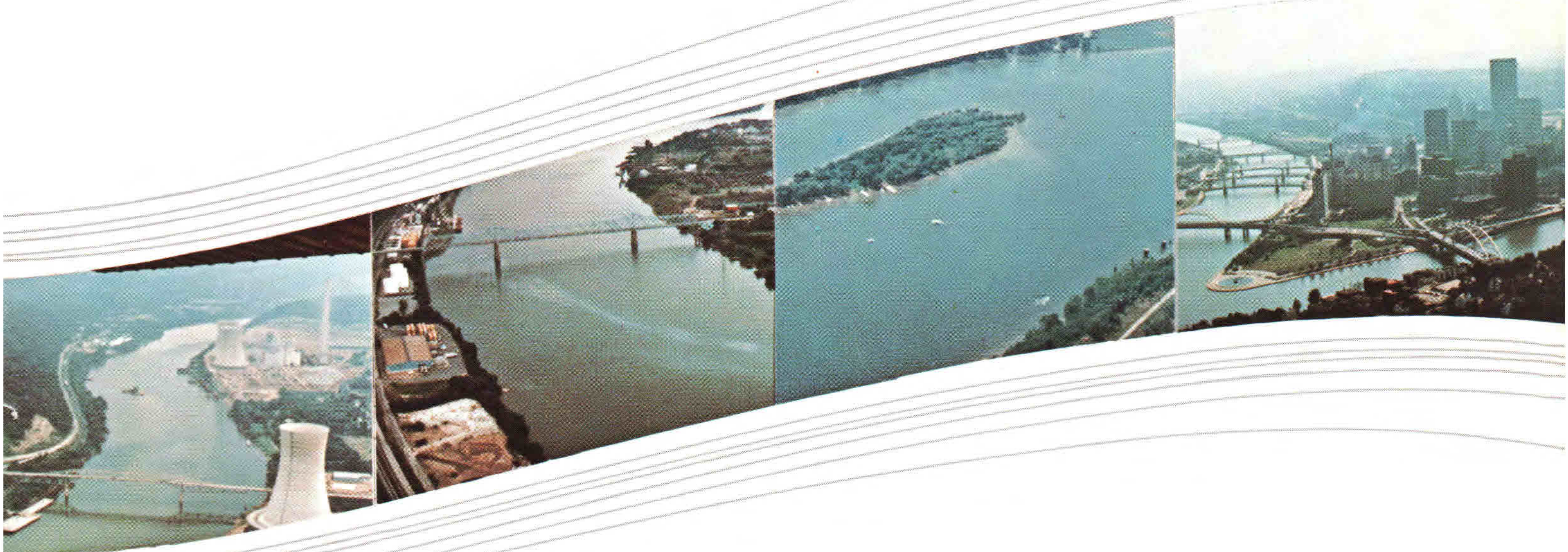
ORSANCO IN REVIEW



1974

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*As of May, 1975

The Commissioners
of the Ohio River Valley
Water Sanitation Commission —
an interstate compact agency
created jointly in 1948 by
the State of Illinois,
the State of Indiana,
the Commonwealth of Kentucky,
the State of New York,
the State of Ohio,
the Commonwealth of Pennsylvania,
the Commonwealth of Virginia and
the State of West Virginia,
with the approval of
the Congress of the United States —
respectfully submit this review
of the activities
of the Commission in 1974.

1974

chairman's message

This has been a pivotal year for ORSANCO. The Commission has undertaken its most searching and comprehensive analysis of ORSANCO'S role and future program. A thorough scrutiny of changing relationships with member States and Federal agencies, stemming from newly-enacted statutes, is an essential element of the inquiry. Evaluation of program priorities will bring about better balance, as well as definition of objectives.

Our new Executive Director has begun the important task of administering the ORSANCO staff work and re-building operating associations with the States and Federal agencies.

Consistent with efforts of all water quality organizations throughout the nation, ORSANCO's Public Interest Committee is energizing a significant public participation activity. Public interest launched the Compact more than thirty years ago, but has lagged in recent years. I believe that a new, positive trend is emerging, which should be strongly encouraged.

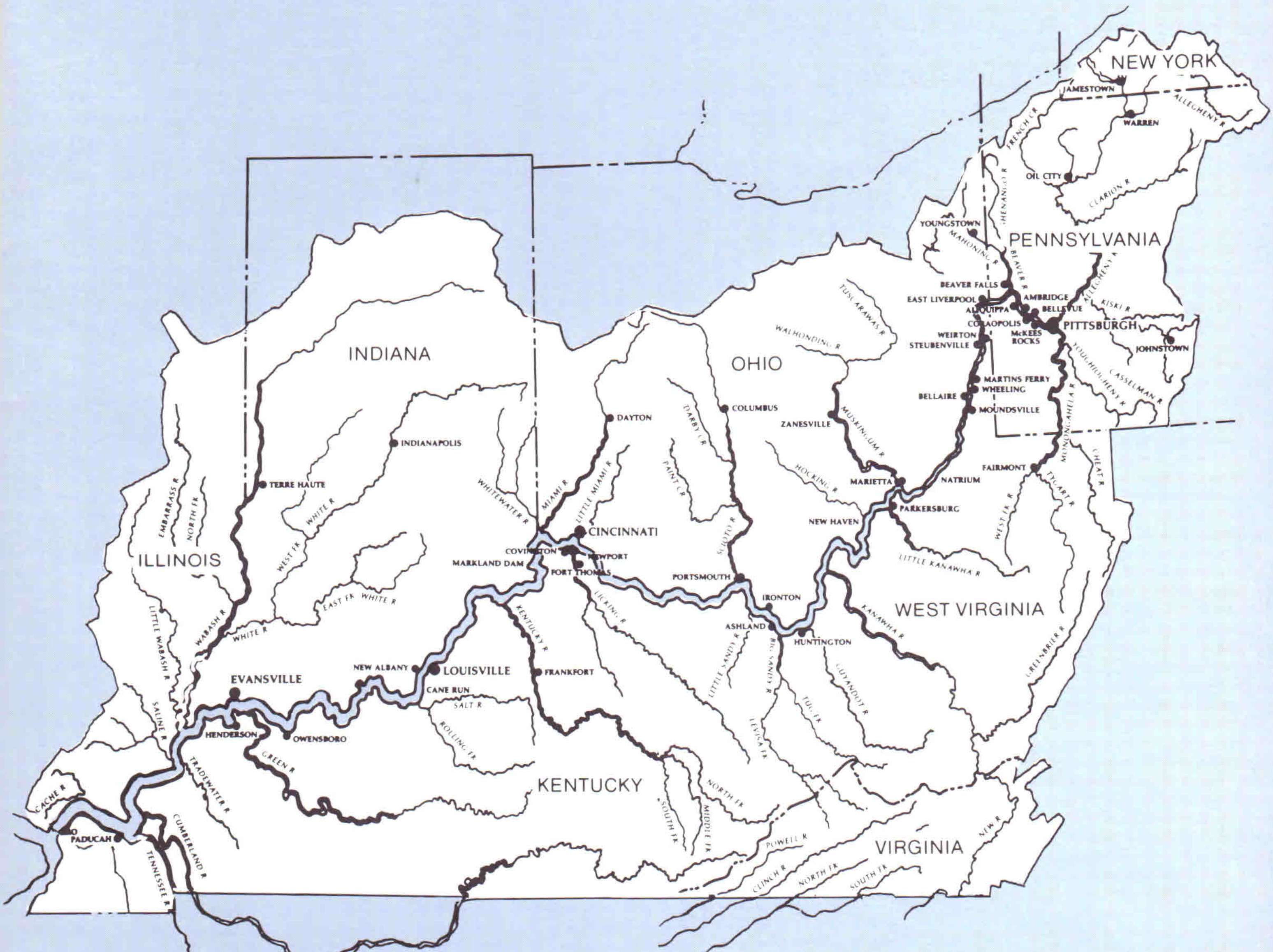
State cooperation, combined with Federal affirmation, has kept ORSANCO active through a complex transitional period. Just as in the past we have been nurtured by citizen and corporate groups committed to cleaner waters and by private individuals with environmental vision, our present and future efforts require us to embrace these sources of strength even more firmly, openly and mindfully.

And just as our Compact generated us as an expert influence, a synergistic and integrative force in water pollution control for the Ohio River Valley, our efforts here also steadily increase.

This volume devotes itself specifically to present time and space, to midstream. It deals with future goals and objectives either briefly or implicitly. About the accomplishments of ORSANCO and its Commission in the current water pollution control arena, however, it has much to say. We have, throughout the year, performed useful evaluative and coordinative roles for both the member States and the Federal government. We have continued to pinpoint major causes of water pollution in the Basin. We have concerned ourselves with critical matters pertinent to water quality. We have provided technical services to both member States and Federal agencies. In our capacity as one of the most broadly based inter-jurisdictional organizations in the United States, we have acted decisively as a forum for our eight member States and as an intermediary on the national front.

