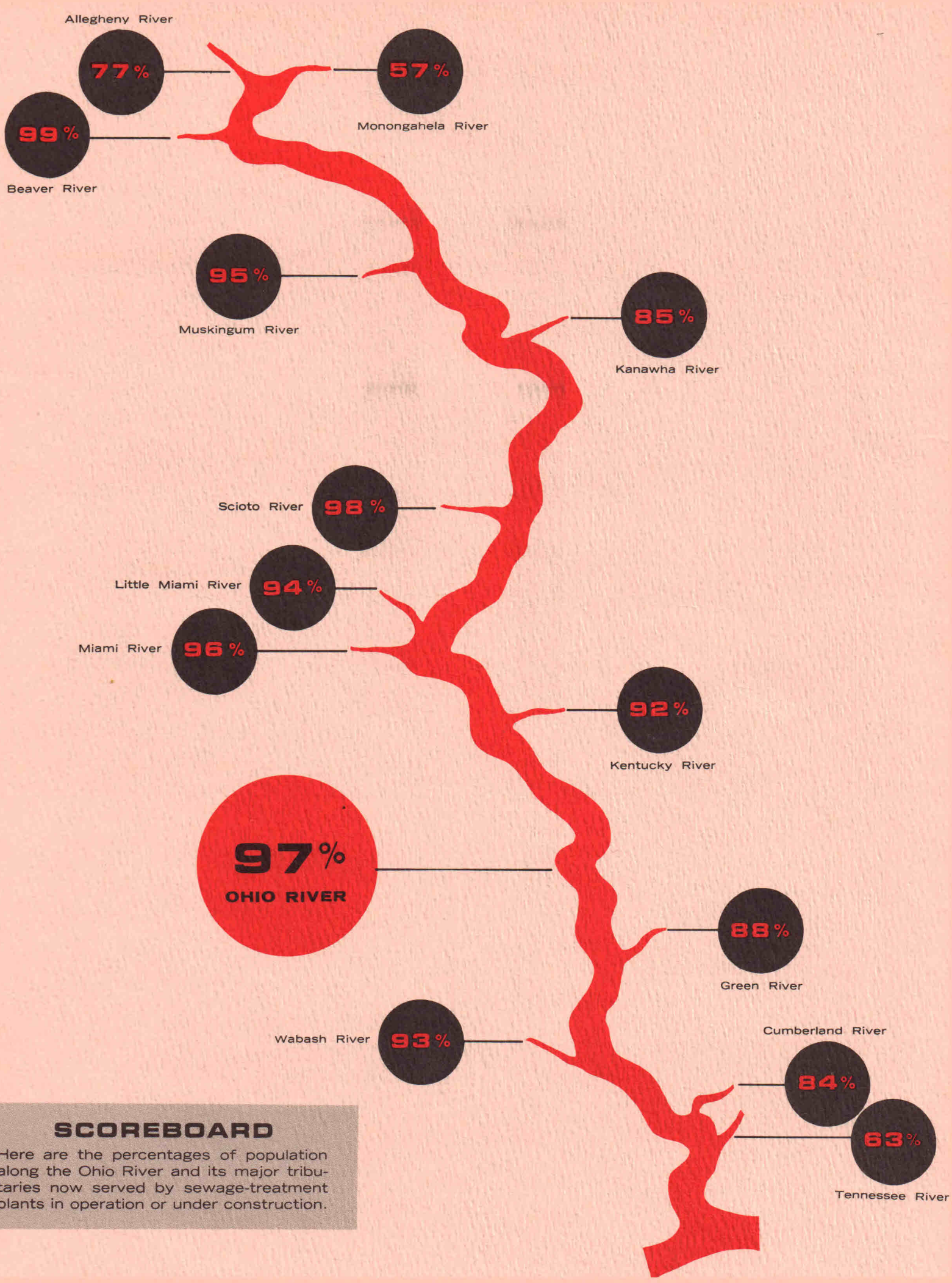
OHIO RIVER VALLEY WATER SANITATION COMMISSION · 1962

YESTERDAY . . . TODAY AND TOMORROW

14th Annual Report on the interstate crusade for clean streams to the Governors of

ILLINOIS	OHIO
INDIANA	PENNSYLVANIA
KENTUCKY	VIRGINIA
NEW YORK	WEST VIRGINIA



SCOREBOARD

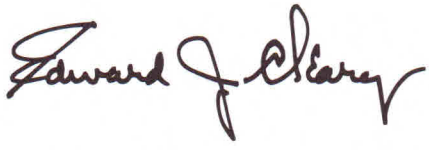
Here are the percentages of population along the Ohio River and its major tributaries now served by sewage-treatment plants in operation or under construction.

RECORDS ARE MADE TO BUILD ON . . .

not to stand on. Viewed in this fashion, the record of fourteen years endeavor by the Ohio Valley states in river clean-up provides a solid foundation. Construction has been completed or is underway for treatment plants at all major and most of the minor sources of sewage pollution. And 85 percent of the industrial establishments in the valley are in compliance with at least basic control requirements.

Perhaps in no other valley of the United States was there a pollution problem of greater magnitude than that faced in 1948 by the eight states who signed the Ohio River Valley Water Sanitation Compact. With determination and imagination, they have tackled this problem. And today these states can assert with pride that no other region has registered greater progress in curbing pollution. But this is not a record to stand on; it is one that offers exciting prospects on which to build.

Accomplishments in the elimination of gross pollution have prepared the way for enhancing river-quality protection. Opportunities now exist for introducing those refinements in control and practice that will insure for the Ohio Valley optimum utilization of water resources. Some of these techniques are already under development. Conditions have never been more favorable for promoting their application.



December 1, 1962

Executive Director and Chief Engineer

OHIO RIVER VALLEY WATER SANITATION COMMISSION
Headquarters: 414 Walnut Street, Cincinnati 2, Ohio

YESTERDAY . . . 1948

RIVER abuse was symbolized by indiscriminate discharge of sewage, oil, phenols, acids, salts, solids and every other form of debris into the Ohio River from municipalities and industries. A report to the Congress of the United States by the Army Corps of Engineers and U. S. Public Health Service, described this situation in this fashion:

"Practically all streams in the Ohio River basin are polluted by domestic and industrial wastes, while some have severe corrosive characteristics imparted to them by acid mine-drainage. The Ohio River is polluted to such an extent that 30 public sources of water supply . . . are endangered. The pollution of a number of tributaries is as severe as, or even more severe, than the worst reaches on the main Ohio River." *House Document No. 266, 78th Congress, 1944.*

These were the dreary circumstances — which had grown even more dismal because of World War II industrial expansion — that greeted inauguration of the Ohio River Valley Water Sanitation Compact (ORSANCO) fourteen years ago.

The compact established an interstate commission to coordinate and supplement the efforts of eight states in halting river degradation. Because the Ohio River and its tributaries flow through several states, clean-up could be accomplished only if each state did its part to curb pollution. To insure execution of good intentions, the compact empowered the interstate commission to enforce compliance by any municipality or industry should state efforts prove ineffective.

