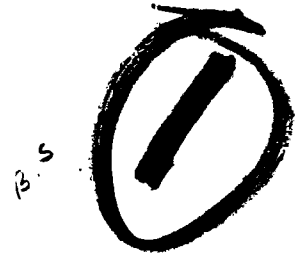


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BELTZVILLE LAKE PROJECT

WATER QUALITY DATA REPORT (RCS DAEN-CWE-15)

Prepared By

**U. S. Army Corps of Engineers
Philadelphia District**

TIME PERIOD

OCTOBER 1, 1978 TO SEPTEMBER 30, 1979

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project itself, and the basin draining into the lake. The report presents data and information useful to the operation of Beltzville Lake for water quality control in the lake and downstream.

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SUMMARY

1.01. Summary. Beltzville Lake, located on the Pohopoco Creek in Carbon County, Northwest of Allentown, Pennsylvania, has been in operation since October of 1970. The primary purposes of the project are flood control, water quality control, future water supply, low flow augmentation and recreation. This report, which covers the time period beginning 1 October 1978 through 30 September 1979 deals with the water quality aspect of the project. The drainage basin above Beltzville Dam which was formerly devoted principally to farming is presently undergoing a complete land pattern change apparently due to the influence of Beltzville Lake. Farm land is being sold for building lots and new homes are being constructed throughout the basin. It appears that in addition to contamination from animal runoff, there will be a increase in septic tank seepage, which may become a problem in future lake management. In general, accumulated data ^{1/} (APPENDIX A) indicate that stream inflow and the reservoir is of high water quality. The collected data also indicated a favorable comparison with water quality for public water supplies as adopted by the Commonwealth of Pennsylvania (DER) and U. S. Environmental Protection Agency.

1/ Peri, Inc., Water Quality Management Report (1979).

The reservoir exhibits a moderating effect on water quality and the very slight acidic conditions and nutrient loadings associated with ammonia nitrogen and phosphorous have been nicely controlled to prevent any shocks on receiving streams. In general, following periods of heavy precipitation there is a slight increase in ammonia nitrogen and phosphorous and a decrease in pH. This is associated more with runoff from surrounding areas and is not a direct function of the reservoir.

Water Quality monitoring presently is minimally adequate consistent with available funding. During FY 79, Bacteriological testing was instituted at all sampling points in addition to chemical testing that was being done for the past several years. Future management efforts will require additional Biological Data to meet the criteria established by the Commonwealth of Pennsylvania (DER). ^{1/}

SECTION II - INFORMATION

2-01. Purpose and Scope. This report presents and briefly interprets the water quality data collected through 1979 related to the operation of the Beltzville Lake Project. It includes the general characteristics of the area influenced by the dam, the project itself, and the basin draining into the lake. The report presents data and information useful to the operation of Beltzville Lake for water quality control in the lake and downstream.

^{1/} Commonwealth of Pennsylvania (DER) Chapter 93. Water Quality Criteria.

2-02. Authority. This report is submitted in accordance with the Corps of Engineers policy as set forth in ER 1110-2-334, "Water Quality Management at Corps Civil Works Facilities," 1 May 1974.

2-03. Background Information. Beltzville Dam, located in Northeastern Pennsylvania, (Plate 1) was completed in 17 September 1971. The pool was raised to elevation 628.0 in December 1971 and the project has been in operation ever since. The project is one of five flood control dams in the Lehigh and Delaware River Basin. In addition to functions of these projects such as flood control, water supply and recreation, it is necessary to make frequent checks of the quality downstream and in the reservoir. These quality checks and data collected by other agencies are the source of data in this report.

2-04. Pertinent References. The following references are considered pertinent to this report, (ER 1110-2-1402 and 1130-2-415).

a. Pennsylvania Department of Environmental Resources Annual Bacteriological Test report of Public Bathing Waters.

b. U. S. Army Corps of Engineers, Philadelphia District Bacteriological Data (APPENDIX D).

c. U. S. Army Corps of Engineers, Philadelphia District, Lake Profiles on Dissolved Oxygen, pH, and Temperature (APPENDIX B).

d. Water Quality Management Report - Contract DACW61-78-A-003

(APPENDIX A)

SECTION III - AREA AND PROJECT DESCRIPTION

3-01. River Basin Characteristics. Beltzville Lake is located in Carbon County in northeastern Pennsylvania on the Pohopoco Creek, a tributary of Lehigh River (Plate 1). The Pohopoco Creek drainage area is 111 square miles and the portion above the damsite is 93.3 square miles. The drainage area above the dam was principally devoted to agricultural production prior to the construction of the dam; however, land patterns are changing due to the increase of housing construction. Lands formerly devoted to agricultural pursuits is fast becoming recreation-oriented. However, with the increase of housing, additional causes of concern arise from septic overflows due to the lack of sewerage systems in the watershed. Periodic nutrient lake loading occurs occasionally but this is minimal and no deleterious effects have been noticed on water quality.^{1/} These effects are counterbalanced by the flushing action caused by early spring and fall rainfall.

3-02. Project Description. The Beltzville project, completed in 1971, provides supplies of water, reduction of flood damage and facilities for public recreation. The dam is built across Pohopoco Creek about one-third of a mile from its juncture with Sawmill Run, and about 4 miles east of Lehighton, Pennsylvania. The dam extends 4,300 feet across the Pohopoco

^{1/} Water Quality Management Report. Contract (DACW61-78-A-003) (APPENDIX A).

Valley and rises 170 feet above the creek bed. The water in the lake discharges through a conduit located near the southern end of the dam. The lake, when filled to its normal level is five miles long. The elevation of the lake is 628 feet above sea level. The lake provides a recreational capacity for 250,000 visitors annually; however, the Pennsylvania Bureau of State Parks reported 579,370 visitors at Beltzville for calendar year 1979 as of 30 November. The three major recreational sites are: Pine Run area presently developed while the remaining two, Trinity Gorge and Twinflower, are undeveloped.

3-03. Climate. The Lehigh River Basin, including the area drained by Pohopoco Creek, has a temperate northeast Atlantic coast climate that is characterized by frequent changes in temperature and occasional moderate amounts of precipitation. The area is subject to precipitation from normal rainfall, thunderstorms, snowfall, and heavy rains associated with hurricanes. The mean annual temperature in the Lehigh River Basin is about 50°F. The mean monthly precipitation during 1979 varied from a minimum of 1.12 inches in July to a maximum of 7.82 inches in May, as recorded by the U. S. Weather Service at Beltzville. Selected climatological data for 1979 is found in Table 1.

3-04. Dam and Lake Characteristics.

a. Embankment. The dam is a rock faced earth embankment with an impervious core and random fill outer sections, has a crest length 4,200 feet with a maximum height of 170 feet above the stream bed. The top of

the dam is at elevation 672 feet (sea level datum). The embankment has a top width of 30 feet. The top of the dam is surfaced with gravel to serve as a maintenance road. Access to an intake tower is by a service bridge.

b. Spillway. The spillway contains a concrete crest 275 feet wide and approximately 325 feet long approximately centered in an upland channel cut into the right bank. The spillway discharge after leaving the unlined downstream section, will flow in a natural valley into Sawmill Run and Pohopoco Creek.

c. Outlet Works. The outlet works is located near the center of the dam and consists of a control tower and multi-level intake structure located on the upstream side of the dam. The tower leads gated water passages through the dam and a conventional stilling basin is provided at the downstream end to dissipate the energy of the conduit discharge.

d. Access Roads to Dam. Access to the top of the dam is directly from the operations building on the right bank via a bridge crossing the spillway channel.

e. Reservoir. The reservoir when filled to the top of the water supply pool, elevation 628, is approximately seven miles long and $\frac{1}{2}$ mile wide at point of maximum width. The average depth of the reservoir is about 60 feet and the maximum is 125 feet. The stream slopes vary from about 310 feet per mile to about 5 feet per mile. The topography includes

all land classification types from rolling farmland to sheer rock faces. The flood plain in the reservoir area has been developed as a recreational and farming area.

3-05. Geological History.^{1/} The area is located in the middle portion of the Appalachian Valley and Ridge physiographic province. Pohopoco Creek flows parallel to the northeast-southwest trending ridges and is incised in gently sloping Devonian shales, siltstones, and sandstones. The project area contains outcroppings of what is thought to be the Centerfield coral reef. This formation, which is rich in fossils, dates back to the Devonian period. There is also evidence that changes in the structure of the earth's crust created lagoons during the Mississippian period. Some of the marine life that inhabited these lagoons has been identified in fossils found in the project area.

3-06. Topography. The difference in elevation between the valleys and ridges in the project area is about 400 feet. A number of deep narrow gorges, most of which are located on the gently sloping north side of the reservoir site, are aligned generally perpendicular to the creek. A high, steep ridge forms the south side of the valley. The ridge is particularly steep near the dam site and upstream portion of the reservoir site. It recedes slightly to the south near the mid-point of the reservoir, leaving a pocket of relatively flat land on the south side of the project area.

^{1/} A detailed geological description can be found in the Beltzville Dam and Reservoir Memorandum 3(GDM) and the Recreation-Resource Management DM No. 18A, U. S. Army Corps of Engineers, Philadelphia District.

3-07. Soil Condition. Glacial frost action south of the Wisconsin terminal moraine produced a channery condition of the soil surface layer. Channery soils are predominant in the project area. They contain thin flat fragments of sandstone, limestone, or shale as much as six inches in length along the longer axis. These fragments are thickly interspersed throughout a silt loam.

3-08. Vegetation. Nearly all relatively flat lands have been cleared and farmed for many years. Uncleared land contains an abundance of second growth hardwoods including species such as red maple, various oaks, ash, hickory, birch, dogwood, sassafras and hawthorn. The slopes of both gorges and ridges are forested with dense stands of hemlock and rhododendron and a scattering of other conifers and hardwood species.

3-09. Land Use. Government lands are recreationally oriented and are divided into picnicking, swimming, boating, hunting, sightseeing, water-skiing, and fishing. Pennsylvania Bureau of Parks manages the recreational areas, the Pennsylvania Fish Commission manages the lake waters and the Game Commission is responsible for the management of the game lands.

The area north and east of the lake were formerly devoted to Agricultural production, however for the past several years, land patterns have changed drastically. Dairy farm operations are being phased out and the land is being developed for homes and recreational businesses.

The land to the south of the lake is a pine-hemlock-hardwood forest which in turn is bordered to the south by more farm and forested lands.

SECTION IV - WATER QUALITY DATA

4-01. Purpose of Sampling Program. The purpose of taking water samples at Beltzville Lake is to acquire an inventory of water quality parameters within the areas influencing and influenced by the lake. These data will be used to evaluate water quality conditions and to determine where, what and if any pollution problems exist in the watershed. It is further anticipated that positive action will be initiated to contain, control or eliminate any point or non-point sources of pollution or contamination. Additionally, it is the intent of the Corps to develop a meaningful program to characterize the lake with respect to standards of the Pennsylvania Department of Environmental Resources under provisions of the Clean Streams Law, Act of June 22, 1937, P.L. 1987.

4-02. Testing Procedures. Water samples are being collected on a year round basis by Corps personnel of the northern area office. These samples^{1/} are being analyzed by a certified laboratory (under contract) for pH, dissolved oxygen, total dissolved solids, ammonia, specific conductance, nitrite, nitrate, and phosphorous. Stratification testing procedures (APPENDIX B) are being continued on the basis of twice per month from April

^{1/} APPENDIX A - Water Quality Management Report.

through November and once per month for the remainder of the year. Temperature readings, specific conductance, dissolved oxygen and pH are taken at prescribed depths and documented. Coliform samples^{1/} are also collected at the same time as the water quality samples and processed within twenty-four hours by a certified laboratory under contract to the Philadelphia District. The fecal coliform samples,^{2/} taken from the beach area, were collected by Pennsylvania Department of Environmental Resources and were analyzed by their laboratories. The current fecal coliforms standards for swimming beaches is 200 fecal col/100ml of sample and this was not exceeded at any time during 1979.

In addition, Pennsylvania (DER) collects well water samples on a monthly basis from May through October at their recreational areas. These samples were analyzed by their laboratories. The data^{3/} results indicated that the sample collected on 13 August 1979 did not meet the PA. DER. Drinking Water Standards and had to be resampled on three consecutive days. The results of zero coliforms each time conformed with PA. DER Standards. Water samples collected from Corps Headquarters are fully in conformance with Pennsylvania Drinking Water Standards.

1/ APPENDIX D - Bacteriological Data - U. S. Army Corps of Engineers, Philadelphia District

2/ COMMONWEALTH OF PENNSYLVANIA - Bureau of State Parks, Annual Bacteriological Test Report of Public Bathing Waters (APPENDIX E)

3/ Record of Public Drinking Water Supply - PA. DER. (APPENDIX F).

4-03. Data Available. Considerable data, collected as a basis for project regulation, are available for analysis. Water quality data;^{1/} (temperature, dissolved oxygen, conductivity, pH, phosphorous, total dissolved solids, nitrate, nitrite, ammonia, and total coliform has been collected and documented. on a regular basis for the past three years. Additional data is available from other sources such as the Pennsylvania Department of Environmental Resources, U. S. Geological Survey, Pennsylvania Fish Commission and information collected and catalogued by the Philadelphia District, Corps of Engineers. The Philadelphia District has programmed an expanded water quality program for FY 80, to include additional parameters; document the data; evaluate and supply this information in the management of the lake. The Environmental Branch has conducted coordination meetings with the Pennsylvania Department of Resources and has encouraged the Water Quality Department to assist in the collection and testing of additional water samples to cover other parameters which are presently not being analyzed. The Corps is also requesting Pennsylvania DER to expand their program to include biological, algal biomass, and chloryphyll a studies.

1/ APPENDIX A - Water Quality Management Report.

4-04. Low Flow Augmentation. Beltzville Lake is regulated under the normal operation plan for downstream water quality, low flow augmentation, and recreational purposes. In the future, regulation of this project for water supply purposes may be added. The following paragraphs describe the necessary regulation requirement and objectives for each of the designated purposes.

a. Pohopoco Creek. A minimum release requirement of 35 cfs has been established to meet downstream requirements of Pohopoco Creek. Of this total release, 3 cfs is required to meet the established future requirements of the Palmerton Water Company, municipal and industrial water supplier in the vicinity of Palmerton, PA. The additional 4 cfs will provide adequate stream flow between the water supply intakes and the mouth of Pohopoco Creek. These releases will be made through the water quality outlet system.

b. Lehigh River. A desirable minimum flow of 400 cfs at Bethlehem, PA was established in House Document 522, 87th Congress, 2nd Session. At present until other goals are established along the Lehigh River it will be the task of Beltzville Lake and F. E. Walter Dam to augment all deficient flows as necessary to bring the flow at the Bethlehem gage to 400 cfs.

(1) During drought conditions when F. E. Walter Dam is below conservation pool (elev. 1300.0), Beltzville Lake will have to supply all flows necessary to augment the Bethlehem goal.

(2) All low flow augmentation releases will be made through the water quality outlet system. The minimum release limit will be 35 cfs and the maximum approximately 400 cfs (normal pool elev. 628.0)

c. Delaware River. The Delaware River Basin Commission presently in coordination with other intersected agencies is evaluating low flow goals at Trenton, New Jersey.

(1) Until such time as a new goal is established, a goal of 2700 cfs at Trenton will be used. Beltzville Lake will be based on amounts requested by the Delaware River Master Office at Milford, PA.

(2) Flows required in excess of 400 cfs (approximate capacity of the water quality outlet system) will have to be requested and approved by the Delaware River Basin Commission and the District Engineer. These excess releases will necessitate the use of the flood control outlet system.

d. Water Quality. The 27,880 acre-feet allocated for water supply storage at Beltzville Lake has not at present been sold by the Government to any water-using agency. For the present time the total storage between elevations 537.0 and 628.0 - 38,830 acre-feet - will be allocated for low flow augmentation, water quality and recreation. Low flow and recreational releases will be made in conjunction with water quality releases. All releases for these purposes will be made through the water quality outlet system. The range of releases will vary from a minimum of 35 cfs to a maximum of approximately 400 cfs.

The U. S. Fish and Wildlife Service in conjunction with the Pennsylvania Fish Commission have made certain requests in regard to the temperatures of releases from Beltzville Lake. Fish will be stocked below the dam, in the tailwater, as well as in the lake. The fishing below the dam will be primarily for trout. The interested agencies have requested that releases for the summer months have temperatures that range between 50-65 degrees Fahrenheit. During other times of the year a temperature as close as possible to this optimum will be desired.

Bi-monthly stratification monitoring data, will provide an indication as to the location of water in storage having specific temperatures, dissolved oxygen and pH readings; it also provides a guide for selecting the most desirable combination of intake ports to satisfy downstream water quality requirements.

SECTION V - INTERPRETATION OF DATA

5-01. General Post-impoundment Conditions. Analysis of data collected by USGS at Station 132 shown in Table 2, indicates that the water quality generally is good with little or no effect caused by the outflow from Beltzville Lake. The problems of algae growths and coliforms in the lake are insignificant.

Water samples have been taken by the park superintendent and tested for coliforms on a weekly basis at two beach locations beginning in May till the closing down of the beach area in September. The analysis indicates that the coliform bacteriological test results (APPENDIX E) are within the allowable limits of water quality standards for swimming areas under provisions of the Clean Streams Law, reference Title 25, Chapter 193 of Public Law 177 as amended, Commonwealth of Pennsylvania.

Bi-monthly stratification monitoring data, ^{1/} will provide an indication as to the location of water in storage having specific temperatures, dissolved oxygen and pH readings; it also provides a guide for selecting the most desirable combination of intake ports to satisfy downstream water quality requirements.

It has been observed that the lake each summer has been anerobic in the deep portions. Releases, however, have not been deficient in dissolved oxygen. Reaeration of water as it passes through the flood control conduit and stilling basin has been sufficient to elevate dissolved oxygen (DO) levels to near saturation. (See Appendix A).

a. Water Chemistry.

(1) Nitrogen. The nitrogen concentrations in Beltzville Reservoir react as expected: the highest levels are at station B-5 where the effect

1/ Philadelphia District - Bi-Monthly Stratification Data - Appendix B.

of runoff is least modified. Stations B-1 and B-3 show the moderating effects of the reservoir and station B-4 reflects the effect of the Wild Creek Reservoir. Station B-1 reflects the concentrating effect of the reservoir since the peaks and valleys are higher than the stations in the reservoir. Runoff appears to be the major source of nitrogen in the lake. This is particularly noticeable in the spring and fall when large quantities of nitrogen based fertilizers are used by farmers in the area drained by the Pohopoco Creek. The ammonia nitrogen concentrations are more readily affected by rainfall than the other forms of nitrogen. Nitrate nitrogen concentrations exceed those mentioned by some sources as being necessary for excessive algae populations. Whether these high concentrations exist throughout the lake or only on the surface is not known. However, nuisance algae blooms have not been a continuing problem since the lake was filled. The effect of the lake stratifying is reflected in the ammonia nitrogen curves for station B-1 during the summer. Since nitrate and nitrite nitrogen are reduced to ammonia nitrogen when oxygen is limiting, the downstream discharges should be highest in ammonia when the lake is stratified. This held true during the summer. The spring and fall overturns will also bring ammonia compounds from the hypolimnion to the epilimnion. This may be the source of the ammonia peaks in mid-April and early September. However, historical data is lacking to confirm this opinion.

