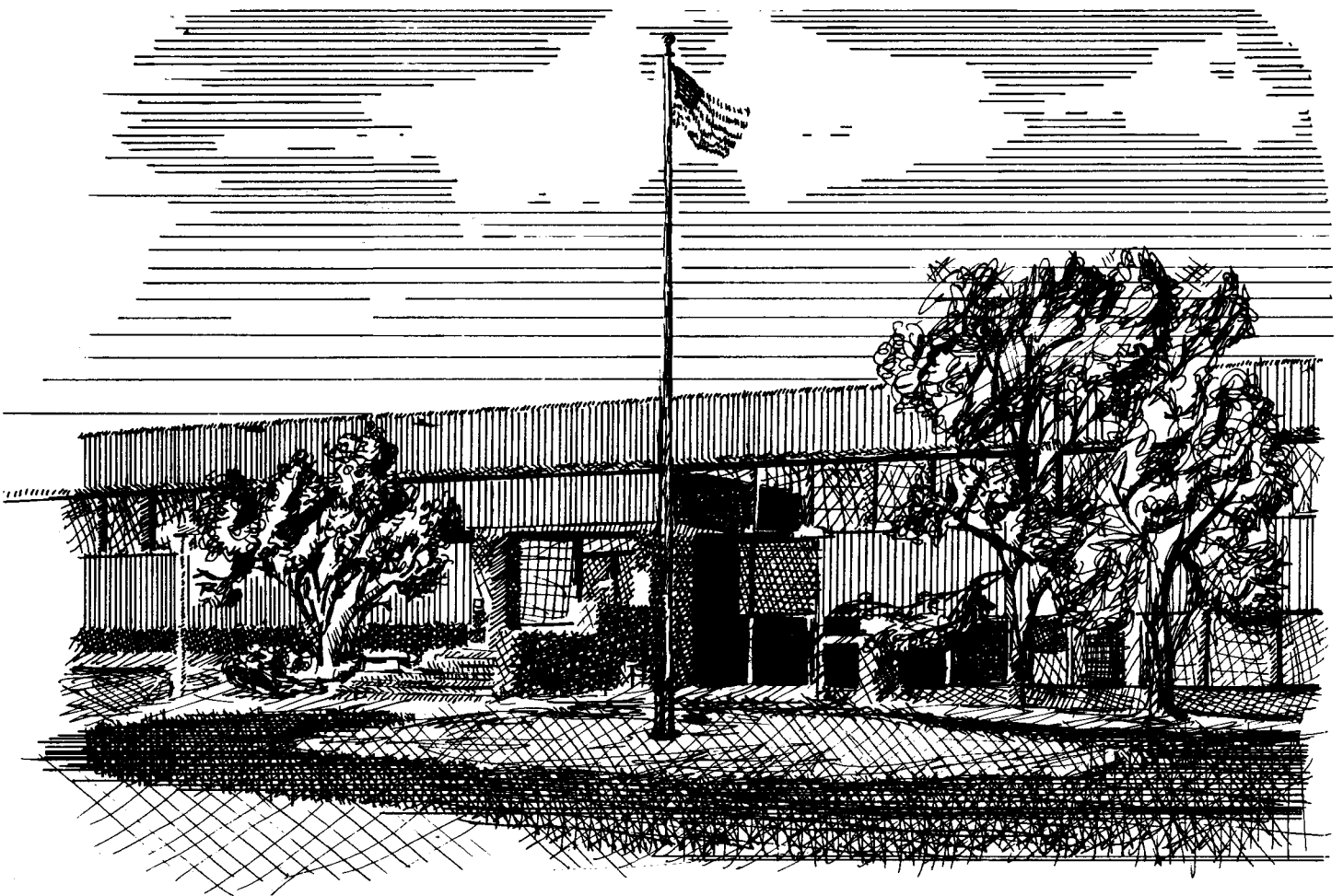


1986 ANNUAL REPORT



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GEORGE W. KUHN
DRAIN COMMISSIONER
OAKLAND COUNTY, MICHIGAN

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1986 ANNUAL REPORT

OF THE

OAKLAND COUNTY DRAIN COMMISSIONER

OAKLAND COUNTY

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GEORGE W. KUHN

Oakland County Drain Commissioner



GEORGE W. KUHN
OAKLAND COUNTY DRAIN COMMISSIONER
PUBLIC WORKS DRIVE
PONTIAC, MICHIGAN 48054
858-0958

ROBERT H. FREDERICKS
Chief Deputy Commissioner
858-0970

DAVID J. SNYDER
Deputy and Chief Engineer
858-0976

April 1, 1987

Honorable Board of Commissioners
County of Oakland
1200 North Telegraph Road
Pontiac, Michigan 48053

Mr. Chairman, Ladies & Gentlemen:

As required by the Michigan Drain Code, enclosed is the Annual Report of the operations of the Drain Commissioner's Office during the period of January 1, 1986 through December 31, 1986. There are three areas in which I would like to comment.

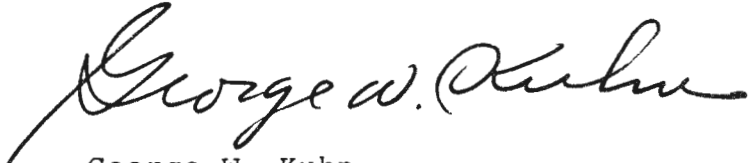
One item of importance is the fact that the more than nine years of rate challenges in the Federal District Court against the Detroit Water Board have finally come to an end. The last four issues were resolved by negotiated settlement with Detroit. A listing of several Federal Court accomplishments, which were significant in reducing and controlling the cost of sanitary sewage treatment, is attached.

A second area of note is the attached analysis of sewer rate charges which reflects a substantial cutback from June, 1983 to July, 1987 for the S.O.C.S.D.S. district.

Finally, the overall workload in the Drain Office increased substantially in 1986, and required the hiring of two new civil engineers and additional support staff. We are continuing to experience a substantial increase in new projects during 1987.

In closing, I wish to extend my sincere thanks and appreciation to all of the members of the Board of Commissioners and to the members of the various standing committees for the continued cooperation and assistance extended to this office during the past year.

Most sincerely,


George W. Kuhn

FINANCIAL ACCOMPLISHMENTS - FEDERAL COURT CASE

1977 - 1986

	ESTIMATED COST SAVINGS -----
1. In 1978 we eliminated 7% differential rate of return charged to suburban rates (savings systemwide \$7 million, Oakland's share \$1.5 million annually).	\$13,500,000
2. In 1978 Court awarded refund for overcharges on maintenance operations. (\$9 million systemwide, Oakland's share \$1 million).	\$ 1,000,000
3. In 1978 Court reduced 1978-79 rate increase from 2.03 to 2.00 (savings .03 per 1,000 cubic feet).	\$ 260,000
4. In 1979 Court ordered outside financial audit of Detroit Water & Sewerage Department.	-0-
5. In March, 1979 Court placed Detroit Water & Sewerage Department under Federal receivership.	-0-
6. In January, 1980 sewer rate proposal of 3.45 mcf was reduced to 3.40, another \$.05 savings.	\$ 350,000
7. In 1980 Court ordered a budget reduction for 1980-81 of \$3.5 million (from \$184 million to \$180.5 million).	-0-
8. In 1984 a negotiated contract settlement on actual usage vs minimum usage (cost savings \$60,000).	\$ 60,000
9. In 1983 look back rebate for overcharges resulting from fiscal 1982-83 maintenance operations.	\$ 1,700,000
10. In 1984 a look back rebate for overcharges resulting from fiscal 1983-84 maintenance operations.	\$ 1,500,000
11. In 1985 a look back rebate for overcharges resulting from fiscal 1984-85 maintenance operations.	\$ 1,600,000
12. In 1986 a look back rebate for overcharges resulting from fiscal 1985-86 maintenance operations.	\$ 1,400,000
13. In 1986 a negotiated settlement was reached with Detroit Water Board on a credit for storm water overflow for Southeastern Oakland County Sewage Disposal System (cost savings - \$400,000 annually) (Effective date 1/1/85 thru 12/31/86)	\$ 600,000

GRAND TOTAL COST SAVINGS	\$21,970,000



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Chief Deputy Commissioner
858-0970

DAVID J. SNYDER
Deputy and Chief Engineer
858-0976

DATE: February 9, 1987
TO: All County Commissioners
FROM: George W. Kuhn
SUBJECT: Detroit Sewer Rates for Fiscal Year 1987-1988

I am pleased to announce that the Detroit Water and Sewerage Department for the fourth year in a row has lowered its sewage disposal rate to the Southeastern Oakland County Sewage Disposal System. In fiscal year 1982-1983 the Detroit rate peaked at \$4.58 per thousand cubic feet of sewage flow. The proposed 1987-1988 rate is \$3.98 per mcf which represents a substantial .30¢ per mcf reduction from the current rate of \$4.28.

Similarly for the fourth consecutive year the Southeastern Oakland County Sewage Disposal System will receive a Look-Back Adjustment or rebate from the City of Detroit. For this coming year the S.O.C.S.D.S. will receive \$1,115,924 which represents a refund of rate dollars paid to the City of Detroit in excess of the actual cost of operating the DWSD system in the 1985-1986 rate year. Over the past three years, the Southeastern Oakland County system has received more than \$2,860,000 in rebates which have been refunded to the fourteen municipalities in the district.

Finally, the water rate charged the Southeastern Oakland County District for fresh water used to flush our Pollution Control Facility will drop to \$2.10 per thousand cubic feet, a reduction of 57% from the current rate of \$4.97.

I am pleased that we have been successful during the last four years in obtaining these substantial savings which have directly benefited the residents of the fourteen Southeastern Oakland County municipalities which are members of the district.

OAKLAND COUNTY DRAIN COMMISSIONER

SUMMARY OF DETROIT WATER AND SEWERAGE DEPARTMENT RATES

Sewage Disposal Rate

<u>Rate Year</u>	<u>Rate Per 1,000 cubic feet</u>
June 1, 1980 - May 30, 1982	\$4.23
June 1, 1982 - May 30, 1983	4.34
June 1, 1983 - May 30, 1984	4.58
June 1, 1984 - June 30, 1985	4.36
July 1, 1985 - June 30, 1986	4.33
July 1, 1986 - June 30, 1987	4.28
July 1, 1987 - June 30, 1988	3.98

Look-Back Adjustment Refund

<u>For Rate Year</u>	<u>Paid During</u>	
1982-1983	1984-1985	\$ 980,628
1983-1984	1985-1986	791,697
1984-1985	1986-1987	1,087,902
1985-1986	1987-1988	1,115,924

February 9, 1987

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ENGINEERING UNIT

THE COUNTY DRAIN COMMISSIONER

The County Drain Commissioner has broad powers and responsibilities under several state laws. His primary duties are described in the Michigan Drain Code, Act 40 of 1956. Additional powers and duties of the Drain Commissioner derive from the provisions of two public works acts, Act 342 of 1939 and Act 185 of 1957, the Inland Lake Level Control Act, Act 146 of 1961, the Inland Lake Improvement Act, Act 345 of 1966, the Subdivision Control Act, Act 288 of 1967, the Soil Erosion and Sedimentation Control Act, Act 347 of 1972, and various other statutes.

For organizational purposes the functions of the Drain Commissioner as a part of Oakland County government are delegated to four operating units, Engineering, S.O.C.S.D.S., Inspection and Maintenance. The employees in each of these units perform the multitude of tasks necessary under the different programs of the office of the County Drain Commissioner to construct and maintain a variety of public works facilities for the use of residents in all parts of Oakland County.

ENGINEERING UNIT

The staff of engineers and other technical personnel in this unit are responsible for the design and construction of public works facilities of various kinds including storm drains, sanitary sewers, water mains and lake level control structures. The Chief Engineer, David J. Snyder, and the Assistant Chief Engineer, Herold J. Lueders, supervise the engineering functions of the unit. At the end of 1986 there were 23 employees in this unit. The following specific activities are performed in the Engineering Unit.

New Project Construction

Engineers and other support personnel administer the construction activity on new storm drains, sanitary sewers, water mains, and lake level control structures. This activity includes close cooperation with local units of government, state and federal agencies, consulting engineers, contractors and other interested parties. A summary of specific projects completed or under construction during 1986 is provided later in this report.

Plat Review

Under the provisions of Public Act 288 of 1967, the Subdivision Control Act, the Drain Commissioner reviews and approves all new subdivision plats in Oakland County. The review by the Drain Commissioner is made to ensure that adequate storm drainage facilities have been included in the engineering plans for the proposed plat. Act 288 made the approval of the Drain Commissioner mandatory. In addition, Act 419 of 1976, the Mobile Home Commission Act, requires that the Drain Commissioner review and approve the outlet drainage for new mobile home developments.

In 1986, 40 preliminary plats, 62 sets of subdivision construction plans, 61 final subdivision plats, and the outlet drainage for two mobile home developments were reviewed by the engineering staff of the Drain Commissioner. A total of 21 Oakland County communities were represented in the projects reviewed. The final subdivision plats comprised 263 commercial lots, 2384 residential lots, and 368 mobile home sites. The Drain Office engineer in charge of plat review is Joseph P. Kozma, P.E.

Easement Acquisition

Prior to building any public works facility it is necessary to secure easements. Easements are either permanent (land upon which a structure is located) or temporary (land required during construction of the facility). Upon completion of a project, temporary easements revert back to the owner, while permanent easements remain under the control of the Drain Commissioner.

The easement acquisition program of the Drain Commissioner's Office has a staff of six people who are supervised by James Isaacs, R.L.S. During 1986 approximately 500 easement parcels were title searched, written and appraised by the Right-of-Way staff. A total of 264 easement parcels were acquired during 1986.

The Drain Commissioner's Office in 1986 sold four parcels of excess property. The money generated from these sales was returned to the drainage districts involved. Also, in order to facilitate construction and maintenance of various drain projects throughout Oakland County, it became necessary to purchase 15 parcels of land during 1986.

When a mutually acceptable agreement with a property owner cannot be reached, it is necessary to file a condemnation action in Circuit Court under Act 87 of P.A. of 1980, as amended. The Right-of-Way staff works closely with the Oakland County Corporation Counsel or outside legal counsel in filing a condemnation action. As a result of a condemnation proceeding, the Court awards the requested easement to the Drainage District, and, with the assistance of expert appraisers, awards the property owners a sum of money deemed to represent the diminution in value to the property caused by the easement.

The Right-of-Way staff works in close conjunction with the design engineer to determine the minimum requirements for construction and maintenance easements and relocations in order to minimize easement acquisition costs.

Lake Level Program

Under the provisions of Act 146 of 1961, the Drain Commissioner's office participates in legal proceedings to establish and build lake level control structures for lakes in Oakland County.

Oakland County is approximately 30 miles from east to west, and 30 miles from north to south, with an area of approximately 900 square miles. For water management purposes, portions of the County are located within the basins of six rivers, the Clinton, Huron, Rouge, Flint, Shiawassee and Belle Rivers. There are 48 lakes in the County where levels have been established and assigned to the Drain Commissioner for control. The 48 lakes are in four river basins; 31 in the Clinton, 13 in the Huron, two in the Rouge, and two in the Shiawassee.

In some cases the level of more than one lake can be controlled from a single lake level control structure. A summary containing basic information about the regulated lakes in Oakland County appears on the two following pages of this report.

Jack Portman, Civil Engineer III, is in charge of the lake level program which involves the operation and maintenance of 31 lake level control structures, six water supply pumps, and one storm water pump.

Regular inspection of lake level control structures is made on a weekly basis, or more often as weather conditions may dictate. The level of each lake is read and recorded, and adjustments to the structures are made throughout the year. Every effort is made to maintain the established legal level. Regular inspection also assures that the structures are in good operating condition, and permits scheduled maintenance and repairs when needed.

Special assessment districts are prepared for each project and, as necessary, annual assessment rolls are prepared to provide for necessary maintenance expenditures.

Drain and Lake Level Assessments

Drains constructed prior to 1956 were financed by special assessment against the property served by the drain. Maintenance charges for these drains are assessed against the special assessment district established when the drain was constructed. During 1986 maintenance work was performed on 17 of the special assessment drains, known as Chapter 4 drains, and 22 lake level projects.

In 1986 the Board of Commissioners approved assessments in the amount of \$265,751.85 to assess property for the maintenance costs of Chapter 4 Drains and Lake Level Control Projects, and the construction of two new lake level structures.

Soil Erosion and Sedimentation Control

For the past twelve years the Drain Commissioner's Office has operated as the designated enforcing agency in Oakland County for the Soil Erosion and Sedimentation Control Act, Act 347 of 1972. The program is operated to obtain the maximum effectiveness in protecting the environment without placing an unreasonable burden on individual property owners.

OAKLAND COUNTY DRAIN COMMISSIONER
LAKE LEVEL PROJECTS

PROJECT NAME	LAKE	SIZE (IN ACRES)	YEAR ESTABLISHED	LOCATION
<u>CLINTON RIVER BASIN</u>				
Lakeville Lake	Lakeville*	492	1961	Addison Township
Oxford Multi-Lakes	Mickelson	61	1973	Oxford Township
	Squaw	29		
	Clear	32		
	Long	33		
	Cedar	15		
	Tan	58		
	Mill Pond*	2		
Waterford Multi-Lakes	Cemetery or Middle	28	1966	Independence & Waterford Townships
	Dollar*	6		
	Greens	101		
	Maceday	234		
	Lotus	169		
	Lester	22		
	Van Norman*	27		
	Upper Silver	41		
	Silver	108		
	Mohawk	35		
	Wormer	38		
	Schoolhouse	40		
	Loon*	265		
Williams*	175			
Oakland-Woodhull Lakes	Woodhull	135	1958	Waterford Township
	Oakland*	235		
Watkins Lake	Watkins*	229	1960	Waterford Township
Cass Lake	Cass*	1280	1969	City of Keego Harbor and Waterford Township
Orchard Lake	Orchard*	850	1966	West Bloomfield Twp. & City of Orchard Lake Vlg.