Water pollution did not reflect the lack of laws or of technical know-how for dealing with it. The unrestrained fouling of streams by millions of people and thousands of industries stemmed from indifference. Few were informed about conditions; and fewer still were inspired to contribute the support necessary to bring about a change. In brief, the task facing the eight states was primarily one of generating public awareness — and with it the willingness to pay the price for clean streams.

Dimensions of the task suggested it would require at least ten years to secure tangible results. It envisioned creating support for investment of local funds for municipal sewage-treatment works serving more than 8,000,000 people — at a cost averaging $100 per capita! Similar in magnitude was the investment to be made by industries. Simply to convert blueprints into structures of concrete and steel would be the work of years, to say nothing of the time in motivating people to vote the money.

Construction of control works to eliminate obvious pollution was regarded as Target No. 1, with attention directed first to the 1,000-mile Ohio River and then to its tributaries. Progress in this endeavor would permit attention to Target No. 2, where the aim would be on development of additional means to insure the preservation of water quality.

This was the situation in 1948, when the states of Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia and West Virginia signed their compact for river rehabilitation. How far these aspirations have been translated into realities — and what further opportunities lie ahead — are detailed in the following pages.

TODAY . . . 1962

PERHAPS the most eloquent measure of progress in this crusade to convert apathy into action — to win support for the proposition that river clean-up is everybody's business — is the fact that the people of the Ohio Valley have invested almost a billion dollars for construction of pollution-abatement facilities.

Sewage-treatment plants serving 90 percent of the sewered population of the Ohio Valley are in operation or under construction. Along the main stem of the Ohio River the record is even better — 97 percent; this represents a dramatic reversal of the situation in 1948, when less than one percent of the population treated its sewage!

ORSANCO minimum requirements for waste control are being met by 85 percent of the industrial establishments. But this is regarded as only a good beginning on a stupendous task. Some of the largest industries cannot yet be rated as fully in compliance with basic requirements. And decision on up-grading of industrial-waste controls lays claim for continuing attention.

Preventive measures for minimizing seasonal degradation of river quality by salt-bearing wastes have been adopted by the eight states, and are being applied to two-thirds of the chloride-salt load that could affect the Ohio River.

Contamination resulting from the transport and storage of oil, one of the most elusive pollution-control problems, is being checked by airplane and boat surveillance, and notably with the aid of U. S. Coast Guard personnel in the Cincinnati area.

Procedures for amelioration of acid mine-drainage pollution have been promulgated by ORSANCO, given endorsement by representatives of the coal industry, and are now being applied. This development has much significance because mine-drainage in some places was legally exempted from regulation until "practicable means for control" had been demonstrated. Such exemptions no longer apply in the Ohio Valley states, and thus the way has been cleared for enforcement of control measures.

River-quality monitoring, along with the conception and creation of an electronic-sentinel system, has been pioneered by ORSANCO. It offers a new technique in maintaining vigilance on water conditions and for detection of control violations.

River-protection opportunities have been further enhanced by introduction of a hazard-alert procedure to deal with the unavoidable risk occasioned by spills and accidental discharges. This unique operation was made possible by arrangements with members of ORSANCO industry and water-user committees. It has been improved through development of a special service from the U. S. Weather Bureau in forecasting daily information on volume and velocity of river flows.

Sponsorship of studies to provide essential data for determining future pollution-control needs has resulted in: Exploration of physiological aspects of water quality with respect to toxicity of trace substances; an appraisal of the aquatic-life resources of the Ohio River; and the continuing assay of radioactivity in river silt, fishes and plankton.

. . . AND

TOMORROW?

SECURING construction of treatment works, which is the basic and most time-consuming element of stream cleanup, represents only the first stage in executing a pollution-control program. ORSANCO now is happily confronted with shouldering the second task, which may be identified as the "operations" phase of river-quality management.

With sewage plant construction nine-tenths complete, efforts can be concentrated on eradication of every remaining vestige of obvious pollution. There are some small municipalities, and a substantial number of industries, that have not yet measured up to their obligations. Correction of these situations claims top priority.

Of equal concern are manifestations of careless or incompetent operation of control facilities. These conditions are revealed by instances of by-passing untreated wastes into streams, failure to disinfect effluents and by the discharge of sludges. This problem invites regulatory agencies to increase the frequency of plant inspections and to encourage improved performance of operating personnel.

Then there is the inevitability of unexpected spills and accidental discharges into the river from industries and from the transport of barge cargoes. To cope with such situations ORSANCO has inaugurated a hazard-alert system with Cincinnati headquarters as the clearinghouse. Expansion of these procedures deserves encouragement.

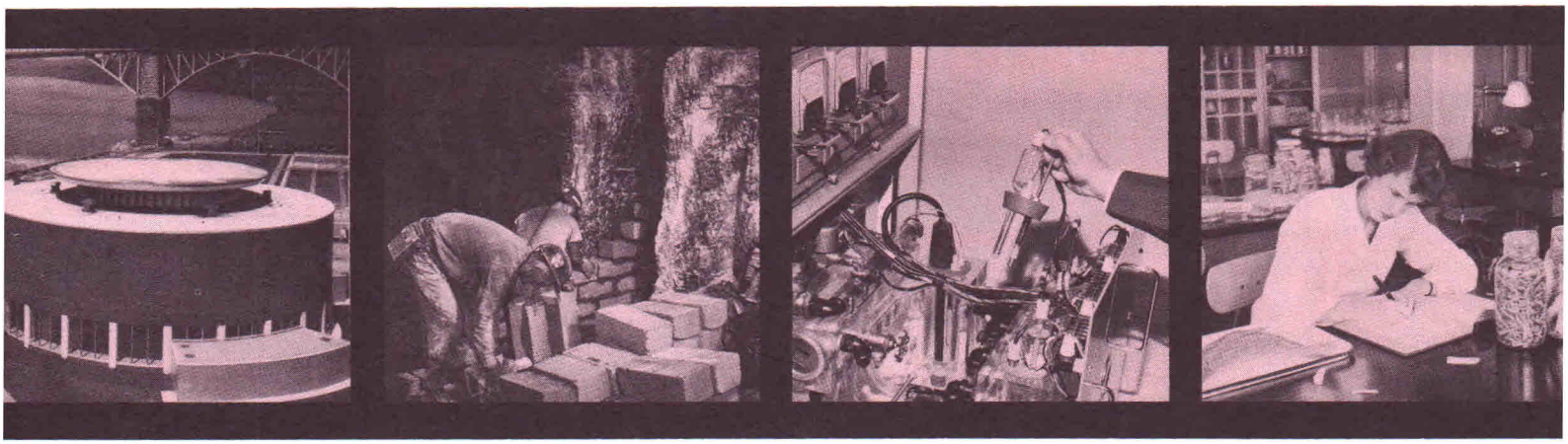
Development of the ORSANCO ROBOT MONITOR system has introduced both a new concept and unique equipment for safeguarding river quality. Two years of experience reveal exciting prospects for improving equipment and broadening its application to pollution-control practice.

Not the least of the opportunities to promote river protection involves the matter of policing and handling complaints. One proposal suggests the establishment of a corps of river wardens for the Ohio and its tributaries. Their role would be to routinely patrol and promptly challenge clean-stream violations, notably with regard to oil pollution. In addition, they would be used to investigate complaints and thus satisfy a vital public-relations function.