Generally the nitrogen levels in the reservoir are elevated. The lack of severe algae blooms indicates that nitrogen may not be a problem but algae data has not been collected for this lake. Although there may not be a problem, a present build-up of nitrogen in the benthos may create a problem.

(2) Phosphates. The phosphate concentrations follow the rainfall curves with the highest peaks occurring in the spring and fall when the farm fields are uncovered. The peaks tend to be highest at stations B-1 and B-3 since the lake acts as a concentrator. The B-5 curve is smoother than the other curves since the phosphates concentrate in the hypolimnion and are released over a longer period. The occasional high readings at station B-4 may be the result of phosphate laden water being released from the Bethlehem Water Supply Reservoirs. The wide fluctuation in the peaks of the curves tend to support this conclusion since water is released only when the supply of water exceeds the demand.

(3) Dissolved Oxygen.^{1/} Dissolved oxygen is adequate in all feeder streams and in the reservoir itself. During the summer the D.O. readings while the lake was stratified dropped to 4 ppm D.O. at Elevation 510 and 9 ppm at the surface in late August and early September but began rising in late fall when inflows began increasing. The dissolved oxygen curves for day 234 show an increase in oxygen levels from the bottom (elev. 510) to

1/ Philadelphia District, (U.S.A.C.E.) Stratification Curves (APPENDIX B)

elevation 545 to 8 ppm. From elevation 545 (D.O. 8 ppm), the dissolved oxygen drops gradually to approximately 3 ppm at elevation 584. A stratified layer existed at that time from elevation 584 to approximately elevation 595. From elevation 595 the Dissolved Oxygen increased to approximately 9.5 ppm at the surface, (elevation 628).

Generally the dissolved oxygen levels are adequate for aquatic life at all levels during the year. The stratification does not eliminate oxygen completely and concentrations return to acceptable levels with the fall rains and operation of the water quality gates to draw water from the hypolimnion.

(4) pH. pH essentially remains in the range normally found in surface waters in Northeastern Pennsylvania. There are some times of the year when the range is exceeded but the reason is unknown.

(5) Total Dissolved Solids (TDS) and Specific Conductance. The TDS and Specific Conductance curves follow rainfall except for the in-lake stations, these curves below show a lag time allowing for flow into the reservoir. Station B-4 shows the influence of Wild Creek and Penn Forest Reservoirs by reducing peaks and valleys. This is particularly noticeable in the spring and fall when water is being impounded for drinking. The curve at station B-5 fluctuates the most since most of the land area above

this station is under cultivation and the effect of the reservoir is minimal. The moderating effect of the reservoir is most noticeable at station B-3 when the peaks and valleys of the concentration curve are of a longer duration. The peak in late September is probably due to the fall overturn but not enough data is available to confirm this.

(6) Coliform Sampling. The coliform counts at Beltzville Reservoir remained within the limits established by the Pennsylvania Department of Environmental Resources of no more than a geometric mean of 200 colonies per 100 milliliters of sample on five different days for fecal coliform and no more than 5,000 per 100 milliliters of sample for total coliform. The highest counts follow a period of rain, particularly after a prolonged dry spell. This indicates that most of the coliform load is the result of runoff carrying material into the water rather than a point source. Fecal Streptococcus testing results indicated medium to high readings from April to June 1979; however, the bacteria died off during the exposure travel time to the beach area where readings met the standards established by the PA DER. The coliform counts from the swimming area remain within the limits the Pennsylvania Department of Environmental Resources has established for public swimming areas.

5-02. Fishery. Pohopoco Creek is considered one of the best trout streams in the State. Trout fishing in the impoundment area of the Creek has decreased due to the habitat change resulting from the lake. However, the Pennsylvania Fish Commission has stocked the lake five times since the impoundment opened

in 1972 and intends to continue the program at the lake. During 1979, the Commission stocked the reservoir with channel catfish, Lake trout and tiger muskellunge. The tributaries were stocked with brown and rainbow trout.

Beltzville Reservoir will provide the best fishing if managed as a salmonid-walleye-smallmouth bass lake since dissolved oxygen conditions are suitable for these fish while steep slopes limit other species. Walleye populations are excellent, with yellow perch providing the principle forage. Successful salmonid fishing might be dependent upon development of a suitable forage base. Smallmouth bass populations should improve naturally. Although this lake was noted for its muskellunge, this was probably primarily a result of the great potential for growth provided by new impoundments. Muskellunge will probably not play as important a role in the future.

1979 PENNA. FISH STOCKING AT BELTZVILLE LAKE

Reservoir	-	19,000	channel	catfish
Reservoir	-	8,000	Lake	Trout
Reservoir	-	800	Tiger	Muskellunge
Pohopoco	-	4,000	Brown &	Rainbow Trout (March 79)
Pohopoco	-	2,500	"	" " (May 79)

SECTION VI - RECOMMENDATIONS AND PROPOSED STUDIES

6-01. General. The following recommendations are made relative to the Water Quality Control Management Program at Beltzville Lake.

- a. Maintain present sampling frequency to maintain a closer surveillance over the water quality in the lake.
- b. Continue to correlate data collected from other agencies and establish their sampling locations, procedures and equipment used for testing.
- c. Continue cooperation with the Pennsylvania Fish Commission in the management of the lake and to improve fish habitat both in the lake and downstream from the dam.
- d. Enlist the services of the Pennsylvania DER's Water Quality Section and laboratory facilities to expand our present sampling points and test for additional chemical, bacteriological and biological parameters.
- e. Maintain and improve a permanent record system of data on hand and other data obtained from all other sources. Such data can become a useful management tool and provide a means for evaluating water quality trends.

6-02. Findings and Conclusions. The sampling program will continue essentially unchanged for FY 1980 at Beltzville Lake.

From the data collected during the past year, the quality of the water in Beltzville Lake remains within the standards established by Pennsylvania (DER) and the U. S. Environmental Protection Agency and has changed little in the past year. In general, following periods of heavy precipitation there is a slight increase in ammonia nitrogen and phosphorous levels with a decrease in the pH. This is associated more with run-off from surrounding areas and is not a direct function of the reservoir. Bacteriological data recorded at stream inflows exceeded the standards as established by Pennsylvania DER. However, recorded bacteriological data from the beach area by Pennsylvania DER did not exceed the criteria established by that agency. This indicates that the bacteria both died off by the time the water reached the swim area and no problems were encountered in this regard.

APPENDIX A

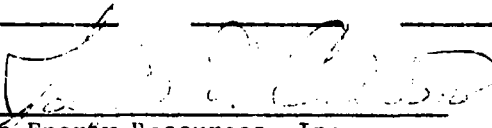
WATER QUALITY MANAGEMENT REPORT (PERI, INC.)

U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 1 (Downstream of Beltzville Dam on Pohopoco
at gauging station)

	Date: 10-17-78 Time: 0845 No. Water/Air	Date: 10-31-78 Time: 0855 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	13/40	12/8			
pH	6.61	6.67			
D.O., mg/l	11.0	10.2			
PO ₄ , mg/l	< 0.01	< 0.01			
TDS, mg/l	72.5	62.5			
Spec. Cond., (umhos)	50	51			
NH ₃ -N, mg/l	< 0.10	0.83			
NO ₃ -N, mg/l	0.17	0.42			
NO ₂ -N, mg/l	< 0.01	< 0.01			
Weather Conditions	clear, cold	clear			
Water Conditions					
Gauge	2.76	2.71			

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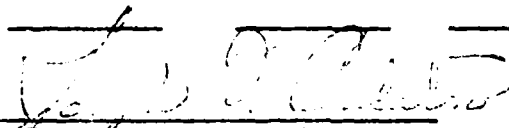
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PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 2 Upper reach of Pine Run - Leltzville Dam

	Date: 10-17-78 Time: 0910 No. Water/Air	Date: 10-31-78 Time: 0913 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	85/60	7/7			
pH	6.61	6.61			
D.O., mg/l	12.6	10.5			
PO ₄ , mg/l	<0.01	<0.01			
TDS, mg/l	310	50			
Spec. Cond., (umhos)	55	47			
NH ₃ -N, mg/l	<0.10	0.66			
NO ₃ -N, mg/l	0.01	0.18			
NO ₂ -N, mg/l	<0.01	<0.01			
Weather Conditions	clear, col ^d	clear			
Water Conditions					
Gauge					

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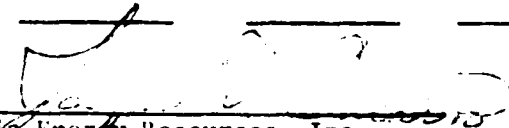
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Monthly Water Quality Management Report

Site 3 South side of launch ramp and west of parking lot - Beltzville Dam

	Date: 10-17-78 Time: 920 No. Water/Air	Date: 10-31-78 Time: 0920 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	17.60	15.8			
pH	6.85	6.06			
D.O., mg/l	1.7	1.4			
PO ₄ , mg/l	< .1	< 0.01			
TDS, mg/l	112.5	11			
Spec. Cond., (umhos)	5	53			
NH ₃ -N, mg/l	< 0.10	0.33			
NO ₃ -N, mg/l	< .1	0.36			
NO ₂ -N, mg/l	< .1	< 0.01			
Weather Conditions	clear, cold	clear			
Water Conditions					
Gauge					

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Monthly Water Quality Management Report

Site 4 (Wild Creek, east of Twp. Road #478) - Beltzville Dam

	Date: 10-17-78 Time: 0930 No.	Date: 10-31-78 Time: 0940 No.	Date: Time: No.	Date: Time: No.	Date: Time: No.
	Water/Air	Water/Air	Water/Air	Water/Air	Water/Air
Temp., °C	7.5	7.7			
pH	6.74	6.47			
D.O., mg/l	2.5	10.4			
PO ₄ , mg/l	.1	<0.01			
TDS, mg/l	52.5	187.5			
Spec. Cond., (umhos)	.8	50			
NH ₃ -N, mg/l	<0.10	0.33			
NO ₃ -N, mg/l	2.06	0.62			
NO ₂ -N, mg/l	<0.01	<0.01			
Weather Conditions	clear, cold	clear			
Water Conditions					
Gauge					

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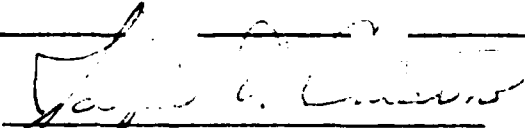
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Monthly Water Quality Management Report

Site 5 (Pohopoco Creek east of Twp. Rd. #478)- Beltzville Dam

	Date: 10-17-78 Time: 0940 No. Water/Air	Date: 10-31-78 Time: 0955 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	9/6	7/8			
pH	6.63	6.81			
D.O., mg/l	11.9	10.8			
PO ₄ , mg/l	< 0.01	< 0.01			
TDS, mg/l	62.5	60.0			
Spec. Cond., (umhos)	66	58			
NH ₃ -N, mg/l	< 0.10	0.83			
NO ₃ -N, mg/l	0.39	1.2			
NO ₂ -N, mg/l	< 0.01	< 0.01			
Weather Conditions	clear, cold	clear			
Water Conditions					
Gauge					

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Monthly Water Quality Management Report

Site ? Upper reach of Pine Run - Peltzville Dam

	Date: 11-14-78 Time: 0830 No. Water/Air	Date: 11-28-78 Time: 0945 No. Water/Air	Date: Time: No. / Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	8/10	6/2			
pH	6.86	6.62			
D.O., mg/l	9.6	12.9			
PO ₄ , mg/l	0.02	0.02			
TDS, mg/l	37.5	30			
Spec. Cond., (umhos)	47	49			
NH ₃ -N, mg/l	0.33	< 0.10			
NO ₃ -N, mg/l	0.17	0.08			
NO ₂ -N, mg/l	< 0.01	< 0.01			
Weather Conditions	overcast	overcast			
Water Conditions					
Gauge					

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Monthly Water Quality Management Report

Site 3 South side of launch ramp and west of parking lot - Reltzville Dam

	Date: 11-14-78 Time: 0840 No. Water/Air	Date: 11-28-78 Time: 1000 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	12/10	9/2			
pH	6.72	6.68			
D.O., mg/l	8.1	10.4			
PO ₄ , mg/l	0.02	0.07			
TDS, mg/l	45	52.5			
Spec. Cond., (umhos)	50	48			
NH ₃ -N, mg/l	0.33	< 0.10			
NO ₃ -N, mg/l	0.46	0.30			
NO ₂ -N, mg/l	< 0.01	< 0.01			
Weather Conditions	overcast overcast	overcast			
Water Conditions					
Gauge					

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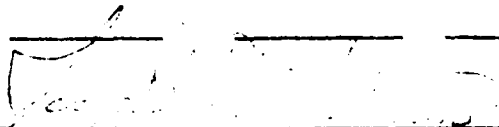
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Monthly Water Quality Management Report

Site 4 (Wild Creek, east of Twp. Road #478) - Beltzville Dam

	Date: 11-14-78 Time: 0850 No. Water/Air	Date: 11-28-78 Time: 1020 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	10/11	9.5/2			
pH	6.83	6.51			
D.O., mg/l	10.6	11.2			
PO ₄ , mg/l	0.05	0.03			
TDS, mg/l	40	57.5			
Spec. Cond., (umhos)		34			
NH ₃ -N, mg/l	0.41	< 0.10			
NO ₃ -N, mg/l	0.21	0.11			
NO ₂ -N, mg/l	< 0.01	< 0.01			
Weather Conditions	overcast	overcast			
Water Conditions					
Gauge					

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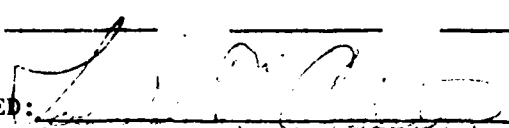
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Monthly Water Quality Management Report

Site 5 (Pohopoco Creek east of Twp. Rd. #478) - Beltzville Dam

	Date: 11-14-78 Time: 0900 No. Water/Air	Date: 11-28-78 Time: 1035 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	8/11	7/2			
pH	7.00	6.69			
D.O., mg/l	11.9	13.6			
PO ₄ , mg/l	0.03	0.02			
TDS, mg/l	35	30			
Spec. Cond., (umhos)	56	53			
NH ₃ -N, mg/l	0.66	< 0.10			
NO ₃ -N, mg/l	0.97	0.98			
NO ₂ -N, mg/l	< 0.01	< 0.01			
Weather Conditions	overcast	overcast			
Water Conditions					
Gauge					

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Monthly Water Quality Management Report

Site 1 (Downstream of Beltzville Dam on Pohopoco at gauging station)

	Date: 11-14-78 Time: 0800 No.	Date: 11-28-78 Time: 0930 No.	Date: Time: No.	Date: Time: No.	Date: Time: No.
	Water/Air	Water/Air	Water/Air		
Temp., °C	10/10	9/2			
pH	6.96	6.68			
D.O., mg/l	10.9	11.9			
PO ₄ , mg/l	0.01	0.04			
TDS, mg/l	42.5	47.5			
Spec. Cond., (umhos)	50	47			
NH ₃ -N, mg/l	0.66	<0.10			
NO ₃ -N, mg/l	0.39	0.40			
NO ₂ -N, mg/l	<0.01	<0.01			
Weather Conditions	overcast	overcast			
Water Conditions					
Gauge	2.68	2.58			

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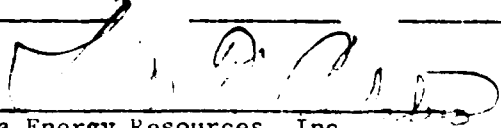
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Monthly Water Quality Management Report

Site 1 (Downstream of Beltzville Dam on Pohopoco at gauging station)

	Date: 12-12-78 Time: 0830 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	5/-5				
pH	6.77				
D.O., mg/l	11.3				
PO ₄ , mg/l	0.03				
TDS, mg/l	72				
Spec. Cond., (umhos)	53				
NH ₃ -N, mg/l	<0.10				
NO ₃ -N, mg/l	0.36				
NO ₂ -N, mg/l	<0.01				
Weather Conditions	overcast	overcast			
Water Conditions					
Gauge					

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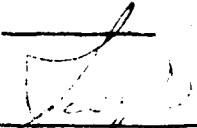
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Monthly Water Quality Management Report

Site 2 Upper reach of Pine Run - Beltzville Dam

	Date: 12-12-78 Time: 550 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	5/-3				
pH	6.49				
D.O., mg/l	11.4				
PO ₄ , mg/l	0.02				
TDS, mg/l	70				
Spec. Cond., (umhos)	63				
NH ₃ -N, mg/l	< .10				
NO ₃ -N, mg/l	0.13				
NO ₂ -N, mg/l	< .01				
Weather Conditions	overcast				
Water Conditions					
Gauge					

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Monthly Water Quality Management Report

Site 3 South side of launch ramp and west of parking lot - Peltzville Dam

	Date: 12-12-78 Time: 0900 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	6/-3				
pH	6.83				
D.O., mg/l	10.9				
PO ₄ , mg/l	0.09				
TDS, mg/l	46				
Spec. Cond., (umhos)	55				
NH ₃ -N, mg/l	<0.10				
NO ₃ -N, mg/l	0.48				
NO ₂ -N, mg/l	<0.01				
Weather Conditions	overcast	overcast			
Water Conditions					
Gauge					

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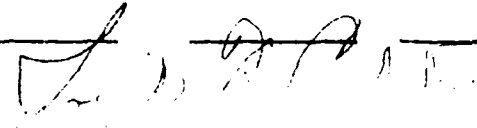
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Monthly Water Quality Management Report

Site 4 (Wild Creek, east of Twp. Road #478) - Beltzville Dam

	Date: 12-12-78 Time: 0910 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	9/-3				
pH	6.43				
D.O., mg/l	10.5				
PO ₄ , mg/l	0.04				
TDS, mg/l	40				
Spec. Cond., (umhos)	45				
NH ₃ -N, mg/l	< 0.10				
NO ₃ -N, mg/l	0.95				
NO ₂ -N, mg/l	< 0.01				
Weather Conditions	<u>overcast</u>	<u>overcast</u>			
Water Conditions					
Gauge					

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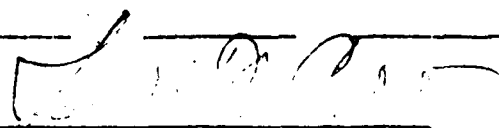
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Monthly Water Quality Management Report

Site 5 (Pohopoco Creek east of Twp. Rd. #478)- Beltzville Dam

	Date: 12-12-78 Time: 0920 No. Water/Air	Date: Time: No. Water/Air	Date: Time: No. Water/Air	Date: Time: No.	Date: Time: No.
Temp., °C	3/-3				
pH	6.57				
D.O., mg/l	12.0				
PO ₄ , mg/l	0.02				
TDS, mg/l	78				
Spec. Cond., (umhos)	61				
NH ₃ -N, mg/l	< 0.10				
NO ₃ -N, mg/l	1.5				
NO ₂ -N, mg/l	< 0.01				
Weather Conditions	overcast	overcast			
Water Conditions					
Gauge					

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PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 1 (Downstream of Beltzville Dam on Pohopoco at gauging station)

