

SECOND ANNUAL REPORT  
August 28, 1981 thru August 27, 1982

submitted to

Department of Environmental Quality  
State of Wyoming

for the

BISON BASIN PROJECT  
In-Situ Leach Uranium Mine  
Permit to Mine No. 504

Ogle Petroleum Inc.  
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Casper, Wy 82601

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OGLE PETROLEUM INC.

## I. MINING ACTIVITIES

Ogle Petroleum Inc. (OPI) began mining in the commercial phase on August 21, 1981. Mining was initiated in Mining Unit No. 1 (which includes the one acre R & D field) and has continued in this unit up to the present time using sodium carbonate/bicarbonate as the lixiviant and oxygen as the primary oxidant. There are currently 115 injection wells and 71 recovery wells in operation in Mining Unit No. 1. Mining Unit No. 1 is comprised of 11.7 acres of land, including the one acre R & D field.

During the period covered by this report, the processing plant has operated at an average flow rate of 371.5 gallons per minute (gpm). Table 1, below, lists the average monthly flow rates to the processing plant during the reporting period.

TABLE 1

### Average Monthly Flow Rates to the Processing Plant

August, 1981	336 gpm
September, 1981	334 gpm
October, 1981	317 gpm
November, 1981	383 gpm
December, 1981	415 gpm
January, 1982	352 gpm
February, 1982	379 gpm
March, 1982	446 gpm
April, 1982	388 gpm
May, 1982	405 gpm
June, 1982	460 gpm
July, 1982	351 gpm
August 17, 1982	264 gpm

Table 2 below lists the average flow rates to the evaporation ponds for this reporting period.

TABLE 2

### Average Flow Rates to the Evaporation Ponds

August, 1981	0.97 gpm
September, 1981	7.33 gpm
October, 1981	10.19 gpm
November, 1981	7.62 gpm
December, 1981	5.03 gpm

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January, 1982	4.49 gpm
February, 1982	4.63 gpm
March, 1982	5.90 gpm
April, 1982	7.70 gpm
May, 1982	0.80 gpm
June, 1982	0.45 gpm
July, 1982	2.30 gpm
August 17, 1982	0.81 gpm

Flow rates to the evaporation ponds for the months of May and June, 1982 show substantially lower flow rates than those observed in previous months. These reduced flow rates were due primarily to a conservation effort by OPI to stabilize the aquifers prior to and during the pump test conducted in Mining Unit No. 2 in May, 1982. Reduced flow rates to the ponds in June and July are a result of changes in the filter wash system. Water used for backwashing the sand filters is now contained in a "closed" system where filter wash water is recycled. Prior to this "closed" system, water from the production zone was utilized for washing the sand filters, thus increasing the flows to the evaporation ponds.

The total number of gallons injected and recovered during this reporting period are as presented in Table 3 below:

TABLE 3

Total Number of Gallons Injected and Recovered

Injected	191,186,695
Recovered	193,616,143

The total volume of liquid waste effluent (processing plant bleed) discharged to the evaporation ponds during this report period was 2,429,448 gallons.

II. CONSTRUCTION AND DEVELOPMENT

During the period covered by this report, OPI has completed several projects which were under construction at the time of the first Annual Report. The addition to the north side of the pro-

cessing plant building which contains offices, a laboratory, shop, etc., was completed in November of 1981. Figure 1 shows an updated drawing of the plant facility layout including this new addition.

Construction of Pond No. 2 - Cell No. 2 was completed in September 1981 and construction of Evaporation Pond No. 3 was completed in October of 1981. The location of these evaporation ponds is shown on Figure 2, the Site Plan Layout. The land area disturbed and the topsoil volumes stockpiled for the evaporation ponds are discussed in following sections.

Additional development at the Bison Basin Mine includes the completion of drilling and completing the wells contained in Mining Unit No. 2. Drilling of production, injection, and monitor wells for Mining Unit No. 2 was completed in November, 1981.

Other minor construction activities performed during this report period include the development of an outside chemical storage area within the plant facilities compound. This area lies north of the processing plant and is used for fuel storage and storage of bagged salt and soda ash. Approximately one foot of topsoil was removed from this area to insure that contamination of topsoil does not occur. A small impoundment was also constructed around the fuel storage area, to contain any leaks or spills of gasoline or diesel fuel. The fuel storage area is shown on Figure 2.

The equipment storage area, or boneyard which was located south of the plant facility compound has been located inside the plant facility compound as shown on Figure 2. Prior to placing the equipment within this area, OPI stripped and stockpiled approximately 6 inches of topsoil from the boneyard area within the compound. As of July 15, 1982, all equipment and materials have been moved to the new storage area.

On April 15, 1982, the DEQ conducted an inspection of the mine site. During this inspection, the DEQ concluded that topsoil impacts on wellfield areas and roadways were severe enough to warrant topsoil removal from these areas. OPI submitted a Topsoil Impact Mitigation Plan on May 13, 1982 which required OPI to strip topsoil from wellfield roadways and alternate rows within the wellfield. Following the submittal of this plan, OPI

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requested additional discussion concerning the removal of topsoil from the wellfields. The DEQ again visited the mine site in June and observed a significant amount of growth on areas in the wellfield previously thought to be severely impacted. Following the June visit to the mine by the DEQ, OPI submitted a Revised Topsoil Impact Mitigation Plan dated June 15, 1982. This revised plan waived the requirement to strip topsoil from wellfield rows. Instead of stripping topsoil from the wellfield, OPI has closed every other row to vehicular traffic as shown on Figure 2. Mine site personnel have also been instructed to limit their travel whenever possible and have also been instructed to drive only on designated roadways which are illustrated on Figure 2.

Also included in the Revised Topsoil Impact Mitigation Plan of April 15, 1982 was a commitment by OPI to strip topsoil from wellfield access roads. OPI has carried out this requirement by stripping and stockpiling 3 to 4 inches of topsoil from the wellfield roadways as shown on Figure 2.

The procedures outline above which include closing certain areas to vehicular traffic and stripping main roadways is believed to result in minimal impacts on topsoil in areas where topsoil is partially removed or left in place.

At the present time, the "hook-up" of Mining Unit No. 2 is the only construction activity being conducted. These activities include the installation of pumps, surface pipe and electrical equipment. Mining Unit No. 2 is essentially ready for start-up.

### III. SURFACE DISTURBANCES AND TOPSOIL STOCKPILE VOLUMES

This section contains tabulations of surface area disturbances within the permit area. Surface disturbances are categorized under two type of disturbances. Category "A" consists of those areas where excavations are necessary or topsoil may be degraded by chemicals or frequent trafficking. Category "B" consists of those areas where topsoil is minimally impacted by infrequent vehicular traffic. Tabulations for surface disturbances list areas disturbed only to the present time. Tables 4 and 5 list tabulations of Category "A" and Category "B" disturbances, respectively. These areas are shown on Figure 2, the Site Plan Layout.

TABLE 4

Category "A" Disturbances

<u>Description</u>	<u>Area (Sq. Ft.)</u>
Processing Plan Building including Tank Pad and Support Facilities Addition	27,700
Diesel Fuel Storage Tanks	1,500
Carbon Dioxide Storage Tanks	1,500
Septic Tank and Leach Field	3,000
Solid Waste Landfill	7,500
Access Roads to Wellfields	116,880
Outside Chemical Storage Area	13,700
Boneyard Area (Equipment parking, material storage, etc....)	23,770
Evaporation Pond	433,376
Mud Pits	<u>22,160</u>
Total land area disturbed to date under Category "A"	651,086 Sq. Ft. (14.9 acres)

TABLE 5

Category "B" Disturbances

<u>Description</u>	<u>Area (Sq. Ft.)</u>
Office, Personnel, and Storage Trailers	6,000
L.P. Gas Storage Tanks	2,000
Vehicle Parking Area	4,000
Wellfield Areas (including 0.93 acre R & D Test Area)	<u>1,004,483</u>
Total land area disturbed to date under Category "B"	1,016,483 (23.3 acres)

The estimated topsoil quantities removed and stockpiled for the category "A" areas described above are presented in Table 6 below:

TABLE 6

Estimated Stockpiled Topsoil Volumes

<u>Area Description</u>	<u>Cubic Yards</u>
Processing Plant Building including Tank Pad and Support Facilities Addition	1500
Diesel Fuel Storage Tanks	56
Carbon Dioxide Storage Tanks	56
Septic Tank and Leach Field	111
Solid Waste Landfill	277
Access Roads to Wellfield	1442
Outside Chemical Storage Area	254
Boneyard Area (Equipment parking, materials storage, etc...)	290
Evaporation Ponds	<u>15,300</u>
Total Volume	19,286 Cu. Yds.

All topsoil stockpiles and topsoil substitute stockpiles will be seeded this fall with Crested Wheatgrass to provide for temporary stabilization. The seeding rate will be 12 pounds per acre of pure live seed.

IV. MINING AND RESTORATION/RECLAMATION SCHEDULE

Table 7 below is a revised Mining and Restoration/Reclamation Schedule for the Bison Basin Mine. This schedule has been revised due to plans which include mining the first and second mining units for two years each instead of one year each as previously estimated.

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TABLE 7

Revised Mining and Restoration/Reclamation Schedule

<u>Year of Operation</u>	<u>Mining Unit(s) to be Mined</u>	<u>Mining Unit to be Restored</u>	<u>Mining Unit to be Reclaimed</u>
1	-	-	-
2	1	-	-
3	1 & 2	-	-
4	2	1	-
5	3	2	1
6	3 & 4	-	-
7	4	3	2
8	-	4	3
9	-	-	4

V. RESTORATION AND RECLAMATION

No restoration has been performed at the Bison Basin Mine during the time period covered by this report. According to the Restoration/Reclamation Schedule presented in the previous section, no restoration activities are expected to begin until the fourth year of the license.