PROJECT NAME	LAKE	SIZE (IN ACRES)	YEAR ESTABLISHED	LOCATION
<u>CLINTON RIVER BASIN</u> (Continued)				
Indianwood**	Indianwood*	122	1986	Orion Township
Sylvan, Otter, & Dawson Mill Pond***	Sylvan Otter Dawson Mill Pond (Price Dam)	458 81 8	1986	Cities of Keego Harbor, Pontiac, & Sylvan Lake & Waterford Twp.
<u>HURON RIVER BASIN</u>				
Big Lake	Big*	220	1967	Springfield Twp.
White Lake	White*	540	1965	Highland and White Lake Townships
Duck Lake	Duck*	307	1962	Highland Township
Pontiac Lake	Pontiac*	615	1944	White Lake Twp.
Oxbow Lake	Oxbow*	286	1963	White Lake Twp.
Cedar Island Lake	Cedar Island*	169	1964	White Lake Twp.
Fox Lake	Fox*	39	1963	Commerce Twp.
Union Lake	Union*	465	1949	Commerce Twp.
Long Lake	Long*	175	1964	Commerce Twp.
Upper Straits Lake	Upper Straits*	378	1964	West Bloomfield Twp.
Middle & Lower Straits Lake	Middle Straits Lower Straits*	194 220	1963	Commerce Twp.
Commerce Lake	Commerce*	262	1964	Commerce Twp.
<u>ROUGE RIVER BASIN</u>				
Walled & Shawood Lakes	Shawood Walled*	45 670	1984	City of Novi
<u>SHIAWASSEE RIVER BASIN</u>				
Bevins Lake	Bevins*	31	1964	Village of Holly
Tipsico Lake	Tipsico*	301	1954	Rose Township

*Lake level structure located at the outlet of the lakes marked with an asterisk.

**Construction started in late 1986.

***Construction expected to begin in early 1987.

In 1986, 725 applications for soil erosion permits were received by this office as compared to 499 applications received in 1985. There was a noticeable increase in single family and subdivision construction in 1986, as well as increased industrial construction.

The total revenue collected in 1986 was \$158,866.56, and wages totaled \$61,242.15. Although there was an increase of \$3,600.15 in payroll costs in 1986, a net gain of \$97,624.14 occurred. It should be noted that the foregoing comparison does not include the miscellaneous and fixed costs associated with running the program, such as employee fringe benefits, telephones, office space, copying expense, gasoline, office supplies, etc.

As in the past, the Drain Commissioner's Soil Erosion and Sedimentation Control Division continued its informal instructional meetings with builders, developers, property owners, engineers, architects, etc.

Jack Portman, Civil Engineer III, is in charge of the Drain Commissioner's Soil Erosion and Sedimentation Control program.

Construction Permits

The Drain Commissioner, under provisions of the Drain Code, requires that a permit be obtained before making connections to, or doing work affecting, a County drain. The permit program is under the direction of Robert F. Smith, an Engineering Technician.

During 1986 a total of 63 permits were issued for work items affecting County and Inter-County Drains. The number of permits does not directly reflect the extent of construction or modification of the affected drains. A single permit may involve only a single connection to a drain or many different direct points of connection or other involvement.

In most cases before a permit is issued, two sets of construction plans are submitted for review. Requests for a connection to a drain may be submitted by public agencies, private property owners or contractors retained by others to construct particular facilities. All plans submitted for review must conform to the engineering design standards which have been developed by the Drain Commissioner's office to protect the integrity and usefulness of existing facilities.

At the time of construction of any work for which a permit has been issued, an inspection is made to assure that the job is done properly and in accordance with the approved engineering plans. A fee or fee and deposit is charged to offset the cost of this inspection.

I-696 Siphon Construction Program

Due to the construction of the I-696 Freeway in the southern, densely populated portion of Oakland County, several large county drains, both separate and combined, are being altered by Michigan Department of Transportation construction.

The major work items consist of construction of siphons under the depressed expressway. The Michigan Department of Transportation retained outside consulting engineers who designed the major siphon structures necessary to convey the flow in each county drain in pipe underneath the freeway. The entire cost of the design and construction of these major underground structures is being paid by the State of Michigan as part of the cost of the I-696 freeway project. Inspection personnel from the Drain Commissioner's office have been on site to assure that all construction was completed as designed. The supervision of this program was the responsibility of William E. Klockow, P.E.

Future maintenance of these siphon structures will entail higher costs than normally experienced in a county drain facility. A written contract between the Drain Commissioner and the Michigan Department of Transportation is in the final stages of negotiation and will be executed in 1987. The contract will provide that the State will reimburse the Oakland County Drain Commissioner for all additional costs incurred to periodically clean and maintain the new siphons.

The existing county drains affected by the I-696 project, and the estimated cost of each siphon are summarized as follows:

<u>DRAIN</u>	<u>LOCATION</u>	<u>COST</u>
Campbell Road	Campbell Road, Ferndale & Royal Oak	\$800,000.00
Oakdale	Oakdale Road, Pleasant Ridge	\$900,000.00
Royal Oak	Roanoke Road, Oak Park	\$612,000.00
Royal Oak	Manistee Road Oak Park & Huntington Woods	\$515,000.00
Twelve Towns	Gardner Avenue, Oak Park	\$541,000.00
Clarkson	Fairfax Road, Southfield	\$945,000.00
Barry	Lincoln Road, Southfield	\$690,000.00
Rummell	Evergreen Road, Southfield	\$1,750,000.00

Other work items such as taps, utility crossings, structure adjustments, etc. are also involved. The work should be completed in 1989.

Review of Lateral Connections to the S.O.C.S.D.S.

All connections into any sewer that is tributary to the Southeastern Oakland County Sewage Disposal System are required to be first reviewed by this office prior to being submitted to the Michigan Department of Natural Resources.

This review helps protect established Drainage Districts and allows a record to be kept of all facilities outletting into County trunk lines, as well as assuring this office that proper and approved construction standards are used.

The Drain Commissioner works closely with local governments. All plans sent to the Drain Office for review are transmitted through the municipality's engineer or Engineering Department. This is done to assure that sewer lines conform to the local community master plan for sewerage development.

During 1986 the Engineering Unit received and reviewed 33 sets of sanitary and combined sewer plans for facilities that will outlet into the Southeastern Oakland County Sewage Disposal System.

Upon completion of review by Drain Office staff, each set of plans, with the recommendation that a construction permit be issued, is forwarded to the Water Quality Division of the Michigan Department of Natural Resources.

INSPECTION UNIT

INSPECTION UNIT

The Oakland County Drain Commissioner employs trained inspection personnel to inspect drain, sewer and water projects. During 1986 there were nine employees in the Inspection Unit.

The supervisor of the Inspection Unit is Garie M. Vorpapel who schedules and coordinates all activities of the unit, and provides in-the-field assistance to individual inspectors. During each project assignment the individual inspector reports directly to the project engineer.

The primary responsibility of the inspector is to insure that each facility is constructed in accordance with the plans and specifications, with particular attention paid to backfill material, proper compaction, and workmanship. Careful observation of the quality and proper placement of construction materials such as pipe, concrete and reinforcing steel in underground lines, pump stations and other structures are also important duties of the inspector.

Another major function of the inspector is to maintain good public relations with members of the public affected by the construction of various projects. Necessary services, such as mail delivery and garbage collection, and prompt restoration of access to private property during and after construction are expedited to reduce the inconvenience to the public.

The Inspection Unit is in radio and telephone communication with field personnel and local communities during working hours so that any complaints or inquiries or construction-related problems can be handled as quickly as possible.

The inspector prepares daily inspection reports and keeps a log of the progress of construction. His daily records assure accurate and thorough restoration of the construction site, and also insure correct payment to the contractors on the project, thus avoiding possible litigation.

The Inspection Unit also videotapes future construction sites and routes. Particular care is taken with easement areas where possible problems can be anticipated or where difficult types of restoration work will be needed. After construction, the video tapes are referred to as needed during restoration work, and can be used to resolve differences regarding the actual conditions which existed before construction. The video record is valuable to discourage litigation because a visual review of the prior condition of all property is possible.

A particularly important responsibility of the inspector on each project is the preparation of an "as-built" plan, which is a plan that shows exactly how the project was constructed in the field, with dimensions identifying the location of all underground structures. Future surface access for additional installations or service is thereby enhanced with a minimum of disturbance and cost to the existing facility.

The Inspection Unit has the responsibility for the field inspection portion of the Soil Erosion and Sedimentation Control program, and meets with municipalities and private citizens to promote a reasonable and effective soil erosion policy in an effort to reduce the pollution of Oakland County's lakes and streams. The inspector primarily responsible for the soil erosion inspection program is Dan MacLennan. There was a 45% increase in permit applications and inspections in 1986 as compared to the previous year.

The Inspection Unit is also responsible for inspecting connections and other involvements with county drains throughout Oakland County. The inspector is present to insure that the integrity of the system is maintained, and that proper compliance with state and local regulations is observed.

In addition, the Inspection Unit has the responsibility for the inspection of new drainage facilities being established under the provisions of Section 433 of Act No. 40 of the Michigan Drain Code. These facilities, all of which are located in West Bloomfield Township, are being built by private developers in conjunction with the construction of new apartment, condominium, and office complexes.

MAINTENANCE UNIT

MAINTENANCE UNIT

The Oakland County Drain Commissioner is responsible for the regular maintenance of established storm drains located throughout Oakland County. The Drain Office engineer in charge of the Maintenance Unit is George Bondi. There were eight employees in this unit during 1986. Maintenance personnel provide a wide variety of maintenance and repair services. Primary work includes the inspection and maintenance of approximately 600 miles of established county drainage and combined storm and sanitary systems. In addition, lake level control structures used in the regulation, operation and control of the legal levels of 48 Oakland County lakes are maintained by this unit.

In the performance of these functions, personnel use various types of vehicles and construction equipment, including basic and specialized hand and power tools and certain necessary safety equipment. Inventory, repair and proper care of these tools and equipment is a function of the Maintenance Unit.

General Drain Maintenance

Periodic maintenance activities include removing roots, silt and other debris from enclosed drains; repairing structures that have failed or have been damaged; rehabilitating open drains by removing brush, debris, shoals and silt; cleaning and maintaining manholes and catch basins; and inspection and cleaning of diversion gates, meter chambers and outfall structures.

During 1986 general drain maintenance was performed on 78 Chapter 20 drains, two Chapter 21 drains and 46 Chapter 4 drains. Also, maintenance was performed on nine additional drains which have been incorporated as part of the Twelve Towns Relief Drains system.

Drain Inspections

Routine inspections are made, periodically, on all drainage systems. Once inspected the necessary repairs are performed. This preventive maintenance system assures reliable drainage to the residents of Oakland County and avoids costly drain failures.

During 1986 the Maintenance Unit inspected 39 Chapter 20 drains and three Chapter 4 drains. Inspections were also performed on five drains which are now part of the Twelve Towns Relief Drains system.

Equipment

In order to increase efficiency while maintaining personnel at a constant level, the Maintenance Unit employs specialized power equipment.

The single most important piece of equipment is the Vactor Jet. The Vactor works with water pressure and vacuum to clean out storm and sanitary sewers. It is especially efficient in cleaning catch basins, manholes and sewer lines of 48-inch and lesser diameter pipe. By using the Vactor, more work can be done with a two-man crew than formerly could be done with hand equipment and substantially more manpower. It has enabled the Maintenance Unit to clean drains and sewers on an orderly and routine schedule. The result is decreased cost per job, and increased service to the public.

The Vactor, purchased in 1984 to replace a seven year old, seven cubic yard, single axle model previously used, is a 1984 GMC 1200 Series Diesel Vactor with a Brigadier chassis and larger six cylinder Cummins rear engine. It has considerably greater suction and jetting power with a 1000 gallon capacity water tank, and a 16 cubic yard debris holding tank. The Vactor has more than twice the capacity of the older equipment, permitting increased cleaning time before refilling the water tank and dumping the debris are required. The increased power permits cleaning drain pipes to 48" in size as compared to the previous 24" maximum. Additional features include a 30-foot extendable boom on the suction line and tandem axles permitting access to previously unaccessible areas. Also, a water recycling device permits usage of the equipment down to 15 degrees F. as opposed to the previous freezing limitation, thereby extending annual operation in the field by approximately two months.

The Drain Commissioner employs the necessary safety equipment needed to meet OSHA and MIOSHA standards as well as the hazards of the particular drain maintenance work.

Maintenance of Lake Level Structures

The Maintenance Unit also maintains lake level control structures including dike repair, painting and repair of structures, and repair of gates and landscaping. During 1986 maintenance was performed at 25 lake level control locations.

Rain Gauge Operations

There are 25 rain gauges located throughout Oakland County. Drain maintenance personnel install, maintain and repair rain gauges in cooperation with the U. S. Department of Agriculture Weather Service Office. Supplies are distributed to the various stations and recorded data is collected and processed.

Work Sponsorship Programs

In addition to maintenance labor provided by full-time County employees, the Drain Commissioner uses programs that permit the use of workers at little or no cost to the taxpayer. Included are summer employment, County welfare recipient, and Community Service Corps programs which supply labor to assist with drain inspection and repairs, lake level structure maintenance, and removal of brush and debris from open drainage channels.

With minimal costs of supervisory personnel and equipment, these maintenance crews assisted permanent County employees in the maintenance work at substantial cost savings.

Inter-Departmental Services

The Drain Commissioner also cooperates with other County departments to provide specialized personnel and/or equipment as required. By lending personnel and equipment at minimal rates, other County departments were able to reduce their costs to complete specific maintenance assignments. The Department of Facilities and Operations, Oakland-Pontiac Airport, Water and Sewer Engineering, Public Works, and Parks and Recreation utilized these available maintenance services during 1986.

Special Projects

The Drain Commissioner undertook special projects during 1986 utilizing Maintenance staff expertise enabling substantial cost savings. Projects completed were: fence installation on a segment of the Joachim Relief Drains following its construction; repair of concrete inlets to the Pontiac-Clinton River Drain No. 2; assisting the City of Keego Harbor in cleaning drains in conjunction with T.V. inspection; special cleanout of 30" line on Joslyn Road for the City of Pontiac; extensive ditching at Colonial Village and mobile home park on the South Lyon and Yerkes Drains respectively; extensive repair at Bald Eagle Lake inlet, including pipe replacement and inlet reinforcement; new fence installation at Van Norman Lake Level facility following damage from an auto accident; designing and building of new lake level signs; assisting several communities in locating the source of oil spills in drains and lakes; and field inspection of existing storm collection systems on several sites, and the preparation of reports describing existing conditions and making recommendations for rehabilitation or for the construction of new drain project.

Progress continued on a project involving research and compilation of drain histories in conjunction with the development of a computer program designed to store, continuously update, and process information pertinent to drain operation and maintenance. Upon completion of the project, past, present and projected information relative to over 400 Chapter 4, 20 and 21 drains will be readily accessible by computer printout in terms of a drain and the communities it serves, or conversely, a

community and the drains by which it is served. It is anticipated that the availability of such information will improve communication with local units of government and enable the Drain Commissioner and the community, in the interest of public health, convenience and welfare, to more effectively plan maintenance activities and budget future expenditures, while achieving greater efficiency in the economical operation and physical maintenance of Oakland County drains.

SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM

SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM

The District

The Southeastern Oakland County Sewage Disposal System (S.O.C.S.D.S.) serves a district of approximately 46,000 acres and provides sewer service to all of the areas within the Cities of Berkley, Clawson, Ferndale, Hazel Park, Huntington Woods, Madison Heights, Oak Park, Pleasant Ridge, Royal Oak, and the Township of Royal Oak. Part of the area within the Cities of Birmingham, Southfield, Troy, and the Village of Beverly Hills also receive sewer service from the S.O.C.S.D.S. Of the 46,000 acres served, approximately 24,385 acres are served by combined sewers, and the remaining 21,615 acres, primarily in the Cities of Troy and Madison Heights, are served by a separated sewer system.

The Pollution Control Facility - Background

Prior to 1974 the Twelve Towns Relief Drains system collected combined sewage from the district and delivered it to the Dequindre Interceptor at the rate of 118 cubic feet per second. When the total flow exceeded 118 cubic feet per second, the excess was stored in the Twelve Towns system up to a retention capacity of 90 acre/feet. When a storm event occurred of such magnitude that the storage capacity of the Twelve Towns Relief system was exceeded, the excess combined sewage would spill into the Red Run Drain. The Red Run Drain is a large, open inter-county Chapter 21 drain, approximately seven miles in length, which flows east through Macomb County from Dequindre Road until it outlets into the Clinton River. Although physically located in Macomb County, the Red Run Drain is maintained by the Oakland County Drain Commissioner who serves as the Secretary of the Inter-County Drainage District. Overflows occurred approximately 25 times every year and were causing pollution of the Red Run Drain. In 1969 the County of Oakland was ordered by the Michigan Water Resources Commission to abate pollution of the Red Run Drain.

The Drain Commissioner as agent for the County of Oakland retained Hubbell, Roth & Clark, Inc., consulting engineers, to develop a plan to correct the problem of the pollution of the Red Run Drain. Hubbell, Roth & Clark designed a storage facility 65 feet wide and approximately two miles long with a capacity of 190 acre/feet. Construction of the Pollution Control Facility began in 1971 and was completed in 1974. Since 1974 the Pollution Control Facility has received overflows from the Twelve Towns Relief system. With this additional facility the storage capacity of the district has been increased to 280 acre/feet of combined sewage.