	Date: 1-9-79 Time: 0900 No. Water/Air	Date: 2-6-79 Time: 0805 No. Water/Air	Date: 3-6-79 Time: 0935 No. Water/Air	Date: 4-3-79 Time: 0920 No.	Date: 4-17-79 Time: 0855 No.
Temp., °C	4.7/-10	2/-10	3/8	7.10	7.6
pH	6.54	6.44	6.64	6.89	6.73
D.O., mg/l	13.2	13.2	11.9	11.7	11.6
PO ₄ , mg/l	0.02	0.07	0.07	0.03	0.03
TDS, mg/l	98	42	58	36	48
Spec. Cond., (umhos)	56	46	50	45	45
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	.48	0.70	0.71	0.57	0.61
NO ₂ -N, mg/l	0.01	< 0.01	< 0.01	< 0.10	< 0.01
Weather Conditions	clear cold	clear cold	rain	rain	overcast
Water Conditions					
Gauge	4.09	3.09	3.93	3.38	3.39

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PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 2 Upper reach of Pine Run - Beltzville Dam

	Date: 1-9-79 Time: 0920 No. Water/Air	Date: 2-6-79 Time: 0825 No. Water/Air	Date: 3-6-79 Time: 0920 No. Water/Air	Date: 4-3-79 Time: 0810 No.	Date: 4-17-79 Time: 0920 No.
Temp., °C	4.7-10	2/-7	7/7	8/10	8/6
pH	6.26	6.49	6.36	6.82	6.79
D.O., mg/l	12.2	13.2	10.8	10.6	10.6
PO ₄ , mg/l	< 0.01	0.06	0.08	0.02	0.02
TDS, mg/l	88	20	38	42	92
Spec. Cond., (umhos)	95	45	96	52	35
NH ₃ -N, mg/l	0.12	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	0.09	0.09	0.16	0.06	0.84
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.10	< 0.01
Weather Conditions	clear cold	clear cold	rain	rain	overcast
Water Conditions					
Gauge					

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PHILADELPHIA DISTRICT**

Monthly Water Quality Management Report

Site 2 South side of launch ramp and west of parking lot - Beltzville Dam

	Date: 1-979 Time: 0940 No. Water/Air	Date: 2-6-79 Time: 0835 No. Water/Air	Date: 3-6-79 Time: 0835 No. Water/Air	Date: 4-3-79 Time: 0825 No.	Date: 4-17-79 Time: 0935 No.
Temp., °C	+1/-10	1/-8	2/7	8/10	8/8
pH	6.74	6.57	6.78	6.99	7.01
D.O., mg/l	12.2	12.8	10.6	11.1	10.9
PO ₄ , mg/l	< 0.01	0.07	0.11	0.03	0.03
TDS, mg/l	42	34	78	48	98
Spec. Cond., (umhos)	56	46	77	49	51
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	0.60	0.64	0.75	0.35	0.53
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.10	< 0.01
Weather Conditions	clear cold	clear cold	rain	rain	overcast
Water Conditions					
Gauge					

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PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 4 (Wild Creek, east of Twp. Road #478) - Beltzville Dam

	Date: 1-9-79 Time: 1000 No. Water/Air	Date: 2-6-79 Time: 0850 No. Water/Air	Date: 3-6-79 Time: 0845 No. Water/Air	Date: 4-3-79 Time: 0840 No.	Date: 4-17-79 Time: 0950 No.
Temp., °C	+8/-10	3/-8	4/7	8/10	7/9
pH	6.32	6.56	6.47	6.87	6.52
D.O., mg/l	11.2	12.9	11.5	11.0	10.8
PO ₄ , mg/l	0.01	0.06	0.07	0.02	0.02
TDS, mg/l	28	24	32	36	106
Spec. Cond., (umhos)	54	27	30	31	30
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	1.30	0.09	0.16	0.04	0.04
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.10	< 0.01
Weather Conditions	clear cold	clear cold	rain	rain	overcast
Water Conditions					
Gauge					

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Monthly Water Quality Management Report

Site 5 (Pohopoco Creek east of Twp. Rd. #478)- Beltzville Dam

	Date: 1-9-79 Time: 010 No. Water/Air	Date: 2-6-79 Time: 0900 No. Water/Air	Date: 3-6-79 Time: 0855 No. Water/Air	Date: 4-3-79 Time: 0900 No.	Date: 4-17-79 Time: 1000 No.
Temp., °C	<u>7.9</u>	<u>0/-8</u>	<u>7/7</u>	<u>8/10</u>	<u>8/9</u>
pH	<u>6.27</u>	<u>6.65</u>	<u>6.34</u>	<u>6.98</u>	<u>6.70</u>
D.O., mg/l	<u>12.3</u>	<u>13.8</u>	<u>10.6</u>	<u>10.8</u>	<u>10.6</u>
PO ₄ , mg/l	<u>0.01</u>	<u>0.07</u>	<u>0.09</u>	<u>0.02</u>	<u>0.01</u>
TDS, mg/l	<u>18</u>	<u>8</u>	<u>36</u>	<u>42</u>	<u>230</u>
Spec. Cond., (umhos)	<u>54</u>	<u>54</u>	<u>68</u>	<u>52</u>	<u>51</u>
NH ₃ -N, mg/l	<u>< 0.10</u>	<u>< 0.10</u>	<u>< 0.10</u>	<u>< 0.10</u>	<u>< 0.10</u>
NO ₃ -N, mg/l	<u>1.27</u>	<u>1.14</u>	<u>0.50</u>	<u>0.88</u>	<u>0.93</u>
NO ₂ -N, mg/l	<u>< 0.01</u>	<u>< 0.01</u>	<u>< 0.01</u>	<u>< 0.10</u>	<u>< 0.01</u>
Weather Conditions	<u>clear cold</u>	<u>clear cold</u>	<u>rain</u>	<u>rain</u>	<u>overcast</u>
Water Conditions	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>
Gauge	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>

CERTIFIED: Joseph G. Pulastro
Pennsylvania Energy Resources, Inc.
Laboratory No. III-36-B

All analyses are performed in accordance with procedures outlined in Standard Methods for the Examination of Water and Waste Water, 14th Edition, published by the American Public Health Association.

U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 1 (Downstream of Beltzville Dam on Pohopoco at gauging station)

	Date: 5-1-70 Time: 0845 No.	Date: 5-15-70 Time: 0950 No.	Date: 6-5-70 Time: 0750 No.	Date: 6-14-70 Time: 0915 No.	Date: 7-1-70 Time: 0850 No.
	Water/Air	Water/Air	Water/Air	Water/Air	Water/Air
Temp., °C	10.10	10.11	15.00	18.20	18.00
pH	6.97	6.80	6.80	6.76	6.74
D.O., mg/l	10.0	9.8	11.4	11.5	10.4
PO ₄ , mg/l	0.01	0.05	< 0.01	0.01	< 0.01
TDS, mg/l	60	46	58	60	60
Spec. Cond., (umhos)	47	40	45	45	48
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	0.33
NO ₃ -N, mg/l	0.57	0.47	0.67	0.43	0.61
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	clear/ warm	foggy	clear/ warm	warm/ clear	warm overcast
Water Conditions					
Gauge	3.38	3.32		3.92	3.92

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Laboratory No. III-36-B

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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 2 Upper reach of Pine Run - Peltzville Dam

	Date: 5-1-79 Time: 0750 No. Water/Air	Date: 5-15-79 Time: 0810 No. Water/Air	Date: 6-5-79 Time: 0800 No. Water/Air	Date: 6-19-79 Time: 0825 No.	Date: 7-10-79 Time: 0910 No.
Temp., °C	9.0	11/11	12/17	14.20	15.50
pH	6.68	6.66	6.60	6.60	6.76
D.O., mg/l	11.4	9.8	11.4	9.8	9.8
PO ₄ , mg/l	0.01	0.04	< 0.01	0.04	< 0.01
TDS, mg/l	24	46	26	26	22
Spec. Cond., (umhos)	52	49	44	43	45
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	0.11	0.08	0.13	0.02	0.05
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	clear/ warm	foggy	clear/ warm	clear/ warm	warm/ overcast
Water Conditions					
Gauge					

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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 3 South side of launch ramp and west of parking lot - Beltzville Dam

	Date: 5-1-79 Time: 0800 No. Water/Air	Date: 5-15-79 Time: 0820 No. Water/Air	Date: 6-5-79 Time: 0825 No. Water/Air	Date: 6-10-79 Time: 0835 No.	Date: 6-17-79 Time: 0840 No.
Temp., °C	13.1	14.0	20.27	17.5	17.10
pH	7.1	7.15	7.28	7.14	7.14
D.O., mg/l	10.8	9.1	10.6	8.9	9.2
PO ₄ , mg/l	< 0.01	0.02	< 0.01	0.02	< 0.01
TDS, mg/l	38	44	36	46	46
Spec. Cond., (umhos)	49	47	47	43	45
	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NH ₃ -N, mg/l					
NO ₃ -N, mg/l	0.59	0.42	0.48	0.40	0.43
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	clear/ warm	FRY	clear/ warm	warm clear	warm overcast
Water Conditions					
Gauge					

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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 4 (Wild Creek, east of Twp. Road #478) - Beltzville Dam

	Date: 5-1-79 Time: 0815 No. Water/Air	Date: 5-15-79 Time: 0830 No. Water/Air	Date: 6-5-79 Time: 0845 No. Water/Air	Date: 6-19-79 Time: 0845 No.	Date: 7-10-79 Time: 0905 No.
Temp., °C	12.0	13.1	19.1	15.1	11.1
pH	6.77	6.64	6.92	6.63	6.61
D.O., mg/l	10.2	8.8	10.3	9.0	8.6
PO ₄ , mg/l	< 0.01	0.04	< 0.01	0.03	< 0.01
TDS, mg/l	2	46	16	24	16
Spec. Cond., (umhos)	32	32	27	95	30
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	0.18	0.07	0.09	0.27	< 0.01
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	clear warm	foggy	clear/ warm	warm, clear	warm/ overcast
Water Conditions					
Gauge					

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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 5 (Pohopoco Creek east of Twp. Rd. #478) - Beltzville Dam

	Date: 5-1-79 Time: 0825 No. Water/Air	Date: 5-15-79 Time: 0825 No. Water/Air	Date: 6-5-79 Time: 0900 No. Water/Air	Date: 6-19-79 Time: 0855 No.	Date: 7-9-79 Time: 0935 No.
Temp., °C	<u>15/10</u>	<u>14/10</u>	<u>15/18</u>	<u>16/20</u>	<u>17/10</u>
pH	<u>6.75</u>	<u>6.75</u>	<u>6.86</u>	<u>6.87</u>	<u>6.87</u>
D.O., mg/l	<u>9.8</u>	<u>9.7</u>	<u>10.8</u>	<u>11.0</u>	<u>9.0</u>
PO ₄ , mg/l	<u>< 0.01</u>	<u>0.10</u>	<u>< 0.01</u>	<u>0.07</u>	<u>< 0.01</u>
TDS, mg/l	<u>54</u>	<u>48</u>	<u>48</u>	<u>54</u>	<u>58</u>
Spec. Cond., (umhos)	<u>50</u>	<u>51</u>	<u>51</u>	<u>48</u>	<u>48</u>
NH ₃ -N, mg/l	<u>< 0.10</u>	<u>< 0.10</u>	<u>< 0.10</u>	<u>< 0.10</u>	<u>< 0.10</u>
NO ₃ -N, mg/l	<u>1.76</u>	<u>0.82</u>	<u>0.85</u>	<u>1.02</u>	<u>0.96</u>
NO ₂ -N, mg/l	<u>< 0.01</u>	<u>< 0.01</u>	<u>< 0.01</u>	<u>< 0.01</u>	<u>< 0.01</u>
Weather Conditions	<u>clear/ warm</u>	<u>foggy</u>	<u>clear/ warm</u>	<u>clear/ warm</u>	<u>warm overcast</u>
Water Conditions	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>
Gauge	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>

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Pennsylvania Energy Resources, Inc.
Laboratory No. 111-36-B

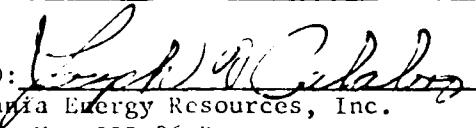
All analyses are performed in accordance with procedures outlined in Standard Methods for the Examination of Water and Waste Water, 15th Edition, published by the American Public Health Association.

U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 1 (Downstream of Beltzville Dam on Pohopoco
at gauging station)

	Date: 7-24-79 Time: 0905 No.	Date: 8-7-79 Time: 0835 No.	Date: 8-21-79 Time: 0835 No.	Date: 9-11-79 Time: 0830 No.	Date: 9-25-79 Time: 0835 No.
	Water/Air	Water/Air	Water/Air	Water/Air	Water/Air
Temp., °C	16/22	16/18	16/20	18/19	15/10
pH	6.81	6.51	6.61	6.61	6.56
D.O., mg/l	10.4	10.0	9.4	9.7	9.7
PO ₄ , mg/l	0.04	0.02	< 0.01	0.03	0-07
TDS, mg/l	80	10	36	52	40
Spec. Cond., (umhos)	45	44	50	46	52
NH ₃ -N, mg/l	0.10	< 0.10	< 0.10	0.10	0.21
NO ₃ -N, mg/l	0.61	0.59	0.28	0.77	0.53
NO ₂ -N, mg/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	warm/ overcast	clear/ warm	rain	clear/ cool	cloudy/ cool
Water Conditions					
Gauge	2.85	2.78	2.78	3.36	2.66

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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 2 Upper reach of Pine Run - Heltzville Dam

	Date: 7-24-79 Time: 0820 No. Water/Air	Date: 8-7-79 Time: 0845 No. Water/Air	Date: 8-21-79 Time: 0905 No. Water/Air	Date: 9-11-79 Time: 0850 No.	Date: 9-25-79 Time: 0910 No.
Temp., °C	17/21	16/16	16/19	15/19	11/10
pH	6.61	6.67	6.65	6.68	6.63
D.O., mg/l	9.8	9.3	10.0	9.7	10.4
PO ₄ , mg/l	0.04	0.03	0.01	0.02	0.08
TDS, mg/l	72	4	6	166	40
Spec. Cond., (umhos)	43	41	41	55	55
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	0.06	0.11	< 0.01	0.02	0.10
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	warm/ overcast	clear/ warm	rain	clear/ cool	cloudy/ cool
Water Conditions					
Gauge					

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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 3 South side of launch ramp and west of parking lot - Beltzville Dam

	Date: 7-24-79 Time: 0830 No. Water/Air	Date: 8-7-79 Time: 0850 No. Water/Air	Date: 8-21-79 Time: 0915 No. Water/Air	Date: 9-11-79 Time: 0900 No.	Date: 9-25-79 Time: 0825 No.
Temp., °C	27/22	16/26	22/19	22/19	19/10
pH	7.15	7.06	6.96	7.15	6.95
D.O., mg/l	9.1	8.4	9.2	8.6	8.2
PO ₄ , mg/l	0.04	0.02	0.01	0.03	0.05
TDS, mg/l	62	4	36	62	18
Spec. Cond., (umhos)	45	42	44	47	47
NH ₃ -N, mg/l	0.10	0.10	0.10	0.10	0.14
NO ₃ -N, mg/l	0.36	0.31	0.36	0.50	0.31
NO ₂ -N, mg/l	0.01	0.01	0.01	0.01	0.01
Weather Conditions	warm/ overcast	clear/ warm	rain	clear/ cool	cloudy/ cool
Water Conditions					
Gauge					

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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 4 (Wild Creek, east of Twp. Road #478) - Beltzville Dam

	Date: 7-24-79 Time: 0840 No. Water/Air	Date: 8-7-79 Time: -- No. Water/Air	Date: 8-21-79 Time: 0930 No. Water/Air	Date: 9-11-79 Time: 0915 No.	Date: 9-25-79 Time: 0930 No.
Temp., °C	24/22	16/23	19/19	14/18	11/11
pH	6.55	6.56	6.69	6.72	6.65
D.O., mg/l	8.9	8.5	9.8	10.2	10.1
PO ₄ , mg/l	0.08	0.02	< 0.01	0.03	0.05
TDS, mg/l	46	10	6	68	40
Spec. Cond., (umhos)	28	32	34	52	54
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
NO ₃ -N, mg/l	< 0.01	0.09	0.07	1.16	0.89
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	warm/ overcast	clear/ warm	rain	clear/ cool	cloudy/ cool
Water Conditions					
Gauge					

CERTIFIED: *Joseph W. Calabro*
Pennsylvania Energy Resources, Inc.
Laboratory No. III-36-B


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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

Monthly Water Quality Management Report

Site 5 (Pohopoco Creek east of Twp. Rd. #478)- Beltzville Dam

	Date: 7-24-79 Time: 0850 No.	Date: 8-7-79 Time: -- No.	Date: 8-21-79 Time: -- No.	Date: 9-11-79 Time: 0920 No.	Date: 9-25-79 Time: 0935 No.
	Water/Air	Water/Air	Water/Air		
Temp., °C	20/22	17/19	19/17	16/19	12/12.5
pH	6.72	7.50	7.02	7.10	6.83
D.O., mg/l	8.2	9.9	9.5	10.2	10.6
PO ₄ , mg/l	0.10	0.02	0.01	0.05	0.04
TDS, mg/l	58	44	28	90	70
Spec. Cond., (umhos)	53	50	55	57	57
NH ₃ -N, mg/l	< 0.10	< 0.10	< 0.10	< 0.10	0.19
NO ₃ -N, mg/l	0.87	0.73	0.76	2.29	1.40
NO ₂ -N, mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Weather Conditions	warm/ overcast	clear/ warm	rain	clear/ cool	cloudy/ cool
Water Conditions					
Gauge					