Additionally, no reclamation work other than the establishment of two test plots has been conducted at the Bison Basin Mine Site during the past year. Reclamation is not scheduled to begin until the fifth year of operations.

Two reclamation demonstration test plots were established in April, 1982 at the Mine Site. These test plots were established in order to demonstrate the effects of topsoil impacts within the wellfield areas which will not be stripped of topsoil. For the locations of these test plots, please refer to Figure 2. Recent observations of these plots show that a large number of seeds have germinated and are growing. For a more complete discussion of these test plots, please refer to OPI's letter of May 4, 1982.

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## VI. GROUNDWATER MONITORING

Analytical results and water level data for all excursion monitor wells are presented in Tables 8 thru 22. These results are also presented in graphical form in Figures 7 thru 153. Monitor well locations are shown on Figure 3.

The analytical results presented are for all of the monitor wells used in conjunction with Mining Unit No. 1. These results cover the time period of August 12, 1981 thru July 28, 1982. The August 12, 1981 samples are pre-operational samples collected for OPI's own information.

During this reporting period, OPI reported two wells to be in excursion status. These wells which have since recovered from excursions are M-14 and M-17. The February 4, 1982 sampling detected an excursion at monitor well M-14. A sample was collected on February 11, 1982 which confirmed the excursion, at which time the NRC and DEQ were notified. After confirming this excursion, OPI began sampling M-14 on a weekly basis. Samples collected from M-14 on March 30, 1982 indicated that M-14 had recovered, as all values had reached baseline concentrations. For a complete report of this excursion and recovery, please refer to OPI's reports dated February 16, February 26, March 22, April 9, and July 22, 1982.

On April 8, 1982 your office was notified by telephone that monitor well M-17 had gone into excursion status. Samples collected on March 30, 1982 indicated total carbonate plus bicarbonate and chloride had exceeded their upper control limits (UCL's). A confirmation sample was collected on April 5, 1982 which confirmed the excursion at M-17. OPI then began sampling M-17 on a weekly basis as required. On June 2, 1982 sample analyses on M-17 exhibited reduction to a point where all excursion parameters were below the UCL's. Since June 2, 1982, M-17 has remained off excursion. For more complete details of this excursion please refer to OPI's reports dated April 9, May 17, and July 13, 1982.

## VII. EVAPORATION POND MONITORING

OPI's evaporation pond monitoring program includes daily

visual inspections of all pond embankments, freeboard limitations and leak detection systems. Daily inspection reports are kept on file at the mine office. Additionally, the evaporation pond monitor wells are sampled on a quarterly basis and analyzed for the six UCL parameters. Water samples from the evaporation ponds are also collected on a quarterly basis and analyzed for a number of elements.

Analytical results from the quarterly samplings of the evaporation pond monitor wells are presented in Tables 23 thru 28. The location of these wells are shown on Figure 4.

One evaporation pond monitor well, M-72 was reported to be in excursion status in OPI's letter of April 9, 1982. As of April, 1982 OPI has collected samples from M-72 on a weekly basis as required. Conductivity, chloride and sodium continue to exceed their UCL's in these samplings. As previously discussed in OPI's correspondence with your office, OPI believes that these values are due to poor ground water quality and drilling fluid contamination of M-72 and not due to a leak in the ponds. The concentrations of the excursion parameters in the pond effluent are considerably higher than those concentrations found in samples collected from M-72. Also, the leak detection system which underlies the liner has not indicated any leakage. The leak detection system under the liner is the primary indicator of leaks. For more information on M-72, please refer to OPI's reports of April 9, May 18, and July 13, 1982.

Water samples are collected on a quarterly basis from the evaporation ponds. This effluent water quality data is presented in Table 29.

#### VIII. ENVIRONMENTAL MONITORING

In addition to OPI's groundwater monitoring program, various other environmental factors are monitored during the mining operation. Surface water quality is collected annually at three locations: West Alkali Creek (upstream point and downstream point) and Grassy Lake. These locations are shown on Figure 5. Surface

water samples were collected on March 11, 1982 during spring runoff at the two collection points on West Alkali Creek. Grassy Lake has remained dry since the summer of 1981. Surface water quality data are presented in Tables 30, 31 and 32.

OPI's environmental dosimetry program consists of monitoring 8 thermoluminescence dosimetry (TLD) locations on a continuous basis, with the dosimeters being exchanged quarterly. The TLD results are presented in Table 33 and the monitoring locations are shown on Figure 6.

### IX. BONDING

OPI's most recent review and revision of bonding requirements presented in the 1981 Annual Report has been increased to reflect the cost of restoration of Mining Unit No. 2. Injection into Unit No. 2 is expected to take place as soon as approval is given. OPI's bonding estimate contained in the 1981 Annual Report was \$755,980. This estimate is being increased by \$275,000 for the restoration costs of Mining Unit No. 2, for a total bonding amount of \$1,030,980. Your letter of May 20, 1982 accepts OPI's bonding calculation of \$1,030,980. An additional bond bringing the bonded amount to \$1,030,980 has recently been submitted to your office. The following is a breakdown of restoration and reclamation costs for OPI's Bison Basin Mine:

#### Restoration and Reclamation Costs

Loading and transporting pond residue from site to nearest tailings dams (308 tons, 100 miles round trip)	16 trips @ \$4/mile (includes loading)	\$ 6,400
Backfilling ponds (40,000 yd <sup>3</sup> )	\$0.75/yd <sup>3</sup>	30,000
Regrading Subsoil and Spreading Topsoil (50,000 yd <sub>3</sub> )	\$1.99/yd <sup>3</sup>	50,000
Seeding (50 acres)	\$65/acre	3,250
Mulching (50 acres)	\$250/acre	12,500

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Building and Equipment Removal and Burial of Unsalvageable Equipment		60,000
Well Plugging (853 wells)	\$110/hole	93,830
Restoration (First Mining Unit)		500,000
Restoration (Second Mining Unit)		<u>275,000</u>
	Total	\$1,030,980

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-8

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2150	117	33	420	910	0.009	N/A
UCL	2580	140	40	504	1092	1.009	N/A
UCL Plus 20%	3096	168	48	605	1310	1.211	N/A
08/12/81	2030	107	34	393	860	0.027	100.25
09/03/81	2250	120	39	385	760	0.036	120.60
09/10/81	2100	98	34	379	760	0.021	140.20
09/16/81	2050	117	34	389	777	0.014	193.80
09/23/81	2130	120	33	379	740	0.010	201.00
10/01/81	2020	117	37	352	560	0.011	219.50
10/14/81	0	0	0	0	0	0.000	203.80
10/21/81	2062	117	32	373	845	0.016	230.00
10/29/81	2300	137	32	399	700	0.016	234.40
11/11/81	2340	122	30	355	670	0.017	216.40
11/25/81	0	0	0	0	0	0.000	219.20
12/09/81	2200	117	30	384	735	0.025	225.80
12/14/81	2200	119	32	298	860	0.024	219.00
12/23/81	1900	63	34	177	850	0.023	204.30
01/08/82	1725	124	30	404	835	-.001	192.20

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-8

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2150	117	33	420	910	0.009	N/A
UCL	2580	140	40	504	1092	1.009	N/A
UCL Plus 20%	3096	168	48	605	1310	1.211	N/A
01/13/82	1725	127	32	416	885	0.004	204.40
01/21/82	1950	109	31	430	805	-.005	199.60
01/28/82	1850	112	32	442	800	0.008	206.00
02/04/82	1920	112	31	380	785	-.005	214.70
02/18/82	1800	114	31	403	810	-.005	204.00
03/30/82	1900	114	32	373	630	-.005	225.10
04/27/82	2200	112	29	395	730	-.005	224.60
06/02/82	1850	119	31	364	815	-.005	183.40
06/17/82	1800	119	30	343	835	-.005	199.00
07/01/82	1840	112	32	401	695	-.005	205.30
07/16/82	1810	114	31	437	765	-.005	190.80
07/28/82	1825	120	26	392	825	0.007	176.00

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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BISON BASIN PROJECT  
MONITOR WELL DATA

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Monitor Well No. M-9

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2190	117	35	410	864	0.010	N/A
UCL	2628	140	42	492	1037	1.010	N/A
UCL Plus 20%	3153	168	50	590	1244	1.212	N/A
08/12/81	2000	122	36	375	825	0.833	99.80
08/26/81	2010	117	36	344	765	0.210	174.50
09/03/81	2100	122	36	385	810	0.127	200.70
09/11/81	2050	98	34	415	680	0.147	121.40
09/16/81	2000	117	34	403	750	0.053	225.50
09/23/81	2050	117	33	363	705	0.105	226.00
10/01/81	0	0	0	0	0	0.000	252.20
10/07/81	2130	117	33	409	788	0.060	240.10
10/14/81	2150	127	34	400	765	0.041	226.40
10/29/81	2360	117	33	397	645	0.049	249.50
11/05/81	2250	122	35	393	764	0.070	243.30
11/11/81	2330	122	33	397	695	0.043	230.80
11/16/81	2230	117	34	334	772	0.060	230.80
11/25/81	2070	114	32	383	700	0.056	247.50
12/02/81	2000	117	35	411	730	0.066	236.40

