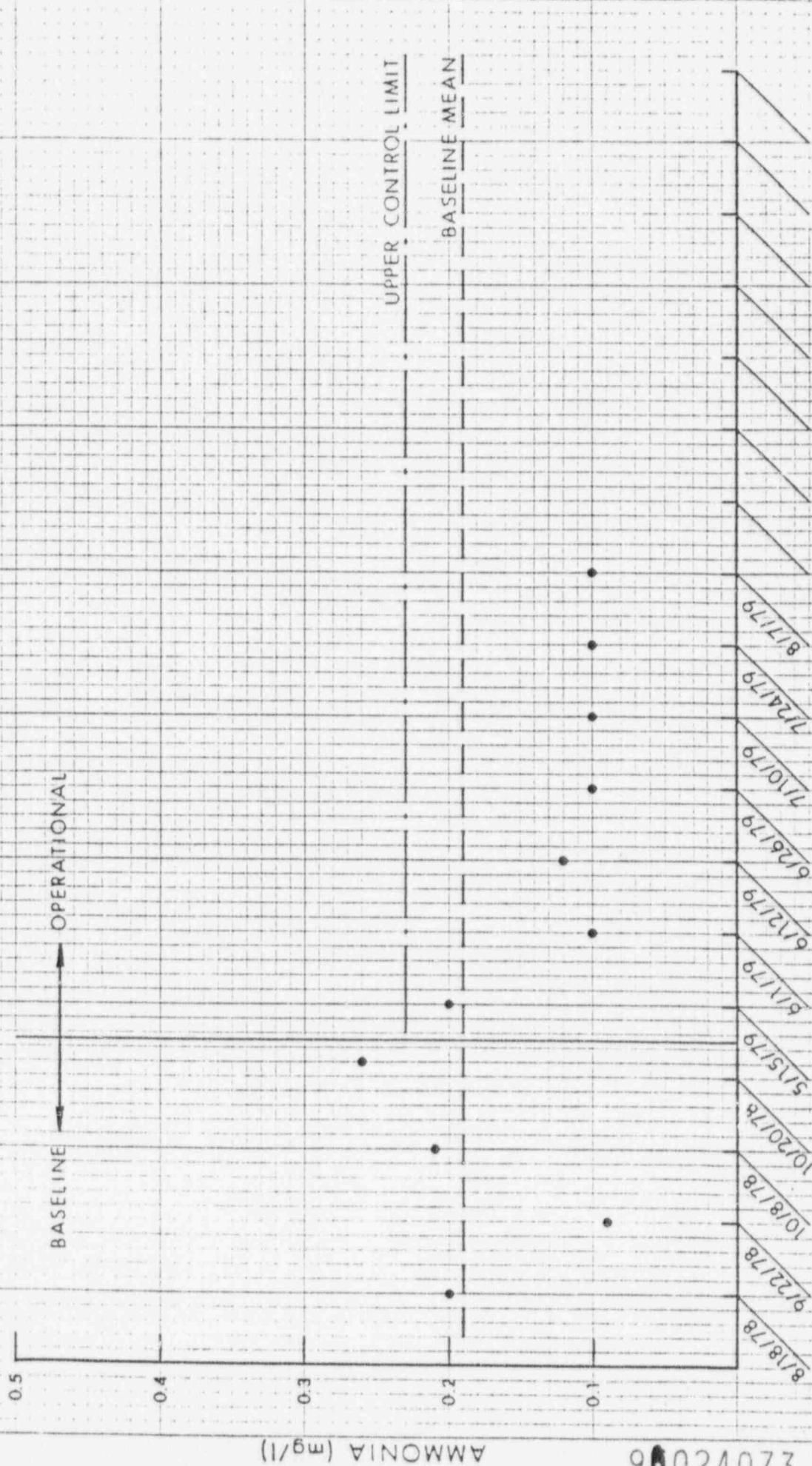
960024072
SPECIFIC CONDUCTIVITY (micromhos/cm)



OGLE PETROLEUM INC.
BISON BASIN PROJECT

MONITOR WELL: 303-6-M 5

AMMONIA



OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

96024073

MONITOR WELL: 303-6-M 5

CHLORIDE

CHLORIDE (mg/l)