Flows of combined sewage retained in the storage basin are later pumped into the Dequindre Interceptor up to a capacity of 260 cubic feet per second. When the storage capacity of both the

Twelve Towns Drain and the Pollution Control Facility are exceeded by a storm event, a spill will occur to the Red Run Drain. Operators of the Pollution Control Facility can anticipate when such a spill is going to occur. With this knowledge, chlorine is pumped into the combined sewage spilling into the Pollution Control Facility to kill bacteria so that the quality of effluent spilling into the Red Run Drain meets standards established by the Michigan Water Resources Commission.

Operations - 1986

The Drain Commissioner currently employs nine people to maintain and operate the S.O.C.S.D.S. system. The employees are divided into two operating units under the direction of William E. Klockow, P.E., managing engineer.

One unit is assigned to a laboratory where staff continually monitors contributors to the sewer system. The purpose of the monitoring program is to test sewage effluent from industries at designated locations so as to limit the users of the system to specific parameters of sewage strengths. The City of Detroit is notified of the results of these tests, and if a violation occurs the industry violating the sewage ordinance is notified. During 1986 approximately 20,000 analyses were performed on more than 4,000 samples collected within the district. Through these efforts the district has been able to control the quality of effluent entering the system and later treated by the City of Detroit.

The second unit maintains and operates the Pollution Control Facility as well as the Red Run Drain. Responsibilities of this unit include the operation of the pump station housing six dewatering pumps which pump combined sewage from the Pollution Control Facility into the Dequindre Interceptor. Once the Pollution Control Facility has been pumped dry, a flushing system is activated to wash down the walls and floor of the Pollution Control Basin. After flushing, employees enter the Pollution Control Basin and remove any remaining debris.

In 1986 there were 22 spills from the Twelve Towns system to the Pollution Control Facility, of which twelve were retained. The remaining 10 spills were chlorinated before spilling to the Red Run Drain. Overflows to the Red Run Drain were limited to a total period of only 84 hours during the entire year. The total volume of flow spilled was approximately 178,000,000 cubic feet.

Much of the area above the Pollution Control Facility has been designated as recreational property. Presently, a golf driving range and nine-hole executive golf course are operated by the Oakland County Parks and Recreation Commission. A wave pool and other recreational facilities are presently being constructed for another portion of the property above the Pollution Control Facility. Areas not being used for recreational purposes are maintained by employees in this unit.

Another major responsibility of the second unit is the operation and maintenance of the Red Run Drain. The Red Run Drain begins at the outlet of the Pollution Control Facility at Thirteen Mile and Dequindre Road and runs northeasterly through Macomb County approximately seven miles where it outlets into the Clinton River. This open watercourse is subject to erosion as well as shoaling. Funding for maintenance activities on the Red Run Drain is provided by assessments against the Chapter 21 inter-county drainage district for the Red Run Drain.

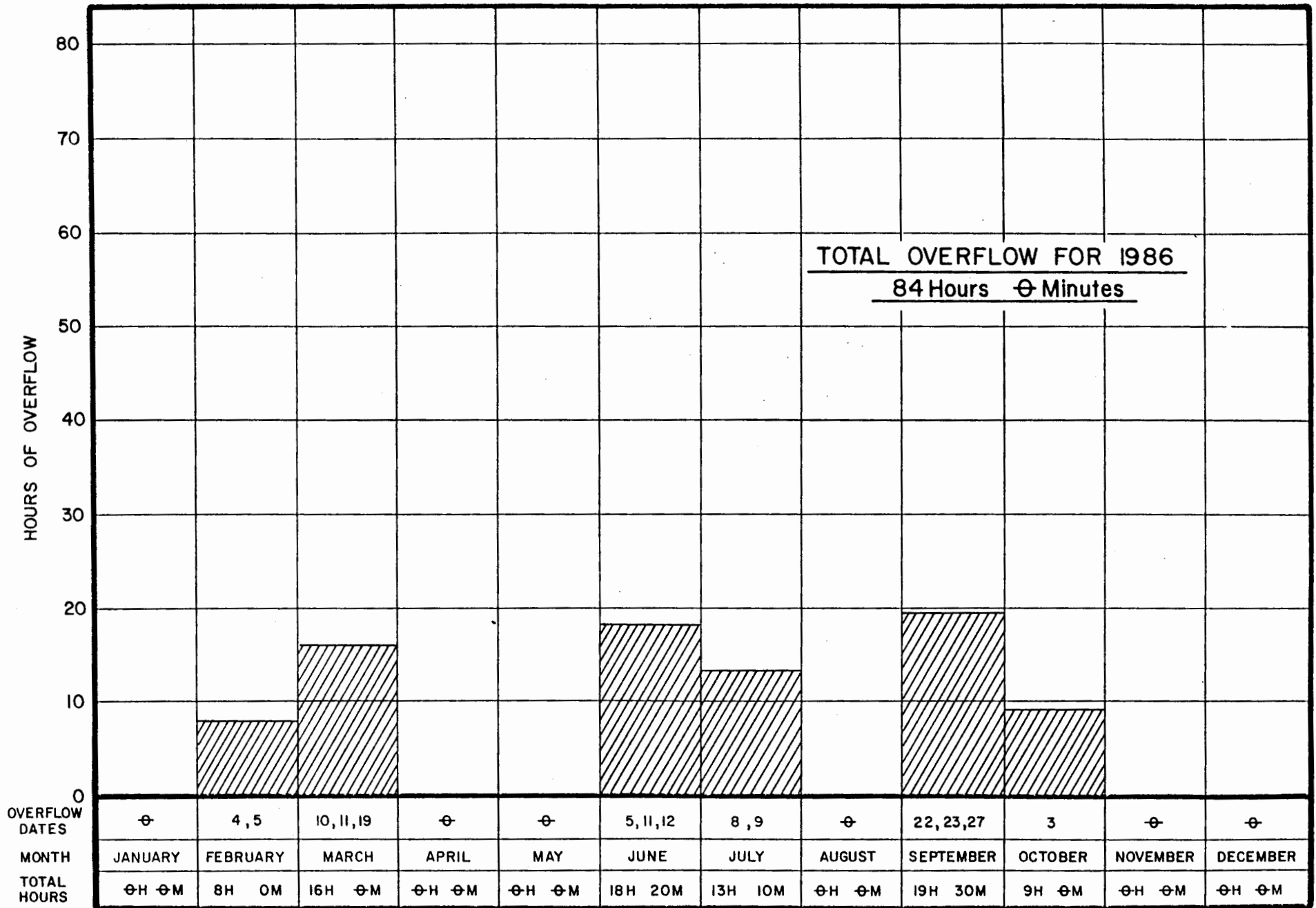
Hazel Park Sewer Repair

The Southeastern Oakland County Sewage Disposal District operates and maintains several major sewer systems within the District. In February, 1986 the District was advised of a sewer failure near Ten Mile Road and I-75. This sewer failure was the result of an acid discharge from an industrial plant into a concrete Hazel Park City sewer which was directly connected to a 66-inch interceptor sewer operated by the Southeastern Oakland County Sewage Disposal District. The 66-inch diameter sewer interceptor is adjacent to I-75 at a depth of 35 feet and serves approximately 150,000 people within the District. A 12-inch reinforced concrete Hazel Park sewer discharging to the 66-inch diameter interceptor was totally consumed by the industrial acid discharge. As a result, backfill material had washed into the 66-inch diameter interceptor sewer. Because of the importance of this 35-foot deep, 66-inch diameter major sewer, it was determined that immediate repairs should be made to protect the users of the system. A contractor was hired who could proceed immediately on a time-equipment-material basis to repair the 66-inch diameter sewer and install a new sewer line not subject to acid deterioration in place of the sewer that failed. The cost of the repair and reconstruction was \$188,682.05, and the cost of this repair will be recovered from the industrial facility that discharged the acid flows into the Hazel Park sewer. Final restoration was completed in June, 1986.

I-696 Involvement

During calendar year 1986 the Southeastern Oakland County Sewage Disposal District was involved with the construction of the new I-696 freeway running westerly through the District along Ten Mile Road. Since I-696 is a recessed freeway, drains which serve the District will be interrupted as construction occurs. Therefore, siphons have been designed by the State Highway Department to handle the flows from these combined drainage systems.

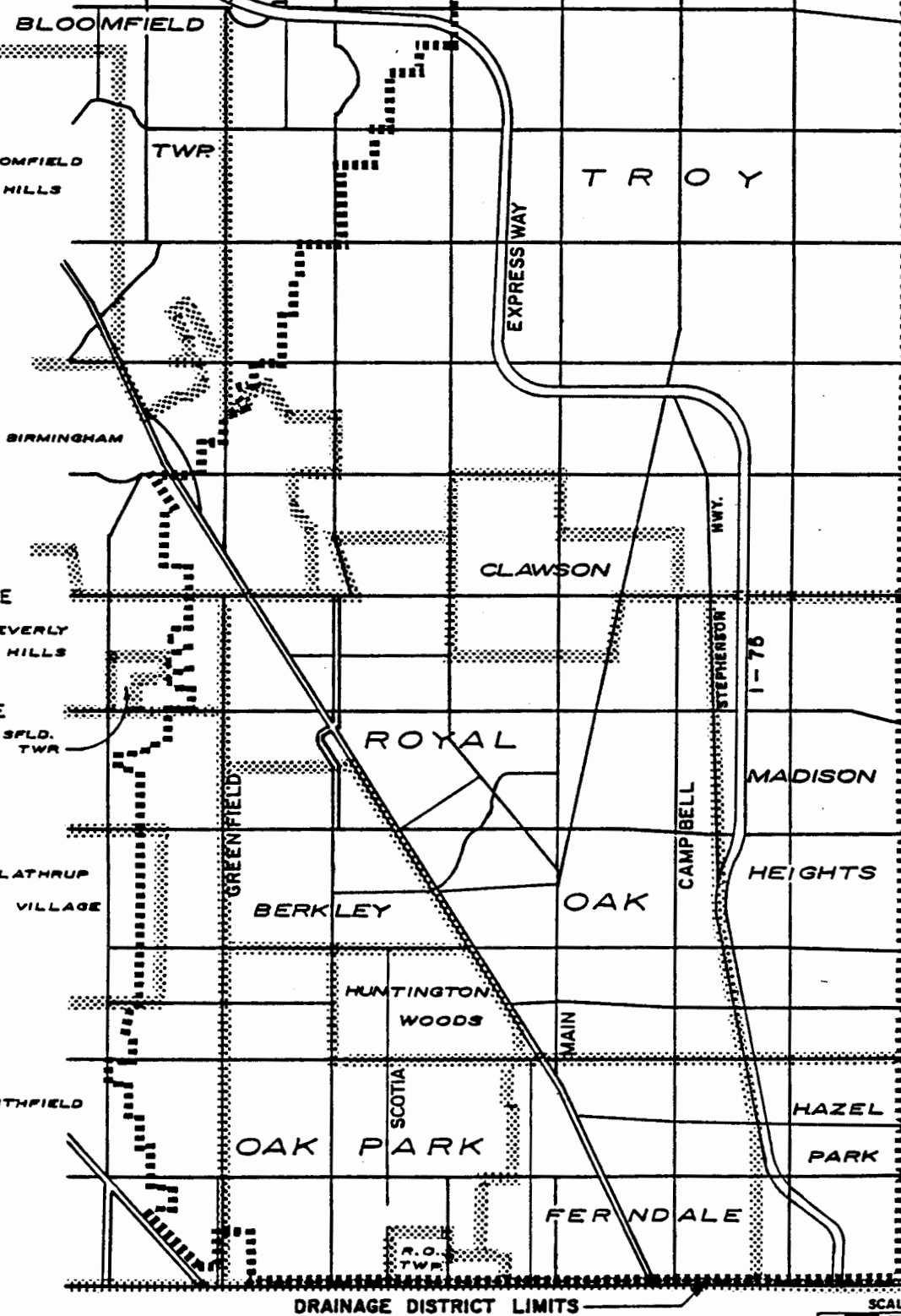
In 1986 the District employed an inspector to oversee the construction of the Oakdale, Allen, Hubbard, and Gardner siphons. Each siphon is valued at about one million dollars in construction costs. Once the siphons are placed into service, it will be the responsibility of the Drain Commissioner to operate and maintain them. The cost for maintenance will be shared with the Michigan Department of Transportation.



SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM
 JANUARY 1, 1986 THRU DECEMBER 31, 1986

SOUTHFIELD ADAMS COOLIDGE CROOKS LIVERNOIS ROCHESTER JOHN R. DEQUINDRE

SOUTH BLVD.
SQUARE LAKE
LONG LAKE
WATTLES
BIG BEAVER
MAPLE
FOURTEEN MILE
THIRTEEN MILE
TWELVE MILE
ELEVEN MILE
TEN MILE
NINE MILE
EIGHT MILE



SCALE IN MILES
0 1 2

OAKLAND COUNTY DRAIN COMMISSIONER'S OFFICE
SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM

DRAIN CONSTRUCTION COMPLETED

DRAIN CONSTRUCTION

The Drain Commissioner, under the provisions of the Michigan Drain Code, Act 40 of Public Acts of 1956, as amended, is authorized to construct new county drains.

Construction of a county drain is undertaken only after a petition has been filed with the Drain Commissioner. Petitions are normally filed by one or more governmental units, however, a petition may be filed by a property owner or a group of property owners.

During the time period covered by this report, nine new drains were in various stages of planning and development, and three drains were under construction.

DRAIN CONSTRUCTION PROJECTS COMPLETED BETWEEN JANUARY 1, 1986 AND DECEMBER 31, 1986

Jackson Drain - Phase II

On March 22, 1982 the City Council of Troy adopted a petition for drainage improvements in Big Beaver Road from the Henry-Graham Drain west to 3/4 mile west of John R., and east to Dequindre Road. The petition was received by this office on March 30, 1982, and the first meeting of the Drainage Board was held the next day. The project was named the Jackson Drain, and Glen Yrjanainen was designated the Drain Office project engineer.

At a meeting held on May 12, 1982 the project was declared practicable and necessary for public health, the Final Order of Determination was approved, and Hubbell, Roth & Clark, Inc. was retained as consulting engineer. The total preliminary cost of the drain was \$1,320,000.

In 1983, as a part of the John R. Road improvement project, 105 lineal feet of Jackson Drain pipe enclosure was installed. The project was delayed approximately one year due to the postponement of the Big Beaver Road widening project; the road project was scheduled for the summer of 1985. Accordingly, work on right-of-way acquisition was started in early 1984. An agreement wherein the Jackson Drainage District and City of Troy each bore 50% of the right-of-way acquisition costs was entered into on September 10, 1984. On October 24, 1984 the Drainage Board approved the plans, specifications, cost estimate, route description, district description, and estimate of life. It set tentative apportionments and scheduled the hearing on final apportionments for December 5, 1984. At this meeting final apportionments of 74.89% to City of Troy and 25.11% to Oakland County were confirmed.

Construction of Phase I, the easterly portion of the project, was completed in 1985 at a final construction cost of \$326,382.55. Miscellaneous cleanup and restoration were completed in the spring of 1986.

The Drain Commissioner designated Donald L. Mills as project engineer for Phase II of the Jackson Drain. Construction bids for Phase II, the westerly portion of the project, were received on September 24, 1985, and the contract to construct the project was awarded to the low bidder, M & M Contracting of Michigan, Inc. in the amount of \$705,062.10. Construction began in January, 1986, and was completed that summer. Final payment was made to the contractor in November of 1986. The final construction cost for Phase II of the Jackson Drain was \$783,384.46.

The Jackson Drain was financed with surplus construction funds from completed drain projects under the provisions of Act No. 165 of the Public Acts of 1984.

Mainland Drain

On July 24, 1972, a petition from the County of Oakland and Township of Waterford was filed with the Drain Commissioner asking for the establishment of an intra-county drain in the City of Pontiac and Township of Waterford, including portions of the Oakland County Service Center. Due to financial problems, progress on this drain was delayed.

In 1985 an existing 18" storm drain located in the east portion of the Service Center paralleling the railroad was inspected and found to be severely deteriorated. Since this drain serves a considerable portion of the Service Center, its replacement with 1385 lineal feet of 30" diameter pipe was proposed as the Mainland Drain - Phase I project under the provisions of Chapter 20 of the Drain Code. The needed right-of-way was acquired, and funding was provided by Oakland County from the 1985 Capital Improvement program. Gerald A. Mitchell, P.E., of the Facilities Engineering Unit of the Oakland County Department of Facilities and Operations was designated as project engineer.

Bids were received, and on October 22, 1985 the Drainage Board awarded a contract to construct the Mainland Drain - Phase I to Polsinelli Construction Company of Warren, Michigan in the amount of \$138,950. Construction was completed during 1986, and the total construction cost was \$158,444.75.

Nelson Drain - Phase I

A petition for certain drain improvements along the existing Gibson and Renshaw Drains in the northeastern part of the City of Troy was filed with the Drain Commissioner on May 7, 1984. At the first Drainage Board meeting held May 23, 1984, the project was named the Nelson Drain, and the public hearing on necessity

was scheduled for July 11, 1984. No objections were made at the hearing, and the project was determined practical and necessary, and the Final Order of Determination was adopted.

Donald L. Mills was designated the Drain Office project engineer for the Nelson Drain, and Hubbell, Roth & Clark, Inc. was employed as consulting engineer.