Our ambit is as extensive as our tasks at hand. Herein lies our strength and our challenge.

the ohio river valley compact district



currents of change in the valley

The Ohio River region has undergone a multitude of shifts since it achieved its infant form long ago. Although the origins of the river post-date the coal epochs and the upheavals that formed the Appalachians, its history is intimately and inextricably interwoven with those events. The river superseded now extinct tributaries, the currents of which had competed with it for ascendancy. Glaciers obliterated other rival streams, broke through aged divides, twisted and engorged the terrain. The river itself had endured its rite of passage and achieved its dominance.

The region warmed gradually after the Glacial Age. Currents beneath the river, tempered by climatic change, provided for the growth of plant life in the area. The river spawned successive generations of aquatic and amphibian life, and its salt-bearing springs became the licks which made the basin attractive to mammals. In the period pre-dating man's arrival, the Ohio River had reached an equilibrium established by nature.

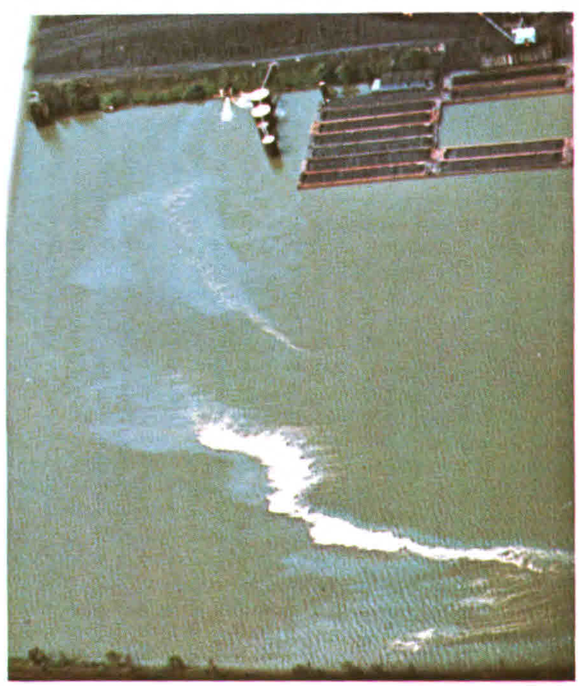
Its geological evolution resulted in its being surrounded by rugged Appalachians to the east, thick deposits of glacial drift to the north of its central region, rough hills and valleys encompassed by steep ridges to the south. Generally, jagged rock and flood plain came to define and lace both its banks. The Ohio River was then a free-flowing stream. It had metamorphosed into its natural state before the earliest human inhabitants settled in the basin.

The first people who lived in the valley were apparently few in number, deficient in tools, and intimidated by the harshness of the regional terrain. Indian cultures developed quite gradually on and near the banks of the Ohio. The river awed them, and they did not alter it. They used it rather for subsistence living and as a major source of religious inspiration.

When European explorers first charted the Ohio in search of a route to the Orient, they were impressed not just with its grandeur, however, but with its greater potential utility. This attitude accompanied those who later settled in the basin. Consequently, the river and its environs incurred further change, this time at the hands of and for the service of man. Much of the area had become a vehicle for accommodating the onrush of civilization and its associated technology. Ironically, in the case of coal, miners used the natural tendency of tributaries to seep acid near coal deposits in order to ascertain the location of a major source of man's fuel. Subsequently, whereas nature had allowed for some acid in the waters, man's progressive mining efforts produced greater levels of acidity than the streams could assimilate. And, whereas limestone, salt, and brine deposits had once supported early mammalian life in the valley, these became the raw materials of an expanding chemical industry and contributed to its wastewaters. Commerce burgeoned on the banks of the Ohio, and the population and its sewage multiplied proportionately.

Although the descendants of the first explorers no longer looked to the river as a possible route to the Orient, their needs for improved stream navigation increased, thus causing them to embark on a program to canalize the Ohio. Once again, the river was physically altered. What geological forces had shaped into a free-flowing stream, man fashioned into a series of slack-water pools.

The cumulative effects of man-inspired change began to be felt early in this century.



The effects of industrial discharges upon the Ohio, including floating debris, oil, and scum.

The nature of the wildlife which the Indians had found upon their arrival in the valley had altered considerably. Certain species of fish were disappearing as a result of the physical effects of canalization and all aquatic life suffered from the chemical effects of the river's untreated sewage and industrial waste.

In addition, the damming of the river, begun in the nineteenth century as "river improvement," because it eased man's travels and was so important to commerce, also contributed to pollution particularly in low-flow periods by concentrating sludge from wastewaters. The simple old conception of a natural resource, a thing of nature to be used by man for the benefit of man, was beginning to appear more complex than it had. It was based on the questionable premise that things of nature would always be present, plentiful, and automatically refurbishable.

These attitudes and their effects, ORSANCO inherited in 1948 when, largely through citizen efforts and the sponsorship of its signatory states it was launched with a legal mandate for further change in the basin. ORSANCO has built its foundation on the assumption that the tools of civilization and technology, some of which had come to work at odds with the natural inclinations of the river, must be used to bring man and nature into harmonious coexistence once again. The Commission recognized that the modifications which civilization had and continues to bring about upon the river need not cause its degeneration and that reasonable and cost effective water pollution control can have a beneficial influence upon the river and economic spheres which it serves.

This review concentrates on just how the Commission as a compact formed among eight basin states and the federal government has benefitted the Ohio, its tributary waters, and its basin citizenry, specifically throughout the year. It will illustrate the effect of friendly scientific interaction with the stream and the cooperative effort which it has engaged in with other agencies and people of the area in order to accomplish the goal of pollution abatement. But like the river, the Commission's work is ongoing. The achievements cited in the present review flow from the past and will suggest future changes toward stream improvement in the valley.

Recreation on the Ohio River.

tally for the valley

Stream quality may improve proportionately to both the quantity and the quality of wastewater treatment facilities in the basin. But in meeting the pollution abatement challenge, generalizations do not suffice. There must be specific evidence of improvement. ORSANCO's work toward pollution abatement emanates from a close working relationship with the states signatory to the compact. Each year, these states provide ORSANCO with data on waste treatment practices of the communities, institutions, and industries using the waters of the Ohio River Compact District. The data, combined with information from a monitoring network, offers valley citizens an annual basis for comparison and evidence of forward currents in wastewater treatment.

On the mainstem in 1973, 132 wastewater treatment plants served a population of 3,461,000 in 295 communities. In 1974, a mainstem population of 3,590,000 in 310 basin communities is provided with wastewater treatment from 139 plants.

A major stride has been taken in mainstem wastewater treatment this year. The Allegheny County Sanitary Plant, currently operating in the Pittsburgh area, has been upgraded to include biological treatment and final clarification. It is now a secondary treatment facility. The significance of such a measure is this: whereas in previous years 200,000 citizens living on the Ohio mainstem were provided with secondary treatment, the completion of this plant has raised the number of mainstem citizens receiving the benefits of secondary treatment to over a million.

Progress is continuing. By 1977, the completion of secondary treatment facilities at two other major metropolitan locations on the mainstem will increase the number of valley inhabitants benefitting from secondary wastewater treatment to approximately 80%.

In the compact region as a whole, 1218 waste treatment plants served 12,226,000 people from 1559 district communities in 1973. 1974 has produced a significant increase in wastewater treatment for the total compact population. Today 1304 treatment plants provide 12,750,000 people in 1585 communities with improved wastewater treatment.

During the past year, there has been a sharp rise in the number of district inhabitants benefitting from new or upgraded facilities. Whereas in 1973 the wastewater from 142,130 people of the district was processed through upgraded wastewater facilities, in 1974, the wastewater discharges from 1,660,000 are being given better treatment. New or augmented plants have been completed in 38 locations in 1974; these plants serve an additional 120 communities throughout the compact district. Moreover, 50 upgraded facilities safeguarding 139 additional communities and 1,496,000

Status of Municipal and Institutional Wastewater Control Facilities — July 1, 1974

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

	ILL.	IND.	KY.	N.Y.	OHIO	PA.	VA.	W. Va.	TOTAL	% of TOTA
Control currently acceptable	59 337,050	65 524,104	145 649,868•	4 29,765	275 1,698,363	233 2,024,190	47 167,923	71 283,329	899 5,694,592	48.94 44.66
Treatment provided, improvements needed	25 57,048	175 1,698,201	41 327,553	12 71,490	86 1,443,560	145 900,582	38 67,621	42 302,923	564 4,868,978	30.70 38.18
Treatment provided, improvements under construction	1 3,980	23 92,394	52 595,578		38 988,614	6 25,718		3 19,080	123 1,725,264	6.70 13.53
New treatment plants under construction		6 6,045			2 3,148	8 35,363		4 28,297	20 72,853	1.09 0.57
No treatment, construction not started		34 33,790	2 2,331	1 1,500	17 17,991	91 191,958	10 11,037	77 131,555	232 390,162	12.63 3.06
Total	85 398,078	303 2,334,534	240 1,575,230	17 102,755	417 4,151,676	483 3,177,811	95 246,581	197 765,184	1,837 12,751,849	
Completed Improvements	2 2,370	12 202,170		1 19,200	13 235,990	84 1,186,041	1 6,780		113 1,652,051	
Completed new facilities		1 641		1 1,500	2 2,201	1 700	2 3,670		7 8,712	

people are scheduled for completion in the near future.