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APPENDIX B

BI-MONTHLY STRATIFICATION DATA - PHILADELPHIA DISTRICT

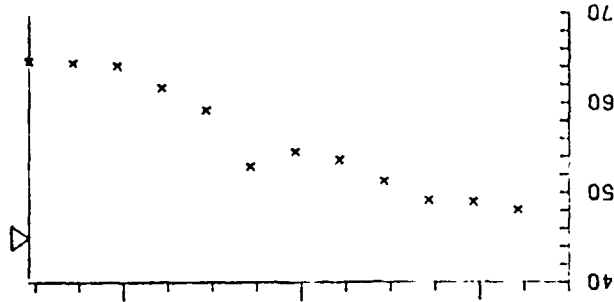
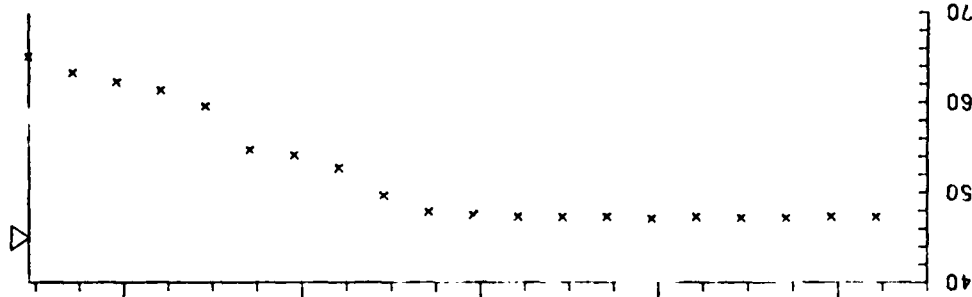
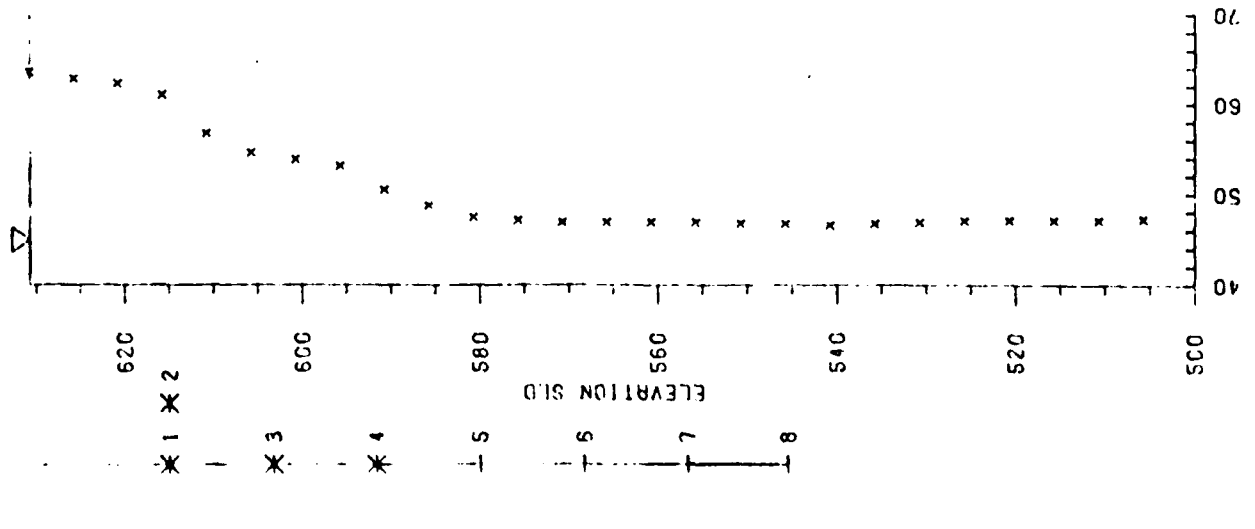
APPENDIX - B

PORTAL LOCATION

SECTION 1

SECTION 3

SECTION 8

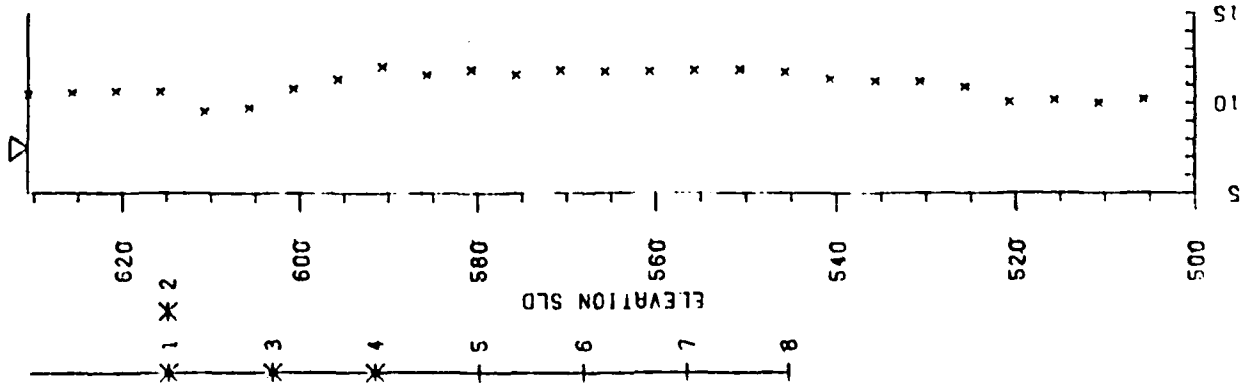


BELLEVILLE LAKE
 CONDUCTIVITY RANGE
 19.00 TO 54.00 MICROMHOS/CM
 PH RANGE 5.87 TO 7.08
 POOL ELEVATION 630.7 FEET SLD
 AIR TEMPERATURE 63 DEGREES F
WATER QUALITY SYSTEM
 PORTALS OPEN
 1 2 3 4
 TORQUE 36.0 INCHES
ELECT. CONTROL SYSTEM
 NO. OF GATES OPEN 2
 GATE SETTINGS 1 0 FT
 1 0 FT
RELEASE PAIR
 DS CASE HEIGHT 4.50 FT
 DS DISCHARGE 705 CFS
 DS TEMPERATURE 51 DEGREES F
 DS CONDUCTIVITY 49 MICROMHOS/CM
 DS PH 6.66
 DS DO 12.5 PPM

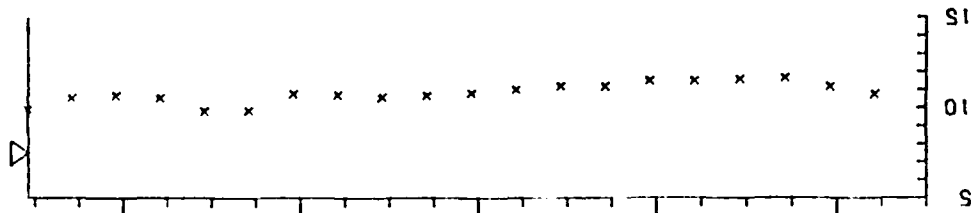
TEMPERATURE, DEGREES F
 YEAR 1979 DAY 150

PORTAL LOCATION

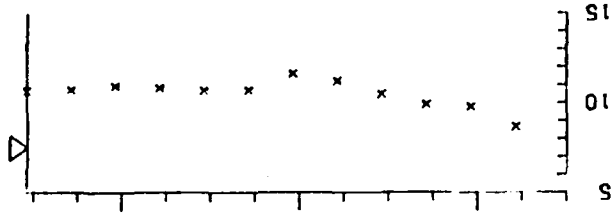
SECTION 1



SECTION 3



SECTION 8



BELTZVILLE LAKE

CONDUCTIVITY RANGE

19.00 TO 54.00 MICROMHOS/CM

PH RANGE 5.87 TO 7.06

POOL ELEVATION 630.7 FEET SLD

AIR TEMPERATURE 63 DEGREES F

WATER QUALITY SYSTEM

PORTALS OPEN

1 2 3 4

TORQUE 36.0 INCHES

FLOOD CONTROL SYSTEM

NO. OF GATES OPEN 2

DATE SETTINGS 1 C FT

1 C FY

RELEASE DATA

DS GATE HEIGHT 4.30 FT

CS DISCHARGE 765 CFS

CS TEMPERATURE 51 DEGREES F

CS CONDUCTIVITY 49 MICROMHOS/CM

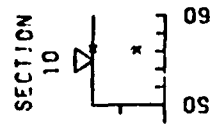
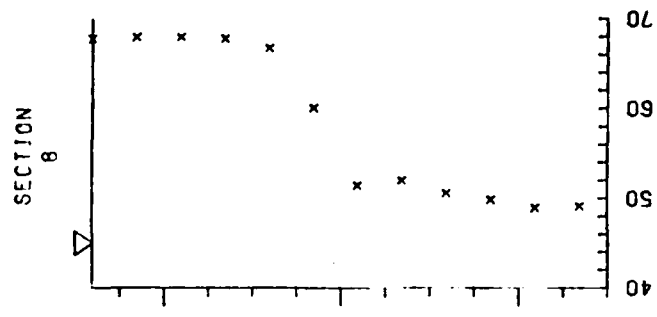
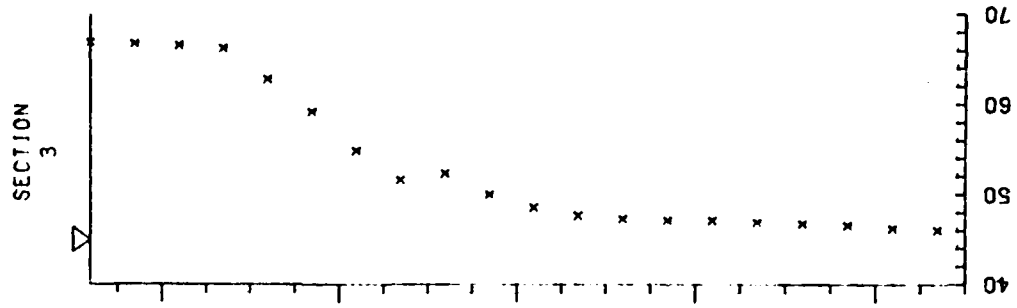
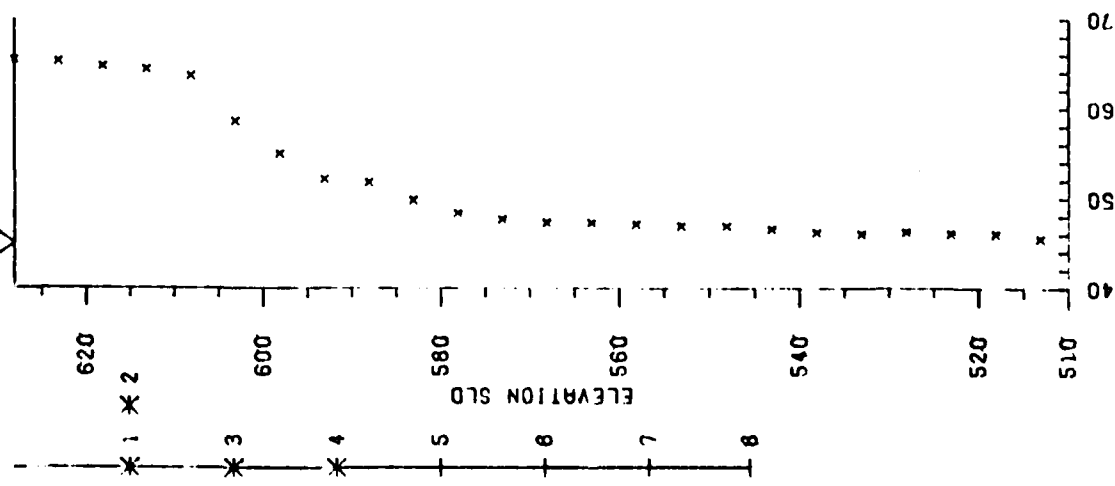
CS PH 6.66

CS CC 12.5 PPM

DISSOLVED OXYGEN, PPM
YEAR 1979 DAY 150

B-2

PORTAL LOCATION



BELTZVILLE LAKE

CONDUCTIVITY RANGE

20.00 TO 54.00 MICROMHOS/CM

PH RANGE 5.73 TO 6.78

POOL ELEVATION 628.1 FEET SLD

AIR TEMPERATURE 64 DEGREES F

WATER QUALITY SYSTEM

PORTALS OPEN

1 2 3 4

TORQUE 18.0 INCHES

FLOOD CONTROL SYSTEM

NO. OF GATES OPEN 0

RELEASE DATA

DS GAGE HEIGHT 3.08 FT

DS DISCHARGE 152 CFS

DS TEMPERATURE 61 DEGREES F

DS CONDUCTIVITY 50 MICROMHOS/CM

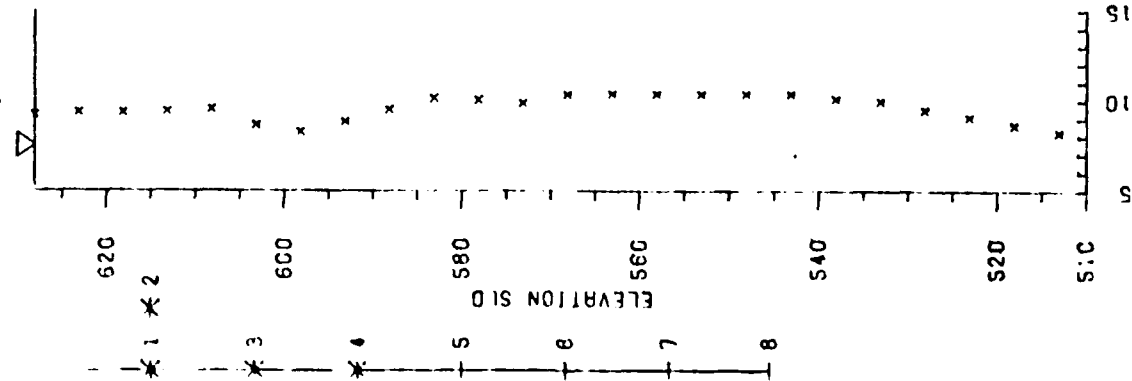
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DS DC 9.6 PPM

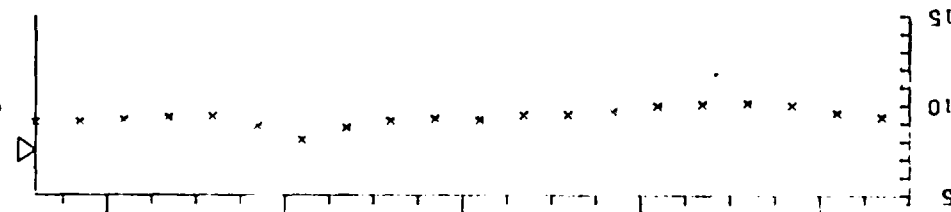
TEMPERATURE, DEGREES F
YEAR 1979 DAY 164

PORTAL
LOCATION

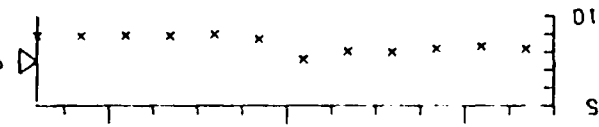
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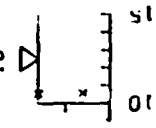
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3



SECTION
8



SECTION
10



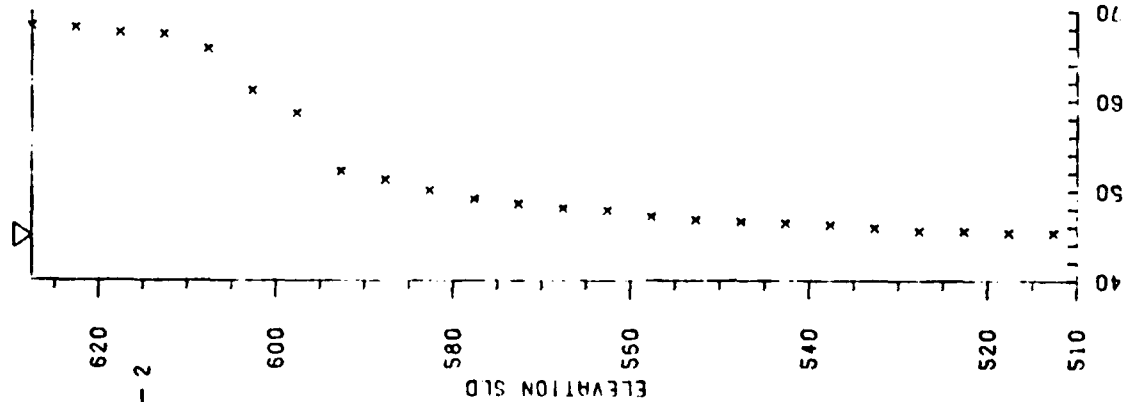
BELZVILLE LAKE
 CONDUCTIVITY RANGE
 20.00 TO 54.00 MICROMHOS/CM
 PH RANGE 5.73 TO 6.78
 POOL ELEVATION 628.1 FEET SLD
 AIR TEMPERATURE 64 DEGREES F
 WATER QUALITY SYSTEM
 PORTALS OPEN 1 2 3 4
 TORQUE 18.0 INCHES
 FLOOD CONTROL SYSTEM
 NO. OF GATES OPEN 0
 RELEASE ORIGIN
 DS GAGE HEIGHT 3.08 FT
 DS DISCHARGE 152 CFS
 DS TEMPERATURE 61 DEGREES F
 DS CONDUCTIVITY 50 MICROMHOS/CM
 DS PH 6.65
 DS DO 9.6 PPM

DISSOLVED OXYGEN, PPM
 YEAR 1979 DAY 164

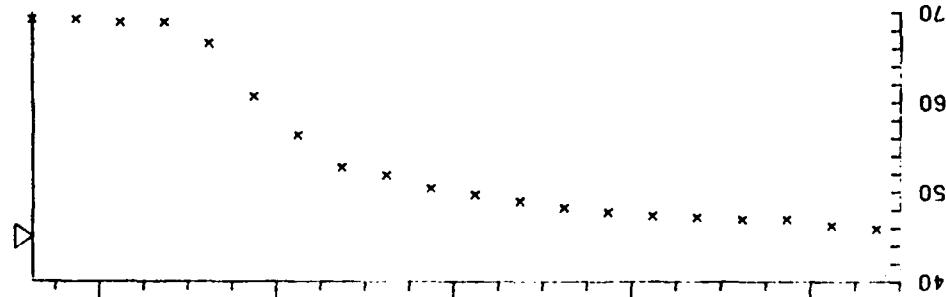
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PORTAL
LOCATION

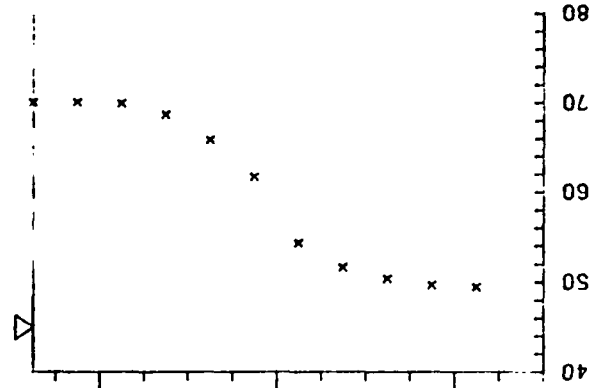
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1