BASELINE ← → OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

8/18/78

9/22/78

10/8/78

10/20/78

5/15/79

6/11/79

6/12/79

6/26/79

7/10/79

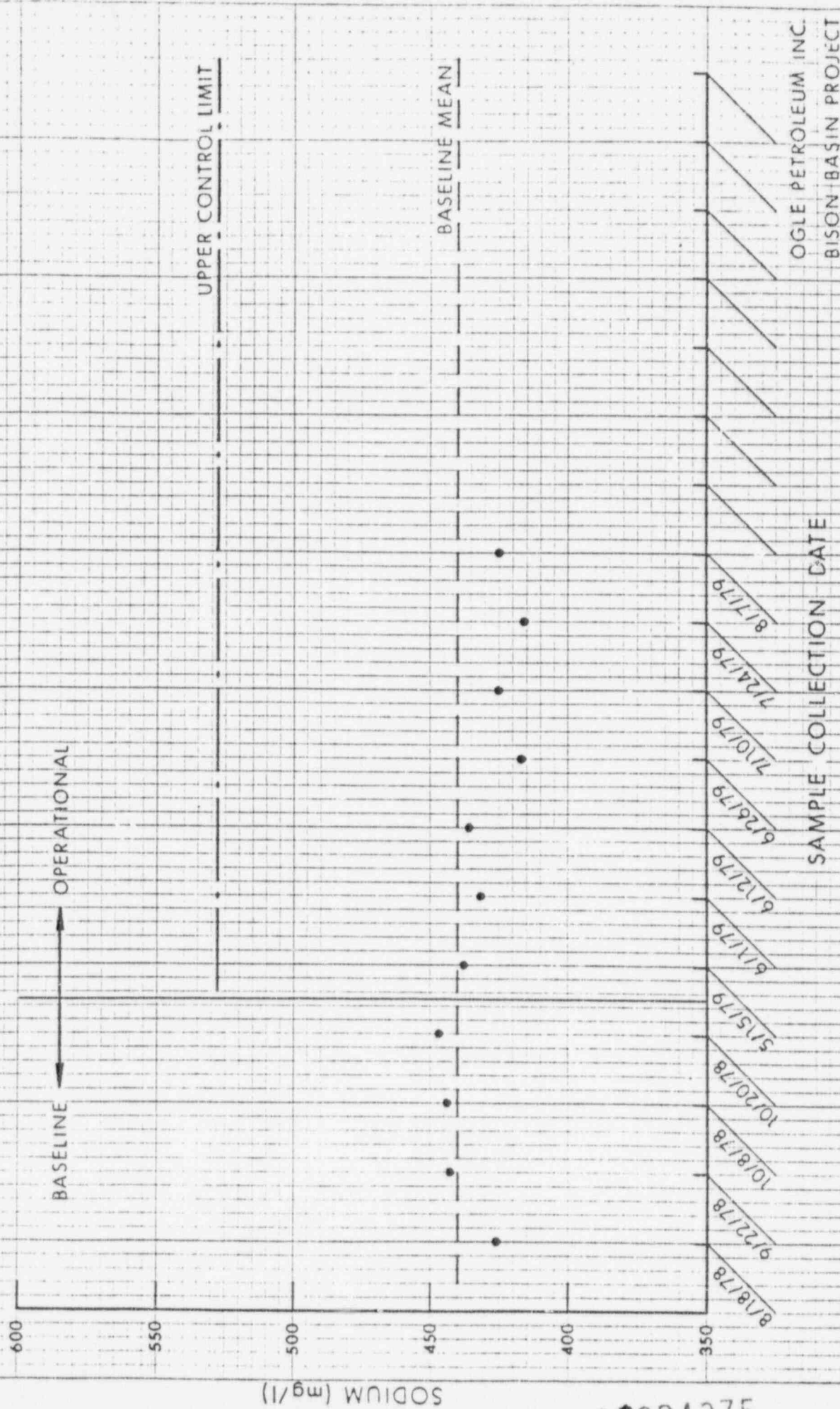
7/24/79

8/7/79

90024074

MONITOR WELL: 303-6-M 5

SODIUM



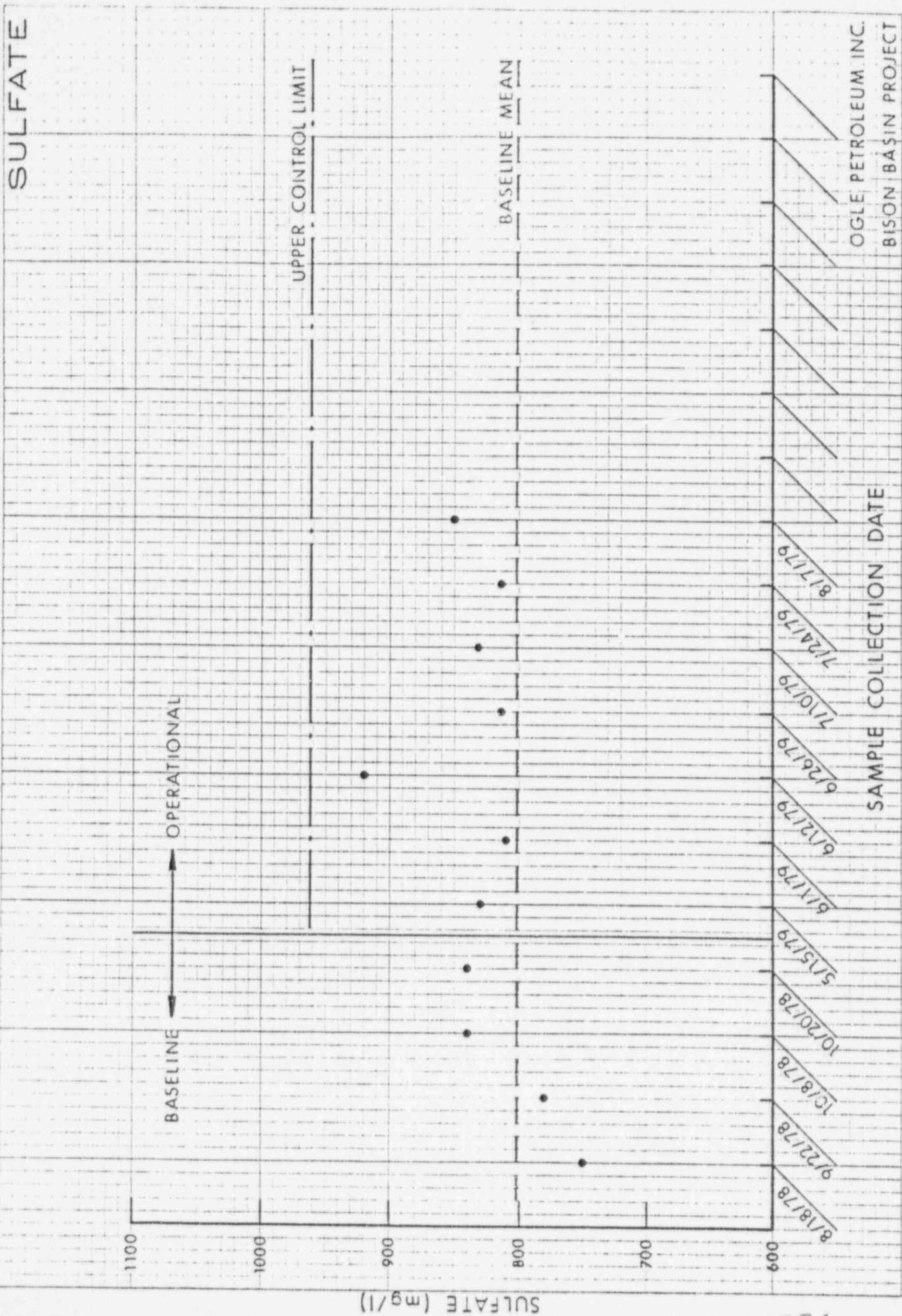
OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

SODIUM (mg/l)

90024075

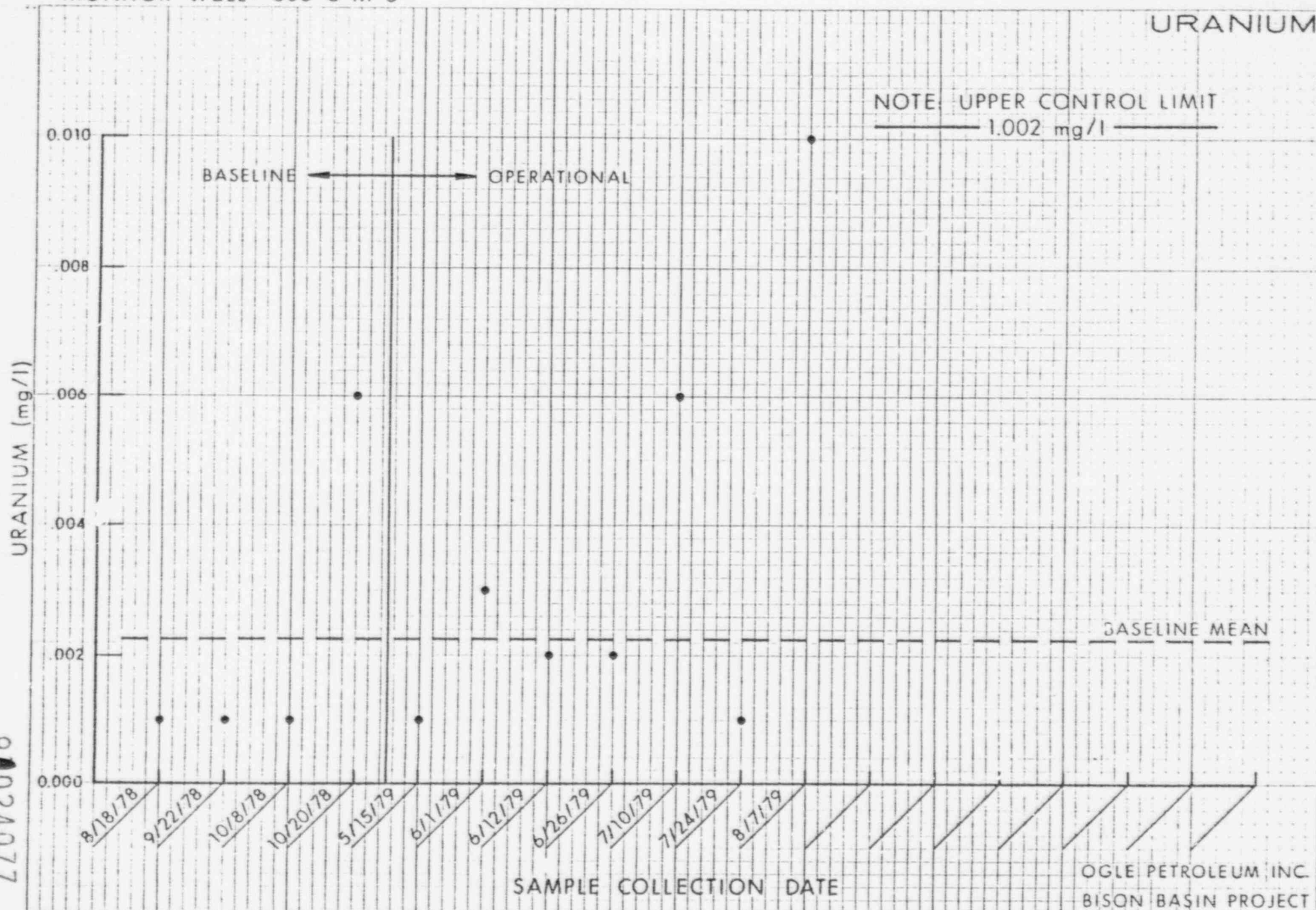
MONITOR WELL: 303-6-M 5



90024076

MONITOR WELL: 303-6-M 5

URANIUM



90024077

MONITOR WELL: 303-6-M 5

CARBONATE PLUS BICARBONATE

CARBONATE PLUS BICARBONATE (mg/l)