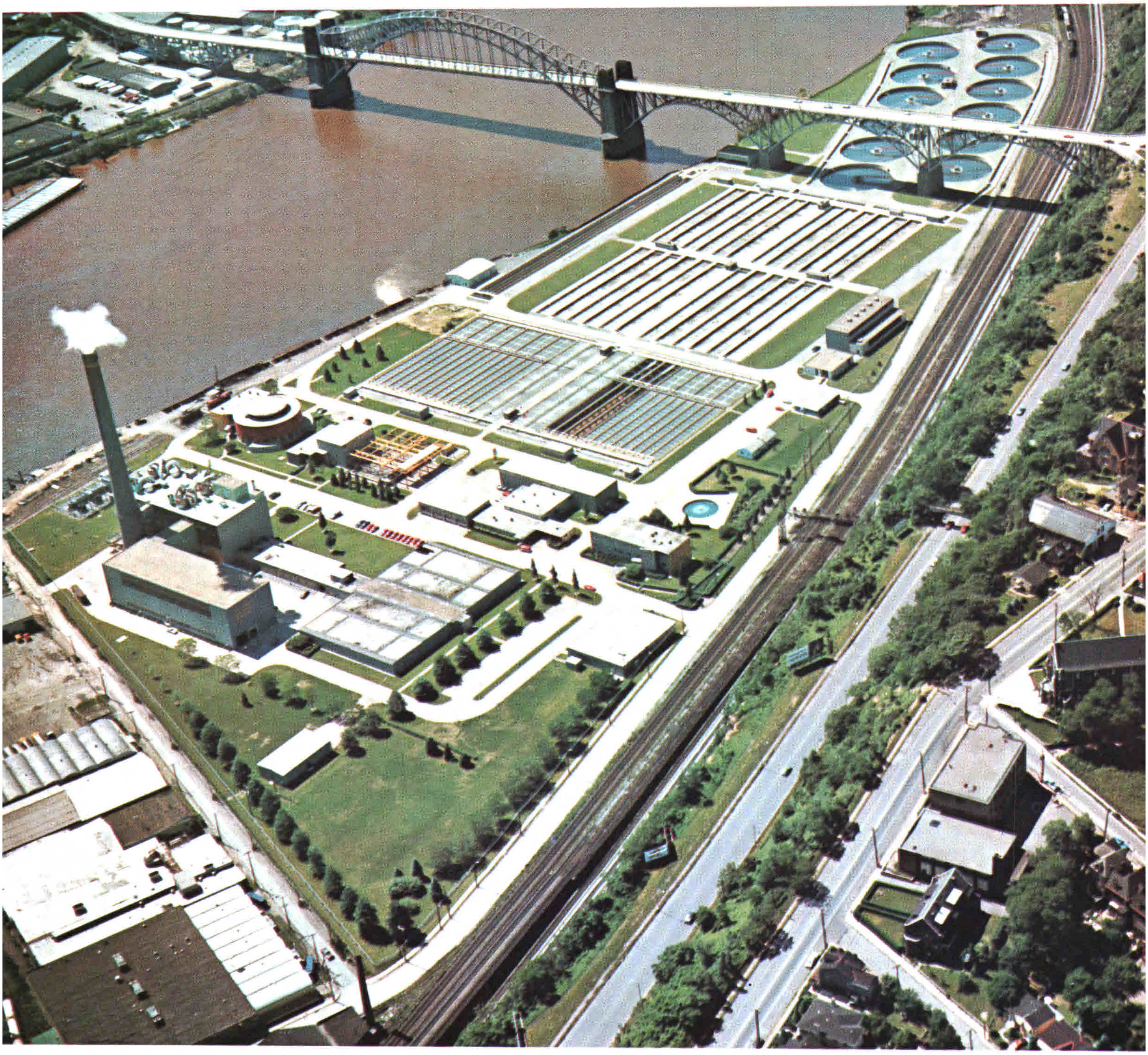
In the industrial wastewater treatment area, one measure of progress is the numbers of plants effecting or refining wastewater treatment facilities. Of the 1587 industrial plants now discharging wastewaters into compact streams, 338 require improvement over their present control facilities, and 88 have undertaken either to construct new facilities or to upgrade those presently operating. Today, 1111 district plants meet with currently acceptable ORSANCO standards, 59 of this number having completed construction of improvements.

Status of Industrial Wastewater Control Facilities — July 1, 1974

STATUS	ILL.	IND.	KY.	N.Y.	OHIO	PA.	VA.	W. VA.	TOTAL	% of TOTAL
Controls currently acceptable	38	160	136	9	206	292	50	214	1111	70.00
Control facilities provided, improvements needed	5	61	4	11	131	80	7	89	388	24.45
Control facilities provided, improvements under construction	6	24	6	3	22	11		12	84	5.29
New control facilities under construction	1			2				1	4	0.25
Total	50	245	146	25	359	389	57	316	1587	
Completed improvements or new facilities	1	2	1	5	14	5		31	59	

Levels of Treatment Achieved in the Compact District — July 1, 1974

Basin	No Treatment	Primary Intermediate	Secondary or Higher	Under Construction
Ohio Main Stem				
Number of communities	8	179	127	85
Population	13,213	2,040,206	1,568,573	1,239,587
Allegheny				
Number of communities	57	63	67	6
Population	139,574	309,361	336,497	34,532
Beaver				
Number of communities	—	34	49	1
Population	—	441,638	326,238	5,200
Big Sandy				
Number of communities	14	9	19	—
Population	24,203	17,570	31,717	—
Cumberland				
Number of communities	—	2	26	—
Population	—	5,440	97,521	—
Green				
Number of communities	1	1	27	—
Population	901	1,590	135,927	—
Guyandot				
Number of communities	3	5	6	—
Population	1,709	9,630	9,425	—
Hocking				
Number of communities	1	2	9	—
Population	2,120	15,269	85,236	—
Kanawha				
Number of communities	28	31	48	4
Population	31,279	85,629	268,377	19,547
Kentucky				
Number of communities	—	3	24	—
Population	—	25,935	190,328	—
Licking				
Number of communities	—	—	13	—
Population	—	—	56,584	—
Little Miami				
Number of communities	—	1	30	—
Population	—	1,500	186,976	—
Miami				
Number of communities	4	3	61	6
Population	2,071	8,520	915,653	52,489
Minor tributaries				
Number of communities	15	17	124	3
Population	19,212	56,530	511,842	2,861
Monongahela				
Number of communities	70	45	60	8
Population	175,959	277,020	317,042	41,300
Muskingum				
Number of communities	5	24	76	2
Population	7,020	141,008	530,441	20,450
Salt				
Number of communities	—	—	16	—
Population	—	—	87,267	—
Scioto				
Number of communities	5	6	56	1
Population	3,465	38,100	897,470	13,100
Tennessee				
Number of communities	7	16	27	—
Population	8,846	25,976	81,817	—
Wabash				
Number of communities	38	29	242	23
Population	39,343	100,297	2,121,689	68,077



The Allegheny County Sanitary Treatment Plant (ALCOSAN), serving the Pittsburgh area, now includes secondary treatment and final clarification.

Photograph courtesy of Allegheny County Sanitary Authority.

basin-wide needs

The Federal Water Pollution Control Act (P.L. 92-500) stipulates that as of July 1, 1977, effluent limitations for point sources other than publicly owned treatment works shall require the application of the best practical control technology currently available. The law also provides that publicly owned treatment facilities meet "secondary treatment as defined by the Administrator," and that where the preservation of water quality requires that more stringent effluent standards be applied, the water quality requirements will prevail.

Federal grant funds aiding communities in their construction of wastewater treatment facilities under P.L. 92-500 are allocated on the basis of the ratio of "the estimated cost of constructing all needed publicly owned treatment works in each state . . . to the estimated cost of construction of all needed publicly owned treatment works in all of the states."