Phase I of the Nelson Drain consisted of a 25-acre retention basin which was constructed on the east side of Rochester Road between Long Lake and Square Lake Roads. Construction bids were received on September 10, 1985, and the contract was awarded to the low bidder, Richard Mancini Equipment Co. in the amount of \$838,181.39. Actual construction including site clearing, tree removal, and earth excavation began in November of 1985. Phase I was essentially complete and in service by the fall of 1986. Minor cleanup and restoration remains to be completed in the spring of 1987.

The Nelson Drain is being financed with surplus construction funds from completed drain projects under the provisions of Act No. 165 of the Public Acts of 1984.

Skarritt Drain

On April 9, 1985 the City of Pontiac adopted a resolution to petition the Drain Commissioner to construct a storm drain on Joslyn Road north of Walton Boulevard. Originally a City of Pontiac project, the City hired Giffels-Webster Engineers, Inc. to prepare engineering plans for the drain improvements. Construction bids were received by the City of Pontiac in February of 1985, and the contract was awarded to Harry Rosen's Bulldozing Services, Inc., the low bidder. Construction was hindered, however, because easements could not be obtained.

At a meeting of the Skarritt Drainage Board held June 26, 1985 the project was declared practicable and necessary for public health, the Final Order of Determination was approved, and Giffels-Webster Engineers, Inc. was employed as consulting engineer.

In an effort to obtain the necessary easements, Glen Yrjanainen, P.E. of the Drain Commissioner's staff redesigned the Skarritt Drain. After the redesign, all necessary easements were obtained and a change order reflecting the revisions was prepared. Harry Rosen's Bulldozing Services, Inc. submitted a revised bid incorporating the design revisions, and the contract was amended to reflect the changes. William E. Klockow, P.E. was designated as project engineer for the Skarritt Drain.

Construction of the drain began in October of 1985, with 75% of the project completed by the end of that year. The balance of the construction was completed by April of 1986, and the project was placed into service at that time. Most of the restoration and final cleanup work was completed in 1986; however, some restoration work will be completed in 1987. Total construction cost was \$161,606.32.

The Skarritt Drain was financed with surplus construction funds from completed draan projects under the provisions of Act No. 165 of the Public Acts of 1984.

DRAINS UNDER CONSTRUCTION

DRAINS UNDER CONSTRUCTION

Caddell Drain - Phase II

In October of 1981 severe flooding took place in the I-96, Ten Mile Road, Grand River and Halstead Road areas of Farmington Hills. The area is known as the Tarabusi Creek District on the City of Farmington Hills Master Storm Drainage Plan which was then being prepared by Hubbell, Roth & Clark, Inc., consulting engineers. On December 21, 1981 the City of Farmington Hills approved petitioning for a county drain in the area. Several meetings between the county, state and the involved municipalities and their consultants took place, and on April 30, 1982 a petition, jointly signed by the City of Farmington, the City of Farmington Hills and the City of Novi was received by the Drain Office. On May 3, 1982 the first meeting of the Drainage Board took place and the project was named the Caddell Drain. On June 6, 1982 the project was declared necessary for the public health and the Final Order of Determination was signed; Hubbell, Roth & Clark, Inc. was retained as consulting engineer and the firm of Dickinson, Wright, Moon, Van Dusen & Freeman as bond counsel.

At a meeting at the Michigan Department of Transportation held July 29, 1982 preliminary authorization was received to proceed with Phase I of the drain, construction of an overflow system that would help relieve excessive flooding to the properties immediately west of M-102. The system could flood the freeway in a severe storm, but should prevent major flooding damage to buildings and other private property. Should this happen, the freeway will be closed and a by-pass route used for traffic. An action plan for closing the freeway was incorporated into a three party agreement between the Drain Office, the Michigan Department of Transportation and the City of Farmington Hills. Financing was provided by the City of Farmington Hills. Bids were taken by the Drainage Board on September 22, 1982, and the work was awarded to Dan's Excavating, Inc., Utica, Michigan for \$104,280.00. The 8'6" diameter overflow pipe was installed by open cut methods through the northbound M-102 off ramp during the weekend of October 15, 1982.

Plans and specifications for the entire project were approved and tentative apportionments set at a Drainage Board meeting held on December 1, 1982. Final apportionments were confirmed at the January 26, 1983 meeting of the Drainage Board.

In 1984 William E. Klockow was designated the project engineer for the Caddell Drain.

In early 1985 the final engineering plans for Phase II of the Caddell Drain were completed. Permit applications were filed with governing agencies and easement negotiations began. The Board of Commissioners approved a Full Faith and Credit resolution for the sale of bonds on February 28, 1985. Bonds in the amount of \$3,475,000 were sold on April 24, 1985.

In October, 1985 a revised estimate of cost of \$5,100,000 was prepared to reflect changes which were required by easement considerations, permit requirements, and changes required by the involved communities. It was determined at that time to receive construction bids as soon as possible in order to proceed with construction.

Construction bids were received on December 18, 1985, and on January 28, 1986, the Caddell Drain, Phase II construction contract was awarded to the low bidder, Richard Mancini Equipment Company, for their bid in the amount of \$3,478,000.

The contractor began construction of Phase II on March 19, 1986, and throughout the remainder of the year completed 71% of the work required under the terms of the contract at a cost of \$2,470,000. The completed portions of the project are now in service, and the risk of flooding of the Red Roof Inn or private property in the vicinity of Halstead Road and Grand River has been eliminated. It is anticipated that the contractor will complete construction of Phase II before the official completion date of May, 1987.

Holland Drain

The City of Pontiac adopted a petition on October 29, 1985 to construct a storm drain to alleviate flooding problems on Walton Boulevard between Perry Street and Joslyn Avenue. The project includes an improvement of the Galloway Creek.

At a meeting held December 18, 1985 the project was declared practicable and necessary for public health, the Final Order of Determination was approved, and the Engineering Staff of the Oakland County Drain Commissioner was employed to prepare plans, specifications and an estimate of cost. Glen Yrjanainen, P.E. was selected to design the project and to function as the project engineer for the proposed drain.

Plans for the Holland Drain were completed by the spring of 1986, and all required construction easements to build the project were secured by the following summer.

Construction bids were received at a meeting held October 28, 1986, and on December 9, 1986 the contract to construct the project was awarded to Adamo Contracting Corporation of Detroit, Michigan for their low bid of \$1,069,554.

Construction of the Holland Drain had begun by mid-December, 1986, and it is expected that the entire project will be completed by the summer of 1987.

The Holland Drain is being financed with surplus construction funds from completed drain projects under the provisions of Act No. 165 of the Public Acts of 1984.

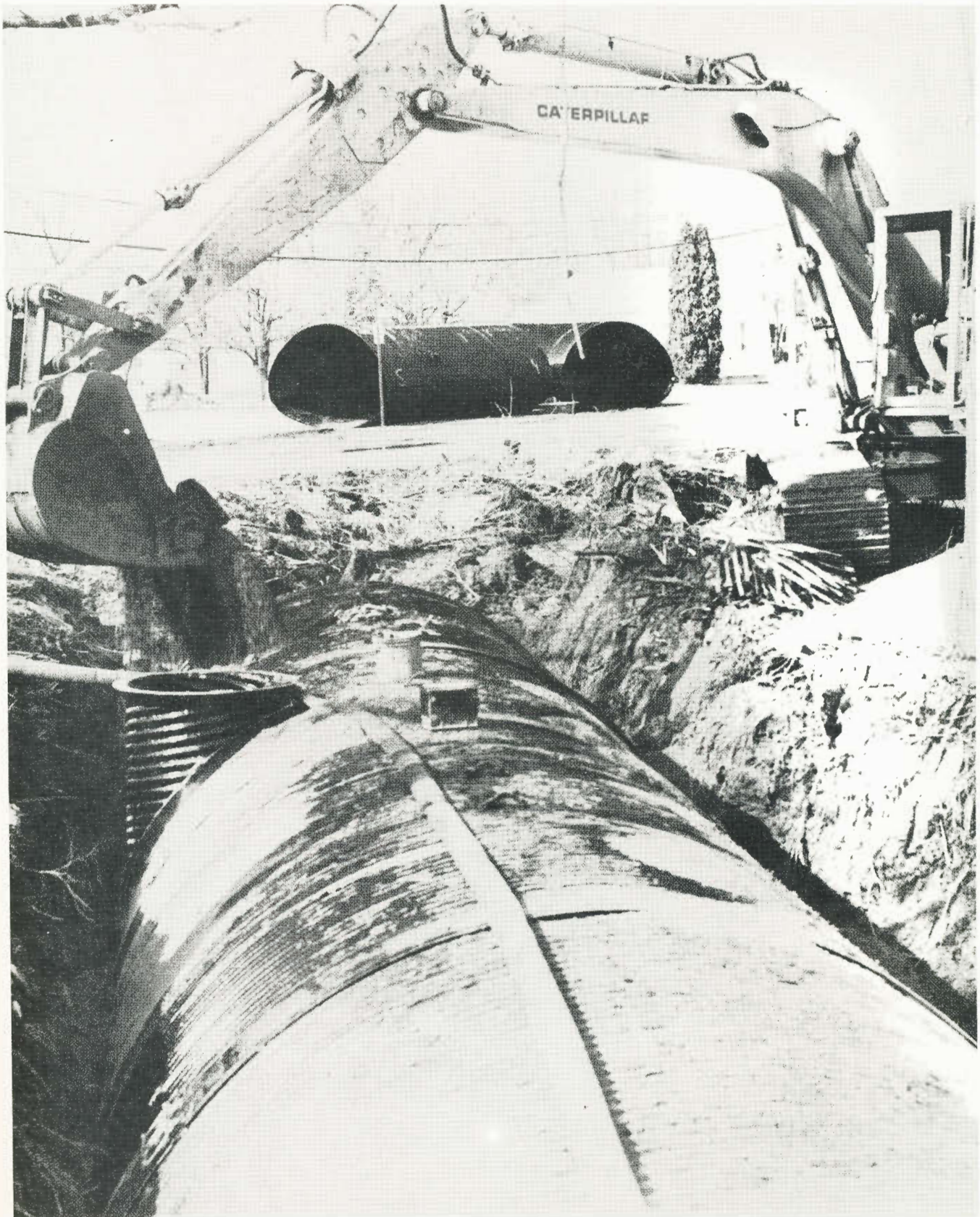
Oakdale Drain

Because of the construction of the I-696 Freeway through the City of Pleasant Ridge, it became necessary to construct a siphon at the existing drain crossing at Oakdale Boulevard. The City of Pleasant Ridge on May 8, 1986 filed a petition with the Drain Commissioner to construct this siphon as a county drain.

At a drainage Board meeting held on July 8, 1986, a public hearing was held, and no objections to the project were made. The project was declared practicable and necessary for the public health, and the Final Order of Determination was authorized and executed.

The Engineering Department of the Department of Transportation of the State of Michigan was appointed to prepare plans and specifications for the project. The project was bid as a section of the Freeway project and is presently under construction. The cost of construction for the Oakdale Drain as bid was \$900,000.

The entire cost of the Oakdale Drain will be paid by the Michigan Department of Transportation.



HOLLAND DRAIN – City of Pontiac



JACKSON DRAIN – Phase II – City of Troy

WEST BLOOMFIELD STORM DRAIN PROGRAM

WEST BLOOMFIELD STORM DRAIN PROGRAM

The Charter Township of West Bloomfield on February 7, 1986 adopted Ordinance No. 49A which, in part, requires that proposed drainage facilities serving more than one premises be operated and maintained by the Oakland County Drain Commissioner. To accomplish this, the Drain Commissioner, under the provisions of Section 433 of Act No. 40 of P.A. 1956, as amended, has entered into agreement with property owners and developers to establish their private drains as County drains. The agreements provide that the property owner and developer assume all costs involved in the establishment and construction of the drain. In addition, the agreement provides that the properties within the development bear the costs of operation and maintenance of the drain by special assessment.

Construction of the following West Bloomfield Township drains under Section 433 of the Drain Code was completed in 1986:

- The Arbors of West Bloomfield Drain
- Chimney Hill Apartments Drain
- Maple Place Condominium Drain
- Maple Place Woods Drain
- Professional Village of West Bloomfield Drain
- Ravines of West Bloomfield Drain
- Walnut Hills of West Bloomfield Drain
- Walnut Woods Apartments Drain

The following West Bloomfield Township drain projects established under Section 433 of the Drain Code were under construction in 1986:

- The Arbors of West Bloomfield Drain - Branch No. 1
- Aspen Ridge Condominium Drain
- Bloomfield Glens Health Center Drain
- Crown Center Drain
- DeConick Drain - Branch No. 2
- Edwards Relief Drains - Branch No. 2
- Greenpointe Condominium Drain
- Greenpointe Condominium Drain - Branch No. 1
- Maple Park Office Center Drain
- Mapleridge Condominium Drain
- Maple West Retail Center Drain
- Maplewoods North Subdivision Drain - Branch No. 1
- Sherwood Creek Cluster Homes Drain
- Silverbrooke Villa Apartment Drain
- Simsbury Condominium Drain
- Westwood Park Drain

Joseph P. Kozma, P.E., is the engineer responsible for the supervision of this new program.

SEWER AND WATER CONSTRUCTION COMPLETED

SEWER AND WATER CONSTRUCTION COMPLETED

Bingham Farms Extension No. 3

In May of 1985 the Drain Commissioner's Office received a request from the Village of Bingham Farms to construct a short sanitary sewer extension along 13 Mile Road east of Telegraph Road to serve two residential lots which were inadvertently omitted from the Village system constructed several years prior. The Village Council requested that this extension be constructed utilizing surplus funds on deposit with Oakland County.

An agreement between Bingham Farms and the County of Oakland was approved by the Village Council on August 26, 1985. The Oakland County Board of Commissioners approved the agreement on September 26, 1985, assigned the project development and construction to the Drain Commissioner as County Agency, and transferred \$21,500 in surplus funds from prior years construction projects to finance the project work.

The consulting firm of Giffels-Webster Engineers, Inc. was retained to design the system and prepare construction plans and specifications. Donald L. Mills, P.E. was designated as project engineer for Bingham Farms Extension No. 3.

Construction bids were received December 23, 1985, and the contract was awarded to SBG Construction, Inc. of Wixom, Michigan, in the amount of \$12,250. Construction began in January, 1986, and the sewer was completed and placed into service in March, 1986. Cleanup and restoration began in the spring of 1986 and was completed in the summer. Final payment to the contractor was made in October, 1986, with the final construction cost of the Bingham Farms Extension No. 3 totalling \$12,318.00.

Lapeer-Brown Road Water Main Extension

In early 1985 the Drain Commissioner received a request from the Township of Orion to construct a water transmission main extension in Brown and Lapeer Roads from design plans and specifications supplied by the Township and prepared by Orchard, Hiltz & McCliment, Inc., Township consulting engineers. An agreement between Orion Township and the County of Oakland was approved by the Orion Township Board on April 15, 1985, and by the Oakland County Board of Commissioners on May 9, 1985. The agreement assigned the construction to the Drain Commissioner as County Agency, and provided the necessary funds from Orion Township. Joseph P. Kozma, P.E. was designated as Drain Office project engineer.

Construction bids were received on July 1, 1985, and the contract was awarded to L. D'Agostini & Sons, Inc. of Sterling Heights, Michigan in the amount of \$808,034 to construct approximately 18,000 feet of 12" to 24" diameter water main along Lapeer Road (M-24) from Brown Road to north of Silverbell Road.

Construction began in July, 1985 and was substantially completed in the spring of 1986. The system was placed in service on April 29, 1986. Final cleanup and restoration will be completed in the spring of 1987.

Orion Township Extension No. 3

In December, 1983 the Drain Commissioner's Office received a request from the Township of Orion to construct a sanitary sewer along Lapeer Road (M-24) from a point north of Brown Road to just north of Greenshield Road. This sewer would serve a district easterly and westerly of Lapeer Road and would allow for industrial and commercial development to occur along the M-24 corridor adjacent to the new General Motors plant. The Township Board requested that this project be constructed with surplus funds on deposit with the County.

An agreement between Orion Township and the County of Oakland was approved by the Orion Township Board on February 6, 1984. The Oakland County Board of Commissioners approved the agreement on February 23, 1984, and assigned the project development and construction to the Drain Commissioner's office as County Agency. The consulting firm of Orchard, Hiltz & McCliment, Inc. was employed to design the system and prepare construction plans and specifications. Joseph P. Kozma, P.E., was selected as the Drain Office project engineer.

Construction bids were received July 1, 1985, and L. D'Agostini & Sons, Inc. of Sterling Heights, Michigan was awarded the \$970,118 contract to construct the approximately 19,000 feet of 8" to 15" diameter sanitary sewer.

Construction began in July, 1985, and the system was placed in service on April 7, 1986. Final cleanup and restoration is expected to be completed in the spring of 1987.

SEWER AND WATER PROJECTS UNDER CONSTRUCTION

SEWER AND WATER PROJECTS UNDER CONSTRUCTION

Milford Sewage Disposal System - Extension No. 2

The Village of Milford is located in the southwest corner of Oakland County and lies in the headwaters of Kent Lake in the Kensington Metropolitan Park and within the Huron River Drainage Basin. Regional sanitary sewer interceptors, such as those which serve much of Oakland County, do not reach the Village of Milford. Therefore, the Village has had to provide its own sanitary sewer collection, treatment, and disposal.

In September, 1967 Oakland County financed and completed the construction of a major treatment plant expansion for the Village of Milford to comply with water quality standards current at the time the expansion was placed into service. In recent years, however, the Milford Village system could no longer meet newer, more stringent treatment standards. In particular, the location of the Village Treatment Plant immediately upstream of Kensington Metropolitan Park, and the Kent Lake impoundment of the Huron River, imposed severe pollutant removal standards on the plant. The United States Environmental Protection Agency and the Michigan Department of Natural Resources cited the Village for pollution of public waters, and it became necessary to provide major improvements.