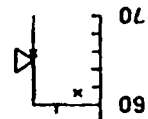
SECTION
3



SECTION
8



SECTION
10



BELTZVILLE LANE

CONDUCTIVITY RANGE

43.00 TO 55.00 MICROMHOS/CM

PH RANGE 5.86 TO 7.73

POOL ELEVATION 627.6 FEET SLD

AIR TEMPERATURE 59 DEGREES F

WATER QUALITY SYSTEM

PORTALS OPEN

1

3

4

6

TORQUE 8.0 INCHES

FLOOD CONTROL SYSTEM

NO. OF GATES OPEN 0

RELEASE DATA

DS GAGE HEIGHT 2.77 FT

DS DISCHARGE 65 CFS

DS TEMPERATURE 59 DEGREES F

DS CONDUCTIVITY 51 MICROMHOS/CM

DS PH 6.72

DS DO 10.0 PPM

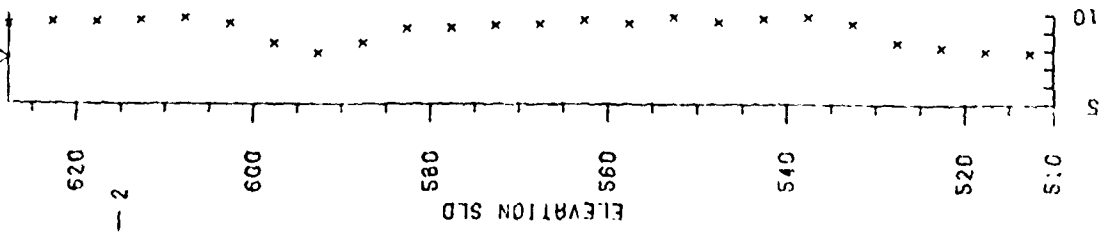
TEMPERATURE, DEGREES F

YEAR 1979 DAY 178

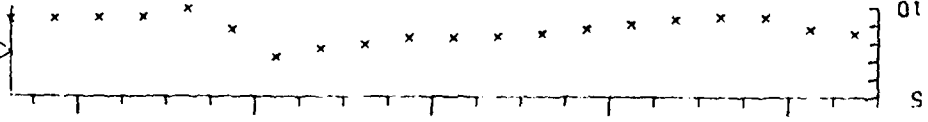
B-5

PORTAL LOCATION

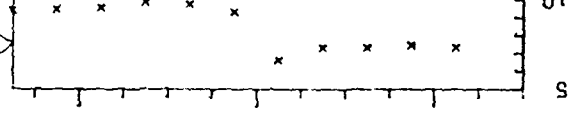
SECTION 1



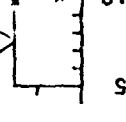
SECTION 3



SECTION 8



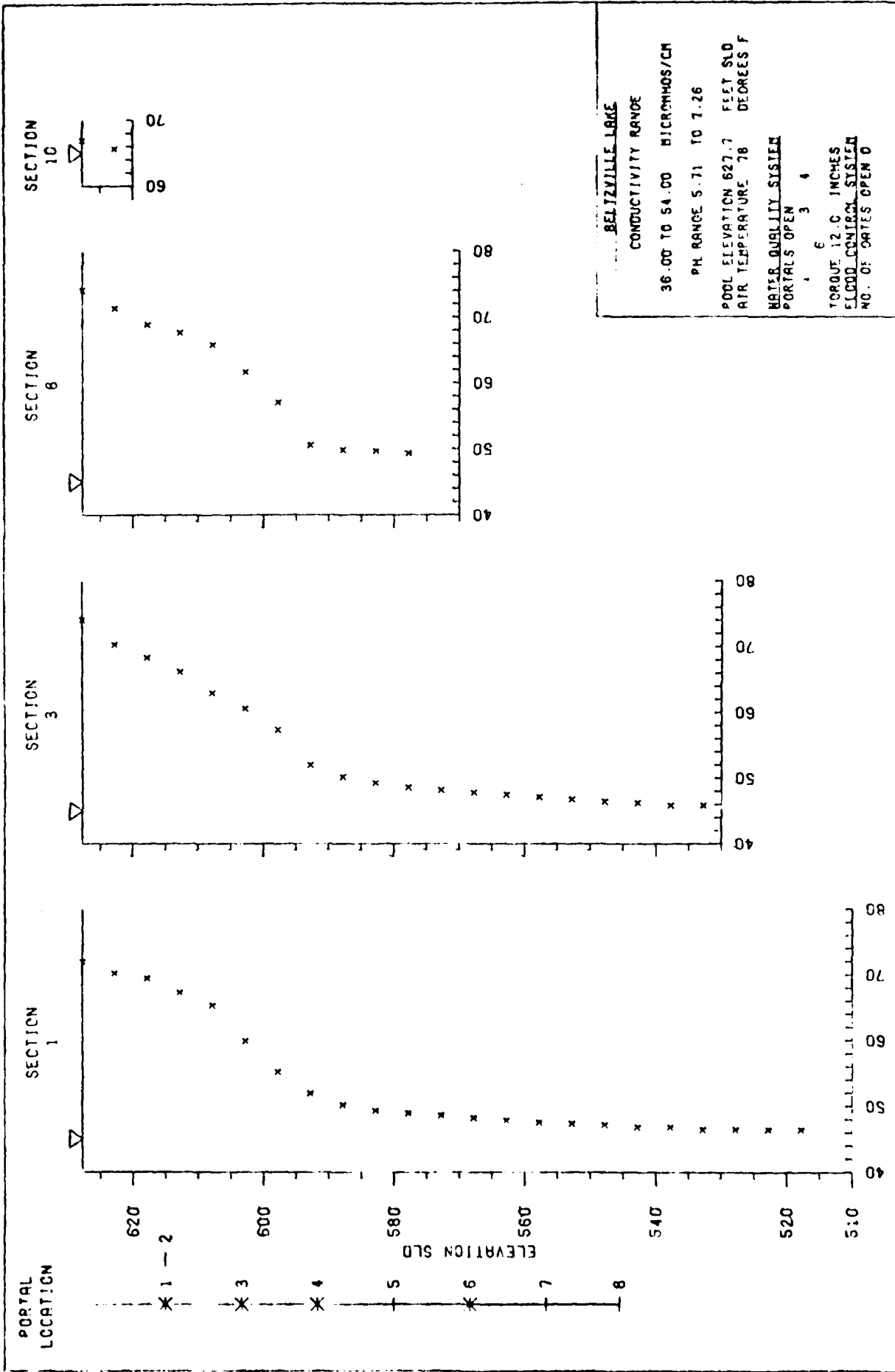
SECTION 10



BELLEVILLE LAKE
 CONDUCTIVITY RANGE
 43.00 TO 55.00 MICROMHOS/CM
 PH RANGE 5.86 TO 7.73
 POOL ELEVATION 627.6 FEET SLD
 AIR TEMPERATURE 69 DEGREES F
 WATER QUALITY SYSTEM
 PORTALS OPEN
 1 3 4
 6
 TORQUE 8.0 INCHES
 FLOOD CONTROL SYSTEM
 NO. OF COPIES OPEN 0
 RELEASE DATA
 CS CASE #1047 2.77 FT
 CS DISCHARGE 65 CFS
 CS TEMPERATURE 59 DEGREES F
 CS CONDUCTIVITY 51 MICROMHOS/CM
 CS PH 6.72
 CS DO 0.0 PPM

DISSOLVED OXYGEN, PPM
 YEAR 1979 Day 178

B-6



BELLEVILLE LAKE

CONDUCTIVITY RANGE
36.00 TO 54.00 MICROMHOS/CM

PH RANGE 5.71 TO 7.26

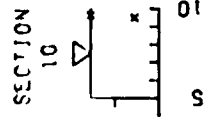
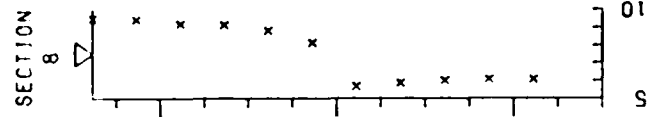
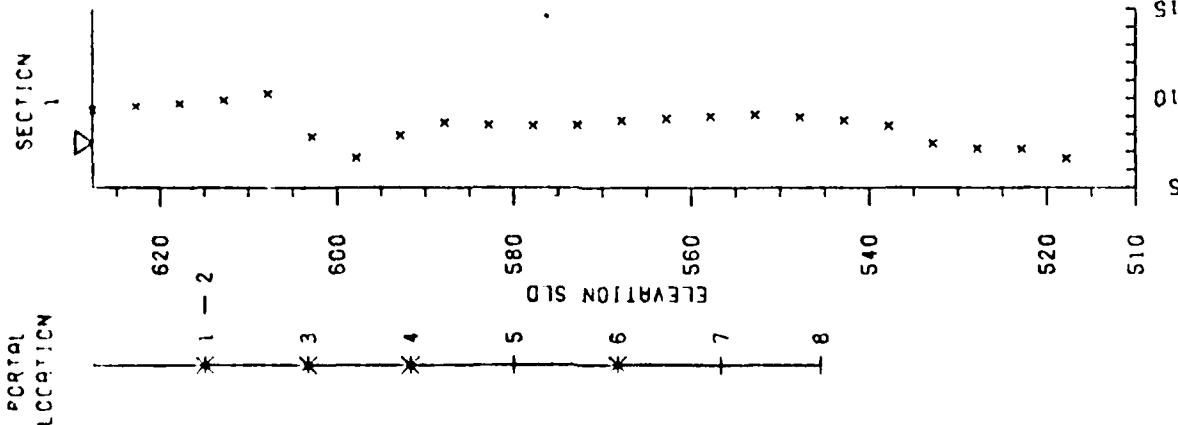
POOL ELEVATION 627.7 FEET SLD
AIR TEMPERATURE 78 DEGREES F

WATER QUALITY SYSTEM
PORTALS OPEN
1 3 4
6

TORQUE 12.0 INCHES
FLOOD CONTROL SYSTEM
NO. OF GATES OPEN 0

RELEASE DATA
DS OPER HEIGHT 2 92 FT
DS DISCHARGE 102 CFS
DS TEMPERATURE 61 DEGREES F
DS CONDUCTIVITY 49 MICROMHOS/CM
DS PH 6.54
DS DO 9.6 PPM

TEMPERATURE, DEGREES F
YEAR 1979 DAY 192



--- BELLEVILLE LAKE

CONDUCTIVITY RANGE
36.00 TO 54.00 MICROMHOS/CM

PH RANGE 5.71 TO 7.26

POOL ELEVATION 627.7 FEET SLD

AIR TEMPERATURE 78 DEGREES F

WATER QUALITY SYSTEM
PORTALS OPEN 1 3 4 6

TORQUE 12.0 INCHES

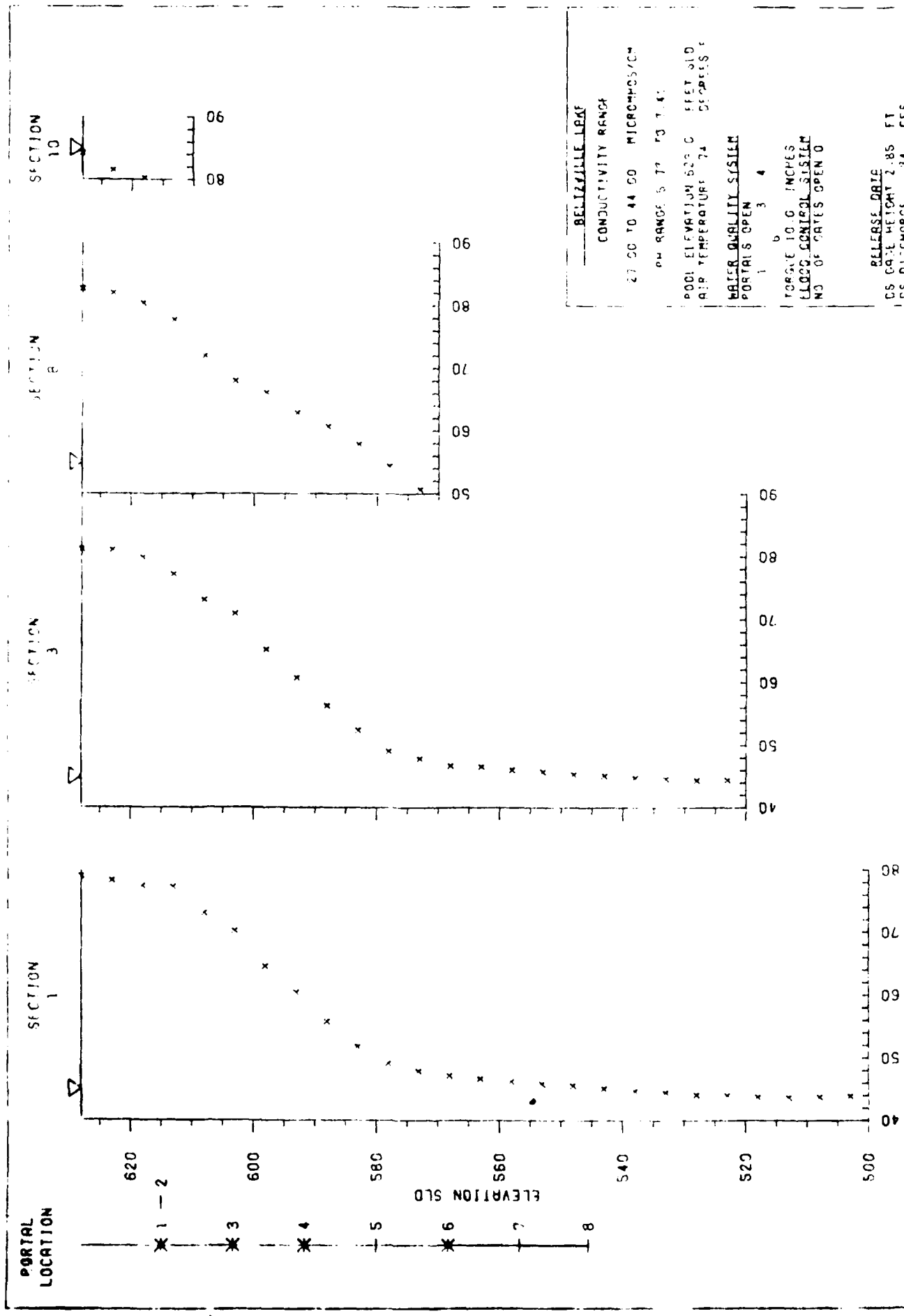
FLOOD CONTROL SYSTEM
NO. OF GATES OPEN 0

RELEASE DATA

DS CASE HEIGHT	2.92	FT
DS DISCHARGE	102	CFS
DS TEMPERATURE	61	DEGREES F
DS CONDUCTIVITY	49	MICROMHOS/CM
DS PH	6.54	PPM
DS PC	9.6	PPM

DISSOLVED OXYGEN, PPM
YEAR 1979 DAY 192

B-8

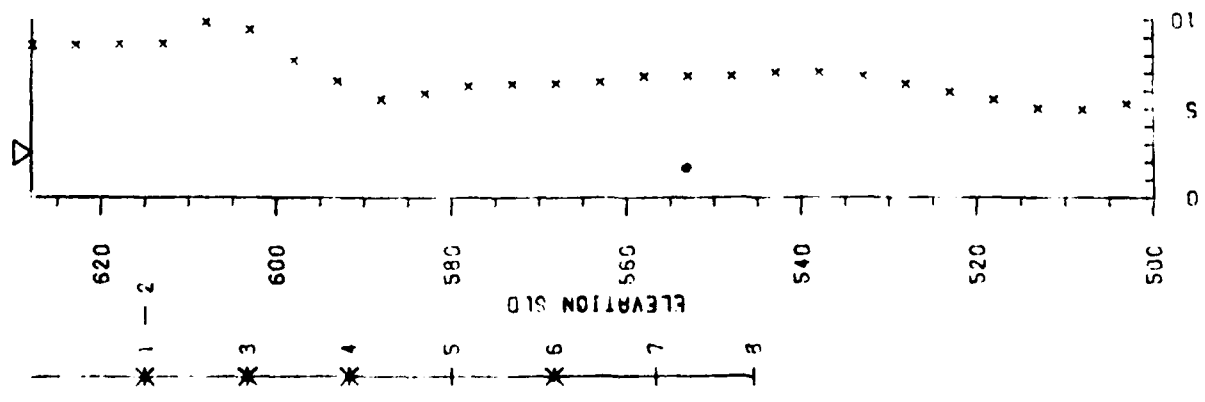


BELLEVILLE LAKE
 CONDUCTIVITY RANGE
 27.00 TO 44.00 MICROMHOS/CM
 PH RANGE 5.79 TO 7.41
 POOL ELEVATION 500.0 FEET AHD
 AIR TEMPERATURE 74 DEGREES F
 WATER QUALITY SYSTEM
 PORTALS OPEN 1 3 4
 TORQUE 10.0 INCHES
 LOGGICAL SYSTEM
 NO. OF GATES OPEN 0
 RELEASE DRIE
 CS CASE WEIGHT 2.85 FT
 CS DISCHARGE 34 CFS
 CS TEMPERATURE 63 DEGREES F
 CS CONDUCTIVITY 20 MICROMHOS/CM
 CS PH 7.41

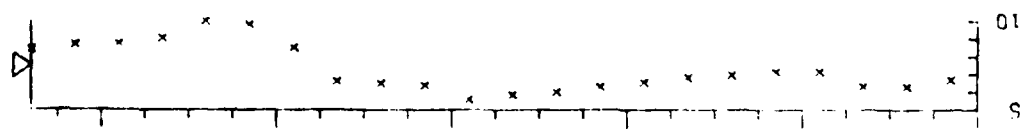
TEMPERATURE, DEGREES F
 40 50 60 70 80 90

PORTAL LOCATION

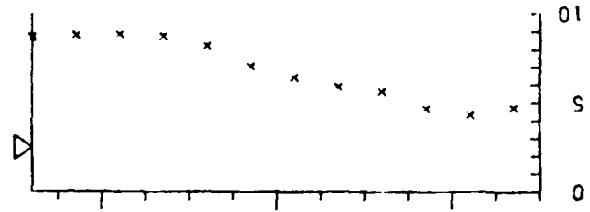
SECTION 1



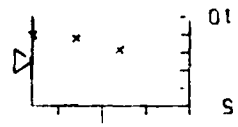
SECTION 3



SECTION 8



SECTION 10



BELLEVILLE LAKE
 CONDUCTIVITY RANGE
 27.00 TO 44.00 MICROMHO/CM
 PH RANGE 5.33 TO 7.41
 DOOR ELEVATION 72.00 FEET STD
 AIR TEMPERATURE 74 DEGREES F
 WATER QUALITY SYSTEM
 PORTALS OPEN 1 3 4 6
 TORQUE 10.0 INCHES
 FLOOD CONTROL SYSTEM
 NO. OF GATES OPEN 0
 RELEASE ORIA
 DS GATE HEIGHT 2.85 FT
 DS DISCHARGE 84 CFS
 DS TEMPERATURE 57 DEGREES F
 DS CONDUCTIVITY 27.00 MICROMHO/CM
 DS PH 7.41