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-9

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2190	117	35	410	864	0.010	N/A
UCL	2628	140	42	492	1037	1.010	N/A
UCL Plus 20%	3153	168	50	590	1244	1.212	N/A
12/09/81	2170	117	32	378	750	0.044	238.80
12/14/81	2150	117	34	361	815	0.043	229.90
12/23/81	1810	49	34	170	795	0.043	213.50
01/08/82	1700	129	30	395	825	0.029	170.50
01/13/82	1725	124	32	399	820	0.032	214.40
01/21/82	1800	114	33	413	580	0.030	198.50
02/04/82	1820	114	35	385	800	0.038	201.30
02/11/82	2000	120	32	389	790	0.026	229.50
02/18/82	1780	114	33	381	805	0.038	204.80
02/25/82	1900	117	35	404	800	0.033	0.00
03/30/82	1870	114	34	357	760	0.012	243.60
04/27/82	2080	114	31	397	815	0.011	220.10
06/02/82	1830	114	32	378	800	0.026	179.80
06/17/82	1800	119	32	351	805	0.012	194.80
07/01/82	1810	117	35	394	710	0.028	200.10

NOTE: "--" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

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Monitor Well No. M-9

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2190	117	35	410	864	0.010	N/A
UCL	2628	140	42	492	1037	1.010	N/A
UCL Plus 20%	3153	168	50	590	1244	1.212	N/A
07/16/82	1800	117	33	298	805	0.031	195.50
07/28/82	1790	124	35	391	792	0.024	129.60

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-10

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2000	142	40	418	805	0.008	N/A
UCL	2400	170	48	502	966	1.008	N/A
UCL Plus 20%	2880	204	58	602	1159	1.210	N/A
08/12/81	1850	117	38	357	765	0.010	91.00
09/03/81	2000	127	38	363	675	0.013	101.30
09/16/81	1780	132	36	357	607	-.005	108.00
10/01/81	1800	124	37	300	550	0.006	102.10
10/14/81	2000	127	36	370	710	0.015	93.40
10/29/81	0	0	0	0	0	0.000	89.60
11/11/81	2230	117	32	345	695	0.014	78.00
11/25/81	2300	122	31	376	690	0.021	99.40
12/03/81	2010	112	33	415	748	0.013	86.70
12/09/81	2220	117	31	376	750	0.017	84.80
12/24/81	1890	89	33	350	805	0.019	91.80
01/08/82	1850	127	30	394	805	-.001	130.70
01/21/82	1800	111	32	416	765	-.005	135.30
02/04/82	1800	109	30	385	740	-.005	104.60
02/18/82	1700	107	31	381	765	-.005	117.60

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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MONITOR WELL DATA

Monitor Well No. M-10

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2000	142	40	418	805	0.008	N/A
UCL	2400	170	48	502	966	1.008	N/A
UCL Plus 20%	2880	204	58	602	1159	1.210	N/A
03/30/82	1820	114	32	345	735	0.005	122.40
04/27/82	2000	117	30	382	743	0.005	148.20
06/02/82	1800	122	31	331	775	-.005	140.10
06/17/82	1800	124	32	329	750	-.005	125.90
07/01/82	1730	117	33	372	644	-.005	121.40
07/16/82	1700	119	32	364	755	-.005	114.40
07/28/82	1725	121	33	387	738	-.005	119.20

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-11

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2160	132	40	423	760	0.010	N/A
UCL	2597	158	48	508	912	1.010	N/A
UCL Plus 20%	3116	190	58	610	1088	1.212	N/A
08/13/81	1980	122	38	363	695	0.012	78.70
09/03/81	0	0	0	0	0	0.000	81.00
09/16/81	0	0	0	0	0	0.000	84.00
10/01/81	1850	124	38	347	595	-.005	87.00
10/14/81	1850	127	35	376	785	0.015	82.10
10/29/81	2200	122	35	378	674	0.012	83.20
11/11/81	2140	127	35	218	645	0.014	85.70
11/25/81	2210	107	33	374	680	0.019	167.00
12/03/81	2000	113	34	404	700	0.013	131.60
12/09/81	2140	125	31	369	685	0.022	129.40
12/14/81	2160	126	34	363	750	0.021	138.00
12/23/81	1850	102	35	376	710	0.021	143.20
01/08/82	1575	134	32	375	710	-.001	148.70
01/21/82	1750	119	32	399	725	-.005	148.10
02/04/82	1550	122	33	380	705	-.005	134.20

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-11

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2160	132	40	423	760	0.010	N/A
UCL	2597	158	48	508	912	1.010	N/A
UCL Plus 20%	3116	190	58	610	1088	1.212	N/A
02/18/82	1700	112	32	370	745	-.005	148.90
03/30/82	1800	114	33	365	680	-.005	148.30
04/27/82	1950	122	30	382	743	-.005	164.60
06/02/82	1750	124	33	376	740	-.005	149.80
06/17/82	1700	124	31	340	680	-.005	146.30
07/01/82	1710	119	34	370	630	-.005	152.10
07/16/82	1710	119	32	345	745	-.005	138.10
07/28/82	1680	120	33	378	756	0.036	135.40

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-12

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2070	132	31	420	820	0.013	N/A
UCL	2484	158	37	504	984	1.013	N/A
UCL Plus 20%	2980	198	44	605	1181	1.216	N/A
08/12/81	2170	117	32	381	830	0.016	98.00
09/03/81	2150	122	32	391	880	0.016	106.00
09/16/81	1980	122	30	387	680	-.005	112.50
10/01/81	1950	117	29	313	750	-.005	117.50
10/14/81	2100	127	28	370	835	0.016	79.40
10/29/81	2270	117	29	401	728	0.012	102.00
11/11/81	2280	127	28	373	745	0.012	107.10
11/25/81	2310	112	30	396	720	0.021	167.80
12/03/81	2050	119	31	417	760	0.015	172.10
12/09/81	2150	122	28	386	790	0.020	160.20
12/14/81	2100	122	30	398	835	0.021	172.70
12/23/81	1700	68	32	358	805	0.022	175.00
01/08/82	1675	129	28	404	773	-.001	184.60
01/21/82	1900	117	29	425	795	-.005	192.80
01/28/82	1910	121	32	451	805	0.008	0.00

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-12

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2070	132	31	420	820	0.013	N/A
UCL	2484	158	37	504	984	1.013	N/A
UCL Plus 20%	2980	198	44	605	1181	1.216	N/A
02/04/82	1800	122	30	396	695	-.005	164.90
02/11/82	1990	122	29	334	740	-.005	158.20
02/18/82	1800	112	29	400	835	-.005	215.60
03/30/82	1820	117	30	357	725	-.005	182.00
04/27/82	2000	112	28	404	747	-.005	226.90
06/02/82	1800	114	30	389	805	-.005	175.30
06/17/82	1850	127	27	334	810	-.005	190.00
07/01/82	1750	114	30	370	680	-.005	197.80
07/16/82	1750	117	30	382	765	-.005	167.70
07/28/82	1775	125	28	402	780	0.031	159.90

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-13

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2110	122	33	430	862	0.014	N/A
UCL	2532	146	40	516	1034	1.014	N/A
UCL Plus 20%	3038	175	48	619	1241	1.217	N/A
08/12/81	2100	122	34	399	800	0.012	113.00
09/03/81	2150	122	32	404	895	0.017	146.60
09/16/81	2170	117	32	393	737	-.005	170.50
10/01/81	2040	117	34	358	630	-.005	182.20
10/14/81	2250	122	31	400	840	0.013	164.60
10/29/81	2330	117	31	412	640	0.012	183.40
11/11/81	2400	122	29	355	840	0.012	174.30
11/25/81	2400	120	29	401	743	0.017	170.50
12/09/81	2270	119	30	395	825	0.019	178.40
12/14/81	2300	124	30	386	860	0.022	185.20
12/23/81	1790	107	31	362	835	0.023	150.70
01/08/82	1750	134	28	425	850	-.001	164.10
01/21/82	1210	115	31	437	765	-.005	159.70
02/04/82	1860	117	30	412	845	-.005	198.30
02/18/82	1800	117	30	406	805	-.005	207.10

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-13

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2110	122	33	430	862	0.014	N/A
UCL	2532	146	40	516	1034	1.014	N/A
UCL Plus 20%	3038	175	48	619	1241	1.217	N/A
08/22/84	8224	8224	8224	11597	14641	0.000	0.00
03/30/82	1880	114	33	399	760	-.005	240.40
04/27/82	2050	109	30	410	805	-.005	222.30
06/02/82	1910	114	31	337	820	-.005	170.70
06/17/82	1800	114	31	312	920	-.005	176.90
07/01/82	1800	114	33	367	610	-.005	184.00
07/16/82	1810	114	31	369	770	-.005	151.90
07/28/82	1820	115	31	409	804	0.021	174.50

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-14

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2200	127	29	437	850	0.015	N/A
UCL	2640	152	35	524	1020	1.015	N/A
UCL Plus 20%	3168	182	42	629	1224	1.218	N/A
08/12/81	2120	122	28	402	848	0.016	119.30
09/03/81	2300	127	28	404	860	0.017	166.40
09/16/81	2010	122	27	418	770	-.005	203.10
10/01/81	2080	124	26	398	670	0.013	200.80
10/14/81	2150	127	26	417	785	0.014	183.50
10/29/81	2390	122	31	418	645	0.015	201.00
11/11/81	2450	129	30	363	815	0.011	189.30
11/25/81	2350	122	27	393	800	0.019	168.60
12/03/81	2150	124	29	432	795	0.015	228.20
12/09/81	2290	124	26	405	805	0.022	186.60
12/14/81	2300	127	27	446	885	0.024	113.00
12/23/81	1950	122	29	376	800	0.020	210.90
01/08/82	1725	137	26	411	850	-.001	179.80
01/13/82	1775	134	28	414	885	0.004	172.80
01/21/82	1890	122	28	435	830	-.005	166.50