A determination was made to apply for Federal funding under the Public Law 92-500 grant program. The project appeared to be eligible for grant participation, not only for the treatment, but also for major repair and replacement of a leaking and deteriorating interceptor sewer. The scope of the project was therefore expanded to include the latter.

The system improvements consist of approximately 3,000 feet of 8" sanitary sewer to 21" interceptor sewer, approximately 2,500 feet of rehabilitation of 15" to 21" interceptor sewer, and the treatment plant improvements. The sanitary sewer rehabilitation will utilize a process of insertion of a polyester felt insitu-tube in the existing pipelines and manholes. This method provides a rehabilitation and repair of the sanitary sewers without excavation, disturbance to people or property, and may be accomplished within a relatively short period of time.

The principal feature of the treatment process includes the Oxidation Ditch Activated Sludge Process and Microscreening to comply with the more strictly enforced regulations in the area of removal of pollutants. This process at a design flow of 1.042 MGD can achieve on a daily basis phosphorous concentrations of less than 900 pounds a year, or 0.28 mg/l. Conventional

technology for effluent phosphorous concentrations averages from 0.7 mg/l to 1.0 mg/l and generates a considerable volume of chemical sludge. The proposed innovative system is new and unique technology which has made it eligible for additional grant funding.

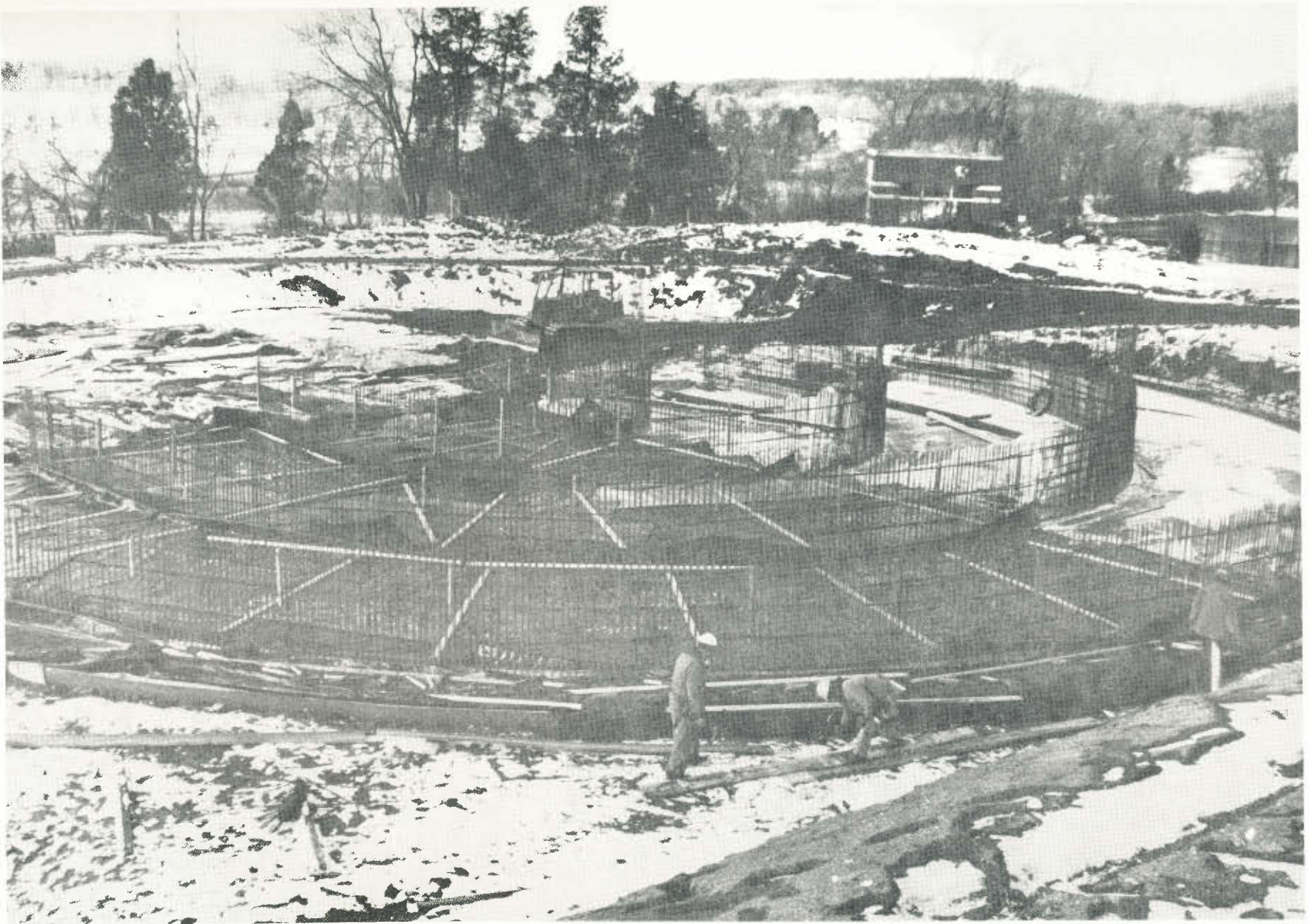
An agreement between the Village of Milford and the County of Oakland was approved by the Village Council on April 28, 1986. The Oakland County Board of Commissioners approved the agreement and authorized the sale of bonds to finance the local share cost on May 22, 1986. Project development and construction was assigned to the Drain Commissioner as County Agency under the provisions of Act 342 of the Public Acts of 1939, as amended.

The firm of Wade, Trim and Associates, Inc. of Taylor, Michigan designed the entire project, prepared construction plans and specifications, and assisted in obtaining Federal funding under the Public Law 92-500 grant program. Wade, Trim and Associates, Inc. will also provide resident engineer inspection services at the treatment plant. Philip Sanzica, P.E. was designated as project engineer for the Milford Sewage Disposal System - Extension No. 2 project.

This project has a grant eligibility of approximately 90% of the total construction and associated project costs. Federal funds for 55% of the grant eligible portions, plus an additional 20% for the innovative technology will total approximately 3.6 million dollars when all of the project work is completed. Oakland County bonds in the amount of \$3,550,000 were sold on September 11, 1986 to cover the local share cost.

Two construction contracts were awarded in September, 1986 to two contractors: Clark Construction Company in the amount of \$5,339,000, and Delaware Equipment Corporation in the amount of \$739,596, for a total cost of \$6,078,596.

The interceptor sewer, consisting of both new construction and rehabilitation, will be completed and ready for service in 1987. The treatment plant will be completed and ready for service in 1988. In the interim, the existing plant continues to provide treatment.



MILFORD SEWAGE DISPOSAL SYSTEM – Extention No. 2

LAKE LEVEL PROJECTS UNDER CONSTRUCTION

LAKE LEVEL PROJECTS UNDER CONSTRUCTION

Indianwood Dam

In the 1920's a private dam was constructed at a stream in Section 3 of Orion Township, thereby creating Indianwood Lake.

By 1986 this privately owned dam was in a deteriorating condition. In the winter of 1986 the lakefront owners on Indianwood Lake petitioned for a legal lake level under the provisions of Lake Level Act No. 146 of 1961, asking that the existing dam be reconstructed, and then operated and maintained by the County.

Glen Yrjanainen, P.E. of the Drain Office engineering staff was selected to design the new dam.

In April, 1986 the County of Oakland agreed to finance the construction cost of the project, and granted an interest-free loan of \$100,000 to the Indianwood Lake dam project to be paid back from special assessments over a seven-year period.

On August 12, 1986 construction bids were received for the Indianwood Dam, and a contract was subsequently awarded to the P & R Contracting Company, Inc., of Washington, Michigan, for their low bid of \$97,221.

Circuit Court Judge Norman Lippitt established a legal level for Indianwood Lake on August 27, 1986.

Construction of the new dam began in November, 1986. It is expected that the entire project will be completed in 1987.

Price Dam

In the early 1900's a private dam was constructed at the Clinton River outlet from the Dawson Mill Pond, in Section 31 of the City of Pontiac.

Commonly known as the Dawson Mill Pond Dam, the structure regulates the levels of the Dawson Mill Pond, Sylvan Lake, and Otter Lake. The operation of the dam in recent years has been under the jurisdiction of the City of Pontiac. By 1960 the dam was in a deteriorating, unsafe condition.

In the spring of 1986 the affected communities, namely the Township of Waterford and the Cities of Pontiac, Keego Harbor, and Sylvan Lake, had concluded that the dam should be replaced with a new structure. At a meeting organized by the Drain Commissioner on March 13, 1986, it was agreed that the project cost would be apportioned as follows: City of Pontiac 40.0%; Township of Waterford 35.99%; City of Sylvan Lake 15.94%; City of Keego Harbor 8.07%.

In June, 1986 the County of Oakland agreed to finance the construction cost of the project, and granted an interest-free loan of \$400,000 to be paid back from special assessments over a seven-year period to the Price Dam project.

Petitions were received under the provisions of the Inland Lake Level Act No. 146 of 1961, to establish a legal level, replace the dam with a new structure, and to place operation and maintenance of the new dam with the Oakland County Drain Commissioner. On July 16, 1986 Circuit Court Judge Steven Andrews established a legal level for the Dawson Mill Pond, Otter Lake and Sylvan Lake. Conceptual plans for the new dam were prepared by Glen Yrjanainen, P.E. of the Drain Office engineering staff.

Hampton Engineering Associates, Inc. was retained to prepare final construction plans and specifications for the new dam using the conceptual plans approved by the Court as the basis for the design.

The reconstruction of the existing Dawson Mill Pond dam was renamed the "Price Dam". Glen Yrjanainen, P.E., was designated the project engineer for the Price Dam project.

It is expected that construction bids for the Price Dam will be received in February, 1987, with construction to be completed in 1987.

LAKE IMPROVEMENT BOARDS

**OAKLAND COUNTY
REFERENCE LIBRARY**

LAKE IMPROVEMENT BOARDS

The Inland Lake Improvement Act, Act No. 345 of 1966, as amended, permits a local unit of government to create a lake improvement board after receiving petitions from 2/3 of the freeholders owning land abutting the lake. Section 4 of the Act provides that the County Drain Commissioner will serve as a member of the lake improvement board.

A brief summary of the activity of each lake improvement board during 1986 follows:

Big Lake Improvement Board

Big Lake is approximately 220 acres in size and is located in Springfield Township. The Oakland County Drain Commissioner also operates and maintains a lake level structure for Big Lake under the provisions of the Inland Lake Level Act. The members of the Lake Improvement Board during 1986 were Bernard A. Wendt, Chairman, Richard D. Kuhn, Jr., representing the Oakland County Board of Commissioners, Bob Lloyd, representing the lakefront owners on Big Lake, Peg Bostwick, representing the Michigan Department of Natural Resources, and Robert H. Fredericks, representing the Oakland County Drain Commissioner.

During 1983 the Lake Improvement Board approved a five-year lake improvement project consisting primarily of weed harvesting, and a five-year special assessment roll to finance the project.

Also in 1983 the Lake Improvement Board entered into a contract with the Big Lake Quality Water Association, Inc., a non-profit corporation formed by the residents on Big Lake to perform the weed harvesting work.

The Lake Board approved an amendment to the Clean Lakes Project Contract which will permit an additional grant of \$5,000 to assist in financing the weed harvesting work on the lake in 1986. Payments of \$4,528.54 were approved during 1986 for D.N.R. services in connection with the Clean Lakes Project Contract. During 1986 the weed harvesting program was continued by the residents through their non-profit corporation. Payments by the Lake Improvement Board to the contractor for weed harvesting in 1986 totaled \$28,650.

The fourth year of the five-year program of weed harvesting was successful on Big Lake. Some problems in coordinating volunteer activities and supervision of the weed harvesting operation were encountered. The Big Lake Quality Water Association has elected new officers and has resolved to improve the management of the weed harvesting program during 1987.

Charlick Lake Improvement Board

Charlick Lake is located in Section 9 of Highland Township, being north of Middle Road, south of Clyde Road, and west of Milford Road. The lake has an approximate surface area of 20.5 acres.

The following individuals served as Charlick Lake Improvement Board members for 1986: Thomas Dunleavy, Board Chairman and Highland Township Supervisor; Richard Skarritt, representing the Oakland County Board of Commissioners; John Fitzgerald, representing the lakefront property owners, Glen Yrjanainen, Board Secretary and representative of the Oakland County Drain Commissioner; and Richard Mikula, representing the Michigan Department of Natural Resources.

In 1985 an engineering feasibility study recommended that a long term solution to improve the quality and condition of the lake would be to dredge and deepen the lake, as opposed to short term solutions such as weed harvesting or the use of chemicals, etc. The results of a questionnaire circulated to the lake owners during the summer of 1985 indicated that the residents wanted a chemical weed control program for their lake.

At a meeting held September 15, 1985 the Lake Board authorized a chemical weed control program for Charlick Lake to be carried out in 1986, and approved a special assessment for the December, 1985 tax rolls in the amount of \$3,800 to implement the program.

The Lake Board entered into a contract with the Association at the April 7, 1986 board meeting whereby the Association would oversee the chemical weed control program. The Association then subcontracted the work to the Rose Exterminator Company who proceeded to apply the chemicals to control weed growth in the lake.

The Association presented the Lake Board with their proposed budget for a three-year chemical weed control program at a meeting held September 11, 1986. On September 29, 1986 the Lake Board approved a special assessment for the December tax rolls of 1986, 1987 and 1988, in the amount of \$3,875.62 per year, to implement the three-year chemical weed control program for Charlick Lake.

Duck Lake Improvement Board

Duck Lake is located in Sections 2, 11, 12 and 14 of Highland Township, being north of Wardlow Road, south of White Lake Road, west of Duck Lake Road, and east of Harvey Lake Road. The lake has an approximate surface area of 307 acres.

The following individuals served as Duck Lake Board members for 1986: Thomas Dunleavy, Board Chairman and Highland Township Supervisor; Richard Skarritt, representing the Oakland County Board of Commissioners; Robert Hess, Board Secretary and

representative of the lakefront owners on Duck Lake; Glen Yrjanainen, representing the office of Oakland County Drain Commissioner; and Richard Mikula, representing the Michigan Department of Natural Resources.

In 1984 a feasibility study recommended that a weed harvesting program be implemented for Duck Lake.

On March 3, 1986 the property owners association on Duck Lake presented the Board with a proposed 1986 program budget, which included both chemical control and weed harvesting.

On March 24, 1986 the Lake Board entered into a contract with the Association whereby the Association would oversee the 1986 program. A special assessment was adopted for the summer 1986 tax rolls for \$55,590.53 to implement the 1986 program.

The Association subsequently subcontracted the weed harvesting work to the Environmental Aquatic Harvesting Company, and the chemical application work to the Aquatic Nuisance Plant Control Company.

Forest Lake Improvement Board

Following receipt of a petition from lake residents, the Bloomfield Township Board at a meeting held January 13, 1986 established the Forest Lake Improvement Board. On January 15, 1986 the Board organized as follows: Fred Korzon, Bloomfield Township Supervisor, and Deloris V. Little, Bloomfield Township Clerk, were elected to serve as chairman and secretary, respectively. Other members included Nancy McConnell, representing the Oakland County Board of Commissioners; Susan Knowles, representing lake residents; Howard Wandell, representing the Michigan Department of Natural Resources; and David J. Snyder, representing the Oakland County Drain Commissioner. Randal L. Ford, P.E., Bloomfield Township Engineer, was appointed as project engineer.

On March 26, 1986 the Board approved a program consisting of two mechanical weed harvestings to be carried out in the summer of 1986. A budget of \$12,950 and a related special assessment roll were also approved. The 1986 weed harvesting program was successfully completed.

Indianwood Lake Improvement Board

Indianwood Lake is approximately 80 acres in size and is located primarily in Orion Township, with a small portion in Oxford Township. The members of the Lake Improvement Board during 1986 were Roy Rewold, Chairman and member of the Oakland County Board of Commissioners, Katherine E. Jacobs, Orion Township Clerk, representing Orion Township, Mary Heitjan, representing the lakefront owners on Indianwood Lake, Peg Bostwick representing the Michigan Department of Natural Resources, and Robert H. Fredericks, representing the Oakland County Drain Commissioner.

At a public hearing held on September 27, 1984, the Lake Improvement Board approved a new five-year project to continue the weed harvesting program on Indianwood Lake for the years 1985 through 1989. At a second public hearing held on November 29, 1984, the Lake Improvement Board confirmed a five-year special assessment roll to finance the cost of the lake improvement program through 1989.

On January 29, 1985 a contract for weed harvesting was awarded to KAM Aquatics, Ewart, Michigan. As part of the second year of the contract, two weed harvests were performed during 1986, one in late May and early June and one in late July and early August. A total of \$19,350 was paid to the contractor for weed harvesting work in 1986. A full report of expenditures by the Indianwood Lake Improvement Board is included in the Financial Report Section.

During the year the Lake Improvement Board received information concerning the Michigan Clean Water Incentives Program. The firm of Cleary Engineers, Inc. was retained to file a grant application to receive funds for a study of the watershed of Indianwood Lake.

The Lake Board will accept bids early next year to continue a weed harvesting program in 1987.

Island Lake Improvement Board

Island Lake is approximately 108 acres in size and is located in Bloomfield Township. The members of the Lake Improvement Board during 1986 were Fred Korzon, Chairman and Bloomfield Township Supervisor, Nancy McConnell, representing the Oakland County Board of Commissioners, Howard Wandell, representing the Michigan Department of Natural Resources, and David J. Snyder representing the Oakland County Drain Commissioner. On March 20, 1985 Marvin Katke was appointed to serve four years on the Board as the Island Lake property owners' representative.