In 1974, in order to gather preliminary information on this matter for presentation to Congress, U.S. EPA conducted a state-by-state "needs" survey. The Compact states of the Ohio River basin, in response to the survey, reported that the costs for implementing secondary treatment plants and facilities which would satisfy higher water quality standards and for constructing the interceptor sewers and pumping stations required for collecting and transporting wastewaters to these plants and facilities approximate some four billion dollars. These costs, classified according to state and basin, are specified in the following tables.

1974 "Needs" Survey
According to State
(Dollars times 1,000)

State	Secondary Treatment	Tertiary Treatment	Interceptor Sewers	Other*	Total
Illinois	21.898	9.401	2.147	50.875	84.321
Indiana	129.174	250.226	199.053	1.123.455	1.701.908
Kentucky	39.099	143.693	257.169	1.083.581	1.523.542
New York	1.961	13.391	20.745	12.167	48.264
Ohio	5.719	763.485	458.039	3.133.638	4.360.881
Pennsylvania	28.377	16.070	35.123	874.790	954.360
Virginia	20.229	2.760	31.075	35.126	89.190
West Virginia	75.858	298.690	1.226.703	1.651.967	3.253.218
Total	322.315	1.497.716	2.230.054	7.965.599	12.015.684

1974 "Needs" Survey
By Basin in Compact District
(Dollars times 1,000)

	Secondary	Tertiary	Interceptor	Other*	Total
Ohio and Minor Tributaries	105.870	208.038	591.291	3.257.990	4.163.189
Allegheny	18.226	14.791	35.136	68.339	136.492
Monongahela	4.222	89.843	182.178	1.055.192	1.331.435
Beaver	3.973	91.895	34.979	201.622	332.469
Muskingum	1.884	65.550	38.741	102.260	208.435
Little Kanawha	6.241	1.965	93.217	124.496	225.919
Hocking	500	12.293	6.747	10.932	30.472
Kanawha	32.356	138.952	516.201	676.744	1.364.253
Guyandot	833	37.203	117.962	146.668	302.666
Big Sandy	1.819	22.571	57.048	96.035	177.473
Scioto	—	209.305	108.778	744.146	1.062.229
Little Miami	—	55.415	52.265	60.012	167.692
Licking	201	9.317	5.167	7.891	22.576
Great Miami	5.355	180.158	110.901	214.335	510.749
Kentucky	3.467	38.988	31.748	113.011	187.214
Salt	120	5.664	2.749	12.446	20.979
Green	1.679	22.628	24.564	53.394	102.265
Wabash	126.202	256.447	183.766	952.762	1.519.177
Cumberland	184	19.273	15.109	33.126	67.692
Tennessee	8.253	17.420	21.507	28.928	76.108

* Sewer system, rehabilitation, replacement, and over-flow control

on-stream information network

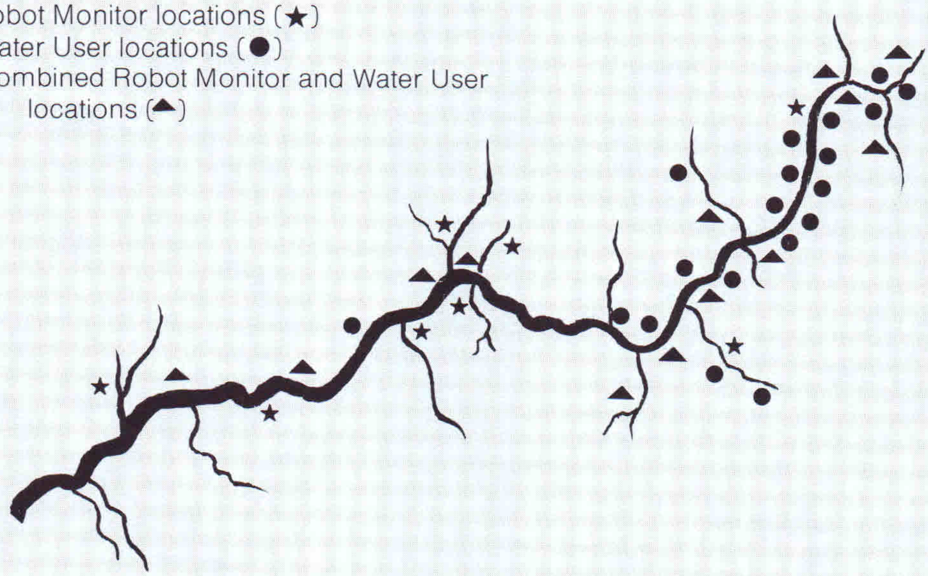
The following table indicates the location and milepoint of both mainstem and tributary monitoring sites — points from which ORSANCO collects stream quality data. These are identified as robot monitor stations, water user stations (stations situated at water treatment plants), or combined data collection locations on the table and the map below.

OHIO RIVER STATIONS - 1971 through 1973

	MILE POINT
● Pittsburgh (Reed), Pa.	2.3
▲ South Heights, Pa.	15.8
★ Stratton, Oh.	53.8
● Toronto, Oh.	59.1
● Weirton, W. Va.	62.2
● Steubenville, Oh.	65.3
● Power, W. Va.	79.3
● Yorkville, Oh.	83.6
● Wheeling, W. Va.	86.8
● Moundsville, W. Va.	111.0
● Natrium, W. Va.	119.4
▲ Willow Island, W. Va.	161.0
● Parkerburg, W. Va.	183.7
▲ New Haven, W. Va.	241.6
● Addison, Oh.	260.7
▲ Huntington, W. Va.	304.2
● South Point, Oh.	318.0
● Portsmouth, Oh.	350.7
▲ Cincinnati (Waterworks), Oh.	462.8
▲ North Bend (Miami Fort), Oh.	490.0
★ Markland Dam	531.5
● Madison (Clifty Creek), Ind.	559.5
▲ Louisville (Waterworks), Ky.	600.6
★ Louisville (Cane Run), Ky.	616.8
▲ Evansville, Ind.	791.5

OHIO RIVER TRIBUTARY STATIONS 1971 through 1973

	Miles from sampling station to confluence of tributary with Ohio River	Mile at which tributary enters Ohio River
▲ Allegheny River at Oakmont, Pa.	13.3	0.0
● Allegheny River at Wilkinsburg, Pa.	8.9	0.0
▲ Monongahela River at Charleroi, Pa.	42.6	0.0
● Monongahela River at South Pittsburgh, Pa.	4.5	0.0
▲ Beaver River at Beaver Falls, Pa.	5.3	25.4
▲ Muskingum River at Philo, Oh.	66.8	172.2
▲ Muskingum River near Beverly, Oh.	28.0	172.2
● New River at Glen Lyn, W. Va.	193.9	
● Kanawha River at Cabin Creek, W. Va.	74.3	265.7
★ Kanawha River at Winfield, W. Va.	31.1	265.7
Big Sandy River near Louisa, Ky.	20.3	317.1
★ Little Miami River at Cincinnati, Ohio	3.4	463.5
★ Licking River at Kenton County, Ky.	4.5	470.3
★ Great Miami River near Cleves, Ohio	5.5	491.1
★ Wabash River near Hutsonville, Ill.	174.0	848.0



MONITOR STATIONS — 1971 through 1973

Robot Monitor locations (★)
Water User locations (●)
Combined Robot Monitor and Water User locations (▲)

stream quality

ORSANCO appraises water quality in the Ohio River and its major tributaries using twenty-one chemical, bacteriological, and physical variables. This year's analyses represent accumulations of data which illustrate quality ranges and the percentages of time Commission criteria were met at the sampling points along the prescribed reaches of the mainstem and its tributaries.

highlights on stream

During the 1971 through 1973 period, stream flows in the Ohio River Basin as a whole were above the long-term average. Summer and fall precipitation was plentiful and no significant low flow periods occurred during these three years.

A direct relationship exists between river flow and dissolved oxygen concentrations whereas an inverse relationship has been established between river flow and dissolved mineral constituent levels.

Coliform bacteria counts increase not only with rising river flows but also with intense precipitation which results in urban and rural stormwater runoff.

Moreover, the relationships between river flow and water quality indicate that the above normal 1971-73 summer-fall stream flow resulted in dissolved oxygen concentrations and coliform counts above the long-term average and in below normal levels of dissolved mineral constituents.