Biggest of the challenges in the Ohio Valley is the curbing of acid mine-drainage. The adoption of an interstate control measure two years ago and the stimulus to action that this has produced, holds promise that enforcement can be pursued with vigor.

Finally, ORSANCO has developed tools and techniques for river-quality diagnoses, and from these findings can determine when and where additional preventive measures may be needed.

Measured in terms of facilities constructed for control of pollution, the Ohio Valley program is approaching achievement of its first and most difficult goal. Meantime, other elements of the cleanup crusade have been advanced. These include promulgation of additional control measures, the introduction of river monitoring, data assembly and appraisal, harnessing of industry resources and increased activities in public education. Never before have circumstances been more propitious for protection of water-quality. To consolidate and extend the gains already made is tomorrow's opportunity.



More than 1,000 sewage-treatment plants, of which the one at Pittsburgh is the largest, are keeping streams clean in the Ohio Valley.

Building an air-seal in an abandoned coal mine is one of the steps being taken for the prevention of acid discharges into streams.

An electronic sentinel, called the "robot monitor," has been developed by ORSANCO for continuous checking of river quality.

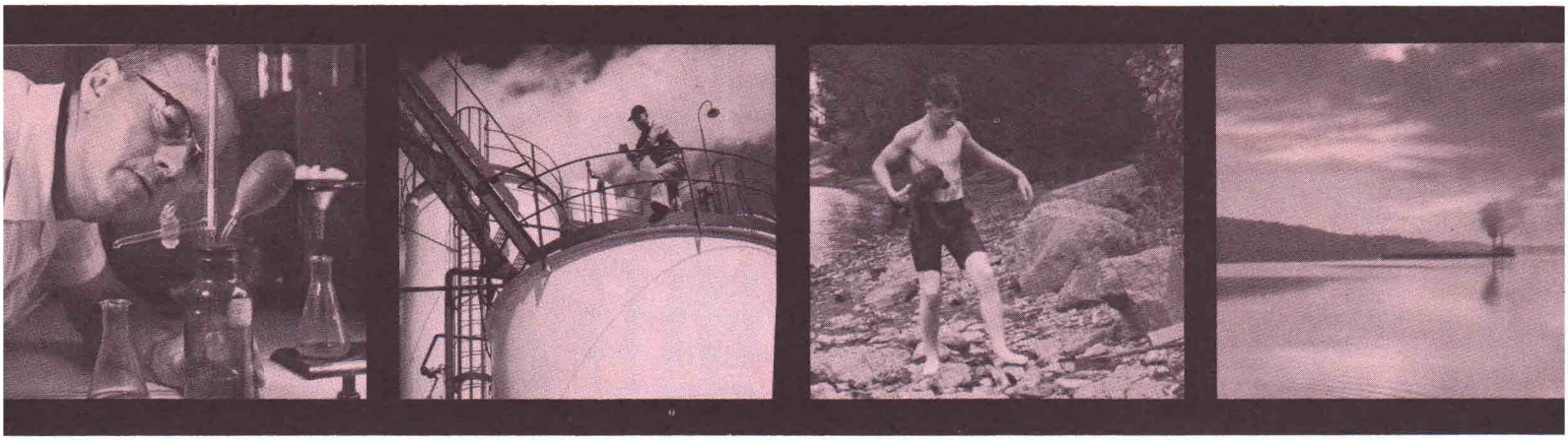
Something fishy here. An inventory of aquatic life is providing one baseline for judging the effectiveness of pollution control.

FOCUS ON CLEAN STREAMS

Supplying information on various aspects of the Ohio Valley clean-streams program claims increasing attention from state and ORSANCO staff personnel. People who have invested almost a billion dollars for construction of sewage-treatment facilities are vitally concerned with the progress and problems of water pollution control. To satisfy the need for more effective communication the commissioners of ORSANCO three years ago authorized the production of documentary films.

Five films in color and with sound are now available. Two more are scheduled for release during the first half of 1963. As outlined in the accompanying description, these films are designed to show what has been accomplished and what still remains to be done in safeguarding water resources. Each of the eight states is supplied with a version of the film highlighting situations within the state as related to the interstate program. Films may be borrowed for group showings by addressing the state agencies listed on the back cover, or by request to Commission headquarters.

In addition to the films ORSANCO distributes on a regular schedule to radio and television stations in the Ohio Valley a series of "spot" announcements related to special activities. For example, during a 13-week summer period this year the messages were oriented to prevention of littering of streams.



A river watcher supplements his visual observations with a laboratory analysis in tracing a suspected source of pollution.

Purification facilities for treating industrial wastes dominate the skyline at the Follansbee plant of the Koppers Company.

A river is to live by and to cherish. It is part of this boy's precious heritage and deserves to be guarded.

Dawn of a new era envelops the Ohio Valley as communities and industries combine their efforts in curbing water pollution.

GOOD RIDDANCE This fast-moving, omnibus film depicts the progress made and the tasks that still remain in curbing water pollution in the Ohio Valley. This offers a general introduction on the regional crusade for clean streams undertaken by eight states. (29½ minutes)

BEARGRASS CREEK The story of what can happen to a stream when people along its banks disregard their obligation to prevent pollution. Of particular interest is the work being done by the University of Louisville in conducting the ORSANCO-sponsored study of aquatic-life resources. (29½ minutes)

OIL ON THE RIVER Beginning with the story of the discovery of oil in the Ohio Valley, this film shows the unhappy consequence of carelessness in handling, transportation, storage and use of oil products and then depicts preventive measures. (20½ minutes)

CRISIS ON THE KANAWHA A portrayal of industrial growth and the failure to keep pace with it in terms of river protection is the opening theme of this film. Then follows a detailed description of the remedial steps that are being taken to deal with the situation. (22 minutes)

RIVER WATCHERS Safeguarding streams from pollution hazards calls for constant vigilance. This is the story of the sentinels in the eight states who are engaged in checking sewage plant operations, aerial surveillance, virus identification, sampling of streams, forecasting river flow and evaluating the results from robot monitors. (18½ minutes)

WATER QUALITY AND FLOW VARIATIONS IN THE OHIO RIVER

WATER-QUALITY surveillance and evaluation is one of the basic functions of the Commission. Chemical and bacteriological data is assembled from forty-five sampling stations throughout the interstate district, eighteen of which are located on the main stem of the Ohio River.

To supplement these manually-operated stations the Commission has developed the ORSANCO ROBOT MONITOR system. This includes: (1) a group of electronic units by means of which water quality is analyzed automatically and continuously; (2) telemeter transmitters; and (3) data-processing facilities. The first monitor unit was installed at Cincinnati in late 1960, and since then ten additional units have been placed in operation.

Information on levels of radioactivity is evaluated under contract with the University of Louisville. Records of river flow are supplied by the U. S. Geological Survey, which operates thirteen gaging stations on the Ohio River.

The accompanying tabulation summarizes 1961 data from the manually-operated stations on the Ohio River. Following are highlights from an evaluation of this data:

RIVER FLOW — The year 1961 was relatively "wet." This means that flows were greater in volume than those normally expected. For example, at Cincinnati the yearly-average flow was 113,000 cubic feet per second (cfs); the average for the past twenty years of record was 94,200 cfs. A yearly-average flow less than that recorded in 1961 may be expected 77 percent of the years.