BASELINE OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

8/18/78

9/22/78

10/8/78

10/20/78

5/15/79

6/11/79

6/12/79

6/26/79

7/10/79

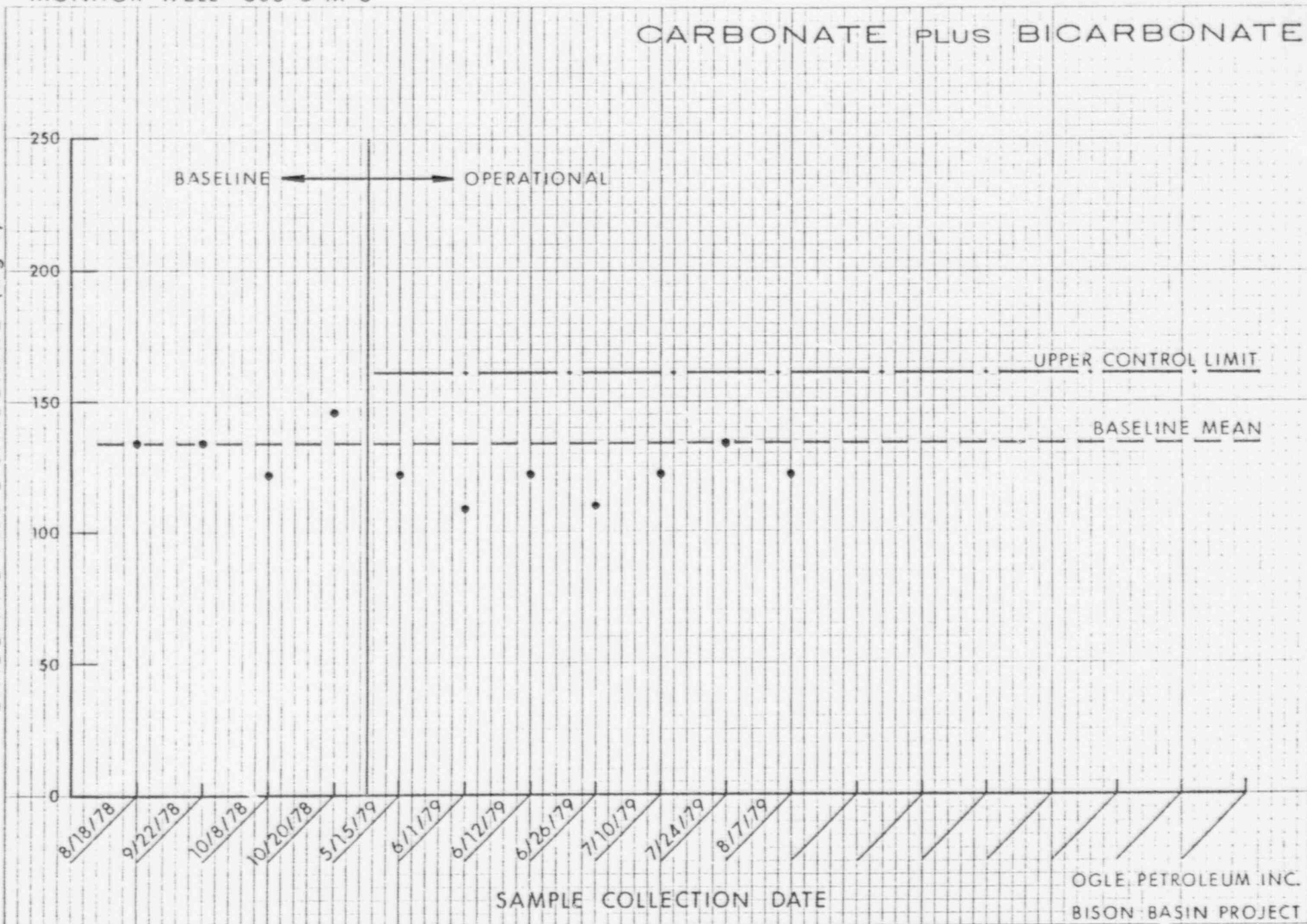
7/24/79

8/7/79

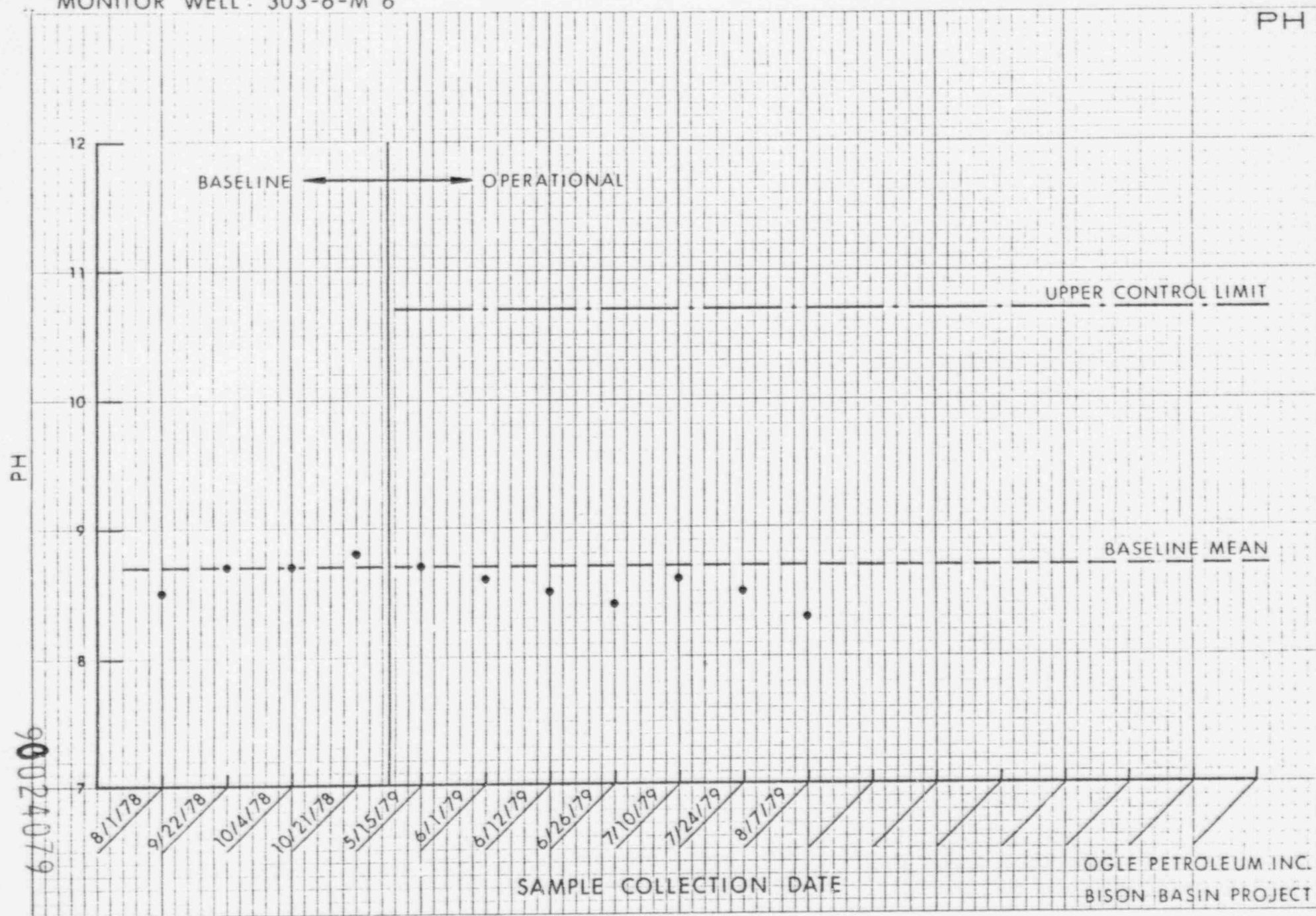
SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT

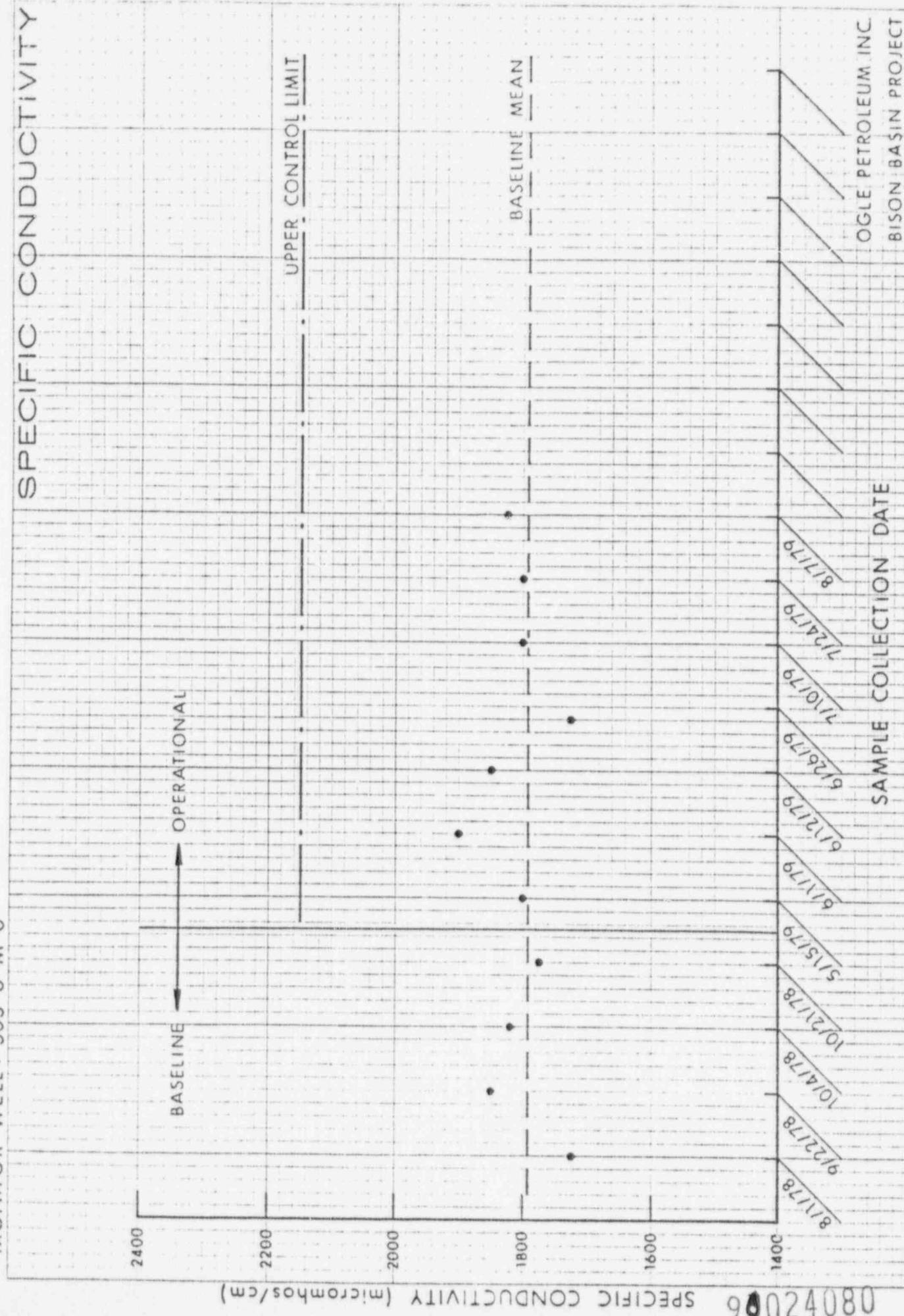
90024078



MONITOR WELL: 303-6-M 6



MONITOR WELL : 303-6-M 6



MONITOR WELL: 303-6-M 6

AMMONIA

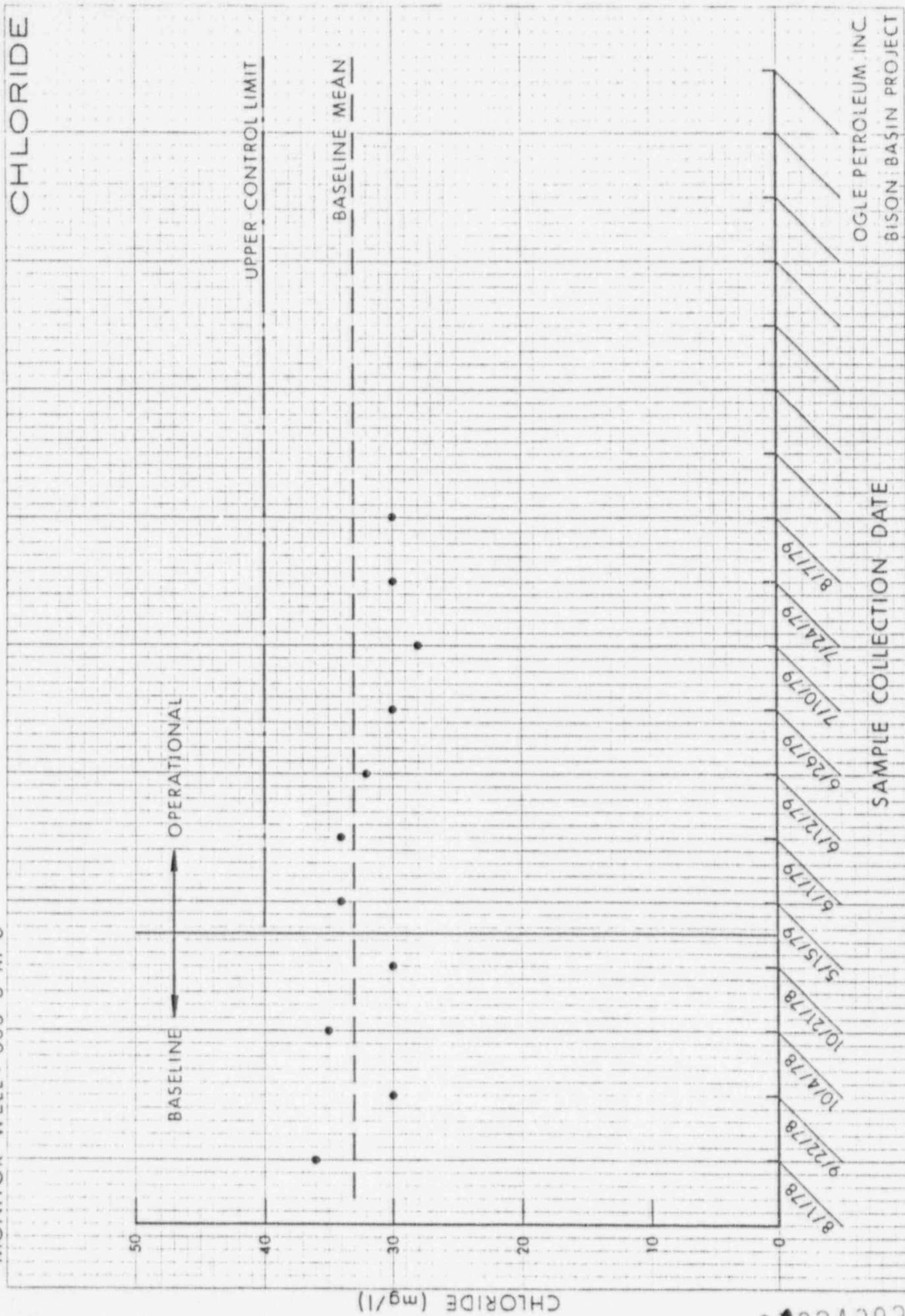


OGLE PETROLEUM INC.
BISON BASIN PROJECT

SAMPLE COLLECTION DATE

18042006

MONITOR WELL : 303-6-M 6