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-14

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2200	127	29	437	850	0.015	N/A
UCL	2640	152	35	524	1020	1.015	N/A
UCL Plus 20%	3168	182	42	629	1224	1.218	N/A
01/28/82	1900	126	28	467	735	-.005	190.10
02/04/82	2100	139	90	451	760	-.005	216.80
02/11/82	3400	163	275	592	1110	0.156	205.00
02/18/82	2950	169	214	577	1116	0.059	226.40
03/30/82	1900	119	30	382	755	0.010	261.00
04/27/82	2080	119	27	419	765	-.005	239.00
06/02/82	1900	119	27	382	835	-.005	191.00
06/17/82	1900	124	27	360	830	-.005	216.30
07/01/82	1810	122	30	410	724	-.005	220.20
07/16/82	1830	124	28	296	855	-.005	164.20
07/28/82	1890	122	27	408	840	0.021	197.10

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-15

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2150	122	42	430	898	0.012	N/A
UCL	2580	146	50	516	1078	1.012	N/A
UCL Plus 20%	3096	175	60	619	1294	1.214	N/A
08/12/81	2110	117	32	396	880	0.014	117.00
09/03/81	2200	122	30	397	870	0.021	184.10
09/11/81	2070	122	30	391	810	0.011	121.90
09/16/81	2150	122	28	403	777	-.005	204.50
09/23/81	2110	122	29	354	740	0.010	195.70
10/01/81	2030	120	29	352	690	-.005	215.50
10/14/81	2100	122	27	491	835	0.014	202.80
10/29/81	2400	122	27	410	665	0.014	256.40
11/11/81	2500	127	26	412	695	0.013	192.00
11/25/81	2410	122	27	419	737	0.020	205.00
12/03/81	2290	127	30	441	820	0.017	226.50
12/09/81	2340	129	27	412	750	0.019	209.20
12/14/81	2320	129	27	423	855	0.022	220.70
12/23/81	1950	122	29	380	860	0.025	141.40
01/08/82	0	0	0	0	0	0.000	176.40

NOTE: "--" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-15

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2150	122	42	430	898	0.012	N/A
UCL	2580	146	50	516	1078	1.012	N/A
UCL Plus 20%	3096	175	60	619	1294	1.214	N/A
01/13/82	1775	132	26	421	930	0.002	0.00
01/21/82	1950	122	27	440	820	-.005	201.20
01/28/82	0	0	0	0	0	0.000	223.50
02/04/82	1890	127	25	418	790	-.005	249.20
02/11/82	0	0	0	0	0	0.000	260.20
02/18/82	1860	114	27	420	830	-.005	225.50
03/30/82	0	0	0	0	0	0.000	263.40
04/27/82	2130	122	25	437	865	-.005	216.30
06/02/82	1920	119	29	411	835	-.005	154.00
06/17/82	1950	129	27	405	860	-.005	220.90
07/01/82	1880	117	28	399	730	-.005	225.00
07/16/82	1850	119	27	413	810	-.005	130.10
07/28/82	1910	125	27	398	810	0.006	171.30

NOTE: "--" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

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Monitor Well No. M-16

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2183	122	40	450	848	0.013	N/A
UCL	2620	146	48	540	1018	1.013	N/A
UCL Plus 20%	3144	175	58	648	1222	1.216	N/A
08/12/81	2240	122	30	402	790	0.018	121.20
09/03/81	2130	127	30	407	885	0.018	167.00
09/16/81	2000	117	27	418	767	0.007	190.60
10/01/81	2030	124	29	373	735	0.008	201.40
10/14/81	2100	127	26	412	880	0.014	191.20
10/29/81	2360	122	27	416	806	0.015	214.00
11/11/81	2450	127	26	424	670	0.011	192.80
11/25/81	2350	117	28	419	810	0.024	203.10
12/03/81	2150	112	29	443	745	0.016	117.30
12/09/81	2250	126	27	410	835	0.022	205.60
12/14/81	2250	126	27	453	870	0.024	209.50
12/23/81	1960	117	29	433	800	0.022	190.60
01/08/82	1775	134	26	417	900	-.001	185.30
01/13/82	1775	132	26	421	930	0.002	190.70
01/21/82	1900	117	27	450	850	-.005	186.60

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

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Monitor Well No. M-16

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2183	122	40	450	848	0.013	N/A
UCL	2620	146	48	540	1018	1.013	N/A
UCL Plus 20%	3144	175	58	648	1222	1.216	N/A
01/28/82	1900	127	27	464	875	0.014	209.10
02/04/82	0	0	0	0	0	0.000	223.40
02/18/82	0	0	0	0	0	0.000	220.00
03/30/82	2100	124	26	433	825	-.005	240.10
04/27/82	2100	124	26	433	825	-.005	206.90
06/02/82	1950	122	26	341	840	-.005	164.30
05/17/82	1900	124	27	390	860	-.005	182.00
07/01/82	1850	124	28	410	960	-.005	191.30
07/16/82	1900	124	26	437	810	-.005	145.80
07/28/82	1905	128	25	392	888	-.005	170.60

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

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Monitor Well No. M-3 (UPPER)

Mining Unit No. 17

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2275	110	18	583	1310	-.001	N/A
UCL	2730	132	22	700	1572	1.001	N/A
UCL Plus 20%	3276	158	26	840	1886	1.201	N/A
08/12/81	2690	93	19	477	1270	0.021	77.00
09/03/81	2700	98	19	485	1205	0.015	73.50
09/16/81	2590	98	16	457	1050	-.005	96.50
10/01/81	2600	98	19	459	920	-.005	99.20
10/14/81	2600	98	16	486	1155	0.021	83.40
10/29/81	2650	88	17	473	1070	0.016	125.50
11/11/81	2805	95	17	486	950	0.016	119.30
11/18/81	2400	112	20	499	1220	0.002	0.00
11/25/81	3000	98	15	525	1140	0.031	93.40
12/03/81	2400	110	16	486	1155	-.001	117.30
12/09/81	2175	110	16	486	1155	-.001	110.30
12/23/81	2390	93	18	440	1160	0.031	144.20
01/08/82	2125	100	16	491	1160	-.001	134.60
01/21/82	2430	81	18	514	1105	-.005	118.40
02/04/82	2300	90	16	517	1155	-.005	124.80

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.



OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

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Monitor Well No. M-3(UPPER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2275	110	18	583	1310	-.001	N/A
UCL	2730	132	22	700	1572	1.001	N/A
UCL Plus 20%	3276	158	26	840	1886	1.201	N/A
02/18/82	2250	85	17	478	1190	-.005	141.40
04/05/82	2400	83	16	455	1135	0.007	113.00
04/27/82	2600	88	17	519	1100	-.005	100.20
06/02/82	2430	65	20	410	1135	-.005	164.60
06/17/82	2200	85	17	457	1130	-.005	84.30
07/01/82	2250	80	17	488	920	-.005	80.50
07/16/82	2250	85	16	482	1245	-.005	82.90
07/28/82	2250	85	16	482	1209	-.005	79.40

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-17 (UPPER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2960	103	19	549	1255	0.017	N/A
UCL	3552	124	23	659	1506	1.017	N/A
UCL Plus 20%	4262	149	28	791	1807	1.220	N/A
08/12/81	2700	73	17	487	1140	0.025	74.50
09/03/81	2700	91	19	481	1145	0.023	70.90
09/16/81	2400	64	17	459	1050	-.005	93.50
10/01/81	2550	90	18	462	900	0.008	94.60
10/14/81	2700	93	16	497	1200	0.016	80.40
10/29/81	3000	90	16	489	950	0.015	115.00
11/11/81	2950	95	16	457	1095	0.012	116.30
11/25/81	2740	107	16	466	1047	0.029	93.50
12/03/81	2650	117	18	506	980	0.024	106.50
12/09/81	2750	112	15	480	970	0.027	106.50
12/14/81	2700	110	16	496	1020	0.030	121.00
12/23/81	2310	102	17	473	1080	0.028	138.10
01/08/82	2100	101	19	487	1115	-.001	128.20
01/21/82	2250	93	16	512	1080	-.005	114.80
02/04/82	2300	118	16	498	1050	-.005	122.50

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-17(UPPER)

Mining Unit No. 1 <sup>20772</sup>

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2960	103	19	549	1255	0.017	N/A
UCL	3552	124	23	659	1506	1.017	N/A
UCL Plus 20%	4262	149	28	791	1807	1.220	N/A
02/18/82	2230	112	20	509	1150	-.005	137.50
03/30/82	2450	176	51	536	1000	-.005	122.40
04/05/82	2610	191	50	514	1145	0.011	108.80
04/12/82	2500	141	27	495	1100	0.017	0.00
04/19/82	2250	147	27	505	1140	0.010	0.00
04/27/82	2175	144	22	465	1060	0.023	0.00
05/04/82	2225	144	22	479	1115	-.001	0.00
05/11/82	2175	141	22	486	1050	-.001	0.00
06/02/82	2300	112	20	495	1135	-.005	0.00
06/17/82	2290	129	21	478	1135	-.005	74.00
06/24/82	2300	129	22	482	930	-.005	72.60
07/01/82	2210	127	23	399	1180	-.005	71.20
07/09/82	2250	129	23	509	870	-.005	88.50
07/16/82	2200	127	22	474	1100	-.005	79.30
07/28/82	2280	126	20	460	1152	0.020	76.70