DISSOLVED OXYGEN, PPM
 YEAR 1973 DAY 22

B-10

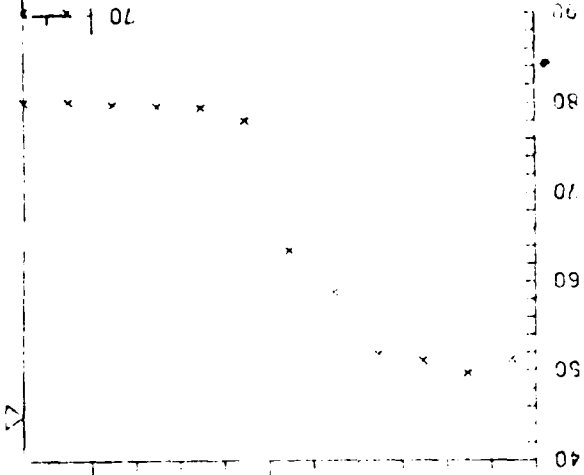
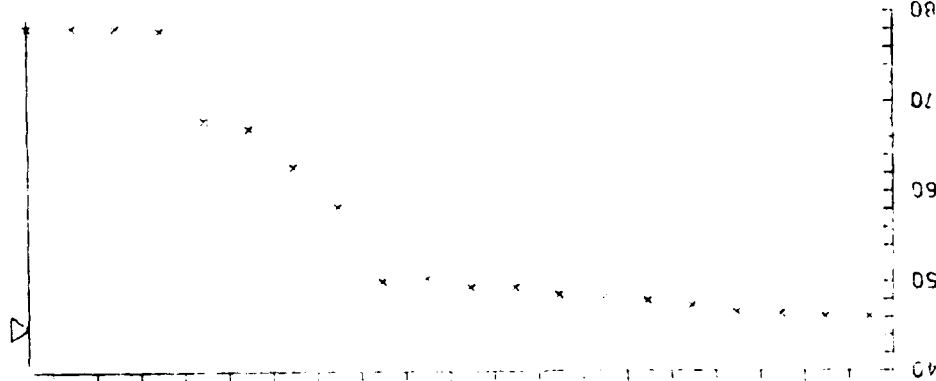
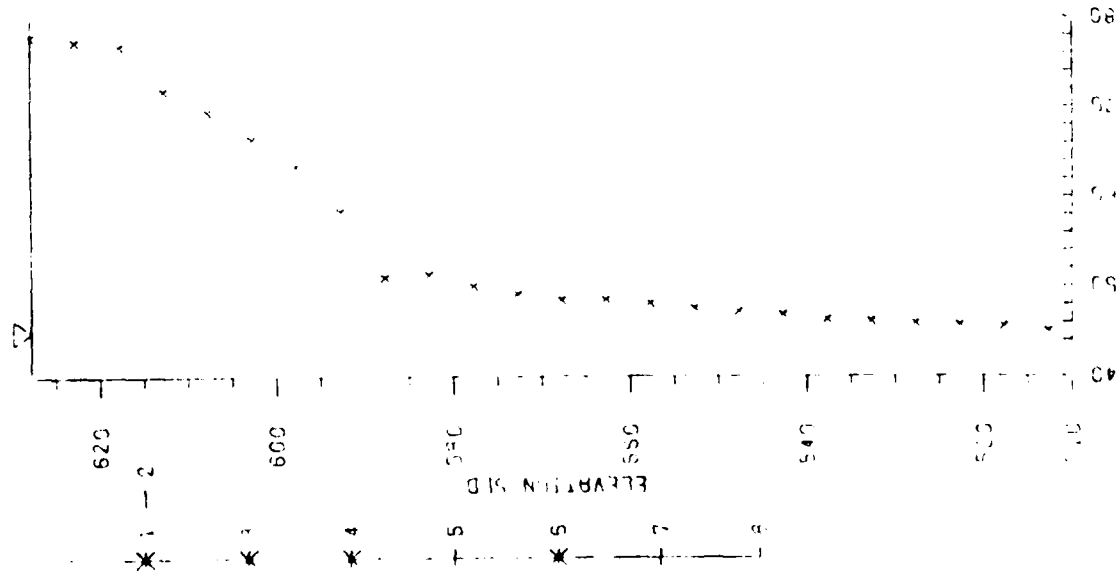
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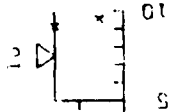


RELEASE DATA
 CS CABLE HEIGHT 2.78 FT
 CS DISCHARGE 67 CFS
 CS TEMPERATURE 65 DEGREES F
 CS CONDUCTIVITY 125 MICROMH/CM
 CS PH 7.20
 CS DO 1.5 PPM

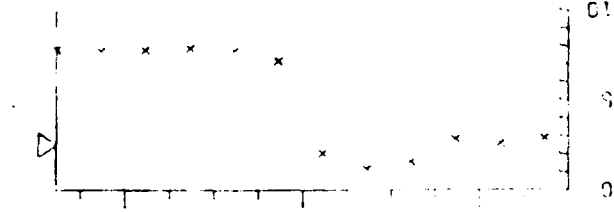
TEMPERATURE, GEOPHYSICAL
 YEAR 1979 DAY 270

B-11

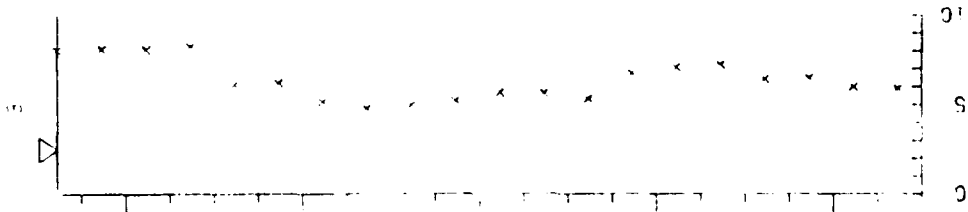
SECTION 10



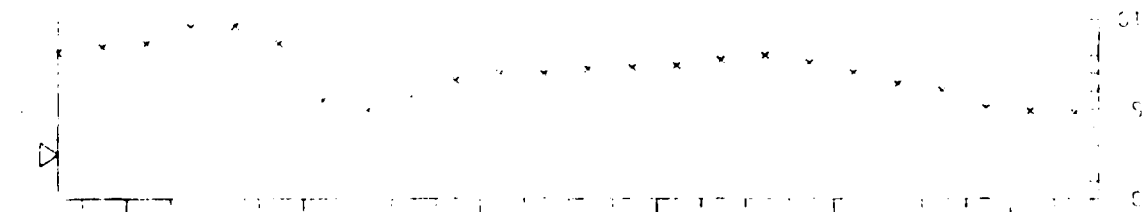
SECTION 9



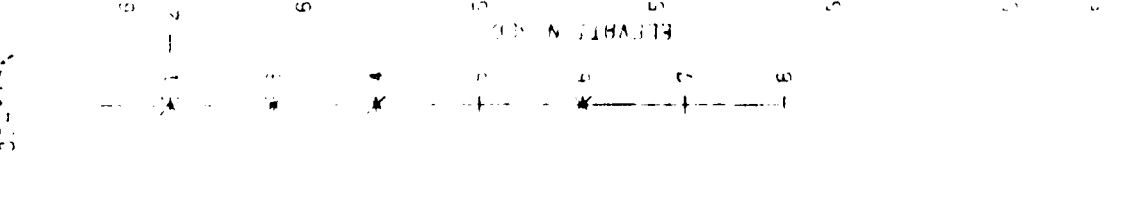
SECTION 8



SECTION 7



SECTION 6



RELIZVILLE LAKE

CONDUCTIVITY RANGE

7.00 TO 59.00 MICROMHSCM

PH RANGE 7.59 TO 7.48

POOL ELEVATION 627.7 FEET SLD

AIR TEMPERATURE 77 DEGREES F

WATER QUALITY SYSTEM

PORTALS OPEN

1 3 4

6

TOPQUE 2.0 INCHES

FLOOD CONTROL SYSTEM

NO. OF GATES OPEN 3

RELEASE DATA

DS GATE HEIGHT 2.78 FT

DS DISCHARGE 57 CFS

DS TEMPERATURE 55 DEGREES F

DS CONDUCTIVITY 25 MICROMHSCM

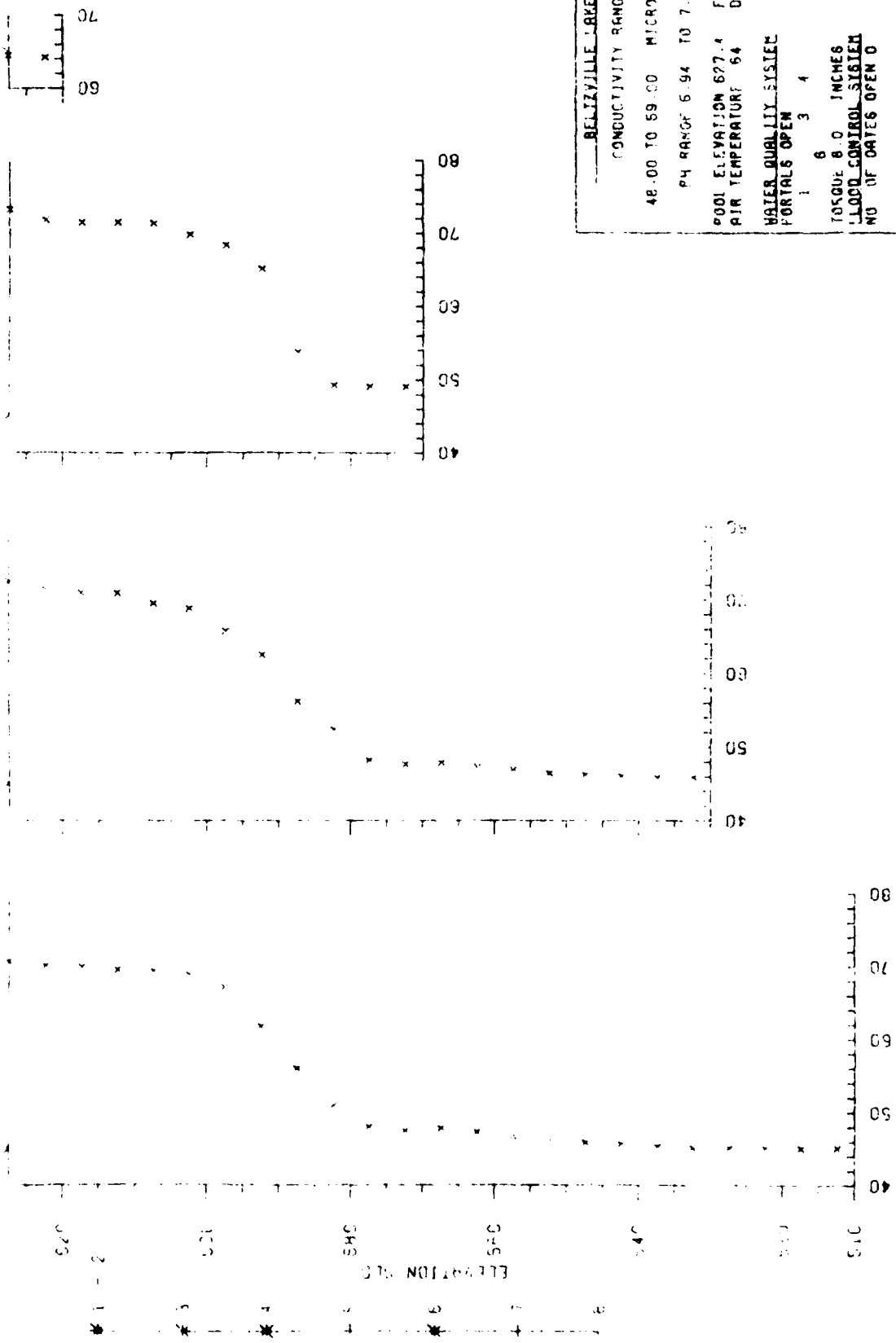
DS CM 0.29

DS DU 9.5 PPM

DISSOLVED OXYGEN, PPM

TEMP 70.3 65.1 22.0

B-12

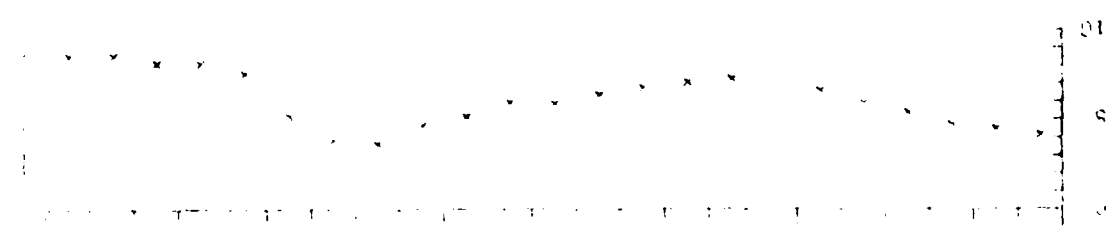
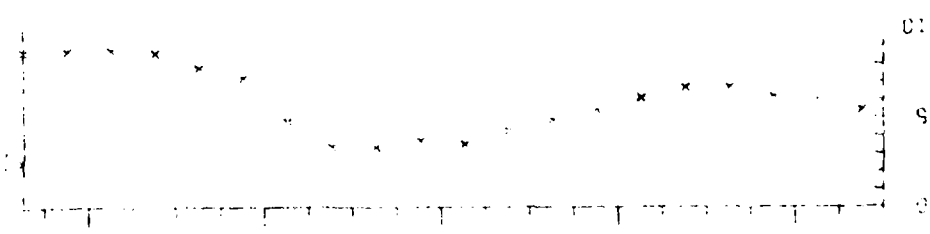
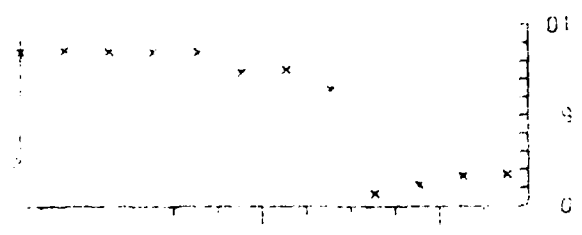
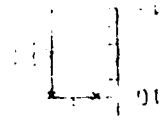


BELLEVILLE LAKE
 CONDUCTIVITY RANGE
 48.00 TO 59.00 MICROPHOS/1M
 PH RANGE 5.94 TO 7.39
 POOL ELEVATION 627.4 FEET 6LD
 AIR TEMPERATURE 64 DEGREES F
 WATER QUALITY SYSTEM
 PORTALS OPEN 1 3 4
 6
 TOSQUE 8.0 INCHES
 FLOOD CONTROL SYSTEM
 NO. OF DATES OPEN 0

RELEASE DATA
 DS ORDE HEIGHT 2.78 FT
 DS DISCHARGE 67 CFS
 DS TEMPERATURE 62 DEGREES F
 DS CONDUCTIVITY 51 MICROPHOS/CP
 DS PH 8.09
 DS DO 10.9 PPM

TEMPERATURE, DEGREES F
 YEAR 1979 DAY 234

B-13



6.0
 2
 5.0
 1
 4.0
 1
 3.0
 1
 2.0
 1
 1.0
 1
 0

BELLEVILLE, MISSOURI
 CONDUCTIVITY RANGE
 48.00 TO 59.00 MICROMHO/CM
 PH RANGE 6.94 TO 7.10
 POOL ELEVATION 520.4 FEET OVER
 AIR TEMPERATURE 74 F
 WATER QUALITY SYSTEM
 PORTALS OPEN 1 3 4 5 6
 TORQUE 8.0 INCHES
 FLOOD CONTROL SYSTEM
 NO. OF GATES OPEN 0
 RELEASE LAIR
 D6 GATE HEIGHT 2.78 FT
 D5 DISCHARGE 67 CFS
 D5 TEMPERATURE 52 DEGREES F
 D5 CONDUCTIVITY 61 MICROMHO/CM
 D5 PH 6.09
 D5 DO 10.9 PPM

DISSOLVED OXYGEN, PPM
 YEAR 1970 DAY 234

B-14

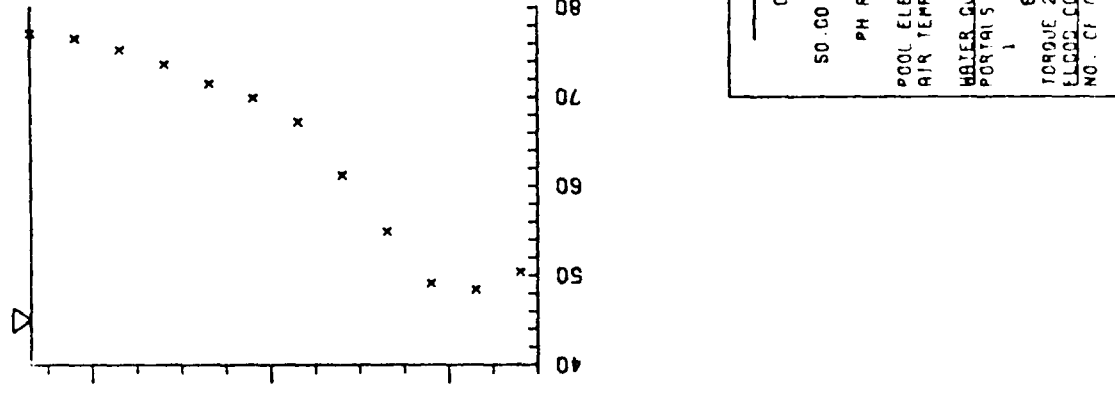
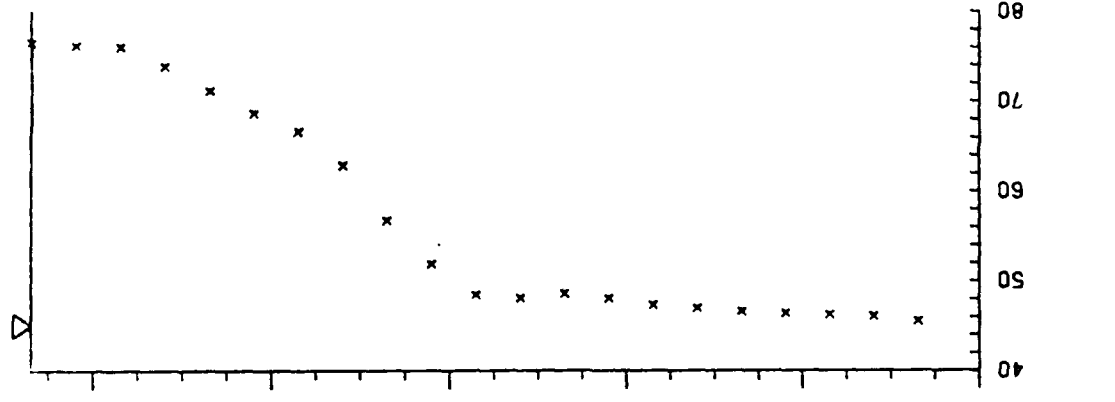
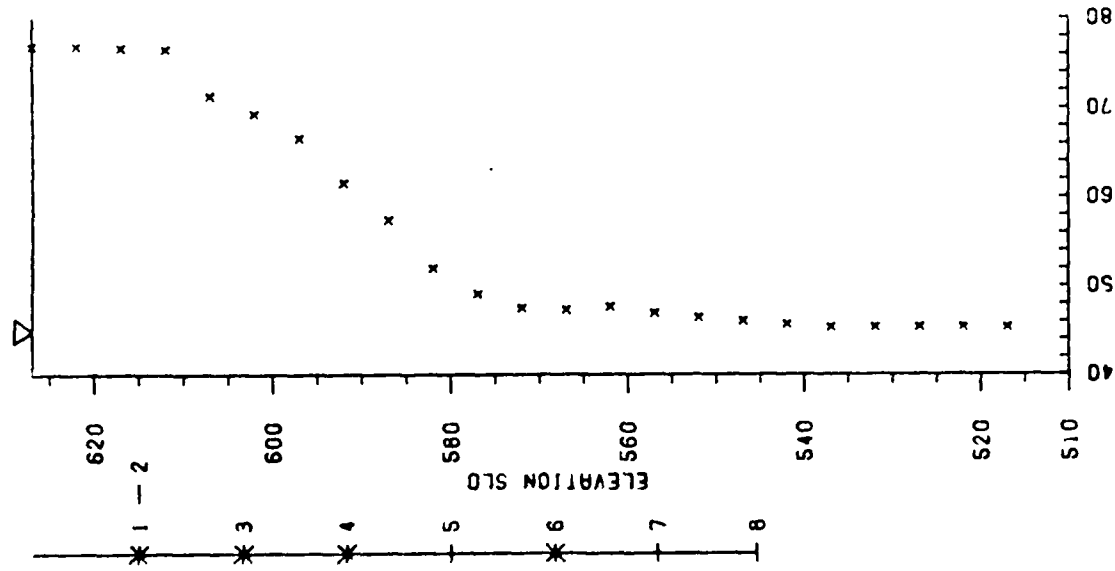
PORTAL LOCATION