In general, however, continuing installation and updating of pollution control facilities, along with improved operation and maintenance of these have bettered stream quality.

the mainstem in detail

Dissolved Oxygen criteria – daily average not less than 5.0 mg/1 and not less than 4.0 mg/1 at any time – were met on an average of 92% of the time during 1971, 1972, and 1973 at the electronic monitor locations. In this three-year period, they were satisfied 100% of the time at eleven monitor sites in the winter and spring months – January, February, March, April, May, November, and December. The following table indicates the percent of time dissolved oxygen standards were not met over the abovementioned years for the summer and fall months.

table I

Percent of Time Dissolved Oxygen Criteria
Were Not Met
at Electronic Monitor Locations
1971 through 1973

(Criteria met 100 percent of time
during months not reported)

Month	1971	1972	1973
South Heights			
June	10	0	0
July	18	0	12
August	16	0	0
September	27	0	0
Stratton			
July	25	*	0
August	6	0	35
September	20	61	45
Willow Island			
June	4	0	0
September	14	0	0
New Haven			
July	3	0	*
August	0	10	0
Huntington			
July	29	0	23
August	28	0	4
September	10	0	0
Cincinnati			
September	10	0	0
Miami Fort			
July	28	0	4
August	60	0	26
September	40	30	93
October	6	0	10
Markland Dam			
June	0	4	20
July	71	15	100
August	87	74	55
September	64	100	100
October	26	55	100
November	0	0	7
Louisville			
June	3	4	21
July	72	6	97
August	90	10	90
September	67	43	68
October	3	0	50
Cane Run			
June	13	17	0
July	93	10	43
August	83	74	100
September	47	77	84
October	0	0	82
Evansville			
July	7	0	0
August	36	0	0

* No Monitor data

Low dissolved oxygen levels at South Heights and Stratton occur as the result of discharges of oxygen demand materials from the intermediate treatment plant, ALCOSAN,* and other wastewater discharges in the Pittsburgh Metropolitan Area. Downstream conditions improve between Stratton and Cincinnati. Discharges from the four primary treatment plants in the Cincinnati Metropolitan Area coupled with low reaeration rates in the Markland and McAlpine navigation pools produce low oxygen levels at Miami Fort, Markland Dam and Louisville. Discharges in the Louisville Metropolitan Area further depress oxygen levels at Cane Run, below Louisville.

This condition was alleviated in late 1973 with the placing on line and operation of secondary treatment facilities by ALCOSAN.

Completion and satisfactory operation of secondary treatment facilities in Pittsburgh (ALCOSAN), Cincinnati, and Louisville areas will enhance dissolved oxygen levels throughout the entire Ohio River.

pH criteria specify that pH shall not be less than 6.0 nor greater than 8.5 at any time. In the Ohio River, pH values of above 8.5 did occur but such values are attributed to photosynthetic rather than man made activity. Low pH readings in the upper Ohio River result in large measure from acid mine drainage in the Allegheny and Monongahela river basins.

table II

Percent of Time pH Criteria
Were Not Met
at Monitor Locations - 1971 - 1973

(Criteria were met 100 percent of the time
during months not listed)

	1971	1972	1973
		(Less than 6.0)	
South Heights			
March	0	1	0
May	0	2	0
June	0	5	0
July	0	9	0
August	6	0	0
September	12	4	0
October	29	0	0
Stratton			
September	2	0	0
Willow Island			
May	0	4	0
July	0	8	0
August	0	0	1
		(More than 8.5)	
Willow Island			
August	0	0	2
September	0	1	0
Louisville			
August	14	0	0
Cane Run			
August	0	7	0
September	0	1	0
Evansville			
August	0	14	0
September	0	11	0

Temperature criteria for the Ohio River are specified on a maximum allowable monthly basis, as follows:

table III

Month	Temperature deg. F
January	50
February	50
March	60
April	70
May	80
June	87
July	89
August	89
September	87
October	78
November	70
December	57

During 1971 through 1973 maximum hourly temperatures registered below the maximum allowable value 100 percent of the time at the South Heights, Willow Island, New Haven, Huntington, Miami Fort, Markland Dam, Louisville and Evansville monitors. Temperature limits were exceeded during October, 1973 and November, 1971 at three locations – Stratton (one percent), Cincinnati (three percent) and Cane Run (four percent)—these temperature values less than one degree F higher than applicable limits during the first three or four days of each month. Air temperatures rose to well above normal during these periods.

Dissolved Solids/Conductivity are highly correlated quality characteristics. Stream criteria for dissolved solids specify that the monthly average shall not exceed 500 mg/1 with no value greater than 750 mg/1. Corresponding conductivity limits are 800 and 1,200 micromhos/cm. These criteria were met 100 percent of the time during 1971, 1972, and 1973 at all eleven Ohio River monitoring locations.

Chloride specifications are not delimited by ORSANCO. The 1962 U.S. Public Health service drinking water standards, however, recommend that chloride levels shall not exceed 250 mg/1 at any time. West Virginia and Illinois stream standards specify 100 and 250 mg/1 respectively as limiting values for chloride. These criteria were satisfied 100 percent of the time at the nine electronic monitor stations equipped with chloride sensors.

Total coliform bacteria, which themselves are not disease producing, are tested to determine the potential presence of fecal or pathogenic organisms. The test may also indicate the presence of bacteria of non-fecal origin, such as those normally found in soil runoff. Assessing whether the density of total coliform bacteria represents a potential health hazard in a particular stream requires a field survey to establish the level of sewage discharges present and the influence of such discharges on observed analytical results.

The fecal coliform test has been initiated to evaluate the bacterial quality of surface waters for purposes of improving sanitary evaluations. Fecal coliform organisms are specifically associated with human and warm-blooded animal wastes and better indicate bacterial quality than does total coliform. Adequate fecal coliform data is not available for the 1971 through 1973 period. The following appraisal is, therefore, based on total coliform information as related to public water supply and body-contact recreation.

ORSANCO's criteria for appraising total coliform bacterial quality conditions specify the following:

> For public water supply and food processing industry: Coliform group not to exceed 5,000 per 100 ml as a monthly-average value; nor exceed this number in more than 20 percent of the samples examined during any month; nor exceed 20,000 per 100 ml in more than five percent of such samples.
>
> For recreational purposes: Coliform group not to exceed 1,000 per 100 ml as a monthly-average value; nor exceed this number in more than 20 percent of the samples examined during any month; nor exceed 2,400 per 100 ml on any day.

Total coliform densities were routinely measured at eight locations. With regard to criteria for public water supplies, the following tabulation shows the number of months that the individual specifications were not met during the three year period:

table IV

Number of Months Total Coliform Criteria
Were Not Met
1971 through 1973

Station	Number of months* average value exceeded 5,000 per 100 ml	Number of months* 20 percent or more of daily values exceeded 5,000 per 100 ml	Number of months* 95 percent or more of daily values exceeded 20,000 per 100 ml
Weirton	32	34	25
Steubenville	23	23	19
Wheeling	28	29	22
Huntington	4	6	0
Portsmouth	1	6	0
Cincinnati	32	34	24
Louisville	15	23	6
Evansville	24	31	9

* a total of the 3 years or 36 months

During 1971 through 1973 for the recreational months of May through September, none of the three specifications for total coliform for recreation were fulfilled at Weirton, Steubenville, Wheeling, Cincinnati or Evansville. However, each of the requirements was met for 4 of the 15 months at Huntington, for two months at Portsmouth, and for three months at Louisville.

Long-term coliform records as related to river flow and location and disinfection of upstream sewage plant effluents indicate that non-point sources, such as urban and rural runoff, are the major factors determining coliform levels in the Ohio River.

The **Threshold Odor** standard ORSANCO sets for public water supply specifies that the threshold odor number of the untreated river water should not exceed 24. For the three-year period covered, this standard was met 100 percent of the time at Cincinnati and Evansville, and 99.5 to 99.7 percent of the time (one sample above 24) at Huntington, Portsmouth and Louisville. At Natrium (mile 119), which is not a public water supply, the threshold odor criterion was fulfilled only 64.8 percent of the time, reflecting the combined impact of municipal and industrial wastewater discharges.

Fluoride levels are measured at Wheeling and Cincinnati sampling locations. The maximum concentrations of 0.8 mg/1 at Wheeling and 0.6 mg/1 at Cincinnati are less than the 1.0 mg/1 limiting value specified in the ORSANCO criteria.

Sulfate concentrations are determined at least once a week at twelve water user locations. During the 1971 through 1973 period, maximum sulfate values were reported at Parkersburg, where less than five percent of the daily samples exceeded the generally recommended 250 mg/1 upper limit. The maximum monthly average at this location was 198 mg/1. Maximum individual and monthly average values increase between Steubenville and Parkersburg and then decrease at downstream sampling locations between Parkersburg and Evansville. The Muskingum River, upstream from Parkersburg, is one of the major sources of sulfate in this section of the Ohio.