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-18(UPPER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2760	93	20	545	1230	-.005	N/A
UCL	3312	112	24	654	1476	1.005	N/A
UCL Plus 20%	3974	134	29	785	1771	1.206	N/A
08/12/81	2760	78	17	481	1230	0.022	59.60
09/03/81	2800	78	19	499	1330	0.026	60.50
09/16/81	2640	83	16	500	1100	-.005	67.70
10/01/81	2700	78	17	485	1110	0.010	78.00
10/14/81	2800	83	17	513	1195	0.017	72.00
10/29/81	3090	78	17	518	1040	0.018	82.00
11/11/81	3090	83	16	501	1070	0.011	91.00
11/25/81	3000	80	17	528	1340	0.033	82.50
12/03/81	2910	75	19	556	1185	0.031	93.40
12/09/81	3000	85	16	541	750	0.034	83.50
12/14/81	3090	88	18	537	1130	0.034	92.30
12/23/81	2650	73	21	528	745	0.029	94.10
01/08/82	2325	93	20	518	1210	-.001	99.00
01/13/82	2275	88	20	511	1245	-.001	91.20
01/21/82	2500	80	19	544	1190	-.005	89.50

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

120772

Monitor Well No. M-18(UPPER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2760	93	20	545	1230	-.005	N/A
UCL	3312	112	24	654	1476	1.005	N/A
UCL Plus 20%	3974	134	29	785	1771	1.206	N/A
01/28/82	2500	83	21	581	1270	-.005	82.50
02/04/82	2450	75	18	541	1275	0.010	82.60
02/18/82	2410	75	19	544	1250	-.005	107.70
03/30/82	2500	78	20	490	1250	-.005	85.70
04/27/82	2480	83	17	502	960	-.005	81.70
06/02/82	2550	78	20	440	1260	0.009	71.60
06/17/82	2490	78	19	467	1290	-.005	68.50
07/01/82	2450	75	19	549	1345	-.005	67.70
07/16/82	2410	75	18	555	1270	-.005	65.90
07/28/82	2510	79	15	537	1330	0.019	68.20

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-61 (UPPER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2632	83	22	480	1190	0.016	N/A
UCL	3158	100	26	576	1428	1.016	N/A
UCL Plus 20%	3790	120	31	691	1714	1.219	N/A
08/12/81	2400	78	17	444	1070	0.016	57.00
09/03/81	2650	83	19	464	1220	0.025	57.80
09/16/81	2430	83	17	472	990	-.005	63.40
10/01/81	2300	81	17	397	900	-.005	70.00
10/14/81	2600	83	18	476	1185	0.018	67.50
10/29/81	2850	78	17	477	920	0.015	78.50
11/11/81	2790	83	17	477	915	0.009	89.20
11/25/81	2700	85	16	511	1100	0.029	0.00
12/03/81	2600	83	18	506	980	0.027	92.30
12/09/81	2650	83	17	489	1010	0.024	84.90
12/23/81	2280	78	20	411	1140	0.029	86.60
01/08/82	2100	90	20	472	1100	-.001	89.80
01/21/82	2230	76	17	440	1110	-.005	84.80
02/04/82	2200	78	18	498	1140	-.005	84.50
02/18/82	2200	75	18	500	1095	-.005	102.80

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-61(UPPER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2632	83	22	480	1190	0.016	N/A
UCL	3158	100	26	576	1428	1.016	N/A
UCL Plus 20%	3790	120	31	691	1714	1.219	N/A
03/30/82	2780	78	18	450	1015	-.005	99.50
04/27/82	2480	83	17	502	960	-.005	81.70
06/02/82	2200	81	18	406	1090	-.005	80.50
06/17/82	2160	80	18	467	1105	-.005	64.70
07/01/82	2150	85	19	372	925	-.005	62.50
07/16/82	2140	80	18	446	1085	-.005	64.00
07/28/82	2205	81	16	462	1116	0.020	64.80

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

Monitor Well No. M-62 (UPPER)

Mining Unit No. 1

20772

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2740	98	20	506	1240	0.022	N/A
UCL	3288	118	24	607	1488	1.002	N/A
UCL Plus 20%	3946	142	29	728	1786	1.226	N/A
08/12/81	2610	83	17	457	1240	0.022	71.50
09/03/81	2700	88	19	481	1230	0.027	69.50
09/16/81	2490	83	16	466	925	-.005	79.60
10/01/81	2530	85	16	488	985	-.005	84.50
10/14/81	2600	88	16	483	1190	0.017	72.40
10/29/81	2900	83	16	496	940	0.016	101.80
11/11/81	2900	88	15	515	965	0.010	101.50
11/25/81	2850	87	15	511	980	0.026	82.70
12/03/81	2650	88	18	533	1100	0.022	101.70
12/09/81	2850	88	17	506	1175	0.029	97.00
12/14/81	2880	88	17	514	1070	0.028	108.40
12/23/81	2350	88	21	358	1035	0.032	122.00
01/08/82	2175	98	18	488	1160	-.001	114.70
01/21/82	2300	80	19	460	1115	0.008	104.50
02/04/82	2260	80	18	523	1100	-.005	104.80

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

1 20772

Monitor Well No. M-62 (UPPER)

Mining Unit No. \_\_\_\_\_

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2740	98	20	506	1240	0.022	N/A
UCL	3288	118	24	607	1488	1.002	N/A
UCL Plus 20%	3946	142	29	728	1786	1.226	N/A
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02/18/82	2240	83	18	509	1130	-.005	124.50
03/30/82	2300	88	18	473	1050	-.005	115.20
06/02/82	2300	83	18	426	1110	-.005	71.30
06/17/82	2300	80	17	447	1085	-.005	70.00
07/01/82	2200	80	18	491	990	-.005	69.70
07/16/82	2250	85	17	475	1110	0.030	67.30

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-19 (LOWER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	1880	127	53	390	616	0.010	N/A
UCL	2256	152	64	468	739	1.010	N/A
UCL Plus 20%	2707	182	77	562	887	1.212	N/A
08/12/81	1810	107	47	337	615	0.011	113.50
09/03/81	1760	119	43	342	580	0.017	115.00
09/11/81	1820	122	40	353	545	0.007	115.10
09/16/81	1660	122	40	359	533	-.005	113.50
09/23/81	1770	124	40	345	450	-.005	118.50
10/01/81	1750	129	38	332	490	-.005	119.80
10/14/81	1750	129	40	334	660	0.009	120.50
10/29/81	2000	122	36	353	604	0.011	116.50
11/11/81	1990	129	40	327	530	-.005	121.50
11/25/81	1900	124	40	354	586	0.016	120.00
12/03/81	1700	122	40	381	535	0.015	121.80
12/09/81	1770	127	39	357	590	0.017	124.00
12/14/81	1920	129	41	386	660	0.014	124.50
12/23/81	1750	122	41	334	602	0.016	122.30
01/08/82	1475	124	20	342	660	-.001	125.70

NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-19 (LOWER)

Mining Unit No. 1

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	1880	127	53	390	616	0.010	N/A
UCL	2256	152	64	468	739	1.010	N/A
UCL Plus 20%	2707	182	77	562	887	1.212	N/A
01/13/82	1525	134	40	356	700	-.001	123.00
01/21/82	1550	120	41	360	520	-.005	125.60
01/28/82	1550	121	39	383	605	-.005	126.30
02/04/82	1550	122	41	364	565	-.005	126.30
02/18/82	1550	122	41	370	595	-.005	127.70
03/30/82	1580	117	40	343	545	-.005	134.20
04/27/82	1750	119	40	365	600	-.005	134.00
06/02/82	1560	124	40	331	600	-.005	122.40
06/17/82	1550	132	41	306	580	-.005	128.30
07/01/82	1500	122	41	344	540	-.005	127.50
07/16/82	1500	122	41	345	660	-.005	127.50
07/28/82	1500	125	40	322	600	0.036	127.10

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OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-7

Evaporation Ponds

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	1060	220	16	67	520	0.006	N/A
UCL	1272	264	19	80	624	1.006	N/A
UCL Plus 20%	2544	317	23	96	749	1.207	N/A
02/18/82	950	166	8	48	385	-.005	52.88
05/20/82	1050	185	8	50	450	0.015	51.90

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-71

Evaporation Ponds

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	1200	244	117	124	218	0.022	N/A
UCL	1440	293	140	149	262	1.022	N/A
UCL Plus 20%	1728	352	168	179	314	1.226	N/A
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11/25/81	1360	207	88	86	263	0.014	55.30
02/18/82	1000	210	72	88	300	0.011	57.60
05/20/82	1090	210	50	71	372	0.011	57.60

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-72

Evaporation Ponds

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	6600	394	98	79	283	0.007	N/A
UCL	7920	473	118	95	340	1.007	N/A
UCL Plus 20%	9504	568	142	114	408	1.208	N/A
08/12/82	9150	72	328	290	5	-.005	72.30
11/25/81	10500	72	114	100	-1	-.005	52.20
02/18/82	8000	144	125	95	-1	-.005	52.50
03/30/82	8800	58	160	100	-1	-.005	52.70
04/12/82	3620	34	173	180	6	-.005	76.50
04/19/82	6200	108	224	219	12	-.005	75.40
04/26/82	8200	139	239	239	2	-.005	74.00
05/04/82	7850	67	224	201	3	-.005	74.00
05/11/82	8395	62	244	212	7	-.005	72.35
05/20/82	8600	84	215	251	10	-.005	71.60
06/03/82	9100	62	283	233	4	-.005	70.30
06/10/82	9000	62	273	226	5	-.005	71.10
06/17/82	8800	108	283	266	5	-.005	71.30
07/01/82	9050	120	312	267	4	-.005	72.20
07/09/82	10500	72	296	276	4	-.005	72.20

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

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Monitor Well No. M-72

Evaporation Ponds

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	6600	394	98	79	283	0.007	N/A
UCL	7920	473	118	95	340	1.007	N/A
UCL Plus 20%	9504	568	142	114	408	1.208	N/A
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07/16/82	10300	84	305	243	4	-.005	72.10
07/23/82	9350	72	338	297	5	-.005	72.10
07/30/82	9250	72	328	300	5	-.005	72.40
08/06/82	9200	84	328	300	4	-.005	72.20

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-73

Evaporation Ponds

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	1590	122	55	111	590	0.519	N/A
UCL	1908	163	66	133	708	1.519	N/A
UCL Plus 20%	2290	196	79	160	850	1.823	N/A
11/25/81	1320	147	14	69	462	0.013	56.20
02/18/82	1000	142	14	66	458	0.009	56.55
05/20/82	1100	146	17	68	468	0.017	56.60

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.



OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-74

Evaporation Ponds

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	1380	234	28	80	528	0.022	N/A
UCL	1656	281	34	96	634	1.022	N/A
UCL Plus 20%	1987	337	41	115	761	1.226	N/A
<hr/>							
11/25/81	1350	244	13	71	460	0.024	50.70
02/18/82	1000	224	12	64	428	0.012	51.04
05/20/82	1050	229	11	64	440	0.011	51.70

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NOTE: "--" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

OGLE PETROLEUM INC.  
BISON BASIN PROJECT  
MONITOR WELL DATA

20772

Monitor Well No. M-75

Evaporation Pond

SAMPLE DATE	CONDUCTIVITY (mmhos/cm)	CARBONATE PLUS BICARBONATE (mg/l)	CHLORIDE (mg/l)	SODIUM (mg/l)	SULFATE (mg/l)	URANIUM (mg/l)	WATER LEVEL (FEET)
Baseline	2360	53	68	189	427	0.061	N/A
UCL	2832	64	82	227	512	1.061	N/A
UCL Plus 20%	3398	77	98	272	614	1.273	N/A
11/25/81	1950	24	32	77	342	0.013	45.50
02/18/82	940	48	25	62	358	-.005	45.35
05/20/82	840	10	23	61	354	-.005	45.60

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NOTE: "-" Before number means not detected at level indicated. Water level is the distance from top of well casing to the water surface. N/A means not applicable. Baseline means high baseline. UCL means upper control limit. "0" means unable to collect sample due to pump or other problems.

TABLE 29  
Evaporation Ponds  
Plant Effluent Quality Data

PARAMETER	SAMPLE COLLECTED 11/25/81	SAMPLE COLLECTED 02/18/82	SAMPLE COLLECTED 03/30/82	SAMPLE COLLECTED 05/20/82		
Turbidity (JTU's)	--	--	--	--		
Dissolved Oxygen	--	--	--	--		
pH (pH units)	--	--	8.32	8.64		
Total Dissolved Solids	--	--	11,564	13,327		
Conductivity (mhos/cm)	20,400	14,980	17,100	19,800		
Ammonia (as N)	--	--	0.12	-0.05		
Nitrate (as N)	--	--	78	14.32		
Nitrite (as N)	--	--	-0.01	-0.01		
Carbonate	0	0	19	72		
Bicarbonate	1829	1932	1215	1086		
Calcium	--	--	99	48		
Chloride	5450	3416	4119	4880		
Boron	--	--	-0.1	0.5		
Fluoride	--	--	0.47	0.46		
Magnesium	--	--	38	48		
Potassium	--	--	32	38		
Sodium	6028	3240	3,858	4,476		
Sulfate	4100	2780	2,800	3,230		
Aluminum	--	--	-0.05	-0.05		
Arsenic	--	--	0.080	0.090		
Barium	--	--	-0.02	-0.02		
Cadmium	--	--	0.034	0.042		
Chromium	--	--	0.03	0.02		
Copper	--	--	0.03	0.03		
Iron	--	--	0.30	0.15		
Lead	--	--	0.16	0.21		
Manganese	--	--	0.02	0.02		
Mercury	--	--	-0.001	-0.001		
Nickel	--	--	0.14	0.17		
Selenium	--	--	0.300	0.550		
Zinc	--	--	0.009	0.017		
Molybdenum	--	--	-0.05	-0.05		
Vanadium	--	--	-0.05	-0.05		
Uranium	61.5	47.15	52.70	77.88		
Radium 226 (pCi/l)	--	--	217 + 2	181 + 2		
Thorium 230 (pCi/l)	--	--	12.0 + 0.07	30.3 + 0.7		

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

-- Means not detected at levels indicated.

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TABLE 30  
West Alkali Creek (Upper)  
Water Quality Data

PARAMETER	SAMPLE COLLECTED 05/18/79	SAMPLE COLLECTED 04/30/80	SAMPLE COLLECTED 05/07/80	SAMPLE COLLECTED 03/30/81	SAMPLE COLLECTED 03/11/82
Turbidity (JTU's)	--	20	12	31	--
Dissolved Oxygen	--	7.0	8.5	6.6	--
pH (pH units)	9.5	8.5	8.8	8.6	8.42
Total Dissolved Solids	640	890	1106	750	370
Conductivity (mhos/cm)	900	1250	1550	970	555
Ammonia (as N)	-0.1	0.11	-0.1	-0.1	0.09
Nitrate (as N)	2.4	6.66	1.8	0.01	4.39
Nitrite (as N)	-0.01	-0.01	-0.01	-0.01	-0.01
Carbonate	168	14	48	36	10
Bicarbonate	110	490	616	463	303
Calcium	13	19	14	19	17
Chloride	58	89	104	66	26
Boron	-1.0	-1.0	-1.0	-1.0	0.3
Fluoride	0.71	0.66	0.93	0.38	0.53
Magnesium	2	8	13	10	0.02
Potassium	18	25	38	17	15
Sodium	198	277	360	231	113
Sulfate	60	144	176	86	35
Aluminum	1.50	1.1	0.46	1.1	0.63
Arsenic	0.04	0.04	0.072	0.03	0.04
Barium	-0.05	-0.05	-0.05	0.05	-0.02
Cadmium	-0.01	-0.01	-0.01	-0.01	-0.005
Chromium	-0.01	-0.02	-0.02	-0.05	-0.01
Copper	0.14	0.03	-0.02	-0.02	-0.01
Iron	1.90	1.11	0.3	0.86	1.11
Lead	-0.05	-0.05	-0.05	-0.05	-0.65
Manganese	0.11	0.06	0.01	0.02	0.02
Mercury	-0.001	-0.001	-0.001	-0.001	-0.001
Nickel	-0.04	-0.04	-0.04	-0.04	-0.04
Selenium	-0.01	-0.01	-0.01	-0.01	-0.002
Zinc	0.37	-0.01	-0.01	0.01	0.016
Molybdenum	-0.05	-0.05	-0.05	-0.1	-0.05
Vanadium	-0.05	-0.05	-0.05	-0.05	-0.05
Uranium	0.030	0.044	0.043	0.023	0.045
Radium 226 (pCi/l)	1.35 ± 0.58	0.76 ± 0.50	0.61 ± 0.24	0 ± 0.4	0.43 ± 0.21
Thorium 230 (pCi/l)	10 ± 8.6	22 ± 6.1	3.78 ± 2.07	1.1 ± 0.6	0.08 ± 0.07

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

-- Means not detected at levels indicated.

TABLE 31  
West Alkali Creek (Lower)  
Water Quality Data

PARAMETER	SAMPLE COLLECTED 05/18/79	SAMPLE COLLECTED 04/30/80	SAMPLE COLLECTED 05/07/81	SAMPLE COLLECTED 03/30/81	SAMPLE COLLECTED 03/11/82
Turbidity (JTU's)	--	38	34	34	--
Dissolved Oxygen	--	6.9	6.6	6.2	--
pH (pH units)	9.3	8.5	9.0	8.5	8.47
Total Dissolved Solids	724	836	1178	656	410
Conductivity (mhos/cm)	1165	1150	1650	850	630
Ammonia (as N)	-0.10	-0.10	-0.10	-0.10	0.10
Nitrate (as N)	3.0	0.06	1.6	-0.01	4.75
Itrite (as N)	-0.01	-0.01	-0.01	-0.01	-0.01
Carbonate	156	14	66	21	10
Bicarbonate	263	449	573	415	322
Calcium	14	18	14	19	20
Chloride	90	79	110	49	30
Boron	-1.0	-1.0	-1.0	-1.0	-0.1
Fluoride	0.81	0.62	0.96	0.51	0.53
Magnesium	6	8	13	10	0.02
Potassium	25	23	39	15	16
Sodium	288	252	382	198	133
Sulfate	90	156	207	79	41
Aluminum	2.15	0.8	0.60	1.0	0.63
Arsenic	0.06	0.04	0.08	0.03	0.04
Barium	-0.05	-0.05	-0.05	-0.05	-0.02
Cadmium	-0.002	-0.01	-0.01	-0.01	-0.005
Chromium	-0.01	-0.02	-0.02	-0.05	-0.01
Copper	0.08	0.02	-0.02	-0.02	-0.01
Iron	3.12	0.84	0.6	0.89	1.09
Lead	-0.05	-0.05	-0.05	-0.05	-0.05
Manganese	0.37	0.05	0.04	0.02	0.02
Mercury	-0.001	-0.001	-0.001	-0.001	-0.001
Nickel	-0.04	-0.04	-0.04	-0.04	-0.01
Selenium	-0.01	-0.01	-0.01	-0.01	-0.002
Zinc	0.17	0.10	-0.01	-0.01	0.017
Molybdenum	-0.05	-0.05	-0.05	-0.05	-0.05
Vanadium	-0.05	-0.05	-0.05	-0.05	-0.05
Uranium	0.038	0.042	0.045	0.026	0.017
Radium 226 (pCi/l)	0.06 ± 0.23	0.60 ± 0.33	0.51 ± 0.18	1.3 ± 0.5	0.30 ± 0.16
Thorium 230 (pCi/l)	0 ± 4.7	5.9 ± 2.6	6.2 ± 2.6	0.4 ± 0.9	0.22 ± 0.08

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--- Means not detected at levels indicated.