28042006

MONITOR WELL : 303-6-M 6

SODIUM

(1/g) SODIUM

BASELINE OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

90024083

8/1/78

9/22/78

10/4/78

10/21/78

5/15/79

6/1/79

6/12/79

6/26/79

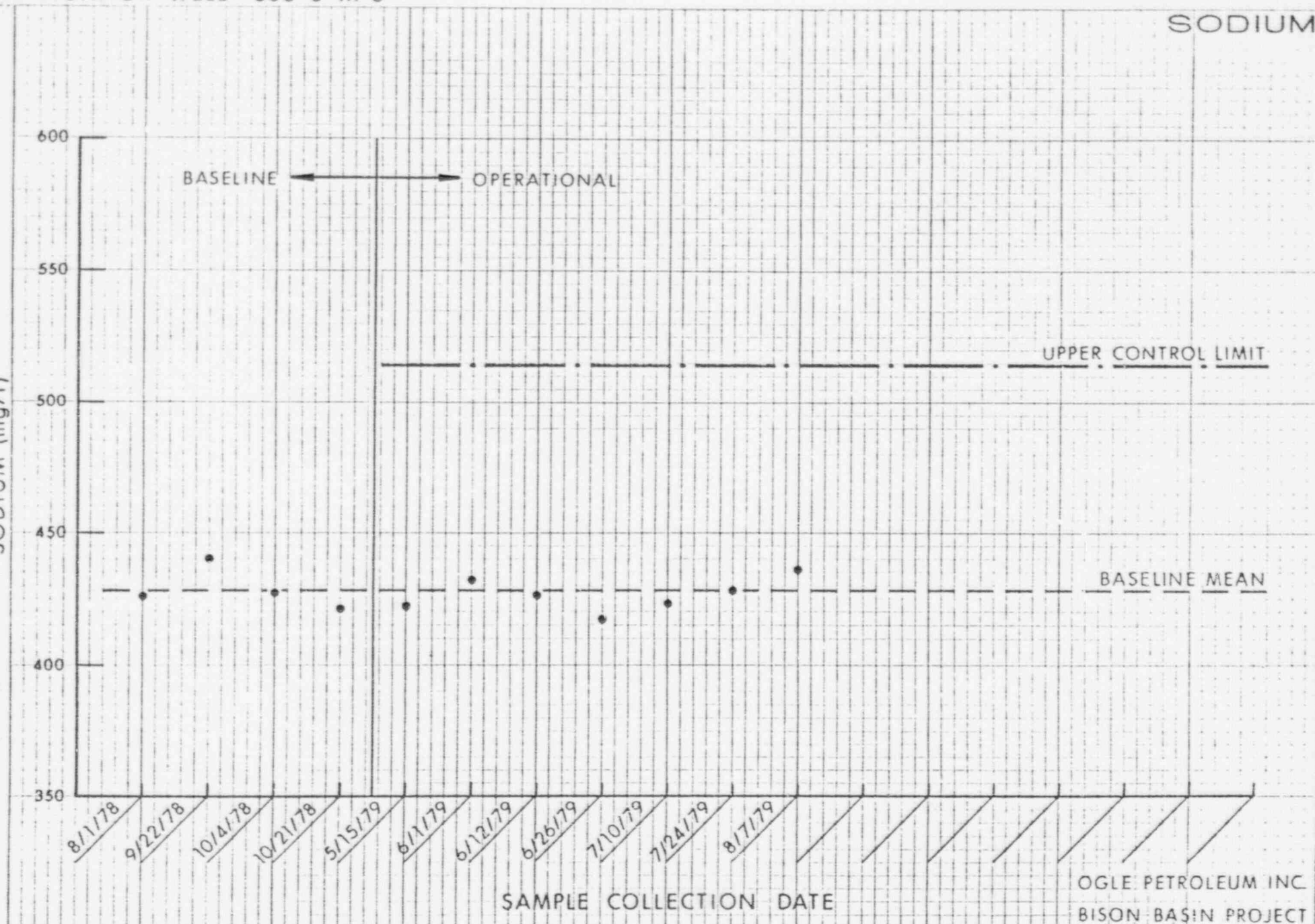
7/10/79

7/24/79

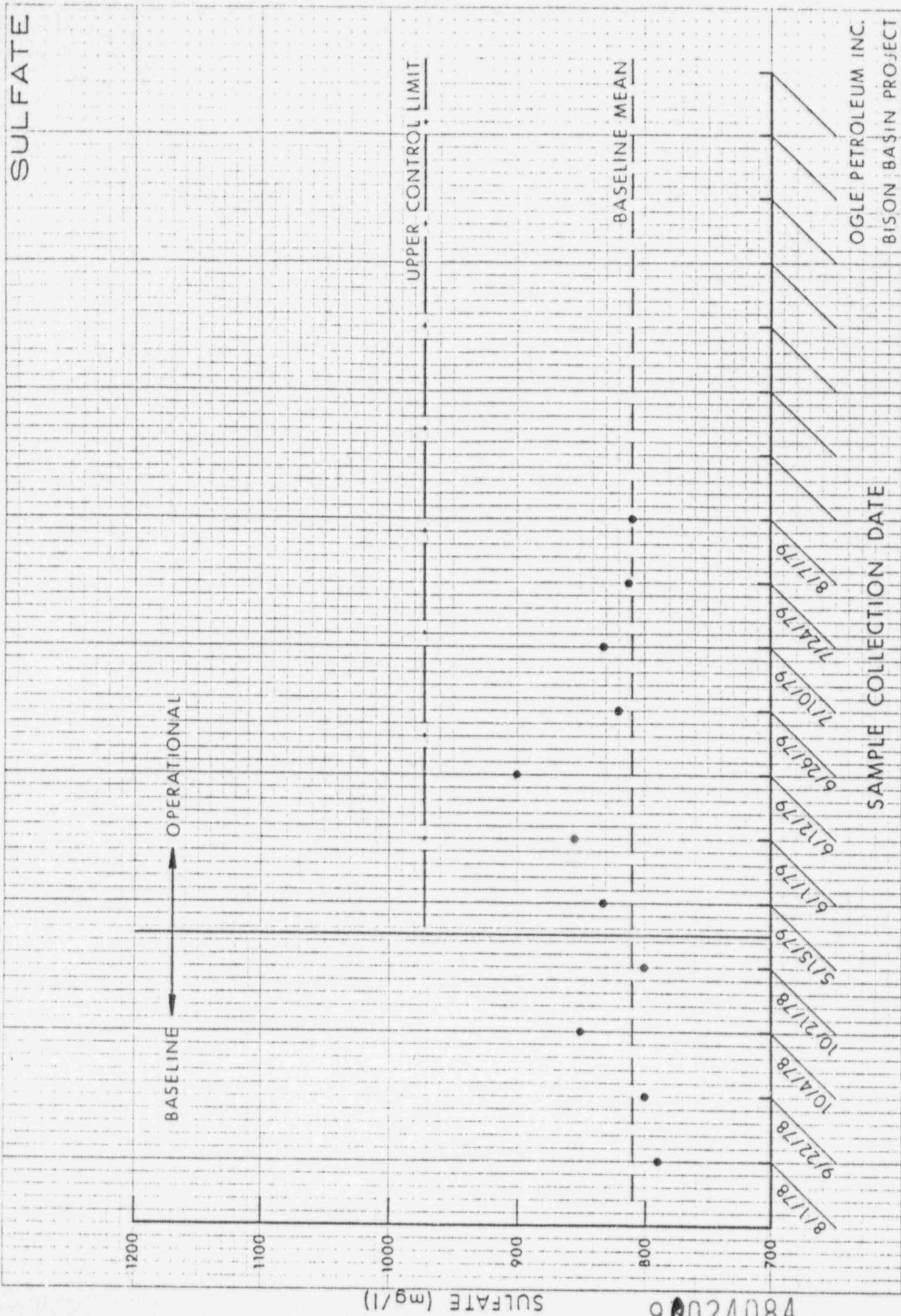