Other Constituents: Maximum and minimum monthly average values for several other water quality parameters are summarized in the following table:

table V

Maximum and Minumum Monthly Average Concentration
for Selected Water Quality Characteristics — 1971 - 1973

(Concentration — mg/1)

Parameter	Mile 2.3 to 260.7		Mile 304.2 to 490.0		Mile 559.5 to 791.5	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
Alkalinity	59	11	97	22	108	34
Total Hardness	241	75	200	89	242	99
Total Iron	3.16	0.06	0.70	0.22	—	—
Total Manganese	2.93	0.15	1.03	0.02	1.92	0.24
Nitrate as N	4.5	0.1	—	—	0.7	0.0
Phosphorous as P	0.40	0.05	—	—	0.45	0.08

The concentration ranges in each section of the river are comparable to corresponding values during previous years.

the tributaries in detail

Dissolved Oxygen hourly values were obtained from electronic monitors on nine major tributaries of the Ohio River. During the 1971 through 1973 period, the dissolved oxygen stream quality criteria were met one hundred percent of the time at monitor stations on the Allegheny, Big Sandy and Monongahela Rivers. At other monitor locations, the percent of time the dissolved oxygen criteria were not met during the summer-fall months is shown in Table VI.They were fulfilled 100 percent of the time during the months not listed.

Low dissolved oxygen levels on the Beaver, Kanawha and Great Miami rivers are attributable, in part, to municipal and industrial wastewater discharges from inadequate treatment facilities in metropolitan areas. On the Muskingum, Licking and Wabash rivers low dissolved oxygen levels result primarily from nonpoint sources of pollutants and biological activity in the stream.

table VI

Rivers Tributary to the Ohio River
Percent of Time Dissolved Oxygen Criteria
Were Not Met
at Electronic Monitor Locations
1971 through 1973

(Criteria were met 100 percent of the time during months not reported)

Tributary Month	1971	1972	1973
Beaver River - Beaver Falls			
May	0	14	0
June	12	17	50
July	5	42	100
August	12	53	74
September	*	89	0
October	100	4	37
Muskingum - Beverly			
July	28	0	0
August	10	0	12
Kanawha - Winfield Dam			
July	87	0	65
August	84	10	55
September	43	77	100
October	6	0	21

Tributary Month	1971	1972	1973
Licking - Kenton County			
June	0	17	0
July	0	0	19
August	0	0	16
September	3	13	50
October	0	0	50
Great Miami - Cleves			
June	13	17	*
July	13	41	0
August	5	0	*
September	17	10	26
Wabash - Hutsonville			
June	33	0	0
July	16	25	59
August	3	0	58
September	10	0	*

* No monitor data

pH criteria for conditions suitable for acquatic life specify no value less than 6.0 nor greater than 8.5. Two categories of criteria violations can be established through readings of hourly data collected from the electronic monitors on nine major tributary streams: pH values of less than 6.0 occurred on the Allegheny, Monongahela, Beaver, Kanawha and Big Sandy rivers; pH values of greater than 8.5, on the Muskingum, Licking, Great Miami, and Wabash rivers. The accompanying table shows the month, year and percent of time the respective criteria were not met. They were satisfied 100 percent of the time during the months which are not listed.

The low pH values on the Allegheny and Monongahela rivers are primarily the result of acid mine drainage from active and abandoned mines. In the Big Sandy, low pH values during 1973 are probably produced by mine drainage. Values below 6.0 on the Beaver and Kanawha rivers cannot be attributed either to mine drainage or to industrial discharges, since both factors may influence the pH at these monitor locations.

The high pH values recorded on the Muskingum, Licking, Great Miami and Wabash rivers are attributed to photosynthetic activity. High

table VII

Rivers Tributary to the Ohio River
Percent of Time pH Criteria
Were Not Met
at Electronic Monitor Locations
1971 through 1973
(Criteria were met 100 percent of the time
during months not reported)

Tributary Month	1971	1972	1973
Allegheny	less than 6.0		
January	1	1	0
March	27	7	0
April	10	24	9
May	0	0	37
June	2	39	1
July	7	54	0
August	0	35	0
September	*	18	0
October	0	0	3
Monongahela	less than 6.0		
January	74	8	10
February	43	3	0
March	100	48	5
April	100	26	0
May	60	25	18
June	90	14	35
July	97	59	1
August	65	66	58
September	61	89	0
October	30	56	3
November	59	4	0
Beaver	less than 6.0		
August	0	7	0
September	0	89	0
Kanawha	less than 6.0		
August	0	21	0
Big Sandy	less than 6.0		
May	0	0	15
June	0	0	1
November	0	0	5
Muskingum	over 8.5		
April	1	0	0
May	1	2	0
June	0	8	0
July	0	0	1
September	0	4	0
Licking	over 8.5		
June	10	0	0
Great Miami	over 8.5		
May	0	1	0
June	0	3	*
September	0	4	21
October	7	0	0
Wabash	over 8.5		
July	0	1	0
August	1	3	0
November	0	3	0
December	0	8	0

* No Monitor data

pH levels which occur naturally are not considered in violation of stream quality criteria.

Temperature criteria for the tributaries are specified on a maximum allowable monthly basis and correspond to values for the main stem with the following exceptions — that 90°F is specified for June, July, August and September instead of the 87°, 89°, 89°, 87°F. for these months in the case of the Ohio River.

During the 1971 through 1973 period the stream temperature criteria were met 100 percent of the time at the monitor locations on the Allegheny, Monongahela, Kanawha and Big Sandy rivers. Except as indicated, the temperature criteria were also fulfilled 100 percent of the time at the other tributary monitor locations.

table VIII

Percent of Hours Temperature Criteria
Were Not Met

Station	Month	Hours
Beaver	October 1971	1
Muskingum	October 1971	7
	November 1971	8
Licking	March 1973	4
Great Miami	April 1971	1
	October 1971	9
Wabash	September 1971	3
	October 1971	5
	October 1973	7

Dissolved Solids (dissolved mineral material) public water supply criteria are specified in terms of a limiting monthly average and by means of individual values, such as those for conductivity, measured by the electronic monitors. The criteria for conductivity, a water quality characteristic highly correlated with dissolved solids, were met 100 percent of the time at monitor locations on the Allegheny, Monongahela, Kanawha, Big Sandy, Licking, Great Miami and Wabash rivers and for 35 of the 36 months on the Beaver River — criteria were exceeded 22 percent of the time during July, 1971 Table IX summarizes the percent of time conductivity criteria were not met at the monitor location on the Muskingum River.

table IX

Percent of Time Conductivity Criteria
Were Not Met
on the Muskingum River
1971 through 1973

Month	1971	1972	1973
June	0	7	0
August	53	0	0
September	94	4	5
October	88	0	19
November	100	7	0
December	10	0	0

Although the Muskingum River is not itself used as a public water supply source, it raises the level of dissolved solids in the Ohio

River, a major public water resource.*

Chloride levels are measured by the electronic monitors on the Muskingum, Kanawha, Licking and Great Miami rivers. The generally accepted limiting concentration of 250 mg/1 for public water supply was met 100 percent of the time on the Kanawha, Licking and Great Miami rivers. The percentages of time chloride levels exceeded 250 mg/1 at the monitor on the Muskingum River are listed in Table X.

table X

Percent of Time Chloride Levels
Were Not Met
1971 through 1973

Month	1971	1972	1973
July	10	0	0
August	47	0	9
September	55	14	0
October	67	0	5
November	93	0	0

The dramatic improvement between 1971 and 1972 resulted from the discontinuance of a soda ash production facility, a major chloride discharger located near the headwaters of the Muskingum River.

Coliform density counts are available from public water supply treatment plants on the Allegheny River at Wilkinsburg, Monongahela River at South Pittsburgh and Beaver River at Beaver Falls. The extent to which ORSANCO's coliform specifications for public water supply sources were not met is shown below.

table XI

Number of Months Total Coliform Criteria
Were Not Met
1971 through 1973

Station	Number of months* average value exceeded 5,000 per 100 ml	Number of months* 20 percent or more of daily values exceeded 5,000 per 100 ml	Number of months* 95 percent or more of daily values exceeded 20,000 per 100 ml
Wilkinsburg	19	20	11
South Pittsburgh	22	30	12
Beaver Falls	36	36	33

* a total of the three years or 36 months

The recreation specifications in ORSANCO's total coliform guidelines were not met at the abovementioned three tributary sampling sites from May through September, the entire water-oriented recreation season.

Threshold odor numbers are routinely determined on the Allegheny and Beaver rivers at the Wilkinsburg and at Beaver Falls water plants. On the Allegheny River, the criteria — threshold odor not to exceed 24 — were met 100 percent of the time during 1971 and 1972. Because the individual samples collected in March, June, November, and December of 1972 exceeded the limit of 24, the criteria were satisfied, on the average, approximately 95% of the time for that year. At Beaver Falls, all threshold odor values were in excess of 24 for the entire three year period on record.