ALKALINITY AND pH — Data for 1961 shows little change in the pattern of alkalinity and pH variations of recent years. Alkalinity in the first 100 miles varied from three to 50 milligrams per liter (mg/1). Yearly average values were less than 22 mg/1, which is considered to be near the lower limit of a desirable quality range.

Downstream from Natrium, W. Va. (mile 119) there was a continuing increase in alkalinity. This trend is shown by the following yearly-average values: 31 mg/1 at Huntington; 41 mg/1 at Cincinnati; 74 mg/1 at Louisville; and 71 mg/1 at Grand Chain, Ill. (mile 963).

The pattern of pH variations was similar to that for alkalinity, namely, relatively low values in the upper river with steadily rising values downstream. At Stratton, Ohio (mile 54), pH varied from 4.2 to 7.4, with a median value of 6.3. At Grand Chain, Ill., the range was 6.8 to 8.0, with a median of 7.3.

ALKYL BENZENE SULFONATE — Concentrations of ABS, the principal surface-active agent in household synthetic detergents, ranged from zero to 0.37 mg/l. Twenty percent of all samples showed a concentration of zero; in ninety percent of the samples the concentration was less than 0.25 mg/1.

Concentrations were well below the value of 0.5 mg/1, which is noted in Federal standards as a limiting concentration for ABS in potable water supplies.

CHLORIDE — Observations confirm a reversal in build-up in chloride-ion content. In 1952, monthly-average values as high as 112 and 116 mg/1 occurred at Huntington and Portsmouth. Now the maximum monthly-average values at the same stations are 62 and 66 mg/1. The change is also reflected in terms of maximum daily values: 135 to 188 mg/1 in 1952, at Huntington and Portsmouth, compared with 83 to 97 mg/1 today. The range in yearly-average values for all stations in 1961, was 16 to 33 mg/1.

COLIFORMS — The coliform picture was varied: Conditions were excellent at Wheeling and Huntington, good at Portsmouth, Cincinnati and Evansville, and questionable at Louisville and Weirton.

At Wheeling and Huntington, yearly-average levels were 1,420 and 2,940 coliforms per 100 milliliters (ml). No monthly-average concentration exceeded 5,000, the Commission's desired objective.

Yearly-average levels at Portsmouth, Cincinnati and Evansville were 5,500, 3,700 and 4,670 coliforms per 100 ml. At Louisville the range was 1,100 to 13,000 in terms of monthly-averages, and the yearly average was 6,930. The range at Weirton was 6,400 to 23,000, with a yearly-average of 14,300.

Comparison of 1961 records with those for 1952, shows lower coliform conditions at Wheeling, Huntington, Portsmouth and Cincinnati. The greatest change was at Wheeling: Here the yearly-average level of 52,100 and the maximum monthly concentration of 154,000 in 1952, may be compared with values of 1,420 and 2,320 today.

DISSOLVED SOLIDS — Yearly-average concentrations ranged from 195 to 259 mg/1. No values exceeded the limit of 500 mg/1 for potable supplies recommended by Federal standards, the highest value for any sample being 412 mg/1.

FLUORIDE — The range in monthly-average concentrations was 0.1 to 0.7 mg/1, and yearly-average values were 0.2 to 0.3 mg/1. Federal standards recommend that fluoride levels in potable supplies that are artificially fluoridated be maintained at 0.7 to 1.2 mg/1.

HARDNESS — Yearly-average values were: 120 to 150 mg/1 above Wheeling; 140 to 170 from Natrium to New Haven (mile 242); 120 to 150 from Huntington to Grand Chain.

Yearly averages were the same in 1961 as in 1952 — from 120 to 170 mg/1. However, maximum values ten years ago were higher. Peak monthly concentrations in 1952 were 220 to 280 mg/1, compared with 160 to 240 mg/1 now.

In the upper Ohio, at least 80 percent of the total hardness is of the non-carbonate or so-called "permanent" type. Downstream from New Haven the ratio of non-carbonate hardness to total hardness decreases such that below Louisville the proportion is less than 50 percent.

SULFATE — Yearly-average values were 54 to 176 mg/1, and maximum monthly-averages varied from 81 to 257 mg/1. These levels are considerably less than those in 1952, when yearly averages were 100 to 230 mg/1 and the maximum monthly averages were 120 to 360 mg/1.

Federal standards recommend that the sulfate content of potable supplies not exceed 250 mg/1. Ohio River levels in 1961, in terms of monthly-average values, were below this concentration at all stations except Yorkville, Ohio (mile 84), where for one month the average was slightly higher, namely 257 mg/1.

RADIOACTIVITY — Ranges and yearly-average values of gross beta activity were: Water samples — 0 to 59 micro-micro curies per liter (mmc/l), average of 13; plankton — 0 to 30 mmc/1, average of 2; fish — 0 to 24 mmc per gram, average of 2; silt — 3 to 105 mmc/g, average of 29.

Concentrations were far below the maximum permissible level set forth in Federal standards, namely, 1,000 mmc/1 of gross beta activity.

There was an increase in radioactivity of water samples during the last three months of 1961. Dr. A. Krebs, ORSANCO radioactivity analyst, points out that the increase "was caused by Russian bomb tests and that observations (in the Ohio Valley) were in agreement with those all over the world." The increase is apparent in the following values: Average activity of 10 mmc/1 in September; 13 mmc/1 in October; 25 mmc/1 in November; and 29 mmc/1 in December.