8/7/79

SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT



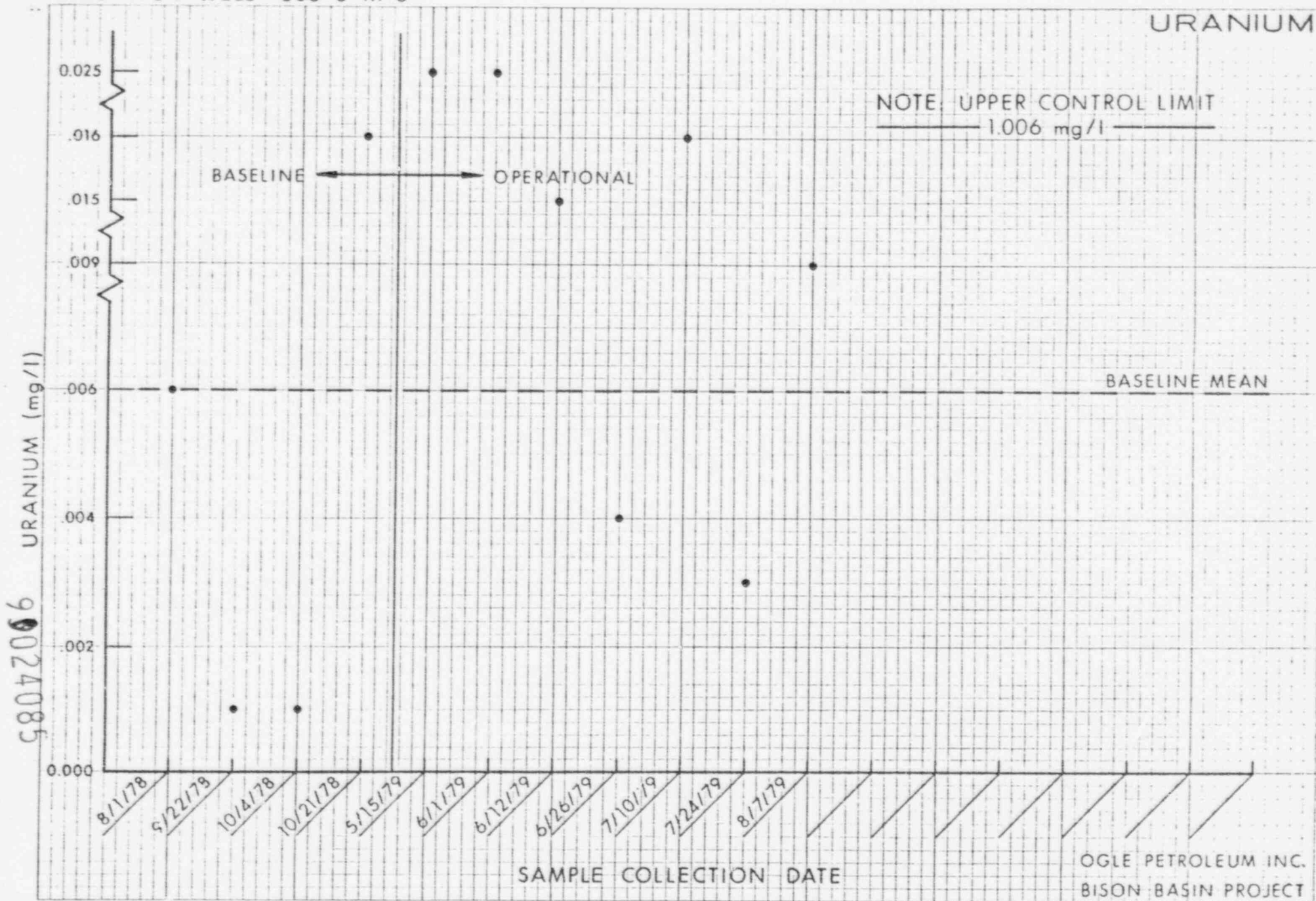
MONITOR WELL : 303-6-M 6



90024084

MONITOR WELL: 303-6-M 6

URANIUM



MONITOR WELL : 303-6-M 6

CARBONATE PLUS BICARBONATE

CARBONATE PLUS BICARBONATE (mg/l)