SECTION 1

SECTION 3

SECTION 8

SECTION 10



BELLEVILLE LAKE
 CONDUCTIVITY RANGE
 50.00 TO 64.00 MICROMHOS/CM
 PH RANGE 5.91 TO 7.51
 POOL ELEVATION 626.9 FEET SLD
 AIR TEMPERATURE 70 DEGREES F
 WATER QUALITY SYSTEM
 PORTALS OPEN 1 3 4 6
 TORQUE 28.0 INCHES
 FLOOD CONTROL SYSTEM
 NO. CY GATES OPEN 0

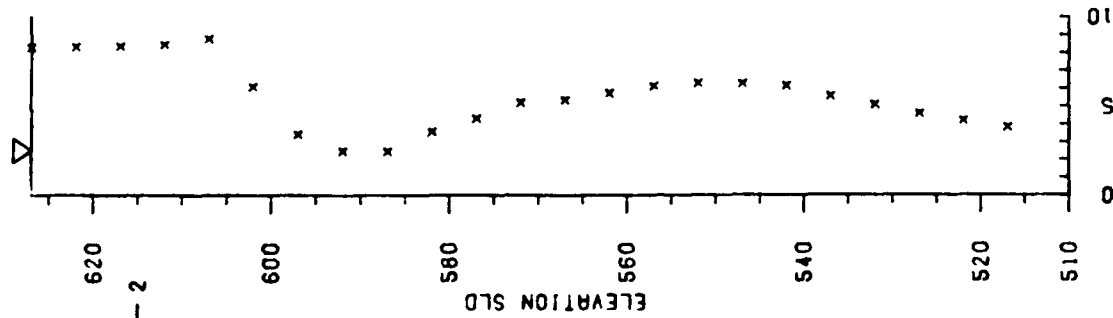
RELEASE DATA
 DS GAGE HEIGHT 3.38 FT
 DS DISCHARGE 278 CFS
 DS TEMPERATURE 65 DEGREES F
 DS CONDUCTIVITY 52 MICROMHOS/CM
 DS PH 6.36
 DS DO 6.9 PPM

TEMPERATURE, DEGREES F
YEAR 1979 DAY 248

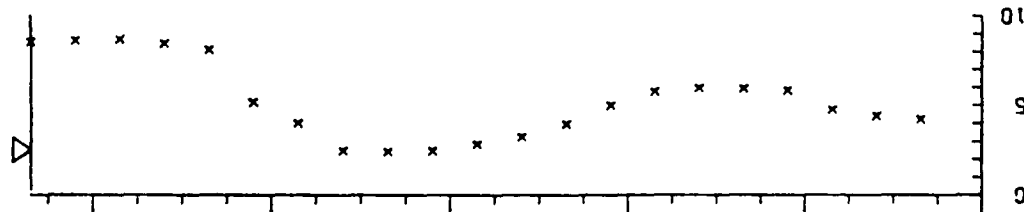
B-15

PORTAL LOCATION

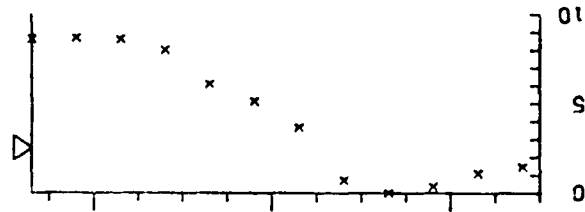
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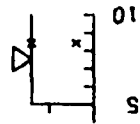
SECTION 3



SECTION 8



SECTION 10



BELLEVILLE LAKE

CONDUCTIVITY RANGE

50.00 TO 64.00 MICROMHOS/CM

PH RANGE 5.91 TO 7.51

POOL ELEVATION 526.9' FEET SLD

AIR TEMPERATURE 70 DEGREES F

WATER QUALITY SYSTEM

PORTALS OPEN

1 3 4

TORQUE 28.0 INCHES

ELLOAD CONTROL SYSTEM

NO. OF GATES OPEN 0

RELEASE DATA

DS GATE HEIGHT 3.39 FT

DS DISCHARGE 278 CFS

DS TEMPERATURE 55 DEGREES F

DS CONDUCTIVITY 52 MICROMHOS/CM

DS PH 6.36

DS DO 8.9 ppm

DISSOLVED OXYGEN, PPM
YEAR 1979 DAY 248

B-16

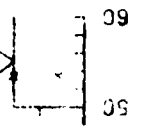
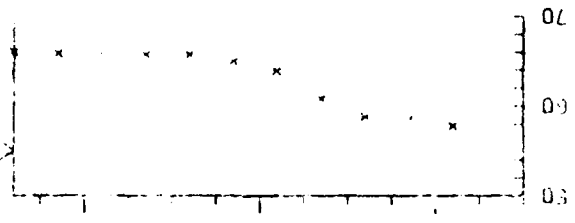
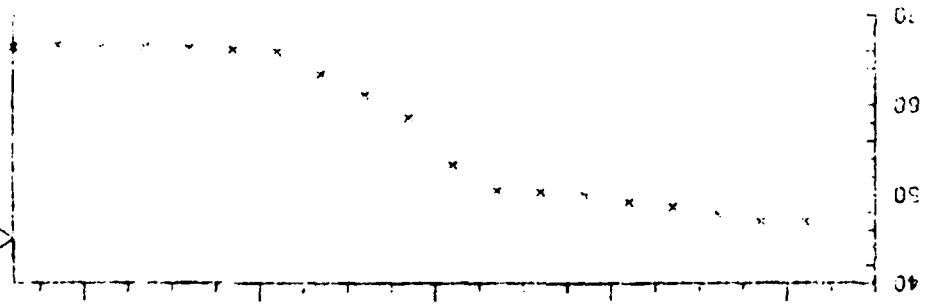
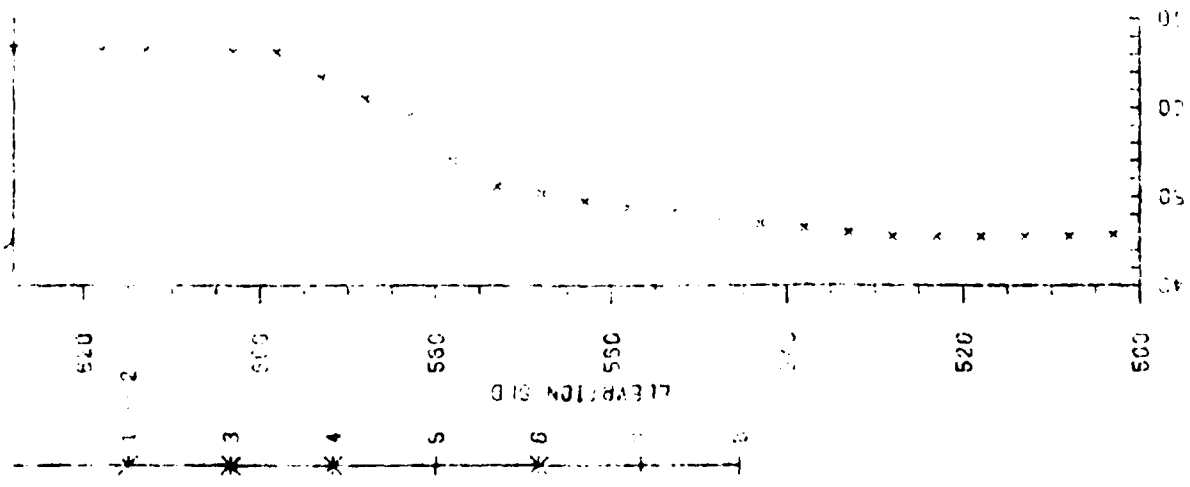
PORTAL LOCATION

SECTION 1

SECTION 3

SECTION 4

SECTION 10



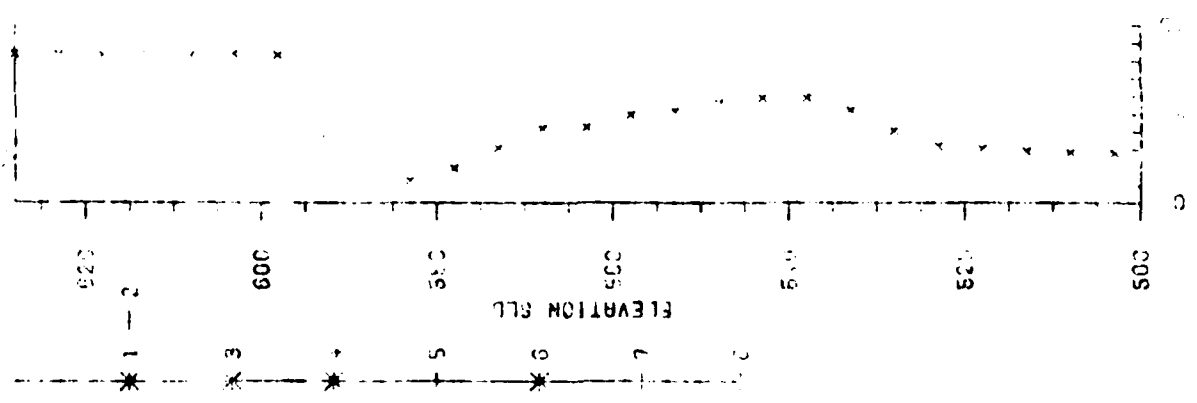
BELLEVILLE LAKE
 CONDUCTIVITY RANGE
 49.00 TO 61.00 MICROMHOS/CM
 PH RANGE 5.58 TO 6.95
 POOL ELEVATION 528.0 FEET SLG
 AIR TEMPERATURE 53 DEGREES F
 WATER QUALITY SYSTEM
 PORTALS OPEN
 1 3 4
 6
 TORQUE 6.0 INCHES
 LOAD CONTROL SYSTEM
 NO. OF GATES OPEN 0

RELEASE DATA
 US DATE HEIGHT 2.05 FT
 US DISCHARGE 42 CFS
 US TEMPERATURE 60 DEGREES F
 US CONDUCTIVITY 52 MICROMHOS/CM
 US PH 6.5

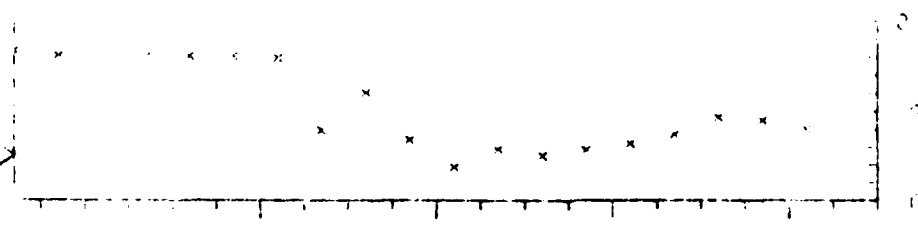
TEMPERATURE, DEGREES F

PURVIS
LOCATION

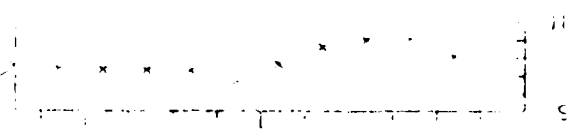
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1



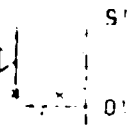
SECTION
3



SECTION
5



SECTION
5



SECTION 1
CONDUCTIVITY MONITOR

PORTS 1-6
TEMPERATURE DECREASE

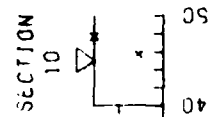
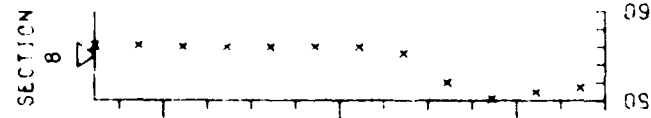
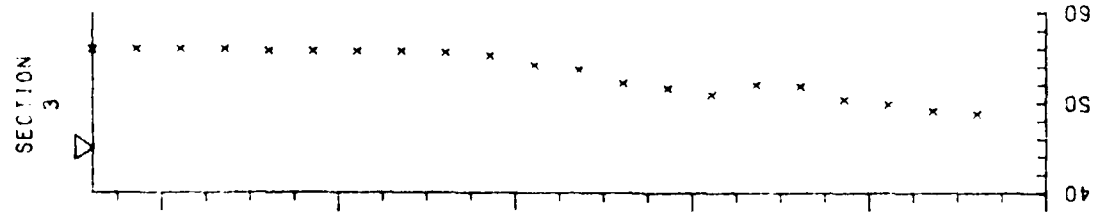
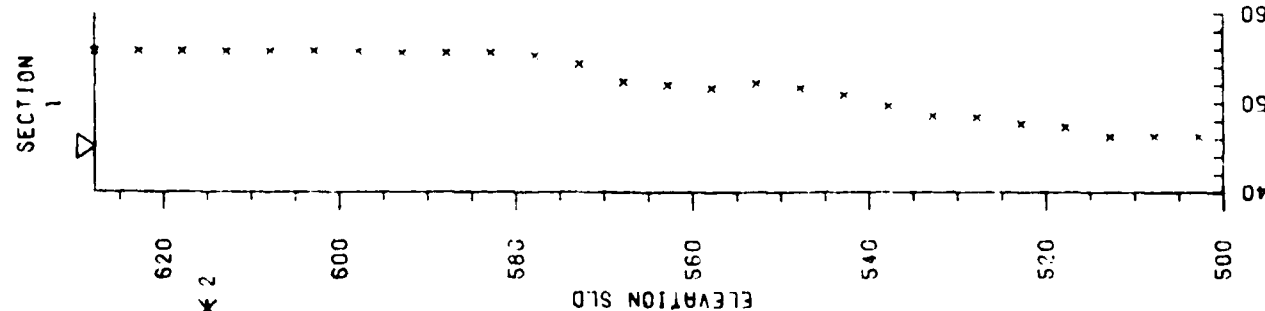
WATER QUALITY SYSTEM
PORTS 1-6

TORQUE 5.0 INCHES
LOAD CONTROL SYSTEM
NO. OF PORTS 6

MANUAL DATA
DATE HEIGHT 1.65
NO. OF PORTS 6
NO. OF PORTS 6

SECTION 1

PORTAL LOCATION



BELLEVILLE LAKE

CONDUCTIVITY RANGE
45.00 TO 57.00 MICROMHOS/CM

PH RANGE 5.40 TO 6.50

POOL ELEVATION 627.6 FEET SLC
AIR TEMPERATURE 49 DEGREES F

WATER QUALITY SYSTEM
PORTALS OPEN
1 2 3 4
6

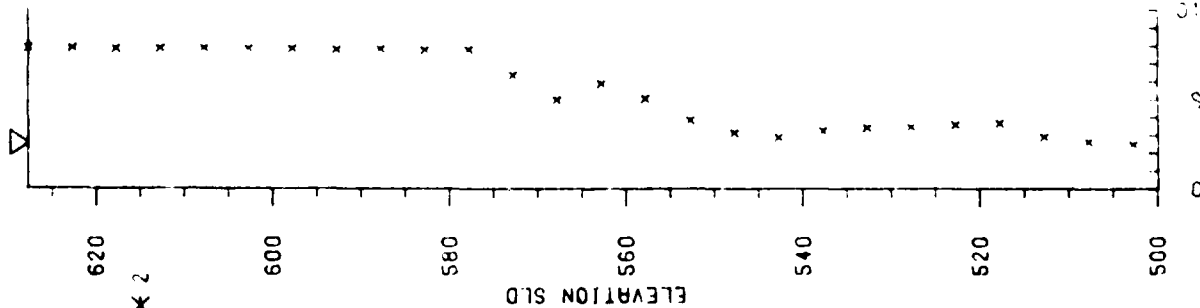
TORQUE 19.0 INCHES
FLOOD CONTROL SYSTEM
NO. OF GATES OPEN 0

RELEASE DATA
DS GAGE HEIGHT 3.12 FT
DS DISCHARGE 167 CFS
DS TEMPERATURE 58 DEGREES F
DS CONDUCTIVITY 49 MICROMHOS/CM
DS PH 5.4

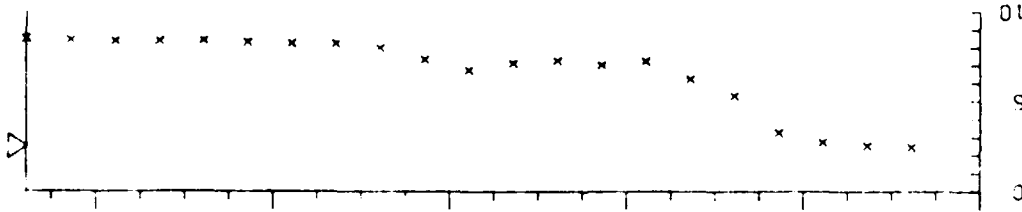
TEMPERATURE, DEGREES F

PORTAL LOCATION

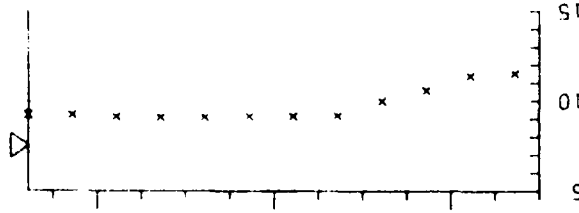
SECTION 1



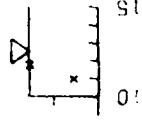
SECTION 3



SECTION 8



SECTION 10



ELEVATION SLD

BELLEVILLE LAKE

CONDUCTIVITY RANGE

45.00 TO 57.00 MICROMHOS/CM

PH RANGE 5.40 TO 6.50

POOL ELEVATION 527.4 FEET SLD

AIR TEMPERATURE 49 DEGREES F

WATER QUALITY SYSTEM

PORTALS OPEN

1 2 3 4

6

TORQUE 19.0 INCHES

FLOOD CONTROL SYSTEM

NO OF GATES OPEN 0

RELEASE ORIA

DS GAGE HEIGHT 3.12 FT

DS DISCHARGE 157 CFS

DS TEMPERATURE 55 DEGREES F

DS CONDUCTIVITY 49 MICROMHOS/CM

DS PH 6.32

DS DO 3.0 ppm

DISSOLVED OXYGEN, PPM

DATE TIME

B-20

APPENDIX C

WATER AND WASTE WATER REPORT - COMMONWEALTH OF PENNSYLVANIA
WQN-STA. 132, POHOPOCO CREEK

APPENDIX - C

NO.	DESCRIPTION	QTY	UNIT	PRICE	AMOUNT
1
2
3
4
5
6
7
8
9
10
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APPENDIX - C - 1

APPENDIX C

WATER AND WASTEWATER REPORT

SAMPLE NUMBER 0307575 NAME ROBERT FREY LAB NO 741275

ESTAB - WQN 132 CASE -

FACILITY - WQN STATION NO- 132

ID CODE NONE TIME 10.45 11/13/79 DATE TYPE 01 NUMBER 11

LAT - LONG - 0 STATION - 010 RECEIVED - 11/14/79

REPORT REVIEWED BY *[Signature]* DATE - 11/22/79

FIELD ANALYSES :

00065 GASE READING 3.5000 FT.
 00010 TEMP, FIELD 9.5000 CELC
 00400 PH, FIELD 6.2000
 00300 D.H., FIELD 10.8000

LABORATORY ANALYSES :

STORET	DESCRIPTION	RESULT	VERIFY	BY	DATE	VERIFY
00076	TURB N METER	2.0000	FTU	G	9LS	11/15/79
00095	SPEC COND	65.0000		G	HWS	11/23/79
00403	PH LAB	7.3000		G	WVM	11/14/79
00410	T ALK CAC03	12.0000	MG/L	G	WVM	11/14/79
00515	RES DISS/105	34.0000	MG/L	G	HWS	11/15/79
00610	T NH3-N	.0100	MG/L	G	ICB	11/14/79
00615	T NO2-N	.0060	MG/L	G	ICB	11/14/79
00620	T NO3-N	.6700	MG/L	G	ICB	11/14/79
00665	PHOS-T MG/L	.0400	MG/L	G	LRS	11/14/79
00900	T HARD CAC03	< 20.0000	MG/L	G	ICB	11/15/79
00915	CA, TOTAL	4.0000	MG/L	G	PYS	11/23/79
00927	MG TOT MG/L	2.7500	MG/L	G	WJF	11/26/79
00940	CHLORIDE	8.0000	MG/L	G	ICB	11/15/79
00945	SO4 TOT	5.0000	MG/L	G	ICB	11/15/79
01045	FE TOT	60.0000	US/L	G	EVC	11/15/79
70508	T ACIDITY HT	.0000	MG/L	G	HWS	11/23/79
01055	MN TOTAL	40.0000	US/L	G	BLT	11/17/79

APPENDIX D
BACTERIOLOGICAL DATA, PHILADELPHIA DISTRICT

HEATVILLE LAKE
 TOTAL COLIFORM COUNTS - NORTHERN AREA DAM SITES

SAMPLE	SAMPLE DATE	
B-1	10-17-78	300
B-2	10-31-78	< 100
B-3		500
B-4		1000
B-5		2000
B-6		4200
B-7		< 50
B-8		1400
B-9		1000

Blank spaces indicate no results either due to equipment failure or poor samples
 All counts are to be expressed as the number of colonies per 100 milliliters of sample
 Water samples collected by personnel at Northern Area Office
 Sampling site locations (Plate /)

HEMPSTEAD LAKE
 FORMAL COLIFORM COUNTS - NORTHERN AREA DAM SITES

SECTION	DATE	SAMPLE DATE
B-1	10-17-78	10-31-78
B-2	2	2
B-3	2	2
B-4	2	2
B-5	26	2

Results reflect no bacteria either due to equipment failure or poor sampling technique. Results are to be compared to the number of colonies per 100 milliliters of sample.