WATER QUALITY AND FLOW VARIATIONS — OHIO RIVER 1961*

Constituent	Mile 55 to 161 (Sewickley Gage)			Mile 221 to 351 (Huntington Gage)			Mile 463 to 560 (Cincinnati Gage)			Mile 601 to 963 (Louisville Gage)		
	Maximum	Minimum	Yearly Avg.	Maximum	Minimum	Yearly Avg.	Maximum	Minimum	Yearly Avg.	Maximum	Minimum	Yearly Avg.
Flow (cfs)	90,200	6,200	34,700	214,700	14,700	85,400	300,600	15,000	113,000	360,400	17,100	131,000
Alkyl Benzene Sulfonate (ABS)	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.0	0.0
Alkalinity (as $CaCO_3$)	32	5	16	46	19	30	74	29	49	107	49	74
Calcium	51	22	34	58	23	39	54	28	37	56	28	39
Chloride	41	7	21	66	12	30	59	12	28	59	8	24
Coliforms (MPN per 100 ml)	23,000	520	7,860	7,800	1,300	4,220	6,300	580	3,720	13,000	1,100	5,800
Color (units)	7	0	4	8	1	5	10	2	6	45	3	10
Fluoride	0.7	0.1	0.3	0.6	0.1	0.3	0.4	0.1	0.3	0.4	0.1	0.2
Hardness, Total (as $CaCO_3$)	242	75	140	228	82	137	192	91	130	197	93	137
Hardness, Non-carb. (as $CaCO_3$)	217	67	124	198	60	107	127	60	80	115	36	62
Iron	2.8	0.05	0.88							2.2	0.15	0.79
Magnesium	14	6.0	9.3	13	6.1	9.5	14	7.6	9.7	15	7.6	10
Manganese	2.3	0.25	1.0									
Nitrate	8.0	2.4	4.6	5.1	2.5	3.5	5.8	3.1	4.5	6.0	2.0	4.0
Odor (threshold odor number)	4	2	3	16	4	6	34	18	23	8	3	5
pH (daily values)	7.7	4.2		8.0	6.1		9.1	4.2		8.8	6.7	
Phenols	46	0	12									
Phosphate	0.40	0.07	0.14	0.40	0.00	0.27	0.50	0.13		0.50	0.09	0.26
Potassium	4.4	1.3	2.5	4.3	1.5	2.5	3.2	1.6	2.3	3.2	0.9	2.1
Silica	7.1	5.3	6.2	7.1	2.9	5.6	6.7	1.7	5.1	7.0	2.4	5.6
Sodium	42	7.3	20	50	8.7	25	35	8	18	31	6.3	15
Solids (total dissolved)	392	134	234	412	139	259	338	155	224	334	150	214
Specific Conductance (micromhos)	589	224	369	651	232	417	554	256	368	543	243	351
Sulfate	257	66	141	203	62	119	162	51	85	131	38	74
Surface Tension (dynes per cm)	76.8	70.4	75.7	76.8	76.1	76.4						
Temperature (deg. F)	90	35	59	81	36	58	81	36	59	81	35	60
Turbidity (units)	271	13	<63	183	10	88	563	7	228	219	7	104
Radioactivity (daily values; mmc/l)	27	0	7	59	5	16	18	1	12	44	0	15

*(Ranges in terms of monthly-average values. Values in mg/l except as noted.)

TALLY FOR THE VALLEY

The status of municipal and industrial waste-control facilities in the Ohio Valley Compact District on July 1, 1962 is detailed in the accompanying tabulations. This summary is based on reports supplied by the eight signatory states.

MUNICIPAL STATUS — More than 90 percent of the 11.5 million sewered population in the district is served by sewage-treatment plants now in operation or under construction. In 1948 only 38 percent of the population was provided with such facilities.

During 1961-62 new works were completed and placed in operation at 73 communities, the combined population of which is 403,400. Improvements to existing plants were completed and placed at another 20 communities serving 168,400.

Construction was started on new treatment plants serving 35 communities whose population totals 350,000. In addition, improvements and enlargements to existing facilities were started at 24 communities serving 141,000.

INDUSTRIAL-WASTE CONTROL FACILITIES — July 1, 1962

STATUS	ILL.	IND.	KY.	N.Y.	OHIO	PA.	VA.	W.VA.	TOTAL	Percent of TOTAL
Control currently acceptable	11	170	142	21	290	420	41	217	1,312	76.1
Control facilities inadequate, improvements in progress	0	7	5	0	41	2	0	6	61	3.6
Control provided, but not adequate	7	20	33	9	34	88	3	13	207	12.0
New control facilities under construction	0	1	1	0	2	9	0	4	17	1.0
Planning treatment facilities or preparing to connect to municipal sewers	0	8	1	6	13	67	3	13	111	6.4
No action by company	0	0	0	7	0	5	0	3	15	0.9
Total number of industries	18	206	182	43	380	591	47	256	1,723	100.0
Complying with ORSANCO minimum requirements	18	189	153	21	357	456	43	222	1,459	84.7

MUNICIPAL AND INSTITUTIONAL SEWAGE-TREATMENT FACILITIES — July 1, 1962

Number of communities (top number) and population served (bottom number)

STATUS	ILL.	IND.	KY.	N.Y.	OHIO	PA.	VA.	W.VA.	TOTAL	Percent of TOTAL
Control currently acceptable	54 308,929	142 1,077,922	159 1,078,057	6 31,868	266 3,099,354	237 2,452,266	31 102,613	54 397,563	949 8,548,572	55.0 74.6
Treatment provided (improvements under construction)	1 3,544	6 532,121	2 65,750	0 0	10 87,787	2 17,732	0 0	2 3,291	23 710,225	1.3 6.2
Treatment provided (improvement needed)	2 12,353	18 114,722	19 64,216	8 66,191	21 144,864	18 93,506	25 31,264	10 28,499	121 555,615	7.0 4.8
New treatment works under construction	6 9,497	5 79,631	6 11,557	0 0	11 192,442	10 69,112	0 0	13 173,020	51 535,259	3.0 4.7
No treatment, construction not started	6 18,145	117 135,364	49 104,290	13 17,875	115 156,301	146 442,273	35 48,797	105 189,877	586 1,112,922	33.7 9.7
TOTAL	69 352,468	288 1,939,760	235 1,323,870	27 115,934	423 3,680,748	413 3,074,889	91 182,674	184 792,250	1,730 11,462,593	100.0 100.0

INDUSTRIAL STATUS — Of the 1,723 industrial plants discharging effluents directly to streams, 1,312 (76 percent) are operating control facilities rated "acceptable" by the signatory states. Another 147 industries have provided control measures that fulfill minimum requirements established by ORSANCO. Thus the total number of industries meeting or bettering interstate requirements is 1,459, or 85 percent.

In addition to those industries that discharge directly to streams and are included in the tabulation as having acceptable control facilities, there are thousands of industries in the compact district whose wastes are being handled satisfactorily through municipal sewage-treatment plants. A survey by ORSANCO's Chemical Industry Committee, issued this year, shows that in the 18 cities over 50,000 population there are some 4,200 industrial plants served by municipal treatment works. The industrial load is reported to be equivalent (on an oxygen-demand basis) to the waste load from an additional population of 70 percent, over and above the actual population served.

FEDERAL AID PROGRAM

Under provisions of the Federal Water Pollution Control Act enacted in 1956 and amended in 1961 (Public Law 87-88) grants-in-aid are made to municipalities for construction of sewage-treatment facilities. During 1961-62 federal grants in the Ohio Valley district were awarded for construction of 67 projects serving 487,000. Details are shown in the accompanying tabulation.

Following is a summary of federal-grant allocations in the compact district for the six years of the program. The summary is based on data in the June 30, 1962, *Project Register* of the U. S. Public Health Service.