During 1983 the Lake Improvement Board approved a five-year lake improvement project for Island Lake and a five-year special assessment roll to finance the project. Per a resolution dated May 13, 1986, the Lake Board approved the 1986 weed harvesting contract with the non-profit corporation which was formed by residents on Island Lake. The Lake Board also confirmed the 1986 assessment of \$29,500.23. The Treasurer of Bloomfield Township serves as the treasurer of the Lake Board and maintains a record of all receipts and expenditures by the Board.

The fourth year of the weed harvesting program on Island Lake was successful. No problems were encountered in 1986, and the program is expected to continue in the same manner in 1987.

Lake Charnwood Improvement Board

Lake Charnwood is a small, private inland lake approximately 10 acres in size, located in Section 6 of the City of Troy. On May 19, 1986 the City of Troy, by resolution of the City Council, established a lake improvement board for Lake Charnwood under the provisions of the Inland Lake Improvement Act of 1966.

The first meeting of the Lake Improvement Board for Lake Charnwood was held on June 19, 1986. The members of the Lake Improvement Board are Marilyn Gosling, Oakland County Commissioner, W. Robert Semple, Assistant City Manager, City of Troy, Dick Mikula, from the Michigan Department of Natural Resources, James Stewart, a resident on Lake Charnwood, and Robert H. Fredericks, from the office of the Oakland County Drain Commissioner. Mr. Fredericks was elected chairman and Mr. Semple was elected secretary of the Lake Improvement Board. C. Hugh Dohany, the Oakland County Treasurer, was designated as the treasurer of the Lake Improvement Board.

The Lake Charnwood Property Owners Association is an active homeowner's association consisting of residents in a single family subdivision adjoining Lake Charnwood which has for a considerable time been studying the feasibility of a project to dredge and deepen Lake Charnwood to remove gravel, soil, and silt which have been deposited over the last 25 years on the bottom of this man-made lake. The decision to petition for the creation of a lake improvement board was made by the Lake Charnwood Property Owners Association so that a mechanism would be available to finance a dredging project for Lake Charnwood.

After receiving proposals from various engineering firms, Progressive Engineering Consultants was selected on September 18, 1986 to prepare a feasibility study and report concerning the improvement of Lake Charnwood. The Lake Improvement Board will receive an engineering feasibility report in 1987, and will pursue the improvement alternatives identified in the report.

Lake Louise Improvement Board

Lake Louise is located in Sections 19, 20 and 30 of Brandon Township near the intersection of Highway M-15 and Glass Road. The water surface covers approximately 112 acres. The lake is bordered by residential and some small businesses on the westerly and northerly sides, and by largely undeveloped land on the easterly and southerly sides. The lake is formed by an outlet dam at the north end which discharges water into Kearsley Creek and then into the Flint River.

The members of the Board in 1986 were Robert Sargent, Chairman and Brandon Township representative; Gordon Jorvitz, Secretary and representative of lakefront property owners; Richard R.

Wilcox, representing the Oakland County Board of Commissioners; Howard Wandell, representing the Michigan Department of Natural Resources; and H. James Lueders, representing the Oakland County Drain Commissioner.

In 1985 a feasibility study recommended an integrated program of mechanical weed harvesting and chemical herbicide treatment. The Board determined that the recommended program was feasible and established a two-year project as recommended.

On March 14, 1986 the Board received bids for weed harvesting, and the successful bidder was the Environmental Aquatic Harvesting Company. The contract called for the weed harvesting to be paid for on an hourly basis with the total amount not to exceed \$14,000. A second contract in the amount of \$2,600 was entered into with Aquatic Services of Caro, Michigan for chemical treatment.

At a public hearing held September 11, 1986, the work of the two contractors was reviewed, and the residents of Lake Louise generally agreed that they would prefer to utilize herbicide treatment for weed control rather than weed harvesting in future years.

Lake Ona Improvement Board

Lake Ona is located in Sections 31 and 32 of White Lake Township, north of Cooley Lake Road and east of Ford Road. The lake has an approximate surface area of 27 acres.

Members of the Lake Ona Improvement Board in 1986 were: James Reid, Board Chairman and White Lake Township Supervisor; William J. McGrath, representing the lakefront property owners; Glen Yrjanainen, Board Secretary representing the Oakland County Drain Commissioner; Anne Hobart, Board member representing the Oakland County Board of Commissioners; and Richard Mikula, representing the Michigan Department of Natural Resources.

In 1984 a feasibility study identifying weed harvesting as a viable method of improving the quality of Lake Ona was received by the Board. Also in 1984 the Board authorized the purchase and operation of a weed harvester for Lake Ona, with the cost to be recovered by a five-year special assessment levied against the lakefront property owners.

The Board also approved in 1984 a five-year special assessment, to run from 1985 through 1989, in the amount of \$13,500 per year, to finance the purchase and operation of a weed harvester for Lake Ona.

Finally, the Lake Board entered into a five-year agreement with the Association in 1984 whereby for a fee of \$13,500 per year, the Association would harvest the weeds from Lake Ona using a weed harvester purchased by the Association specifically for that purpose. The year 1986 marked the end of the second successful year of the five-year weed harvesting program for Lake Ona.

Lakeville Lake Improvement Board

Lakeville Lake is approximately 460 acres in size and is located in Section 2 of Addison Township. The Oakland County Drain Commissioner also operates and maintains a lake level structure for Lakeville Lake under the provisions of the Inland Lake Level Act. The members of the Lake Improvement Board during 1986 were Richard R. Wilcox, Chairman and representative of the Oakland County Board of Commissioners, Robert Swift, representing lakefront property owners on Lakeville Lake, Ellen Delater, representing Addison Township, Barry Horney, representing the Michigan Department of Natural Resources, and Robert H. Fredericks, representing the Oakland County Drain Commissioner.

At a public hearing held on April 11, 1984, the Lake Improvement Board approved a new five-year project to continue the weed harvesting program on Lakeville Lake for the years 1985 through 1989. At a second public hearing held May 23, 1984, the Lake Improvement Board confirmed a five-year special assessment roll to finance the cost of the lake improvement program through 1989.

On May 30, 1985 the Lake Improvement Board entered into a contract with the Lake Restoration Association, Lakeville, Michigan, a non-profit corporation formed by the Lakeville Lake Property Owners Association to continue to perform the weed harvesting work on Lakeville Lake. Payments by the Lake Improvement Board to the contractor for weed harvesting in 1986 totaled \$27,720. A full report on receipts and expenditures by the Lake Improvement Board is included in the Financial Report Section.

The Lake Improvement Board plans to continue the same weed harvesting program on Lakeville Lake during 1987.

Lower Long Lake Improvement Board

Following receipt of a petition from lake residents, the Bloomfield Township Board at a meeting held November 25, 1985 established the Lower Long Lake Improvement Board. On January 15, 1986 the Board organized as follows: Fred Korzon, Bloomfield Township Supervisor, and Deloris V. Little, Bloomfield Township Clerk, were elected to serve as chairman and secretary, respectively. Other members were Nancy McConnell, representing the Oakland County Board of Commissioners; Dick Blieden, representing lake area residents; Howard Wandell, representing

the Michigan Department of Natural Resources; and David J. Snyder, representing the Oakland County Drain Commissioner. Randal L. Ford, P.E., Bloomfield Township Engineer, was appointed as project engineer.

On March 26, 1986 the Board approved a program consisting of two mechanical weed harvestings to be carried out in the summer of 1986. A budget of \$30,000 and a related special assessment roll were also approved. The 1986 weed harvesting program was successfully completed.

Meadow Lake Improvement Board

Following receipt of a petition from lake residents, the Bloomfield Township Board at a meeting held June 23, 1986 established the Meadow Lake Improvement Board. On August 26, 1986 the Board organized as follows: Fred Korzon, Bloomfield Township Supervisor, and Deloris V. Little, Bloomfield Township Clerk, were elected to serve as chairman and secretary, respectively. Other members were David C. Moffitt, representing the Oakland County Board of Commissioners; Maxine Lundin, representing lake area residents; Howard Wandell, representing the Michigan Department of Natural Resources; and David J. Snyder, representing the Oakland County Drain Commissioner. Progressive Engineering Consultants of Grand Rapids, Michigan was appointed project engineer.

At a December 3, 1986 meeting of the Meadow Lake Improvement Board, a weed harvesting program was determined practicable, and a public hearing relative to the project was scheduled for January 19, 1987.

Pontiac Lake Improvement Board

Pontiac Lake is located in Sections 11, 12, 13, and 14 of White Lake Township, and Section 18 of Waterford Township. Pontiac Lake is an artificial impoundment of approximately 615 acres and is bordered by state, county, commercial and residential properties. The Oakland County Drain Commissioner maintains and operates the dam for Pontiac Lake, which forms the lake and maintains its level.

The Pontiac Lake Improvement Board was created in October, 1977 under the provisions of the Inland Lake Improvement Act (Act 345 of the Public Acts of 1966). The organizational meeting of the Board was held on March 21, 1978. The members of the Lake Improvement Board during 1986 were James L. Reid, Chairman and representative of White Lake Township; H. James Lueders, Secretary, representing the Oakland County Drain Commissioner; Anne M. Hobart, representing the Oakland County Board of Commissioners; Jean A. Scott, representing Waterford Township; Richard Mikula, representing the Michigan Department of Natural Resources; and Joseph A. Grasela, representing the lakefront property owners.

A December, 1979 study and report by Johnson & Anderson, Inc., consulting engineers, and the extensive analysis and report prepared by the Michigan Department of Natural Resources published in October, 1981 recommended several lake improvement projects: winter lake level drawdown for lake bottom improvement and aquatic vegetation control; aeration of the deep pool in the lake; supplemental flow augmentation from deep well sources; and mechanical aquatic weed harvesting. The purpose of the extensive study and report by the Michigan Department of Natural Resources was to provide the basis for a grant application for Federal funds through the U.S. Environmental Protection Agency under the Federal Clean Lakes program. Subsequently, grant moneys were provided for an environmental monitoring program, to be conducted by the D.N.R., for construction of a deep well flow augmentation system and for the construction, operation and maintenance of an aeration system. The permanent installation of the deep well flow augmentation system was later cancelled after test well results identified an unsatisfactory water supply and a lack of cost effectiveness for the system.

In late 1981 and early 1982 the Pontiac Lake dam underwent a major reconstruction. In a cooperative effort, the Drain Commissioner's dam repair contractor, C.A. Hull, constructed an aeration system for the deep pool in the lake, complete with compressor building on the dam and the underwater air supply lines and diffusers. The ownership, maintenance and operation of the aeration system became the responsibility of the Lake Improvement Board.

During the latter part of 1982, the Lake Improvement Board determined to proceed with the mechanical aquatic weed harvesting program and approved the spread of a five-year special assessment against property owners in the annual amount of \$50,000 for weed harvesting, and \$5,000 for matching grant obligations and for the operation and maintenance of the aeration system. On January 24, 1983 the Board entered into a contract with the Pontiac Lake Weed Harvesting Company to perform the weed harvesting operations. The Pontiac Lake Weed Harvesting Company is a Michigan, non-profit corporation whose membership is open to all Pontiac Lake residents. Weed harvesting for the four seasons ending in 1986 have been completed with considerable success.

The Lake Improvement Board was advised early in 1984 that Federal Grant funds budgeted and not used for the construction of the deep well flow augmentation system could be used for other activities via a grant amendment offered by the U.S. Environmental Protection Agency to the D.N.R. for the benefit of the Lake Improvement Board. The Lake Improvement Board directed the D.N.R. to accept the grant amendment and entered into an amended contract with the D.N.R. on March 7, 1984. The amendment provided 50% matching grant funds for one year of mechanical weed harvesting, operation and maintenance costs of two additional

seasons of aeration, and additional environmental monitoring by the D.N.R. The period of the grant was extended from February 29, 1984 through December 31, 1985. Approximately \$30,000 was paid to the Lake Improvement Board during that period.

Late in the 1985 operating season of the aeration system, and again in the early part of the 1986 operating season, the Drain Commissioner's Maintenance staff experienced substantial difficulty keeping the aeration system in continuous operation. Inspection and analysis of the system indicated that major repairs and replacements of equipment would be required if the aeration system were to remain in effective operation. At about this same time, the staff of the D.N.R. who were monitoring the lake conditions under the terms of the Clean Lake Grant Program indicated that in their opinion the continued, routine operation of the aeration system was of questionable value. The evaluation report which the D.N.R. published in mid-year confirmed that opinion, and stated that the cost effectiveness of the system for Pontiac Lake was questionable. The Lake Improvement Board directed that the routine operation of the system be discontinued.

Early in 1985 the Pontiac Lake Homeowners' Association requested the Lake Improvement Board to pursue the establishment of a new summer legal lake level approximately six inches higher to improve conditions for summer recreation and for weed harvesting. The Board hired Cleary Engineers, Inc. to conduct a feasibility study. The completed study contained the recommendation that a summer level six inches higher was feasible, that it should be adopted, and that it could be implemented by the installation of a steel plate stop log on the crest of the existing dam. The Lake Improvement Board determined that the majority of lake residents favored the higher summer level, and requested the Drain Commissioner to take appropriate action.

Since a legal level had already been established for Pontiac Lake by order of the Circuit Court, and since that order provided for continuing jurisdiction in lake level matters and allowed for the departure from the normal level by order of the Court, the filing of a new complaint by the Oakland County Board of Commissioners for a new lake level was not necessary. The Court acted on a petition by the Board of Commissioners and established hearing dates in the matter to be held after all lakefront property owners were notified of the petition and hearing dates. Hearings were held on September 24, 1986, October 3, 1986, and October 31, 1986. Briefs were filed with the Circuit Court by interested counsels in November of 1986; however, by the end of 1986 the Court had not rendered a decision.

Much of Pontiac Lake is very shallow which makes harvesting of weeds by mechanical means practically impossible. As a result, noxious aquatic weeds choke the lake where harvesting is not provided. At the request of lakefront residents, the Lake Improvement Board commissioned Cleary Engineers, Inc. to undertake a feasibility study update directed to an integrated program of aquatic weed control. Cleary performed the study and reported with the recommendation that the Board adopt an integrated program composed of a three foot winter lake drawdown, application of chemical herbicides, continued mechanical harvesting, and a formal program of professional monitoring.

In January, 1986 the Board conducted a public hearing to determine the feasibility of the program recommended by Cleary Engineers, Inc. Upon completion of the hearing, the Board determined that an integrated program composed of a single, three foot winter lake drawdown for the winter of 1986, and a two-year application of chemical herbicides coordinated with the remaining two years of mechanical harvesting, and a formal program of professional monitoring, at an annual increase in cost to the existing harvesting program of \$70,000 was a feasible program. The Board also conducted a public hearing on the proposed assessment roll on April 30, 1986, and the roll was confirmed at that time. The two year assessments will be levied on June 15, 1986 and on March 15, 1987.

The 1986 summer weed control program proved to be very satisfactory. Chemicals were applied by Aquatic Technologies, Inc., the successful low bidder for the work. The Pontiac Lake Weed Harvesting Company removed more than 200 harvester loads of weeds. The winter lake drawdown was not successful. The Lake Improvement Board submitted an application, which had been prepared by Cleary Engineers, to the D.N.R. to obtain a permit to conduct a drawdown. The permit was denied.

In August, 1986 the Board received information that State Senator Richard Fessler sponsored a bill to include an appropriation in the State budget for the purchase of new weed harvesting equipment. It is anticipated that the amount will be \$150,000. The grant of funds will be made through the D.N.R. to White Lake Township for equipment which will be available to harvest weeds on lakes located in White Lake Township which have public access. Pontiac Lake residents are expected to receive much of the benefit from this equipment purchase.

Rainbow Lake Improvement Board

Rainbow Lake, an eight acre lake in Section 4 of Waterford Township, involves 21 residents who are affected by the project. A resolution dated September 21, 1981 by the Waterford Township Board established the Rainbow Lake Improvement Board. The Lake Improvement Board held its organizational meeting on November 24, 1982.

The members of the Lake Improvement Board for 1986 were Betty Fortino, Chairman, representing the Oakland County Board of Commissioners, Paul Deni, Secretary, representing Waterford Township; Albert F. Pauly, citizen member; Howard Wandell, representing the Michigan Department of Natural Resources, and David J. Snyder, representing the Oakland County Drain Commissioner.

Gerald A. Cleary, P.E., was retained to prepare an engineering feasibility report which included an economic study and cost estimate. The report was presented to the Rainbow Lake Improvement Board at a meeting held October 18, 1983 and subsequently to the residents at an evening Board meeting held November 1, 1983.

A lake cleanup program was satisfactorily accomplished in 1984 and 1985. In March of 1986 a dredging proposal was introduced. The project and related five-year special assessment roll were approved in June of 1986. Bids for the dredging were taken in December, 1986. The project was awarded to John M. Wudarcki, and the work is scheduled to be completed in the spring of 1987.

Scott Lake Improvement Board

Scott Lake is a kettle lake located in Section 14 of Waterford Township. It comprises 78 acres, and has a surface elevation of 949 feet above mean sea level. There are 50 or more residents fronting on Scott Lake.

In late 1984 two-thirds of the freeholders abutting Scott Lake petitioned Waterford Township to establish a lake improvement board. On February 27, 1985 the first meeting of the Scott Lake Improvement Board took place. Members in 1986 consisted of Betty Fortino, Chairperson and Oakland County Commissioner, Robert C. Sharrard, Waterford Township Trustee, Howard Wandell, Michigan Department of Natural Resources, Donald Borwick, Lakefront property owner, and David J. Snyder, Secretary and representative of the Oakland County Drain Commissioner.