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

TABLE 32  
Grassy Lake  
Water Quality Data

PARAMETER	SAMPLE COLLECTED 05/01/80	SAMPLE COLLECTED 05/07/80	1981	1982
Turbidity (JTU's)	180	3.6		
Dissolved Oxygen	4.8	7.0	No Sample Collected	No Sample Collected
pH (pH units)	228	198		
Conductivity (mhos/cm)	345	300		
Ammonia (as N)	-0.10	-0.10	Lake Dry	Lake Dry
Nitrate (as N)	-0.01	0.5	All	All
Nitrite (as N)	-0.01	-0.01	Year	Year
Carbonate	0	0		
Bicarbonate	81	63		
Calcium	36	31		
Chloride	6	4		
Boron	-1.0	-1.0		
Fluoride	0.06	0.07		
Magnesium	10	9		
Potassium	7	8		
Sodium	17	16		
Sulfate	101	105		
Aluminum	0.8	0.10		
Arsenic	-0.01	-0.01		
Barium	-0.05	-0.05		
Cadmium	-0.01	-0.01		
Chromium	-0.02	-0.02		
Copper	0.02	0.02		
Iron	0.64	0.2		
Lead	-0.05	-0.05		
Manganese	0.09	0.01		
Mercury	-0.001	-0.001		
Nickel	-0.04	-0.04		
Selenium	-0.01	-0.01		
Zinc	-0.01	-0.01		
Molybdenum	-0.05	-0.05		
Vanadium	-0.05	-0.05		
Uranium	0.011	-0.001		
Radium 226 (pCi/l)	2.1 ± 0.58	0.40 ± 0.14		
Thorium 230 (pCi/l)	15.5 ± 4.3	4.72 ± 1.65		

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

— Means not detected at levels indicated.

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TABLE 33  
ENVIRONMENTAL DOSIMETERS

SAMPLE PERIOD	CONTROL		STATION NUMBER 1		STATION NUMBER 2		STATION NUMBER 3		STATION NUMBER 5	
	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week
07/01/81-10/19/81	36.6 $\pm$ 5.8	2.14	42.0 $\pm$ 3.9	2.45	47.4 $\pm$ 7.7	2.77	42.5 $\pm$ 11.1	2.48	47.7 $\pm$ 20.4	2.78
10/01/81-01/14/82	35.1 $\pm$ 9.1	1.98	38.6 $\pm$ 5.4	2.18	37.2 $\pm$ 23.4	2.10	40.5 $\pm$ 11.1	2.29	41.2 $\pm$ 12.0	2.33
01/01/82-04/05/82	32.0 $\pm$ 8.6	2.00	32.9 $\pm$ 5.2	2.06	45.2 $\pm$ 5.6	2.83	42.6 $\pm$ 11.9	2.83	43.4 $\pm$ 7.6	2.71
04/01/82-07/08/82	28.5 $\pm$ 7.4	1.68	31.8 $\pm$ 5.1	1.87	36.2 $\pm$ 7.4	2.13	47.5 $\pm$ 25.6	2.79	34.7 $\pm$ 5.1	2.04

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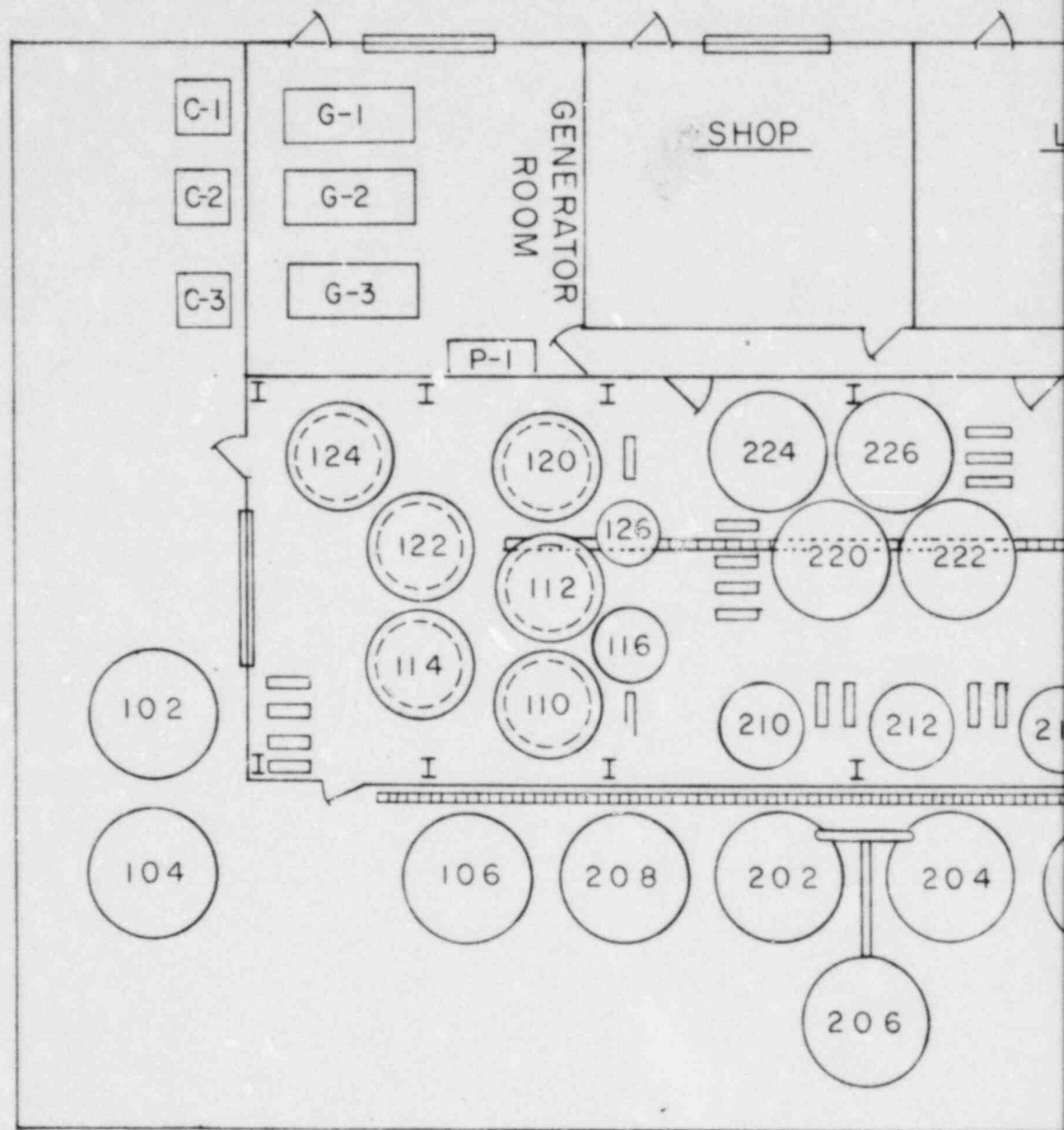
TABLE 33  
ENVIRONMENTAL DOSIMETERS