Year	No. of Projects	Pop. Served	Estimated Cost of Projects	Federal Grants
1956-57	30	1,588,400	$ 13,846,400	$3,616,200
1957-58	51	863,300	27,421,300	5,907,900
1958-59	47	577,700	29,298,300	6,564,300
1959-60	46	351,000	24,464,100	5,557,400
1960-61	46	268,700	21,733,300	4,787,500
1961-62	67	486,900	29,726,600	6,892,000
Total	287	4,136,000	$146,490,000	$33,325,300

MUNICIPALITIES IN THE OHIO VALLEY RECEIVING GRANTS-IN-AID UNDER THE WATER POLLUTION CONTROL ACT

July 1, 1961 through June 30, 1962

(T indicates treatment facilities only; S is sewers only; T-S denotes both)

Municipality	Pop. 1960	Type	Est. Cost Dollars	Fed. Grant
Bridgeport, Ill.	2,300	T	$ 77,500	$ 23,200
Hoopeston, Ill.	6,600	T	420,000	126,000
St. Francisville, Ill.	1,000	T	34,300	10,300
Edinburg, Ind.	3,700	T-S	473,400	142,000
French Lick, Ind.	2,000	T	400,200	120,100
Greencastle, Ind.	8,500	T-S	998,000	250,000
Hartford City, Ind.	8,100	T-S	367,500	110,200
Jeffersonville (Oak Park Conservancy District), Ind.	19,500	T	166,000	49,800
Medora, Ind.	700	T	91,300	27,400
Newburgh, Ind.	1,500	T-S	198,100	59,400
Rockport, Ind.	2,500	T-S	334,500	100,400
Sellersburg, Ind.	2,700	T	200,300	60,100
Terre Haute, Ind.	72,500	T	1,923,000	250,000
Versailles, Ind.	1,200	T	71,600	21,500
Auburn, Ky.	1,000	T	207,900	62,400
Central City, Ky.	3,700	T-S	572,500	171,800
Franklin, Ky.	5,300	T	219,000	65,700
Georgetown, Ky.	7,000	T-S	428,700	128,600
Hazel, Ky.	300	T	25,200	7,500
Hodgenville, Ky.	2,000	T-S	137,100	41,100
Monticello, Ky.	3,000	T-S	290,000	87,000
Mount Sterling, Ky.	5,400	T	260,800	78,200
Murray, Ky.	9,300	S	243,900	73,200
Paintsville, Ky.	4,000	T-S	603,600	173,000
Radcliff, Ky.	3,400	T	277,800	83,300
Chautauqua Utility Dist., N.Y.	10,000	T	133,200	40,000
Barberton, Ohio	33,800	T	1,484,600	250,000
Belmont County Sewer Authority Bellaire, 11,500; Martins Ferry, 12,000; Bridgeport, 3,800; Brookside, Ohio, 800.	28,100	T-S	6,237,000	783,200
Canfield, Ohio	3,300	T-S	8,000	2,400
Celina, Ohio	7,700	T	342,100	102,600
Dalton, Ohio	1,100	T-S	82,000	24,600
Heath, Ohio	2,400	T	529,300	158,800
Howland Twp. (Trumbull Co. Board of Commissioners), Ohio	—	T	118,500	35,600
Indian Lake S.D., Ohio	6,000	T-S	175,000	52,500
Millersport, Ohio	800	T	78,100	23,400
Milton S.D. No. 11, Ohio	1,100	T-S	164,000	49,200
Shreve, Ohio	1,600	T-S	187,200	56,200
Tipp City, Ohio	4,300	T-S	263,800	77,800
Vandalia, Ohio	6,300	T	300,000	90,000
Waynesville, Ohio	1,300	T	110,000	33,000
Wellston, Ohio	5,700	T	163,800	49,200
Williamsburg, Ohio	2,000	T-S	127,500	38,300
Beaver, Pa.	6,200	T-S	655,800	196,700
Clairton, Pa.	18,400	T-S	1,230,000	250,000
Emsworth, Pa.	3,300	S	15,800	4,700
Ford City, Pa.	5,400	T-S	614,300	184,300
Glassport, Pa.	8,400	T-S	958,700	250,000
Ligonier, Pa.	2,300	T	498,000	149,400
Port Vue (Trib. to McKeesport), Pa.	6,600	S	41,900	12,600
Rochester Area Authority, Pa.	6,000	T-S	169,900	50,800
Sharon, Pa.	25,300	T	1,015,700	250,000
Christiansburg, Va.	3,700	T-S	395,800	85,500
Bethany, W. Va.	1,000	T	107,900	32,400
Cedar Grove, W. Va.	1,600	T	170,100	51,000
Ceredo, W. Va.	1,400	T-S	87,500	26,300
Charleston, W. Va.	85,800	S	1,208,400	250,000
Chesapeake, W. Va.	2,700	T-S	314,700	94,400
Chester, W. Va.	3,800	T-S	352,500	105,700
East Bank, W. Va.	1,000	T-S	124,100	37,200
Harrisville, W. Va.	1,400	T-S	111,300	33,400
Kanawha Co., Union Public Service District, W. Va.	—	T-S	699,800	210,000
Mason, W. Va.	1,000	T	95,800	28,800
Milton, W.Va.	1,700	T	103,600	31,100
Monongah, W. Va.	1,300	T-S	217,200	65,200
New Haven, W. Va.	1,300	T-S	166,000	49,800
Philippi, W. Va.	2,200	T-S	315,300	94,600
Salem, W. Va.	2,400	T-S	530,200	159,100
TOTAL: 67	486,900		$29,726,600	$6,892,000

Chairman Bern Wright of West Virginia

ADMINISTRATIVE AFFAIRS

During the year covered by this report Dr. Charles L. Wilbar, Jr., of Pennsylvania, served as chairman. Elected to take office on July 1, 1962, were Mr. Bern Wright of West Virginia as chairman, and Mr. Joseph R. Shaw of New York as vice-chairman.

Chairman-elect Wright has been a commissioner of ORSANCO since August, 1957, when he was appointed by Governor Cecil H. Underwood of West Virginia.

A specialist in pollution control, Mr. Wright joined the engineering staff of the West Virginia State Health Department in 1951. In 1957, he was appointed sanitary engineer and executive secretary of the West Virginia Water Commission. Mr. Wright served in that capacity until this agency was merged with a new Department of Natural Resources in 1961. Presently, he is chief of the Division of Water Resources and executive secretary of the state water resources board. Mr. Wright is a civil-engineer graduate of West Virginia University.

MEMBERSHIP CHANGES — Mr. E. Blackburn Moore, speaker of the Virginia House of Delegates and a member of the State Water Control Board, was appointed to the Commission on June 29, 1962, by Governor A. S. Harrison, Jr. to succeed Mr. T. Brady Saunders. Mr. Moore was one of the signers of the Ohio Valley Compact and previously had served five uninterrupted terms from 1948 to 1960. He was chairman of the Commission in 1952-53.

Mr. Saunders, also one of the signers of the compact, served ORSANCO from 1948 until his resignation in 1962. He was also a member of the Virginia State Water Control Board.

STAFF CHANGES — Mr. F. W. Montanari, sanitary engineer, resigned on October 1, 1962, after six years of devoted service to accept the newly created post of Assistant Commissioner for Water Resources in the State of New York. Mr. Thomas R. Crabtree joined the staff on July 1, 1962, as public affairs and information specialist. Mr. Robert J. Boes, chemical engineer, joined the staff on August 20, 1962, to aid in development of industrial-waste control measures.

APPROPRIATIONS — A financial statement for the fiscal year of this report appears on page 16. Appropriations from the states, which totals $130,000, is the same as that requested and received annually since 1955. A grant of $111,473 was accepted from the federal Department of Health, Education, and Welfare in accord with provisions of the Federal Water Pollution Control Act. A new schedule of state appropriations (as shown in the annual report of last year) will go into effect next year based upon the 1960 census.