At its meeting held April 18, 1985, Cleary Engineers, Inc. was hired to study the lake and prepare an engineering feasibility report, improvement recommendations, economic analysis, and cost estimates. The engineering work was completed over the summer of 1985 and was reported to the Lake Improvement Board at its meeting held October 15, 1985.

At the public hearing held December 5, 1985 a herbicide treatment of milfoil was recommended to be implemented in 1986. The Lake Board determined the project practicable, determined to proceed with the project, approved the cost estimate, and confirmed the related special assessment roll.

In April of 1986 a weed harvesting alternate was proposed due to problems with federal guidelines regarding labeling of herbicides and required sign-off procedures. Cuttings took place in late June and mid-August of 1986. The program was generally successful.

Tomahawk Lake Improvement Board

Tomahawk Lake is located in Section 9 of Highland Township, being north of Middle Road, south of Clyde Road, and west of Milford Road. The lake has an approximate surface area of 9.3 acres.

The following individuals served as Tomahawk Lake Improvement Board members in 1986: Thomas Dunleavy, Board Chairman and Highland Township Supervisor; Richard Skarritt, representing the Oakland County Board of Commissioners; Frank Wittbrodt, representing the lakefront property owners; Glen Yrjanainen, Board Secretary and representative of the Oakland County Drain Commissioner; and Richard Mikula, representing the Michigan Department of Natural Resources.

In the spring of 1984 two-thirds of the freeholders of land abutting Tomahawk Lake petitioned Highland Township for the establishment of a lake improvement board under Act 345 of the Public Acts of 1966. The first organizational meeting of the board was held on May 1, 1984.

At the June 25, 1984 board meeting, MPK Engineers, Inc. was authorized to proceed with the preparation of a feasibility study for Tomahawk Lake. The results of the feasibility study were presented at a meeting of the Tomahawk Lake Improvement Board held May 2, 1985. The study recommended that a long term solution to improve the quality and condition of the lake would be to dredge and deepen the lake, as opposed to short term solutions such as weed harvesting or the use of chemicals, etc.

A joint special assessment amount totaling \$6,850 for the Charlick, Woodruff and Tomahawk Lake Improvement Boards was approved on June 10, 1985 to provide funds to pay for the feasibility study.

The results of a questionnaire circulated to the lake owners during the summer of 1985 indicated that the residents wanted a chemical weed control program for their lake. At a meeting held January 14, 1986 the Lake Board authorized a chemical weed control program for Tomahawk Lake for the year 1986, and approved a special assessment in the amount of \$1,600 for the summer, 1986 tax rolls to implement the program.

The engineering services of JCK & Associates, Inc. were employed to secure bids from interested chemical applicators. At the May 22, 1986 meeting the Lake Board awarded a contract to Aqua-Weed Control of Oakland County, Inc., who proceeded to apply the chemicals to the satisfaction of all.

The lake owners presented the Lake Board with a proposed 1987 chemical weed control program budget at the meeting held August 11, 1986. At the September 22, 1986 meeting the Lake Board approved a special assessment in the amount of \$2,000 for the December, 1986 tax rolls to implement the proposed 1987 chemical weed control program.

Upper Long Lake Improvement Board

Upper Long Lake is approximately 123 acres in size and is located in Section 7 of Bloomfield Township and Section 12 of West Bloomfield Township. The members of the Lake Improvement Board during 1986 were Fred Korzon, Bloomfield Township Supervisor, John N. Doherty, West Bloomfield Township Supervisor, Howard Wandell, representing the Michigan Department of Natural Resources, Nancy McConnell, Oakland County Commissioner, and David J. Snyder, representing the Oakland County Drain Commissioner. On March 20, 1985 Arthur B. Pearson was appointed to serve four years on the Board as the lakefront property owners representative.

At a public hearing held on March 26, 1986 the Lake Improvement Board approved a weed control project on Upper Long Lake for 1986. A one year special assessment roll in the amount of \$36,400 was also approved. The Treasurer of Bloomfield Township serves as the treasurer for the Lake Improvement Board and maintains a record of all receipts and expenditures of the Board.

The 1986 program was successfully implemented through the lake owners' association.

Van Norman Lake Improvement Board

Van Norman Lake is located in Sections 32 and 33 of Independence Township and Sections 4 and 5 of Waterford Township near the intersection of Dixie Highway and Andersonville Road. The water surface covers approximately 72 acres and the lake is bordered by mostly residential property. The Oakland County Drain Commissioner operates a lake level structure for Van Norman Lake as a part of the Waterford Multi-Lakes system under the provisions of the Inland Lake Level Act.

The Independence Township Board of Trustees created the Improvement Board for Van Norman Lake on December 8, 1983 in response to petitions signed by two-thirds of the freeholders of Van Norman Lake property. The organizational meeting of the Board took place February 13, 1984. The members of the Lake Improvement Board during 1986 were Richard D. Kuhn, Jr., Chairman and representative of the Oakland County Board of Commissioners,

Richard A. Holman, Secretary, representing Independence Township, Paul Deni representing Waterford Township, Howard Wandell, representing the Michigan Department of Natural Resources, H. James Lueders representing the Oakland County Drain Commissioner, and Charles Harding, representing lakefront property owners.

The principal activity undertaken by the Board during 1986 was the performance of the first-year program of weed harvesting and the limited application of herbicides for weed control. The Board engaged the services of Cleary Engineers, Inc. to prepare the necessary bid documents, and to provide contract administration including inspection during the performance of the work.

Bids for mechanical harvesting and chemical application were received in March, and after review and recommendations by Cleary Engineers, Inc., the Board awarded the mechanical harvesting contract in the amount of \$12,950 to Environmental Aquatic Harvesting Co. of Pontiac, Michigan, and the chemical application contract in the amount of \$3,815 to Aquatic Technologies, Inc. of East Lansing, Michigan. The common opinion of the lake area residents was that the program was successful.

Walters Lake Improvement Board

Walters Lake is located in Sections 12, 13, and 14 of Independence Township near the intersection of Clarkston and Eston Roads. The water surface covers nearly 83 acres and the lake is bounded almost entirely by residential property.

The Independence Township Board of Trustees created the Improvement Board for Walters Lake on October 4, 1983 in response to petitions signed by two-thirds of the freeholders of Walters Lake property. Formal organization of the Board took place on October 26, 1983. The members of the Lake Improvement Board for 1986 were Richard D. Kuhn, Jr., Chairman and representative of the Oakland County Board of Commissioners; Richard A. Holman, Secretary representing Independence Township; Howard Wandell representing the Michigan Department of Natural Resources, H. James Lueders representing the Oakland County Drain Commissioner; and Tom Gregory, representing lakefront property owners.

In early 1984 the Board engaged the services of Cleary Engineers, Inc. to conduct a feasibility study and prepare a report including recommended projects for the improvement of Walters Lake. The report also was to include estimates of cost and methods of cost assessment. Mr. Gerald A. Cleary gave a presentation of the feasibility study at a public hearing in late November, 1984. A great deal of discussion followed the presentation, and at the conclusion of the public hearing the Board decided to delay a decision of project feasibility until additional facts and cost figures were developed.

The Board held a public meeting in June of 1985 to continue the discussion of project feasibility. A large number of lake area residents attended the meeting to hear the latest facts and cost figures. Lengthy discussion expressing strong sentiments both for and against project feasibility, cost estimates, and cost assessment followed. At the conclusion of discussion the Board moved to further postpone a decision of project feasibility until the Board receives more resident input, and until an acceptable method of cost assessment can be developed. No further meetings have been scheduled.

Watkins Lake Weed Control Board

Watkins Lake is located in Waterford Township and has a surface area of 225 acres. Having no natural inlet, Watkins Lake is normally supplemented by storm water runoff and ground water.

The Waterford Township Board adopted a resolution on April 20, 1970 to implement P.A. 345 of 1966 as amended to create the first lake improvement board in Oakland County, the Watkins Lake Weed Control Board. The Board members for 1986 were Betty Fortino, Chairman and representative from the Oakland County Board of Commissioners, Robert C. Sharrard, Board Secretary and Waterford Township representative; Howard Wandell, representative from the Michigan Department of Natural Resources, George W. Kuhn, Oakland County Drain Commissioner, and Betty O'Shea, representing the lakefront property owners.

After the formation of the Watkins Lake Weed Control Board, an engineering study was made by Johnson & Anderson, Inc. and completed on December 1, 1972. Engineering recommendations basically indicated two feasible methods of weed control - chemically treating 100 acres of Watkins Lake and harvesting the remainder. For the first five years of its weed harvesting program the Watkins Lake Weed Control Board contracted with the Oakland County Drain Commissioner's Office for weed harvesting services, however, over the past several years the weed harvesting contract has been awarded to the Watkins Lakefront Owners Association, Inc.

On May 14, 1986 the Board approved a budget of \$26,500 for 1986, and confirmed a special assessment roll in the amount of \$25,000 to be placed on the December 31, 1986 tax rolls. Late in the year of 1986 the Lake Board engaged in a special study to review the special assessment formula for 1987. The Watkins Lake Weed Control Board experienced another successful summer with the weed harvesting program in 1986.

White Lake Improvement Board

White Lake covers an area of approximately 540 acres and is located in Sections 12 and 13 of Highland Township and Sections 7 and 18 of White Lake Township.

The organizational meeting of the Lake Improvement Board for White Lake was held on May 12, 1986. The following individuals served as White Lake Improvement Board members for 1986: Thomas Dunleavy, Board Chairman and Highland Township Supervisor; Anne Hobart, representing the Oakland County Board of Commissioners; Jack Portman, Board Secretary and representative of the Oakland County Drain Commissioner; Robert Pisoni, representing the lakefront owners on White Lake; and Howard Wandell, representing the Michigan Department of Natural Resources. The Oakland County Treasurer was designated to act as treasurer for the Board.

At the May 12, 1986 meeting, the Board Secretary was authorized to solicit proposals for an engineering feasibility report to identify problems of White Lake and present recommendations for lake improvement. On June 9, 1986 the Board received proposals for the engineering feasibility report and accepted the low bid of Cleary Engineers, Inc., subject to the review and approval of the Oakland County Drain Commissioner. Following review, the Engineering Services Agreement was executed on July 3, 1986.

The feasibility report, entitled the White Lake Engineering Report, was presented to the White Lake Improvement Board on September 24, 1986 by Gerald A. Cleary. The report recommended chemical treatment, dredging, and weed harvesting as various solutions to improve the quality and condition of White Lake. The report was received to allow time for all members to review the recommendations.

At a meeting held November 10, 1986 the revised White Lake Engineering Report was presented and formally accepted by the White Lake Improvement Board, subject to the inclusion of requested additional information. The Board moved to schedule a public meeting to be held in early 1987, at which time the White Lake Engineering Report will be formally presented to the community.

Wolverine Lake Improvement Board

Wolverine Lake is approximately 240 acres in size and is located in the Village of Wolverine Lake in Commerce Township. The members of the Lake Improvement Board during 1986 were Timothy R. Kozub, Chairman, Dr. G. William Caddell, representing the Oakland County Board of Commissioners, Al Massey, representing the Michigan Department of Natural Resources, and William E. Klockow, representing the Oakland County Drain Commissioner.

A drawdown of Wolverine Lake occurred in the fall of 1981 and spring of 1982 to allow stump removal, improvement to waterfront properties by residents, and weed control. On August 14, 1986, the Village of Wolverine Lake again applied for a permit to drawdown Wolverine Lake five feet over the 1986-87 winter. A public hearing was held on September 29, 1986 to review the application and to hear any objections to the drawdown.

The Department of Natural Resources determined that the drawdown would cause significant adverse impact on the natural resources of Wolverine Lake, and on October 16, 1986 the Village of Wolverine Lake was notified that a permit for the drawdown would not be issued. The Village of Wolverine Lake appealed the decision of the D.N.R., and a final hearing in the matter is expected sometime in 1987.

Woodruff Lake Improvement Board

Woodruff Lake is located in Section 9 of Highland Township, being north of Middle Road, south of Clyde Road, and west of Milford Road. The lake has an approximate surface area of 37.8 acres.

The following individuals served as Woodruff Lake Improvement Board members in 1986: Thomas Dunleavy, Board Chairman and Highland Township Supervisor; Richard Skarritt, representing the Oakland County Board of Commissioners; Patrick McKeough, representing the lakefront property owners; Glen Yrjanainen, Board Secretary, representing the Oakland County Drain Commissioner; and Richard Mikula, representing the Michigan Department of Natural Resources.

In the spring of 1984 two-thirds of the freeholders of land abutting Woodruff Lake petitioned Highland Township for the establishment of a lake improvement board under Act 345 of the Public Acts of 1966. The first organizational meeting of the Board was held on June 25, 1984.

At the July 9, 1984 board meeting, MPK Engineers, Inc. was authorized to proceed with the preparation of a feasibility study for Woodruff Lake. The results of the feasibility study were presented at a meeting of the Woodruff Lake Improvement Board held May 2, 1985. The study recommended that a long term solution to improve the quality and condition of the lake would be to dredge and deepen the lake, as opposed to short term solutions such as weed harvesting or the use of chemicals, etc.

A joint special assessment amount totaling \$6,850 for the Charlick, Woodruff and Tomahawk Lake Improvement Boards was approved on June 10, 1985 to provide funds to pay for the feasibility study.

The results of a questionnaire circulated to the lake owners during the summer of 1985 indicated that the residents wanted a chemical weed control program for their lake. At a meeting held September 5, 1985 the Lake Board authorized a chemical weed control program for Woodruff Lake for the year 1986, and approved a special assessment in the amount of \$4,700 for the December, 1985 tax roll to implement the program.

At the April 7, 1986 meeting the Lake Board entered into a contract with the Association whereby the Association would oversee the chemical weed control program. The Association then sub-contracted the work to the Rose Exterminator Company who proceeded to apply the chemicals to the satisfaction of all.

The Association presented the Lake Board with their proposed budget for a three-year chemical weed control program at a meeting held September 11, 1986. At the September 29, 1986 meeting the Lake Board approved a special assessment in the amount of \$5,000 per year for the December, 1986 tax roll to implement the three-year chemical weed control program proposed by the Association.

DRAINS UNDER DEVELOPMENT

DRAINS UNDER DEVELOPMENT

Dorothy Webb Drain

At the February 3, 1986 meeting of the Township Board of the Charter Township of West Bloomfield, a petition was adopted for construction of drainage facilities in the Maple Road-Farmington Road area. The first meeting of the Drainage Board for the proposed project was held February 12, 1986, and the drain was formally designated the "Dorothy Webb Drain."

The project was declared practical and necessary at the March 25, 1986 meeting of the Drainage Board, and following execution of the Final Order of Determination, the Drainage Board employed Giffels-Webster Engineers, Inc. to prepare the necessary plans and specifications for the project.

Preliminary construction drawings were received in the summer of 1986. Final construction plans are expected to be completed by early spring of 1987, with easement acquisition to begin immediately thereafter. Construction bids are expected to be received in the summer of 1987, and construction of the project will begin at that time. The estimated construction cost for the Dorothy Webb Drain is \$200,000.

Fredericks Drains

On March 24, 1986 the Troy City Council adopted a petition for drainage improvements and extensions to the Page and Lanni Drains in Sections 9, 10, 15 and 16. The petition was received by this office on March 31, 1986, and the first meeting of the Drainage Board was held on April 8, 1986. The project was named the Fredericks Drain, and Donald L. Mills, P.E., was selected as the project engineer for the Drain Office.

At a meeting held May 22, 1986 the project was declared practical and necessary for the public health, the Final Order of Determination was adopted, and Hubbell, Roth & Clark, Inc. was employed as consulting engineer.

Phase I of the project originates at the westerly terminus of the Page Drain and runs westerly along the southerly limits of the City's D.P.W. yard to the existing Houghten Drain. Included in Phase I is approximately 2,000 lineal feet of 78" diameter pipe, and the construction of a retention basin. Preliminary construction plans have been completed by Hubbell, Roth & Clark, Inc. Right-of-way acquisition is currently underway with actual construction scheduled to begin in the summer of 1987. The estimated construction cost for Phase I is \$558,667.50.

Phase II of the project originates at the Lanni Drain at Rochester and Long Lake Roads, and runs westerly along Long Lake Road to I-75. Phase II consists of approximately 6,600 lineal feet of 54" to 90" diameter pipe along with improvements to

existing retention basins. Preliminary plans should be available by spring of 1987, with easement preparation to begin shortly thereafter. The estimated construction cost for Phase II is \$1,316,350.

The Fredericks Drain is being financed with surplus construction funds from completed drain projects under the provisions of Act No. 165 of the Public Acts of 1984.

Independence M-15 Drain

A petition pursuant to the provisions of Section 327 of the Drain Code was received from the Michigan Department of State Highways and Transportation on January 30, 1976 for certain drainage improvements in the area of M-15 north of Dixie Highway in Sections 28 and 29 of Independence Township.

Following a public hearing on March 2, 1976, the project was determined practical and necessary for the construction and maintenance of a State highway, and it was determined that the application for the location, establishment, and construction of the proposed drain should be granted.

The engineering firm of Spalding, DeDecker & Associates, Inc. was retained, and engineering plans were prepared. An Order for Laying Out and Designating a Drainage District was prepared and executed by the Drain Commissioner on June 28, 1978.

Due to the lack of local funds and controversy over the nature of the proposed roadway configuration, the project was delayed for several years. In 1984 Spalding, DeDecker & Associates, Inc. was reimbursed for engineering costs incurred to date.