BASELINE OPERATIONAL

UPPER CONTROL LIMIT

BASELINE MEAN

3/1/78

9/22/78

10/4/78

10/21/78

5/15/79

6/1/79

6/12/79

6/26/79

7/10/79

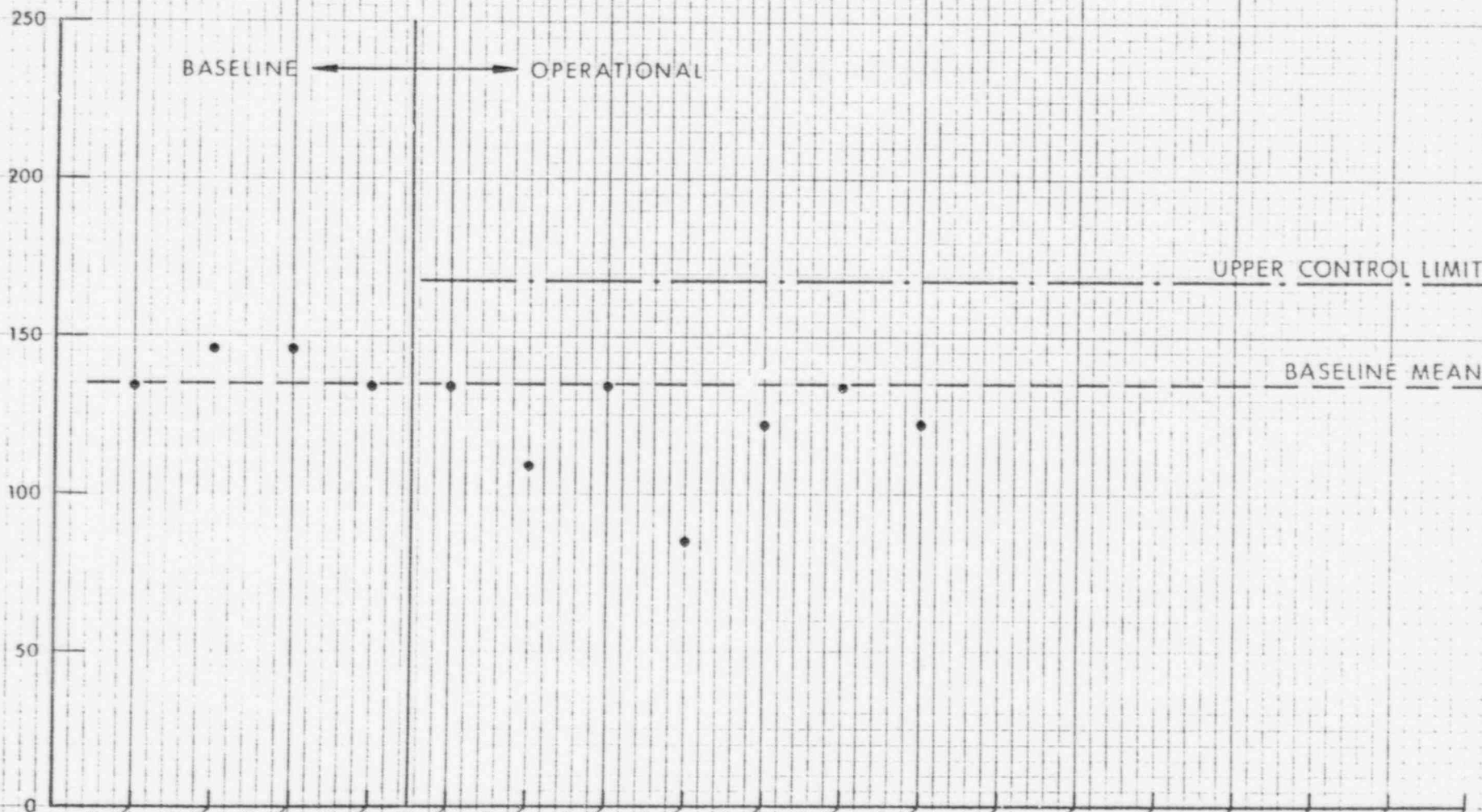
7/24/79

8/7/79

SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT

99024086

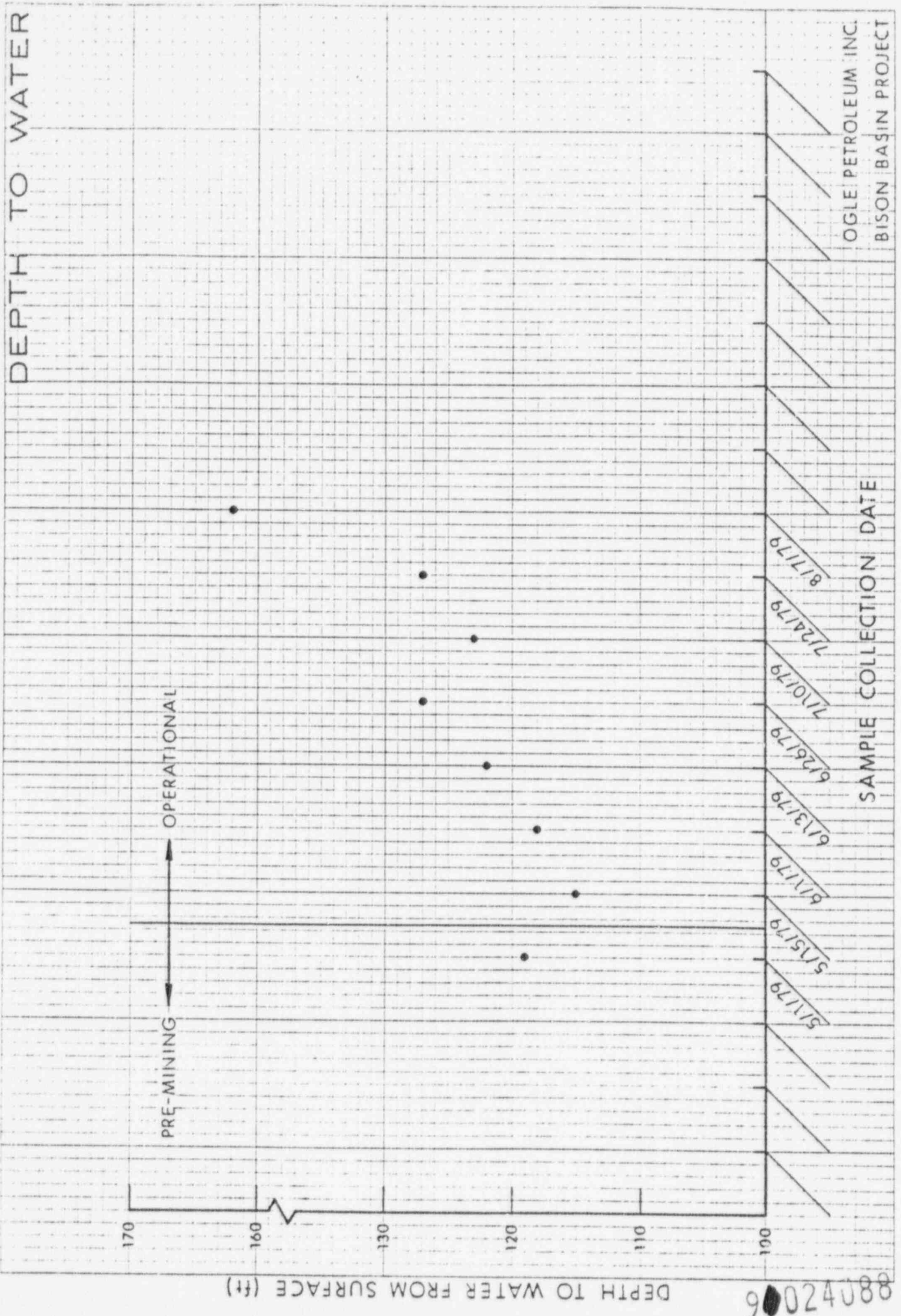


ATTACHMENT II

EXCURSION MONITOR WELLS
WATER LEVEL DATA

90024087

MONITOR WELL : 303-6-M 1



OGLE PETROLEUM INC.
BISON BASIN PROJECT

8804206

MONITOR WELL : 303-6-M 2

DEPTH TO WATER

PRE-MINING

OPERATIONAL

DEPTH TO WATER FROM SURFACE (ft)