CONTRACT PROJECTS

Investigations and projects that require special skills, facilities and personnel are sponsored by the Commission through contractual arrangements. During the fiscal year ending June 30, 1962, the Commission authorized the following contracts:

PUBLIC AFFAIRS PROGRAM

Stuart Finley, Falls Church, Va.

Objective: To produce documentary films and a series of television and radio announcements relating to the conduct of the eight-state crusade for clean streams. Since April, 1960, five films and eight sets of spot announcements have been produced. *Status:* The current contract, which will terminate June 30, 1963, calls for production of two twenty-minute films as well as thirty-two radio and television public-service announcements to be made available to stations in the Ohio Valley. ($36,000)

RADIOACTIVITY INVESTIGATIONS

University of Louisville, The Potamological Institute

Objective: To develop information on the accumulation of radio-materials by fish, aquatic organisms and in river sediments at selected stations along the Ohio River. In addition, to secure evaluation on radioactivity levels revealed from monitoring data. This is a continuation of investigations initiated February 26, 1959. *Status:* Project extended through June 30, 1963. ($8,000)

SERVICING OF ROBOT EQUIPMENT

Engineering Specialties, Madeira, Ohio

Objective: To maintain and improve operation of central station and field units of the electronic water-quality monitor system. Contract provides reimbursement for travel expenses and $7.50 per hour for service. (Estimated annual expenditure $6,000). *Status:* Contract extended through June 30, 1963.

WATER QUALITY MONITORING

United States Geological Survey

Objective: To collect and analyze water samples from locations on the Ohio River and major tributaries. Project was initiated in 1950 and has been continued by yearly contracts since that time. Funds provided by the Commission are matched dollar-for-dollar by the U.S.G.S. *Status:* Program extended through September 30, 1963. ($10,000)

Contracts completed during the year ended June 30, 1962, included: final report on the Aquatic-Life Resources project and the Aquatic-Life Surveillance project; delivery of a mobile monitor which is a portable measurement and recording instrument; and installation of ten robot monitor units contracted for in July, 1960.

COMMITTEE ASSIGNMENTS

(for year ending June 30, 1963)

Executive Committee

Chairman	BERN WRIGHT
Past-chairman	C. L. WILBAR, JR., M.D.
Illinois	C. W. KLASSEN
Indiana	B. A. POOLE
Kentucky	MINOR CLARK
New York	JOSEPH R. SHAW
Ohio	BARTON HOLL
Pennsylvania	KARL MASON
Virginia	W. H. SINGLETON
West Virginia	N. H. DYER, M.D.
Federal	O. LLOYD MEEHEAN

Engineering

New York	M. H. THOMPSON, *Chairman*
Ohio	GEORGE EAGLE, *Vice-chairman*
Illinois	C. W. KLASSEN
Indiana	B. A. POOLE
Kentucky	R. C. PICKARD
Pennsylvania	KARL MASON
Virginia	A. H. PAESSLER
West Virginia	BERN WRIGHT
Corps of Engrs.	WILL BREWER
Dept. of Interior	O. LLOYD MEEHEAN
U.S.P.H.S.	GORDON MCCALLUM
Secretary	F. H. WARING
Staff	ROBERT K. HORTON

Audit

C. L. WILBAR, JR., M.D., *Chairman*
M. E. GOSNELL
ROSS H. WALKER

Bylaws

M. K. MCKAY, *Chairman*
RALPH E. DWORK, M.D.
LYLE W. HORNBECK

Finance

HUDSON BIERY, *Chairman*
JOSEPH R. SHAW
KARL M. MASON

Long-Range Planning

B. A. POOLE, *Chairman*
J. O. MATLICK
C. L. WILBAR, JR., M.D.

Pension Trust

RALPH E. DWORK, M.D.
ROBERT K. HORTON
C. W. KLASSEN

Salaries and Personnel

JOSEPH R. SHAW, *Chairman*
C. W. KLASSEN
N. H. DYER, M.D.

CHAIRMEN OF INDUSTRY AND ADVISORY COMMITTEES

(as of December 1, 1962)

Aquatic-Life Advisory Committee — LLOYD L. SMITH, JR., University of Minnesota, St. Paul, Minnesota

Chemical Industry Committee — WYATT E. WILLIAMS, Standard Ultramarine and Color Co., Huntington, West Va.

Coal Industry Advisory Committee — LARRY COOK, Ohio Reclamation Association, Columbus, Ohio

Metal-Finishing Industry Action Committee — HUBERT S. KLINE, General Motors Corp., Dayton, Ohio

Oil Refining Industry Action Committee — R. N. SIMONSEN, Standard Oil Co., Cleveland, Ohio

Pulp and Paper Industry Committee — W. C. MATHEWS, The Mead Corp., Chillicothe, Ohio

Steel Industry Action Committee — LOUIS F. BIRKEL, Republic Steel Corp., Cleveland, Ohio

Water Users Committee — P. J. WEAVER, The Procter and Gamble Co., Cincinnati, Ohio

FINANCIAL REPORT

The following information relative to revenues collected and expenses paid, and statement of resources, was taken from the Audit Report of Wm. H. Mers and Co., Certified Public Accountants, for the year ended June 30, 1962.

STATEMENT OF REVENUES COLLECTED AND EXPENSES PAID

Revenues collected:		
From signatory states (For detail see Schedule A)		$130,000.00
From U. S. Department of Health, Education, and Welfare (Grant by authority of Federal Water Pollution Control Act)		111,473.00
Sale of publications		157.50
Interest earned on bank deposit		3,433.47
Total revenues collected		$245,063.97
Expenses paid:		
From state funds (For detail see Schedule B)	$122,822.36	
From federal funds — Note A (For detail see Schedule C)	128,923.30	
Total expenses paid		251,745.66
Excess of expenses paid over revenues collected		$ 6,681.69

Note A — $31,089.00 of this expenditure was made from monies received in fiscal 1960-61 and encumbered for disbursement in fiscal 1961-62.

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STATEMENT OF RESOURCES

	State Funds	Federal Funds	Total
Available resources for period to June 30, 1961	$ 52,598.58	$ 42,096.81	$ 94,695.39
Add: Revenues collected:			
Annual budget — July 1, 1961 to June 30, 1962	130,000.00		130,000.00
U. S. Department of Health, Education and Welfare		111,473.00	111,473.00
Sale of publications	157.50		157.50
Interest earned on bank deposit	3,433.47		3,433.47
	$186,189.55	$153,569.81	$339,759.36
Less: Expenses paid: July 1, 1961 to June 30, 1962	122,822.36	128,923.30	251,745.66
Available resources for period to June 30, 1962, before encumbrances	63,367.19	24,646.51	88,013.70
Encumbered resources at June 30, 1962 — Note B	7,630.50	24,606.45	32,236.95
Available resources at June 30, 1962 after encumbrances	$ 55,736.69	$ 40.06	$ 55,776.75

The above amount of $88,013.70 is comprised as follows:

Cash on deposit with the Central Trust Company — Note B		$ 85,998.58
Cash on deposit with American Airlines, Inc.		425.00
Cash on deposit with Ohio Bureau of Workmen's Compensation		100.00
Petty cash on hand		200.00
Accounts receivable:		
Advances for employees:		
Employees' pension trust	$ 1,119.42	
Hospitalization	170.70	1,290.12
Total		$ 88,013.70

Note B — Of the $85,998.58 on deposit with The Central Trust Company at June 30, 1962, $32,236.95 is encumbered.