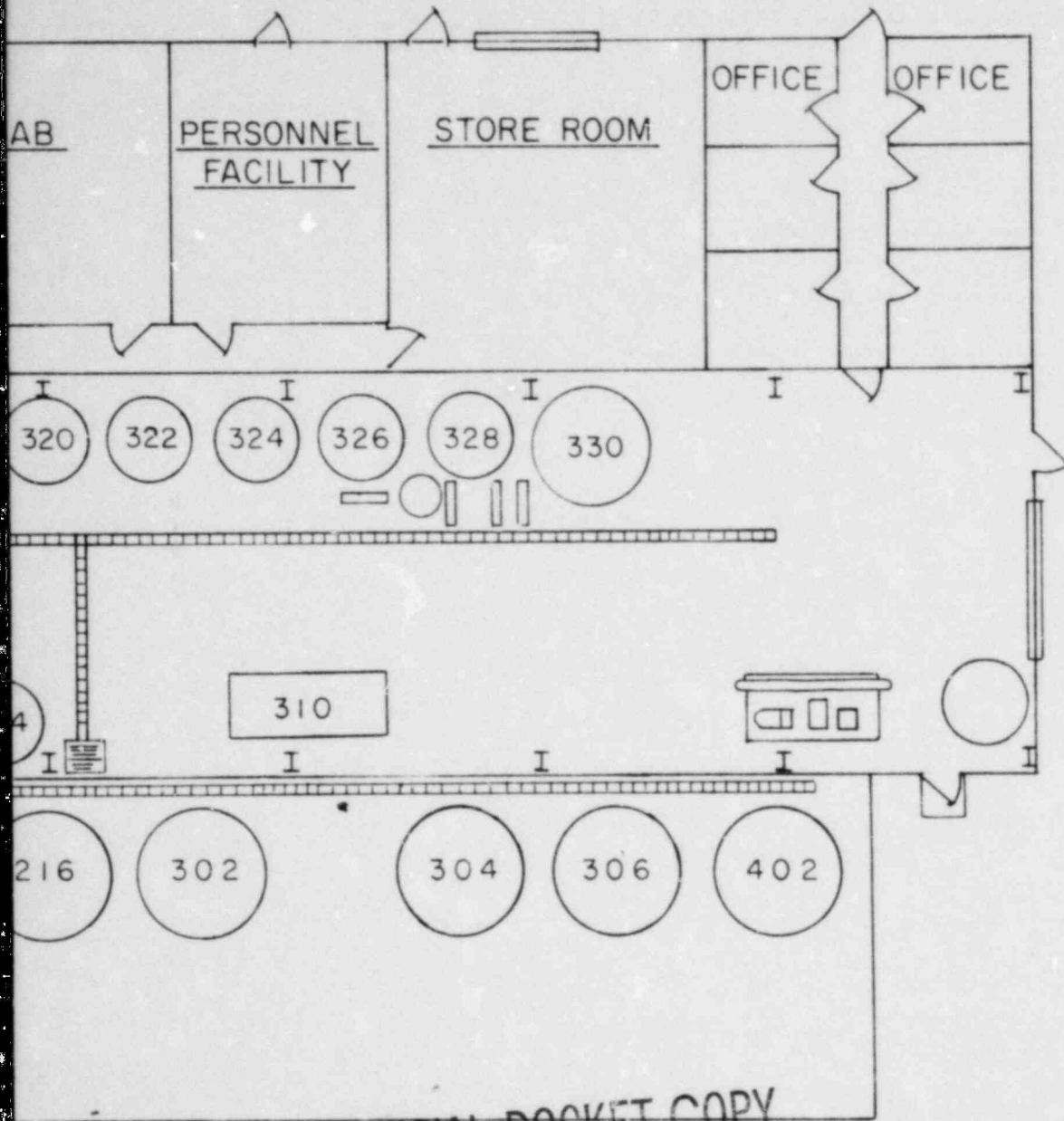
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SAMPLE PERIOD	STATION NUMBER 10		STATION NUMBER 13		STATION NUMBER 21		STATION NUMBER 22	
	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week	Net MREM Ave $\pm$ 2 $\sigma$	MREM/Week
07/01/81-10/19/81	34.2 $\pm$ 6.6	2.00	40.6 $\pm$ 14.8	2.37	38.3 $\pm$ 15.0	2.23	39.2 $\pm$ 11.0	2.29
10/01/81-01/14/82	48.2 $\pm$ 16.4	2.72	45.7 $\pm$ 8.3	2.58	44.3 $\pm$ 9.9	2.50	43.2 $\pm$ 9.1	2.44
01/01/82-04/05/82	39.7 $\pm$ 9.0	2.48	39.1 $\pm$ 9.1	2.44	35.8 $\pm$ 7.3	2.24	34.8 $\pm$ 6.9	2.18
04/01/82-07/08/82	32.3 $\pm$ 8.8	1.90	32.8 $\pm$ 6.6	1.93	31.3 $\pm$ 7.0	1.84	24.3 $\pm$ 5.5	1.72

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**BISON BASIN PROJECT**  
**OPI-WESTERN JOINT VENTURE**  
 COMMERCIAL PLANT GENERAL ARRANGEMENT  
 FIGURE: 1

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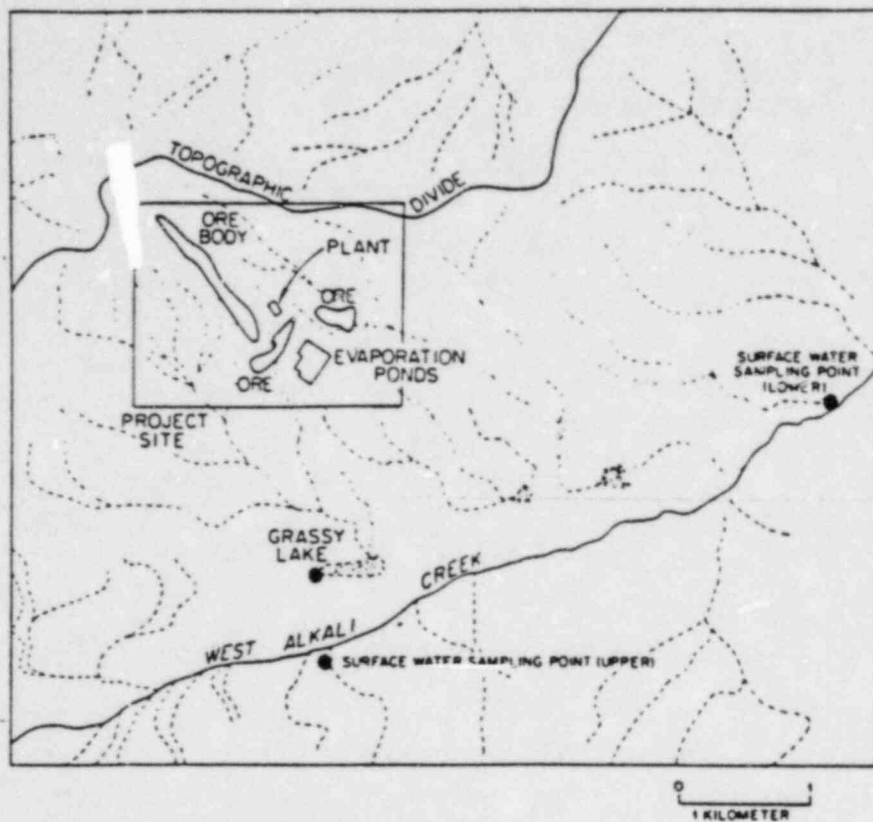
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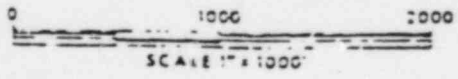
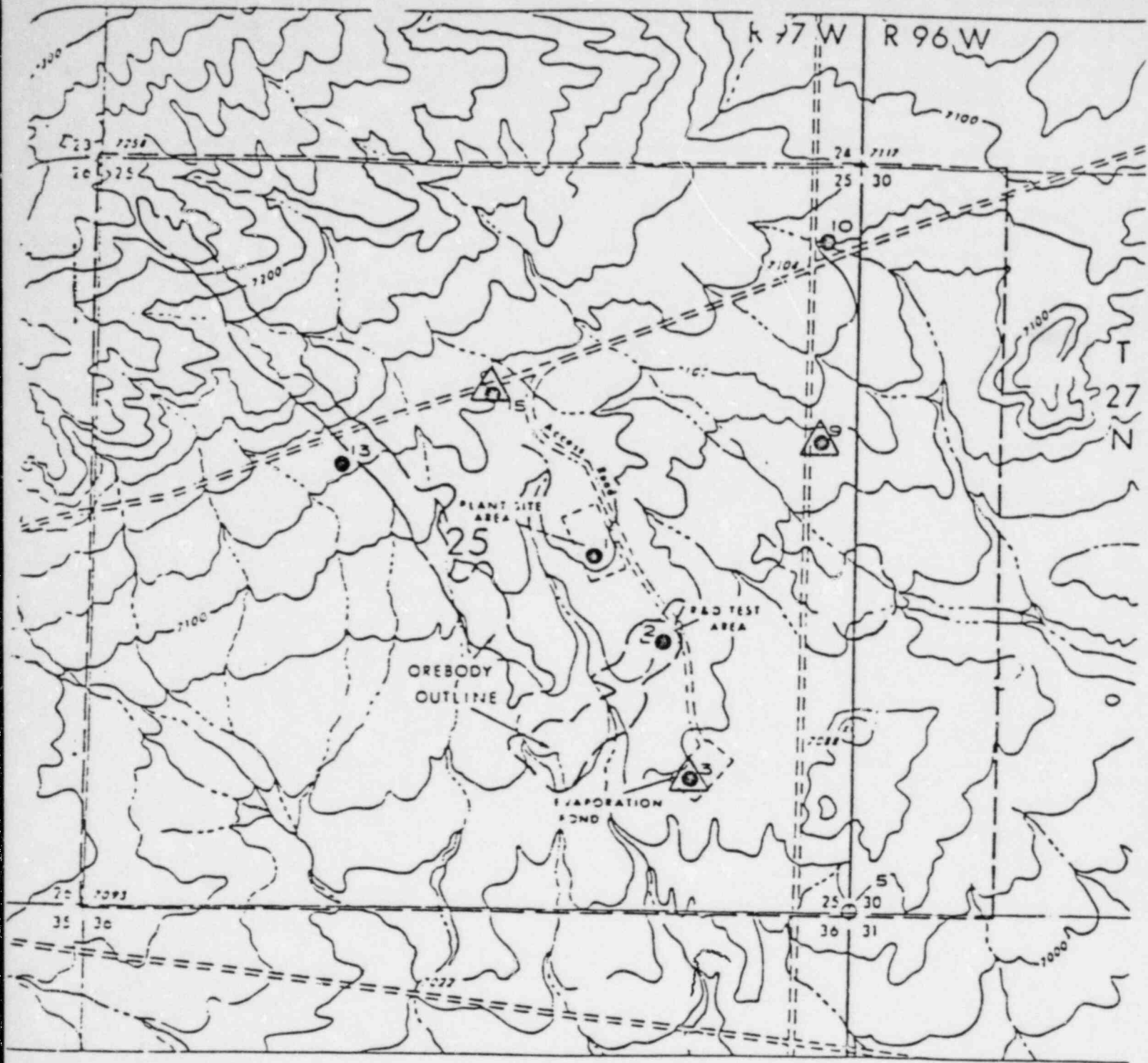
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Figure 5  
Sediment and Surface Water  
Sampling Points



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**EXPLANATION**

-  Project Area Boundary
- LOCATION 21- Intersection of Bison Basin Oil Field Road and Bison Basin Mine Road
- LOCATION 22- Intersection of US 287 and Bison Basin Oil Field Road
-  Soil & Vegetation Sample Site

**OGLE PETROLEUM INC.**

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BISON BASIN PROJECT  
BISON BASIN MINE

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SAMPLING AND  
DOSIMETER LOCATIONS

Figure No. 6

20772