**The marked improvement in dissolved solids beginning in 1972 resulted from the discontinuance of soda ash production near the headwaters of the Muskingum, as described above in Chlorides.*

focus in water quality: orsanco's current research

organics

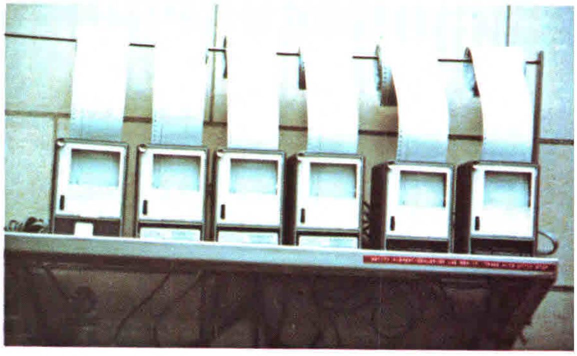
The observation of trace organics in Ohio River water treated for drinking has recently been a troubling one, both for the public in general and for water pollution control agencies in particular. Certain of the organic substances are known or suspected to be carcinogens, while the trace levels reported are not considered as immediate health hazards; whether the levels present in the water are significant from the standpoint of long-term human consumption remains to be answered. In 1973, ORSANCO, with the aid of U.S.EPA funds and under a contract with Carnegie-Mellon laboratories, initiated a limited study to detect, identify, and determine the persistence of trace organic materials in the Ohio River. ORSANCO is obtaining baseline data on organics by investigating the effect of environmental conditions in the Ohio River watershed on the quality of water at five selected treatment plants. The entire research effort must examine organics from a broad environmental perspective, as the validity of the study depends in part on consideration of the fact that organics occur naturally in raw as well as in treated water.

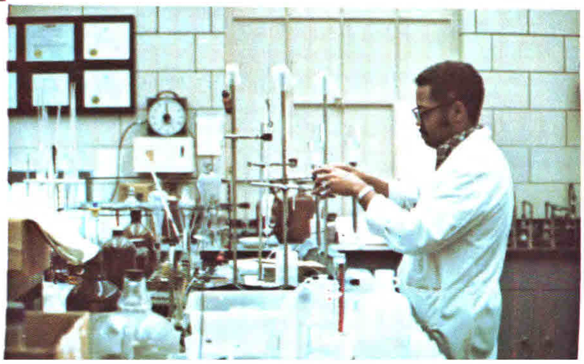
Samples of river water from the five chosen sites have been extracted with methylene chloride, a common organic solvent, concentrated, and analyzed by means of gas chromatography and mass spectrometry. The gas-chromatographic process detects, separates, and points out the relative quantities of the organic constituents in solution. It allows researchers to examine these visually, because the process indicates the constituents as distinct graphic peaks. Some of the materials which show up as peaks in this process are knowns for researchers. What mass spectrometry does is to take the unidentified peaks and chart their ultra-violet spectral characteristics, sometimes at the molecular level. The dual process enables researchers to compute the characteristics of finally identified organics, some of which may be causing the water quality concerns being debated.

Examination of the samples collected at the five major Ohio River water treatment plants has shown that the level of suspended sediment and river temperature are probably important variables in the investigation. Additionally, it has been noted that some 15 new methylene extractable organic constituents form during the drinking water treatment process, including pre- and post-chlorination.

This volatile issue requires much further study, both to pinpoint the troublesome organics and to provide the groundwork for tracking them thoroughly through the water treatment process.

ORSANCO gathers data in co-operation with water treatment plant personnel.





monitoring

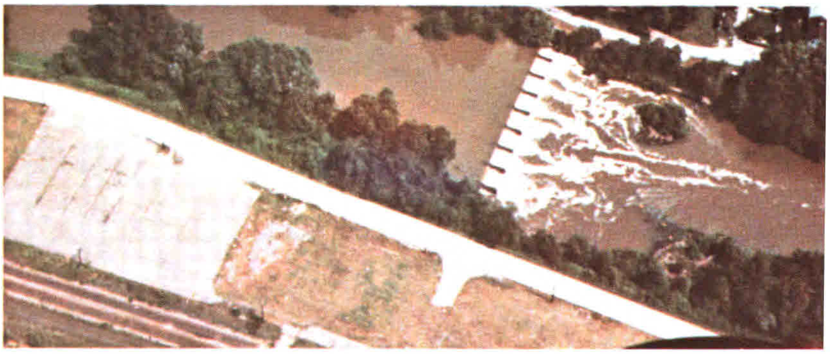
Monitoring provides base-line data essential both to the management of water quality and to the process of planning for water quality improvement. It complements and fosters state and Federal efforts by supplying a continuing, comprehensive picture of actual conditions on stream.

1974 marked the beginning of an augmentation of the monitoring strategy adopted by the Commission. It is to include a network of 37 stations at key locations in the basin, extending the data collection base to better reflect the water quality of the tributaries and strategically altering the locations of several currently operating monitoring stations. These additions will enhance present capabilities of assessing water quality at entry points and on the Ohio River as a whole. At completion of the augmentation process, there will be 25 sampling points combining automatic and manual sampling, 2 operating entirely automatically and 10 functioning manually only.

ORSANCO has moved toward increased manual samplings because of a lack of instrumentation for converting certain key water quality parameters through electrical signals. Scientifically trained staff surveillance specialists will calibrate electronic monitors, perform chemical and biological tests, and collect samples of river water. Time sensitive samples are to be analyzed in water user laboratories such as those available at treatment plants along the specific reaches of the river assigned to each specialist. Others are to be shipped to U.S. Geological Survey regional laboratories for analysis.

The surveillance specialists keep a detailed log of observations regarding river conditions and help to develop and carry out programs requiring field survey team support. They maintain contact with dischargers, and water users, boaters, fishermen, and interested citizens who need knowledge of Ohio River water.

A system "7" has been installed at ORSANCO headquarters. It enables immediate and automatic screening of electronically transmitted robot monitor data.



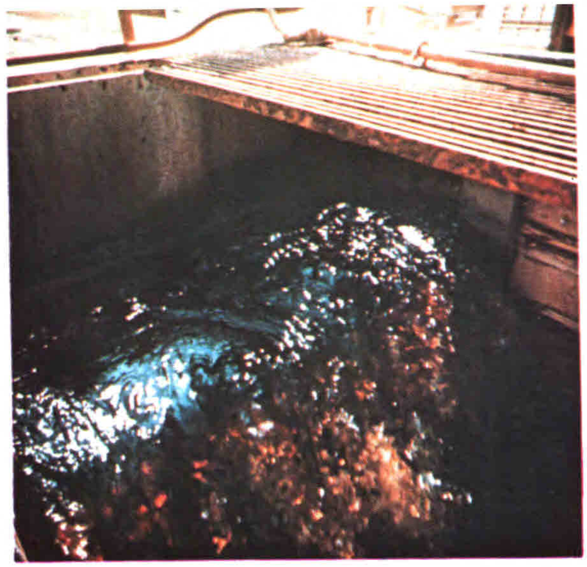
Aerial Surveillance detects and pinpoints the visible impact of sewage and industrial discharges upon the Beaver.

inventory of power plants

A 1974 ORSANCO inventory of power generating facilities on the Ohio River gauged the expansion of this industry, a major user of river water. It established that 34 power plants with some 27,000 Megawatt capacity currently operate along the Ohio, an additional 22 are at some stage of planning or construction, and that 4 of these will be nuclear. A study of the effects of thermal discharges to the Ohio River has been initiated.

Field Surveillance Specialist observes stream conditions and collects water samples near an automatic monitor which he will also check for accuracy.

State and federal representatives coordinate efforts through ORSANCO NPDES Permit Committee. ORSANCO reviews National Pollution Discharge Elimination System (NPDES) permits.



model studies– wasteload allocation

In 1969, the ORSANCO staff, with the support of funds from U.S. EPA (then referred to as the Federal Water Pollution Control Administration) initiated a three-year research project to develop a mathematical model which could integrate monitoring information obtained from river sites with hypotheses about future water quality conditions. The project was successful, and its product, a model known as STREAM, has since been calibrated and polished. It can mirror the river in that it is sequential by milepoint, forecast water quality at a single place over a period of time, and provide a profile of water quality between two places at one point in time. Because of the physical characteristics of the river itself, STREAM has a high degree of stability.

During 1974, modeling studies indicated that the dissolved oxygen criteria would be met by the use of best practicable, secondary treatment, or specified higher levels of treatment in approved plans for pollution control facilities and in accordance with ORSANCO pollution control standard 1-70, if river flow were equal to or greater than the hypothetical one week in ten year critical condition, and if air to water oxygen transfer at 17 of the 19 high level navigation dams were not significantly decreased by the installation of hydropower facilities.