On January 12, 1962, a contract not to exceed $8,000.00 for computer-processing of water-quality data from the robot-monitor system was authorized. As of June 30, 1962, $369.50 was expended leaving a balance of $7,630.50, which shows as an encumbrance of state funds. Due to complexities in programming, all problems involved were not resolved and only a small portion of the authorization had been expended as of June 30, 1962.

As of June 30, 1962, federal funds in the amount of $24,606.45 are encumbered for the Public Affairs Project and for equipment for the Robot Monitor Project.

Schedule A — REVENUES COLLECTED FROM SIGNATORY STATES

State of Illinois	$ 6,695.00
State of Indiana	22,945.00
Commonwealth of Kentucky	27,560.00
State of New York	1,430.00
State of Ohio	30,420.00
Commonwealth of Pennsylvania	20,215.00
Commonwealth of Virginia	4,875.00
State of West Virginia	15,860.00
TOTAL	$130,000.00

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Schedule B — EXPENSES PAID FROM STATE FUNDS

Auditing	$ 700.00
Automobile replacement	2,792.31
Contractual services	1,455.40
Data processing	369.50
Electricity and water	394.33
Employees' pension trust	13,178.41
Insurance	349.03
Legal services	3,600.00
Maintenance and repairs	1,107.19
Meetings and representation	704.41
Miscellaneous	383.22
Office equipment and furnishings	681.49
Office rent	5,143.14
Office supplies	1,833.89
Postage	879.44
Printing	3,779.99
Salaries	57,890.29
Service fees and subscriptions	458.73
Social security tax	1,503.68
Telephone and telegraph	1,257.61
Travel:	
Commissioners	6,457.14
Engineering committee	1,006.69
Staff	5,303.58
Water Users Committee	1,390.83
U. S. Geological Survey (cooperative water quality investigation)	10,000.00
Workmen's compensation	202.06
TOTAL	$122,822.36

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Schedule C — EXPENSES PAID FROM FEDERAL FUNDS

Administrative expense:		
Electricity and water	$ 394.26	
Office rent	5,143.00	
Salaries	29,694.86	
Telephone and telegraph	1,255.37	
Travel	3,629.40	$ 40,116.89
Acid Mine-Drainage Project		1,906.06
Public Affairs Project:		
Contract for films and recordings	29,000.00	
Local program aids	227.14	29,227.14
Radioactivity Evaluation Project — University of Louisville		11,500.00
River Surveillance Project:		
Airplane rental and insurance	221.80	
Boat rental and fuel	1,404.52	
Photography and miscellaneous	753.76	2,380.08
Robot Monitor Project:		
Crating and shipping	40.53	
Installation	2,172.66	
Miscellaneous	2,502.41	
Servicing	5,364.28	
Telephone and telemeter channels	2,624.25	12,704.13
Expenses paid from $41,562.00 encumbered at June 30, 1961 for the Robot Monitor Project:		
Mobile monitor	1,500.00	
Robot monitor units	24,711.00	
Telemeter transmitters	4,878.00	31,089.00
TOTAL		$128,923.30

MEMBERS OF THE COMMISSION

ILLINOIS

Maurice E. Gosnell, Gosnell & Fitzpatrick
Clarence W. Klassen, Chief Sanitary Engineer
Franklin D. Yoder, M.D., Director of Public Health

INDIANA

A. C. Offutt, M.D., State Health Commissioner
B. A. Poole, Stream Pollution Control Board
Joseph L. Quinn, Jr., The Hulman Company

KENTUCKY

Minor Clark, Department of Fish and Wildlife Resources
J. O. Matlick, Commissioner of Conservation
Russell E. Teague, M.D., State Health Commissioner

NEW YORK

Herman E. Hilleboe, M.D., State Health Commissioner
Lyle W. Hornbeck, Bond, Schoeneck and King
Joseph R. Shaw, Associated Industries of New York State, Inc.

OHIO

Hudson Biery, Ohio Valley Improvement Association
Barton Holl, Logan Clay Products Company
Ralph E. Dwork, M.D., Director of Health

PENNSYLVANIA

Karl M. Mason, Department of Health
M. K. McKay, Sanitary Water Board
Charles L. Wilbar, Jr., M.D., Secretary of Health

VIRGINIA

E. Blackburn Moore, State Water Control Board
William H. Singleton, State Water Control Board
Ross H. Walker, State Water Control Board

WEST VIRGINIA

N. H. Dyer, M.D., State Health Commissioner
W. W. Jennings, State Water Commission
Bern Wright, Division of Water Resources

UNITED STATES GOVERNMENT

Edwin E. Abbott, Corps of Engineers
O. Lloyd Meehean, Fish and Wildlife Service
Luther L. Terry, M.D., Public Health Service

officers

Bern Wright, Chairman
Joseph R. Shaw, Vice-Chairman
Fred H. Waring, Secretary
Verna B. Ballman, Treasurer
Edward J. Cleary, Executive Director and Chief Engineer
Leonard A. Weakley, General Counsel

staff

Edward J. Cleary, Executive Director and Chief Engineer
Robert K. Horton Assistant Director
*__Francis W. Montanari,__ Sanitary Engineer
William L. Klein, Chemist-Biologist
Robert J. Boes, Chemical Engineer
David A. Dunsmore, Engineering Assistant
Thomas R. Crabtree, Information Specialist
Verna B. Ballman, Office Manager

Secretaries: Ruth C. Bergmeyer, Alice F. Courtney, Jane W. Renaldo, Grace B. Ziegler

**Resigned October 1, 1962*

REGULATORY AGENCIES OF THE SIGNATORY STATES

Listed below are the names and addresses of the regulatory agencies in each of the signatory states. Inquiries concerning compliance with water-pollution control requirements should be addressed to the agency in the state in which the municipality or industrial plant is located. The state agency will arrange for such contact or consultation with the interstate commission as may be necessary or requested.

A compendium of interstate rules, regulations and standards that have been promulgated by the Ohio River Valley Water Sanitation Commission is available upon request.

ILLINOIS
Technical Secretary
State Sanitary Water Board
Springfield, Illinois

INDIANA
Technical Secretary
Indiana Stream Pollution Control Board
1330 West Michigan Street
Indianapolis 7, Indiana

KENTUCKY
Executive Director and Chief Engineer
Kentucky Water Pollution Control Commission
275 East Main Street
Frankfort, Kentucky

NEW YORK
Director
Bureau of Water Resource Services
Division of Environmental Health Services
New York State Department of Health
84 Holland Avenue
Albany 8, New York

OHIO
Chief Sanitary Engineer
Division of Sanitary Engineering
Ohio Department of Health
Columbus 15, Ohio

PENNSYLVANIA
Sanitary Water Board
Box No. 90
Harrisburg, Pennsylvania

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Executive Secretary
State Water Control Board
415 West Franklin Street
Richmond 20, Virginia

WEST VIRGINIA
Executive Secretary
State Water Resources Board
1709 Washington Street, East
Charleston 1, West Virginia