68042006
90024089

SAMPLE COLLECTION DATE

OGLE PETROLEUM, INC.
BISON BASIN PROJECT

5/1/79

5/15/79

6/1/79

6/12/79

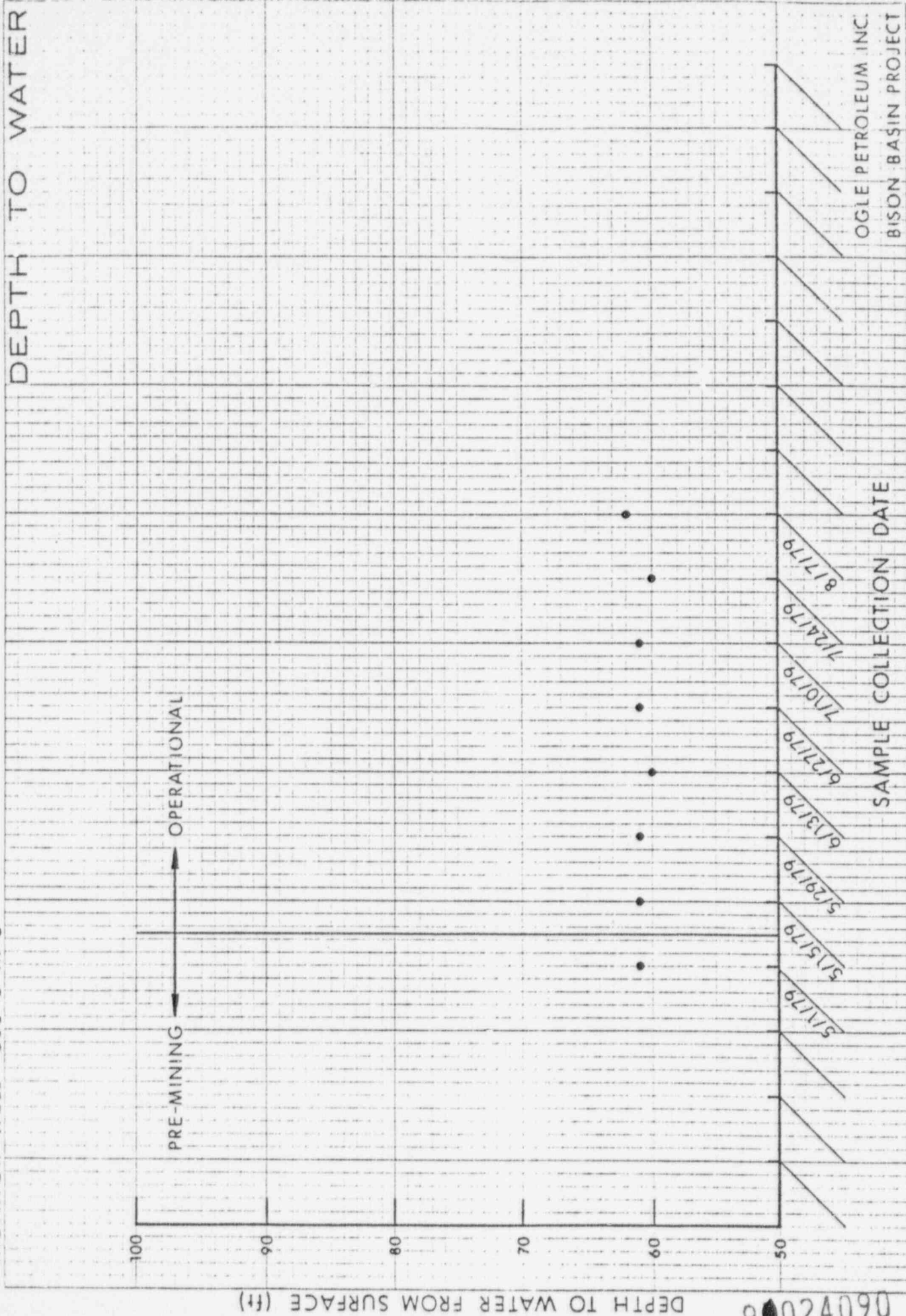
6/26/79

7/10/79

7/24/79

8/7/79

MONITOR WELL: 303-6-M 3



0602040906

MONITOR WELL : 303-6-M 4

DEPTH TO WATER

DEPTH TO WATER FROM SURFACE (ft)

PRE-MINING

OPERATIONAL

180
140
130
120
110
100

5/1/79

5/15/79

5/30/79

6/12/79

6/26/79

7/10/79

7/24/79

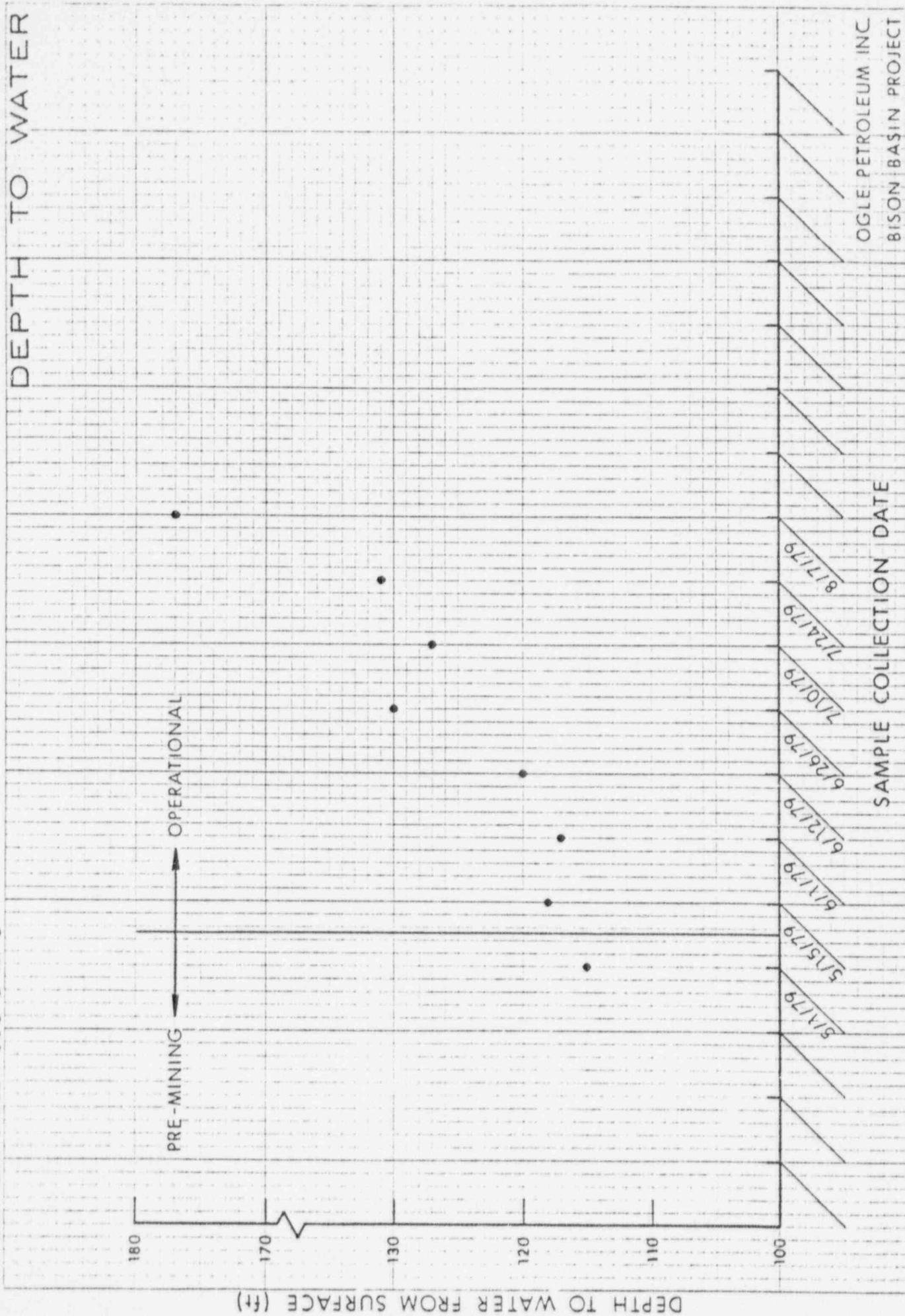
8/7/79

SAMPLE COLLECTION DATE

OGLE PETROLEUM INC.
BISON BASIN PROJECT

90024091

MONITOR WELL : 303-6-M 5



26042020

MONITOR WELL: 303-6-M 6

DEPTH TO WATER

DEPTH TO WATER FROM SURFACE (ft)

PRE-MINING ← → OPERATIONAL

185
180
140
130
120
110
100

5/1/79

5/15/79

6/1/79

6/12/79

6/26/79

7/10/79

7/24/79

8/7/79

SAMPLE COLLECTION DATE

OGLE PETROLEUM INC
BISON BASIN PROJECT

90024093