ORSANCO—an Intergovernmental Forum

The Ohio River basin is an integrated and interactive unit. Although several individual states, each with its own set of laws, border on the Ohio and its major tributaries, what is caused at a river site upstream may have direct effects downstream both for the river and those who live on or near its banks.

In the current pollution control arena, the federal government, by virtue of its supervisory status, deals with pollution from a national-political boundary standpoint. The mainstem of the Ohio, for example, falls within and is administered by four separate U.S. EPA regional offices. The system makes sense politically and in some respects geographically, but there is an important need to meet the kinds of problem-solving tasks which ask that the river be looked at as a unified entity. Furthermore, each of the signatory states of the basin has decision-making powers and participates in operations which may produce inconsistencies and conflicts; an inter-jurisdictional agency such as ORSANCO therefore provides a forum, an arena for bringing conflicts into open discussion and solution.

As an example of the inter-jurisdictional coordination of water quality criteria, the Commission, recognizing that no standardized and static procedure existed for appraising the toxic effect of wastewater discharges upon aquatic life, developed the *ORSANCO 24-Hour Bio-assay*. Published in final form early in 1974 after testing at state and federal laboratories, the Bio-assay is now available for use as a method for measuring toxicity.

Because geological formations, like rivers, do not respect man-made boundaries, the Commission has also devoted its attention to deep-well injections of wastewaters from industrial operations into isolated porous zones under the earth. Through on-going and cooperative study of the issue, the Commission, in 1974, published a *Registry of Wells*. The document has furthered a mutually beneficial exchange of information between the Commission and states affiliated with the Compact regarding the status of deep wells in the basin and current activities in underground disposal of wastewaters which vary from prohibition to regulation by the respective states.

In general, the Commission's inter-jurisdictional efforts have been accomplished among agencies and through task-oriented technical and industrial advisory committees. Recently, ORSANCO has re-asserted the need for a public inlet of this sort. During 1974, the Public Interest Advisory Committee, ORSANCO's aide in matters of citizen concern, has reviewed, analyzed, and commented upon Commission reports, proposals, and programs, thus sharpening the focus of Commission activities through public awareness.

Public Interest Advisory Committee discusses the quality of Ohio River water.

ORSANCO examines deep-well data and maintains the Registry.

administrative highlights–1974

The Commission is composed of three representatives from each of the states signatory to the Compact and three representatives of the United States Government. Commissioners receive no salary but are reimbursed for expenses incurred while performing Commission activities.

the Commission

- Edgar N. Henry has completed two years of service as chairman of the Commission.
- Wesley Gilbertson, Mr. Henry's successor, is now the Chairman of the Commission.
- Arnold L. Mitchell has succeeded Wesley Gilbertson as Vice-Chairman of the Commission.
- Fred H. Waring has resigned after a long-tenure as secretary of the Commission.
- Albert J. Brooks has succeeded Mr. Waring as Secretary-Treasurer of the Commission.
- John E. Pearson, retired professor of the University of Illinois, resigned from the Commission.

the Staff

- Leo Weaver was named the Executive Director and Chief Engineer of the Ohio River Valley Water Sanitation Commission. Previously, as a U.S. Public Health Service Engineer Officer, he specialized in the field of pollution control, directing the U.S. National Water Pollution Surveillance Program and pioneering the early development of the federal solid waste management program. Mr. Weaver was Director of the Washington, D.C. Office of the American Public Works Association and directly prior to his commission appointment served as Assistant Secretary of the Water Pollution Control Federation.
- Janice Squires joined the staff as secretary to the executive director.

ORSANCO Publications: 1973-1974

Registry of Wells for Use in Underground Injection of Wastewater in the Ohio River Valley. March, 1974. A compilation of data on the location, operational status, physical and chemical characteristics of wastewater injection wells, including preliminary findings on the Mt. Simon Sandstones; Prepared by ORSANCO and sponsored by the U.S. Geological Survey.

Twenty-Four Hour Bioassay. January, 1974. A delineation of a standardized procedure for measuring and analyzing the toxic effects of wastewaters upon aquatic life; Developed by the Biological Water Quality Committee with the cooperation of the Chemical Industry Committee of ORSANCO.

Underground Injection of Wastewaters in the Ohio Valley Region. August, 1973. Recommendations for the conduct of regulatory actions, delineations of the scope and sequence of administrative procedures related to such actions, and evaluations of the geological and technological features related to deep well injection in the Ohio River region; Developed by the ORSANCO Advisory Committee on Underground Injection of Wastewaters.

Water Quality Monitoring Strategy for the Ohio River and Lower Reaches of Major Tributaries. December, 1973. A recommended regional monitoring program to satisfy the needs of Federal, State, and Inter-state agencies; Developed by the ORSANCO Ohio River Monitoring Study Team.

ORSANCO Staff *

Leo Weaver — Executive Director & Chief Engineer
Albert J. Brooks — Office Manager
Jessica D. Barron — Information Specialist
Janice Squires, Karen Gray — Secretaries

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William L. Klein — Manager
Thomas Lux — Surveillance Specialist
Glen White — Surveillance Specialist
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John Donnelly — Head, Data Acquisition Engineering
Alice Gosney — Supervisor, Computer Operations
Robert Laugel — Programmer/Analyst
Richard Smith — Programmer/Analyst
Donna Carroll — Secretary

**As of May, 1975*

credits:
Ray Loos — Art
Ronald Padlgek — Photography

Financial Report

The following information relative to revenues, expenditures, and statement of resources was extracted from the Annual Audit Report of Wm. H. Mers & Co., Certified Public Accountants for the year ended June 30, 1974.

OHIO RIVER VALLEY WATER SANITATION COMMISSION

STATEMENT OF REVENUES AND EXPENSES PAID FOR YEAR ENDED JUNE 30, 1974

Revenues:		
From signatory states:		
State of Illinois	$ 11,088.00	
State of Indiana	40,942.00	
Commonwealth of Kentucky	45,760.00	
State of New York	2,332.00	
State of Ohio	56,386.00	
Commonwealth of Pennsylvania	32,164.00	
Commonwealth of Virginia	7,524.00	
State of West Virginia	23,804.00	
Total from signatory states		$220,000.00
From U.S. Environmental Protection Agency (Grant by authority of Federal Water Pollution Control Act)		219,625.35
Other revenue:		
Interest earned on bank deposit	6,322.72	
Sale of publications	1,315.38	
Miscellaneous	906.25	
Total other revenues		8,544.35
Total Revenues		448,169.70
Expenditures:		
From current year funding	407,332.66	
From prior year funding	52,780.86	
Total expenditures		460,113.52
Excess of expenditures over revenues		$ 11,943.82

STATEMENT OF RESOURCES AT JUNE 30, 1974

Cash:		
Central Trust Company	$ 75,549.93	
On hand	201.87	
		$ 75,751.80
Deposits:		
American Airlines	425.00	
Ohio Bureau of Workmen's Compensation	238.00	
		663.00
Accounts receivable:		
U.S. Environmental Protection Agency	19,658.54	
Signatory states	11,203.00	
Advances for employees: Employees' pension trust	1,216.51	
		32,078.05
Less:		108,492.85
Excess of advances over expenses of U.S. Geological Survey Grants entitled Characteristics of Subsurface Formations for the Storage or Disposal of Wastewater		26,383.59
Available resources before encumbrances at June 30, 1974		$ 82,109.26
Available resources before encumbrances at June 30, 1973	$ 94,053.08	
Less excess of expenses paid over revenues	11,943.82	
Available resources before encumbrances at June 30, 1974		$ 82,109.26
Less unexpended encumbrances		29,148.38
Available resources after encumbrances at June 30, 1974		$ 52,960.88

REGULATORY AGENCIES OF THE SIGNATORY STATES

ILLINOIS
Environmental Protection Agency
State of Illinois
2200 Churchill Road
Springfield, Illinois 62706
(217) 525-5467

INDIANA
Indiana Stream Pollution Control Board
1330 West Michigan Street
Indianapolis, Indiana 46206
(317) 633-4420

KENTUCKY
Department of Natural Resources
Capital Plaza Tower
Frankfort, Kentucky 40601
(502) 564-3410

NEW YORK
Environmental Health Services
NYS Department of Environmental Conservation
50 Wolf Road
Albany, New York 12201
(518) 457-7362

OHIO
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216
(614) 466-2390

PENNSYLVANIA
Department of Environmental Resources
P.O. Box 2351
Harrisburg, Pennsylvania 17120
(717) 787-2666

VIRGINIA
State Water Control Board
P.O. Box 11143
Richmond, Virginia 23230
(804) 770-2241

WEST VIRGINIA
Division of Water Resources
Department of Natural Resources
1201 Greenbrier Street
Charleston, West Virginia 25311
(304) 348-2107

ORSANCO
414 Walnut Street
Cincinnati, Ohio 45202
(513) 421-1151

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