Water samples collected by personnel at Northern Area Office

Sampling site locations (PLATE 1)

BELLEVILLE LAKE
TOTAL COLIFORM COUNTS - NORTHERN AREA DAM SITES

PROJECT	SAMPLE DATE
B-1	11-14-78
B-2	11-28-78
B-3	11-28-78
B-4	11-28-78
B-5	11-28-78

Blank spaces indicate no results either due to equipment failure or poor samples
All counts are to be expressed as the number of colonies per 100 milliliters of sample
Water samples collected by personnel at Northern Area Office
Sampling site locations (Plate /)

BEAUVILLE LAKE
FECAL COLIFORM COUNTS - NORTHERN AREA DAM SITES

STATION	DATE	SAMPLE DATE
E-1	11-14-78	11-28-78
E-2	11-14-78	11-28-78
E-3	11-14-78	11-28-78
E-4	11-14-78	11-28-78
E-5	11-14-78	11-28-78

Plate pieces indicate no fecal coliform either due to equipment failure or poor samples. All counts are to be expressed as the number of colonies per 100 milliliters of sample. Water samples collected by personnel at Northern Area Office sampling site locations (PLATE 1)

BELTVILLE LAKE
TOTAL COLIFORM COUNTS - NORTHERN AREA DAM SITES

TR. NO.	SAMPLE DATE
BELTVILLE	12-12-78
B-1	800
B-2	700
B-3	tntr
B-4	000
B-5	2000

Blank spaces indicate no results either due to equipment failure or poor samples
All counts are to be expressed as the number of colonies per 100 milliliters of sample
Water samples collected by personnel at Northern Area Office
Sampling site locations (Plate /)

BEHEVILLE LAKE
ALGAL COLIFORM COUNTS - NORTHERN AREA LAK SITES

SAMPLE DATE

12-12-78

1

3

41

10

25

Counts are expressed either due to equipment failure of poor samples
Counts are to be expressed as the number of colonies per 100 milliliters of sample
Water samples collected by personnel at Northern Area office
sample site locations (PLATE 1)

BELEVILLE LAKE
FLORA CRYPTOCOCCUS COUNTS - NORTHERN AREA DAN SITES

DATE	SAMPLE DATE
12-12-78	9
	3
	8
	12
	7C

Number of colonies is indicated on receipt either due to equipment failure or poor samples
Data values are to be expressed as the number of colonies per 100 milliliters of sample
Water samples collected by personnel at Northern Area Office
Sampling site locations (PLATE 1)

BELLEVILLE LAKE
 TOTAL COLIFORM COUNTS - NORTHERN AREA DAM CILES

STATION	SAMPLE DATE		
	1-9-70	2-6-70	3-6-70
B-1	1200	300	10
B-2	1400	20	20
B-3	65	300	130
B-4	250	40	40
B-5	nmc	210	250

Blank spaces indicate no results either due to equipment failure or poor samples
 All counts are to be expressed as the number of colonies per 100 milliliters of sample
 Water samples collected by personnel at Northern Area Office
 Sampling site locations (Plate 1)

FECAL STREPTOCOCCUS COUNTS - HOUSTON AREA SANITIS

DATE	SAMPLES		COUNTS	DATE
	1-9-79	2-6-79		
1	8	8	17	< 5
2	21	6	112	20
3	16	49	48	3
4	1	4	50	20
5	68	17	8000	76

Counts are reported as number of colonies per 100 milliliters of sample. The number of colonies per 100 milliliters of sample is multiplied by 100 to give the number of colonies per 100 milliliters of sample. The number of colonies per 100 milliliters of sample is reported as (PLATE 1)

AD-A097 171

ARMY ENGINEER DISTRICT PHILADELPHIA PA
BELTZVILLE LAKE PROJECT WATER QUALITY DATA REPORT (RCS DAEN-CWE--ETC(U)
DEC 79

F/G 8/8

UNCLASSIFIED

DAEN/NAP-01340/WQDR79-79/

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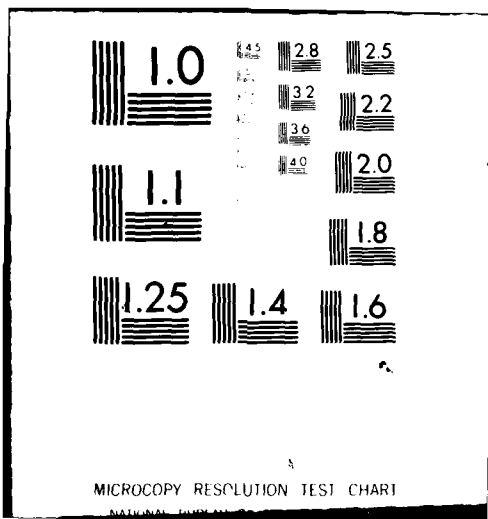
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MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

BELTZVILLE LAKE
FECAL COLIFORM COUNTS - NORTHERN AREA DAM SITES

PROJECT	5-2-79	5-15-79	SAMPLE DATE	6-19-79	7-10-79
B-1	1	4	10	?	5
B-2	4	6	45	40	50
B-3	1	50	1	41	7
B-4	2	1	1	112	410
B-5	147	310	155	230	220

Blank spaces indicate no results either due to equipment failure or poor samples

All counts are to be expressed as the number of colonies per 100 milliliters of sample

Water samples collected by personnel at Northern Area Office

Sampling site locations (PLATE 1)

BELZVILLE LAKE
 FECAL STREPTOCOCCUS COUNTS - NORTHERN AREA DAM SITES

PROJECT	5-2-79	5-15-79	6-5-79	6-19-79	7-10-79
B-1	1500	< 10	12	95	40
B-2	1600	< 100	23	104	40
B-3	2500	< 100	18	342	< 20
B-4	11200	84	16	386	< 20
B-5	6	< 1000	102	850	60

Blank spaces indicate no results either due to equipment failure or poor samples
 and counts are to be expressed as the number of colonies per 100 milliliters of sample
 Water samples collected by personnel at Northern Area Office
 Sampling site locations (PLATE 1)

BELTZVILLE LAKE
TOTAL COLIFORM COUNTS - NORTHERN AREA DAM SITES

PROJECT	SAMPLE DATE		
	7-24-79	8-7-79	8-21-79
B-1	1200	600	1200
B-2	3200	2000	700
B-3	3500	600	800
B-4	20000	4000	1200
B-5	20000	3000	4300

9-25-79

9-11-79

8-21-79

8-7-79

7-24-79

Blank spaces indicate no results either due to equipment failure or poor samples
 All counts are to be expressed as the number of colonies per 100 milliliters of sample
 Water samples collected by personnel at Northern Area Office
 Sampling site locations (Plate /)

APPENDIX E

ANNUAL BACTERIOLOGICAL TEST REPORT OF PUBLIC
BATHING WATERS, PENNSYLVANIA DER

APPENDIX F

RECORD OF PUBLIC DRINKING WATER SUPPLY,
PENNSYLVANIA DER

APPENDIX G

LETTER REPORTS OF WATER SAMPLES
TAKEN AT CORPS HEADQUARTERS, BELTZVILLE
LAKE (PERI, INC.)



WILKES-BARRE CENTER
39 PUBLIC SQUARE, WILKES-BARRE, PENNSYLVANIA 18711
(717) 822-5108

Laboratory No. III-36-B
EPA 39-114 (MI)

January 12, 1979

U. S. Army Corp. of Engineers
North Area Office
Beltzville
R. D. # 4
Lehighton, PA 18235

Attention: Mr. John Lakatosh

Dear Mr. Lakatosh:

Following are the results of the water analyses performed on Beltzville Drinking Water submitted to us on:

Date	Coliform Colonies / 100 ml. sample	Fecal Coliform Colonies / 100 ml. sample
5-23-78	<1	<1
7-25-78	<1	<1
8-8-78	<1	<1
10-17-78	<1	<1
12-12-78	<1	<1
1-8-79	<1	<1

The above results indicate this water at the time of sampling was free from bacteriological (coliform) pollution and meets U. S. Public Health Service Standards for drinking water.

If you have any questions concerning the above results, please contact me at your convenience.

Sincerely,

PENNSYLVANIA ENERGY RESOURCES, INC.

Joseph F. Calabro, Ph. D.
Water Quality Manager

JFC:ss

G-1



Laboratory No. III-36-B
EPA 39-114 (MI)

WILKES-BARRE CENTER BUILDING
39 PUBLIC SQUARE, WILKES-BARRE, PENNSYLVANIA 18711

July 20, 1979

U. S. Army Engineer District, Phila.
Custom House, 2nd & Chestnut Streets
Philadelphia, PA 19106

Gentlemen:

Following are the results of the bacteriological analyses performed on drinking water samples collected from Beltzville, Frances Walter, and the Prompton Dams:

<u>Date & Location</u>	<u>Coliform Colonies / 100 ml. sample</u>	<u>Fecal Coliform Colonies / 100 ml. sample</u>
3-6-79 Beltzville	< 1	< 1
4-3-79 Beltzville, Frances Walter, Prompton	< 1	< 1
5-2-79 Beltzville, Frances Walter, Prompton	< 1	< 1
5-15-79 Beltzville, Frances Walter, Prompton	< 1	< 1
6-5-79 Beltzville, Frances Walter, Prompton	< 1	< 1
7-10-79 Beltzville, Frances Walter, Prompton	< 1	< 1

The above results indicate this water at the time of sampling was free from bacteriological (coliform) pollution and meets U. S. Public Health Service Standards for drinking water.

Sincerely,

PENNSYLVANIA ENERGY RESOURCES, INC.

Joseph F. Calabro, Ph. D.
Water Quality Manager

JFC:ss

G-2



WILKES-BARRE CENTER BUILDING
39 PUBLIC SQUARE, WILKES BARRE, PENNSYLVANIA 18711

Laboratory No. III-36-B
EPA 39-114 (MI)

October 2, 1979

U.S. Army Engineer District, Phila.
Custom House, 2nd & Chestnut Streets
Philadelphia, PA 19106

Gentlemen:

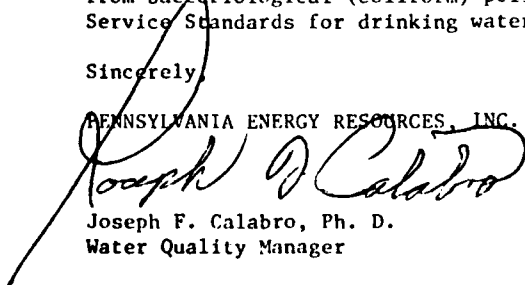
Following are the results of the bacteriological analyses performed on drinking water samples collected from Beltzville, Frances Walter, and the Prompton Dams:

<u>Date & Location</u>	<u>Coliform Colonies / 100 ml. sample</u>	<u>Fecal Coliform / 100 ml. sample</u>
7-24-79 Beltzville, Frances Walter, Prompton	< 1	< 1
8-7-79 Beltzville, Frances Walter, Prompton	< 1	< 1
8-21-79 Beltzville, Frances Walter, Prompton	< 1	< 1
9-11-79 Beltzville, Frances Walter, Prompton	< 1	< 1
9-25-79 Beltzville, Frances Walter, Prompton	< 1	< 1

The above results indicate this water at the time of sampling to be free from bacteriological (coliform) pollution and meets U.S. Public Health Service Standards for drinking water.

Sincerely,

PENNSYLVANIA ENERGY RESOURCES, INC.


Joseph F. Calabro, Ph. D.
Water Quality Manager

JFC:ss

G-3

TABLE 1

BELTZVILLE LAKE - CLIMATOLOGICAL DATA - 1979

TABLE 1

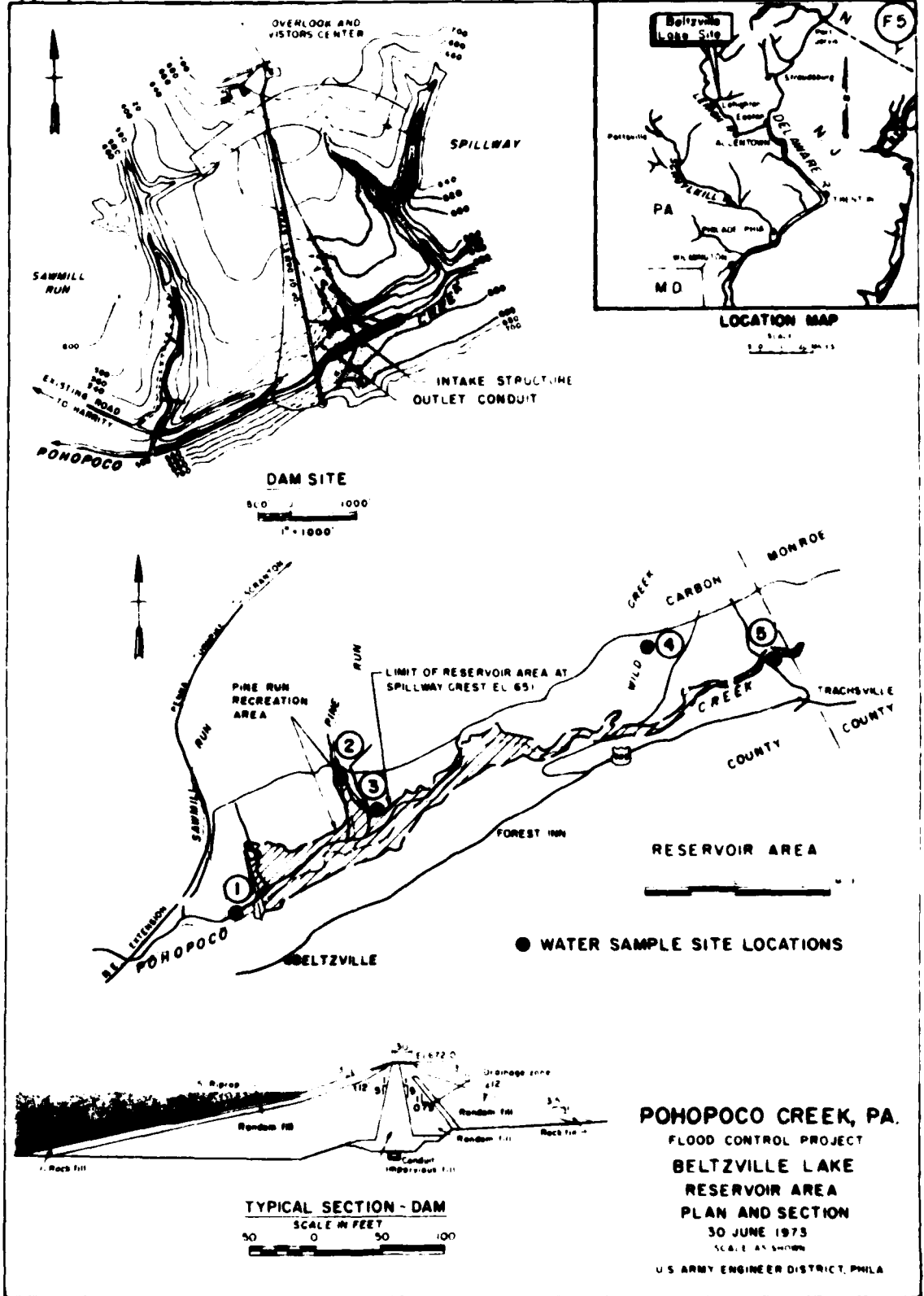
BELTZVILLE LAKECLIMATOLOGICAL DATA - 1979^{1/}

	Precipitation (inches)	Snow (inches)	Avg. Temp. (°F)	High Temp. (°F)	Low Temp. (°F)	Days with Precipitation
Jan.	10.43					
Feb.	4.17	18.0	16.0	46.0	-15	13
Mar	1.42	0	37.8	71	10	3
Apr	5.14	Trace	49.5	77.0	25.0	15
May	7.82	0	58.2	90.0	28.0	20
June	2.60	0	62.0	89.0	35.0	8
July	1.12	0	69.0	91.0	40.0	14
Aug	3.61	0	68.0	90.0	36.0	10

1/ Extracted from the Monthly Summary Report - NOAA.

PLATE 1

LOCATION MAP AND WATER SAMPL
TEST SITE LOCATIONS



POHOPOCO CREEK, PA.
 FLOOD CONTROL PROJECT
BELTZVILLE LAKE
 RESERVOIR AREA
 PLAN AND SECTION
 30 JUNE 1973
 SCALE AS SHOWN
 U.S. ARMY ENGINEER DISTRICT, PHILA

DATA
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