The project was reactivated in early 1985. On April 2, 1985 the Independence Township Board authorized an appropriation of \$160,000 to finance the Township's share of the drain improvements. Petitions were received from the Township of Independence and the Michigan Department of Transportation wherein construction of the Independence M-15 Drain was proposed.

Following a public hearing held September 18, 1985, the Board of Determination, consisting of Lillian Moffitt, Michael Warren, and Ronald Selke, issued the Order of Necessity. In August of 1986 Kieft Engineering, Inc. was retained to update the plans. The project is presently in the right-of-way acquisition stage.

Ireland Drain

A petition for the establishment of an intra-county drain to be located entirely within the City of Rochester Hills was filed by the City with the Oakland County Drain Commissioner on November 6, 1986. The project is being constructed to provide the needed drainage for a future special assessment paving project in the area.

The first meeting of the Drainage Board was held on November 18, 1986, and the project was formally named the Ireland Drain. At that same meeting, the Drainage Board tentatively determined that the project was practical and necessary for the public health. A public hearing on necessity was scheduled for January 6, 1987, at which time, if no objections are received, the Drainage Board will adopt a Final Order of Determination, and will select the consulting engineer for the project.

Johnson Drain

The City of Auburn Hills filed a petition with the Drain Commissioner on July 21, 1986 which requested the construction of a storm drain to serve portions of Sections 23, 26 and 35 in the western portion of the City.

A public hearing was held on October 7, 1986 and no objections to the project were received. The Johnson Drain was declared practicable and necessary for the public health, and the Final Order of Determination was authorized and executed.

The engineering firm of Orchard, Hiltz & McCliment, Inc. was appointed to design the drain, and Philip Sanzica, P.E. of the Drain Commissioner's staff was appointed to serve as project engineer.

The consulting engineer is presently preparing the plans and specifications for the project. The estimated construction cost of the Johnson Drain is \$1,320,000.

Karas Drain

A petition for the establishment of an intra-county drain to be located entirely within the City of Rochester Hills was filed by the City with the Oakland County Drain Commissioner on November 6, 1986.

The first meeting of the Drainage Board was held on November 18, 1986, and the project was formally named the Karas Drain. At that same meeting, the Drainage Board tentatively determined that the project was practical and necessary for the public health. A public hearing on necessity was scheduled for January 6, 1987, at which time, if no objections are received, the Drainage Board will adopt a Final Order of Determination, and will select the consulting engineer for the project.

Moore Drain

A petition for the establishment of an intra-county drain to be located entirely within the Charter Township of Avon was filed by Avon Township with the Oakland County Drain Commissioner on January 19, 1984

The first meeting of the Drainage Board was held on February 8, 1984, and the project was formally named the Moore Drain. At that same meeting, the Drainage Board tentatively determined that the project was practical and necessary for the public health. A public hearing on necessity was held on March 21, 1984, and upon receiving no objections to the project, the Final Order of Determination was adopted. On that same date, the Chairman of the Drainage Board was authorized to enter into an agreement with an engineering firm to be designated by the Charter Township of Avon for the preparation of plans, specifications, and an estimate of cost for the Moore Drain.

No further progress occurred on the proposed Moore Drain during 1985 and 1986; however, it is anticipated that activity on the project will resume in early 1987.

Nelson Drain - Phase II

A petition for certain drain improvements along the existing Gibson and Renshaw Drains in the northeastern part of the City of Troy was filed with the Drain Commissioner on May 7, 1984. At the first Drainage Board meeting held May 23, 1984, the project was named the Nelson Drain, and the public hearing on necessity was scheduled for July 11, 1984. No objections were received at the hearing, and as a result, the project was determined practical and necessary for the public health, and the Final Order of Determination was adopted.

Donald L. Mills, P.E., was designated the Drain Office project engineer for the Nelson Drain, and Hubbell, Roth & Clark, Inc. was employed as consulting engineer.

Phase I of the Nelson Drain, consisting of a 25 acre retention basin on the east side of Rochester Road between Long Lake and Square Lake Roads, was completed in 1986.

Phase II of the project consists of channel improvements and widening from Dequindre Road westerly, and also immediately north and south of Long Lake Road. Construction plans have been completed by Hubbell, Roth & Clark, Inc., and the necessary permits have been obtained. The start of actual construction has been delayed by condemnation proceedings to obtain certain outstanding easements. It is anticipated that construction will begin in the summer of 1987.

The Nelson Drain is being financed with surplus construction funds from completed drain projects under the provisions of Act No. 165 of the Public Acts of 1984.

Van Tassel Drain

A petition for the establishment of an intra-county drain to be located entirely within the Township of Orion was filed by Orion Township with the Oakland County Drain Commissioner on December 3, 1986. The proposed project will be located in the North 1/2 of Section 23 of Orion Township.

The first meeting of the Drainage Board was held on December 9, 1986, and the project was formally named the Van Tassel Drain. At that same meeting, the Drainage Board tentatively determined that the project was practical and necessary for the public health. A public hearing on necessity was scheduled for January 20, 1987, at which time, if no objections are received, the Drainage Board will adopt a Final Order of Determination, and will select a consulting engineer for the project.

SEWER AND WATER PROJECTS UNDER DEVELOPMENT

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Auburn Hills Water and Sewer Projects

The City of Auburn Hills adopted resolutions on December 15, 1986 requesting the Drain Commissioner as County Agency for Oakland County to finance and construct sanitary sewer and water supply systems to serve the northeasterly portion of the City in the general vicinity of the Lapeer Road (M-24) and Interstate 75 interchange. The sanitary sewer system will be a direct extension of the Galloway Arm of the Clinton-Oakland Interceptor which presently terminates at the north line of the City of Pontiac near Giddings Road. The water supply system will draw water from the City of Detroit supply from a connection to be made at Giddings and Lake Angelus Roads.

The service districts for both the water and sewer systems include commercial, industrial, and residential zoning. An immediate need for both of these utilities already exists in this rapid growth area of the City. One of the several major facilities presently under construction within the service district is a new, multi-million dollar sports arena located on Lapeer Road at the I-75 entrance/exit ramp.

The cost of the two projects entitled "Auburn Hills Extension No. 2" (sewer), and "Auburn Hills Water Supply System Extension No. 3," will be financed by the sale of Oakland County combined water and sewer bonds for which the City of Auburn Hills will pledge its full faith and credit for repayment. Preliminary cost figures prepared by the consulting firm of Orchard, Hiltz & McCliment, Inc. indicate a combined project cost of \$3,130,000.

Appropriate resolutions are being prepared for action by the Oakland County Board of Commissioners to approve the contract with the City of Auburn Hills, and to authorize the issue and sale of County bonds. Both actions should be concluded in early 1987.

Evergreen-Farmington Pollution Control Facilities

Two independent sanitary sewer interceptor systems known as the "Farmington" and the "Evergreen" were planned and designed in the mid 50's, and constructed in the late 50's and early 60's. The districts they serve are located in the south-central portion of Oakland County, from the City of Pontiac, south to Eight Mile Road. They have a common north-south boundary along the extended alignment of Inkster Road, the Evergreen to the east and the Farmington to the west.

Discharges from these two interceptors flow by a common connection to a City of Detroit Interceptor located at Eight Mile and Southfield Roads, and thence to the Detroit Sewage Treatment Plant. The Detroit Interceptor sewer carries both storm water

and sanitary sewage, commonly called combined sewage. The Evergreen Interceptor also carries some combined sewage which was designed to spill only periodically into the Rouge River at control structures along its route during times of intense rainfall and limitations of downstream capacity.

Substantial growth has taken place in south Oakland County since the two interceptor systems were completed in the early 60's. The density and character of the growth in both districts have substantially exceeded that which was or could have been anticipated during the design phases. Consequently, physical capacities began to show severe strain and only periodic spills to the Rouge River became frequent spills. Growth and development in the districts continue today although the pace is much slower, but each increase adds to that strain.

Many new public regulations dealing with pollution of the waters of the state have been enacted within the decade of the 70's. As a result, stream water quality standards have been upgraded to a degree that requires much stricter control of pollutant discharges from all sources.

Much developed area within these districts is still served by onsite disposal through septic tanks and tile fields which for a variety of reasons do not function in their modern environment. Collector sewers must be constructed in such areas. New regulations also call for much stricter control over the discharge of combined sewer overflows. Such controls result in an increased demand for capacity to transport and treat sewage. Several sewage collector systems in the district constructed in earlier years contribute excessive non-sanitary flows of ground water or surface water origin. Such flows have increased the intensity of the problem.

On-going studies for project development address many major considerations. Three of these have a considerable impact. Cost to construct the necessary facilities continues to escalate rapidly. Available capacities within the districts' interceptors continue to dwindle. The cost of transportation and treatment of storm and other non-sanitary water inflows continues to increase. Accordingly, it is becoming increasingly cost-effective to reduce or eliminate non-sanitary flows.

Early in 1976, sixteen communities located in the districts requested Oakland County to apply for a Facilities Planning Grant (Step 1) and provided the local share as an advance to finance studies. The Board of Commissioners approved that request and assigned the work to the Drain Commissioner's office, as County Agency under Act 342, Public Acts of 1939, as amended. A subsequent Step 1 grant application was filed and approved by the D.N.R. and E.P.A.

Hubbell, Roth and Clark, Inc. was selected as the consulting engineer to perform the study. Frank Naglich, P.E. of the Sewer, Water and Solid Waste Division continues to act as the project engineer for the Drain Commissioner.

The Facilities Plan was completed in October, 1982. The findings indicated that the program needs approach 38 million dollars for interceptors, 44 million dollars for combined sewer overflow controls, and 8 million dollars for sewer systems rehabilitation. Funding advances from local communities are providing for the preparation of construction plans for portions of the system. Construction plans have been completed, and a federal grant application has been submitted for the first segment of the project which will consist of \$24 million of sanitary relief sewers.

Detroit Facilities Planning is also in progress. The plan includes additional outlet capacity for the Evergreen-Farmington district in conjunction with the North Huron Valley-Rouge Valley project. Construction plans for this outlet, known as the First-Hamilton Relief Sewer, have been completed.

Eight of the sixteen communities within the districts have initiated facilities planning for local needs. These efforts are expected to provide master plans for collector sewers within both developed and undeveloped areas. Construction for these needs could reach a level in excess of 50 million dollars.

North Huron Valley - Rouge Valley Wastewater Control System

The North Huron Valley-Rouge Valley Wastewater Control system is a sanitary interceptor project designed to serve the existing and future needs of eleven communities in Wayne County and three in Oakland County. The three Oakland County communities are the City of Wixom, which will abandon rather than improve its existing wastewater treatment plant; Commerce Township, which currently has no sanitary sewers; and the City of Novi, which is badly in need of additional capacity. All wastewater generated by the communities will be treated by the City of Detroit Wastewater Treatment Plant.

The project is to be financed in part with Federal funds under the EPA Wastewater Construction Grants Act. The County of Wayne has been the grant applicant for the studies portion of the project. Construction of the project will include new facilities in Oakland and Wayne Counties, and in the City of Detroit. Each of these entities will be responsible for its own construction and construction plan preparation. The Board of Commissioners assigned the work to the Drain Commissioner, as County Agency under Act 342, Public Acts of 1939, as amended. Frank Naglich, P.E. of the Sewer, Water & Solid Waste Division continues to act as the project engineer for the Drain Commissioner. Ten major project components are being combined into three construction grant segments. Segment 1 is to be constructed from grant funds available after October 1, 1985; Segment 2 is to be constructed

from funds available after October 1, 1986; and Segment 3 is to be constructed from funds available after October 1, 1987. A description of individual project components and total costs are as follows:

SEGMENT 1 (FY 1986 FUNDS)

1. Component 1 - Master Control Interceptor - \$8.74 million

All work is in Wayne County.

2. Component 10 - Inkster Arm Storage - \$6.00 million

All work is in Wayne County

3. Component 9 - Detroit Improvements - \$19.80 million

9A Evergreen - Farmington Permanent Connection

The interceptor commences with a connection to the existing First Hamilton Interceptor at Seven Mile and San Juan, thence north in San Juan, thence west in Outer Drive, thence west in Vassar Drive, thence northwest in James Couzens, thence west in St. Martins, thence north in Oakfield and terminating at a connection to the existing interceptor in Eight Mile Road.

9B Diversion Structure

The diversion structure, located at Fourth and Myrtle, will inter-connect the existing First Hamilton Interceptor to the existing North Interceptor East Arm.

9C Control Gate Modification

A control gate on the Detroit River Interceptor will be modified to complete the Evergreen-Farmington flow shifting.

SEGMENT 2 (FY 1987 FUNDS)

1. Component 4 - Middle Rouge Interceptor from Inkster to Farmington - \$9.17 million.

2. Component 2 - Middle Rouge Interceptor from Master Control to Telegraph - \$6.97 million

3. Component 3 - Middle Rouge Interceptor from Telegraph to Inkster - \$7.35 million

All work is in Wayne County.

SEGMENT 3 (FY 1988 FUNDS)

1. Component 5 - Middle Rouge Interceptor from Farmington to Haggerty - 18.12 million

2. Component 8 - Warren Arm Interceptor - \$12.75 million
3. Component 7 - North Arm - Wayne County - \$3.00 million

7A North Arm Connection

7B Haggerty Arm

All work on these three components is in Wayne County

4. Component 6 - North Arm - Oakland County - \$18.45 million

6A Wixom Arm

The interceptor commences at the existing Wixom Wastewater Treatment Plant, thence east along Charms Road to Wixom Road, thence south to Potter Road, thence east to Benstein Road, interconnecting to the terminus of the Commerce Arm, thence due south along Benstein Road extended to the Chesapeake and Ohio Railroad, thence southeasterly along the Chesapeake and Ohio Railroad and terminating at a connection to the existing Novi Interceptor at the I-96 Expressway.

6B Commerce Arm

The interceptor main branch commences at the intersection of Commerce Road at Creedmore Road extended, thence south in Creedmore Road to Bluebird Drive, thence southerly along Bluebird Drive and the easterly shore of Commerce Lake to Watuga Road, thence southerly to Oakley Park Road, thence westerly adjacent to Oakley Park Road to Benstein Road, thence south in Benstein Road and terminating at a connection to the Wixom Arm at the intersection of Benstein Road and Potter Road extended, including a branch from the Walled Lake Central High School along Oakley Park Road westerly to a connection to the main branch. Currently the Township of Commerce is doing additional facilities planning to confirm the need and cost effectiveness of the Commerce Arm.

Recently the communities of Canton, Plymouth, and Northville Townships have indicated a desire to remove themselves from the proposed project and look to the Ypsilanti Community Wastewater Treatment Plant for service. Wayne County is studying the options that remain for the other communities. Upon completion of these two efforts, the original project concept will either be shown to be the most cost-effective and most easily implemented, or the project will be split into two projects.

Orion Township Extension No. 4

On September 17, 1985 the Drain Commissioner's Office received a request from the Township of Orion to construct a sanitary sewer along Lapeer Road (M-24) from a point south of Scripps Road northerly to Clarkston Road. This sewer would serve a district easterly and westerly of Lapeer Road, and would provide service

to existing and future industrial and commercial enterprise in this vicinity. The Township Board requested that this project be constructed utilizing surplus funds currently on deposit with the County.

An agreement between Orion Township and the County of Oakland was approved by the Orion Township Board on October 7, 1985. The Oakland County Board of Commissioners approved the agreement on October 24, 1985, assigned the project development and construction to the Drain Commissioner as County Agency, and transferred \$1,039,000 in surplus funds from prior years sewer construction projects to finance the work. Donald Mills, P.E., was selected as the project engineer for Orion Township Extension No. 4.

The consulting firm of Orchard, Hiltz & McCliment, Inc. was contracted to design the system and prepare construction plans and specifications. The system will be composed of approximately 8,400 lineal feet of 12" and 10" diameter sanitary sewer and appurtenances.

Construction plans have been completed by Orchard, Hiltz & McCliment, Inc., and the necessary easements and permits have been obtained. Construction bids are scheduled to be received in February, 1987, with actual construction to begin in the spring. Completion of the Orion Township Extension No. 4 project is scheduled for the fall of 1987.

The second stage of this project consists of the installation of a pump station, force main, and appurtenances to service the area easterly and westerly of M-24 and north of Scripps Road. Funding for this facility is available; however, final design and actual construction has been temporarily delayed due to lack of existing or proposed development in the area.

West Bloomfield Water Supply System - Section VIII

West Bloomfield Township has requested Oakland County to proceed with the development of a project to complete the construction of the water transmission mains along Haggerty Road (20" diameter) and Maple Road (16" diameter) at the northwest corner of Section 31.

An agreement between West Bloomfield Township and the County of Oakland was approved by the Township Board on August 19, 1985. The Oakland County Board of Commissioners approved the agreement on September 26, 1985, assigned the project development and construction to the Drain Commissioner as County Agency, and transferred \$362,000 in surplus funds from prior years water construction projects to finance the project work.

The project is composed of approximately 4,000 lineal feet of 16" and 20" diameter water transmission mains. The firm of Hubbell, Roth & Clark, Inc. was retained to design the system and prepare construction plans and specifications. Donald L. Mills, P.E., was selected as the Drain Office project engineer.

Construction plans have been completed by Hubbell, Roth & Clark, Inc., and the necessary easements and permits have been obtained.

The advertisement for receipt of bids and the start of actual construction has been delayed while negotiations take place between West Bloomfield Township and the City of Detroit to permit the eventual construction of a 400,000 gallon elevated water storage tank in the northwest portion of the Township. Final sizing of the Haggerty Road main is in question until a decision is made on construction of the storage tank.

Current projections are that construction will be underway by the summer of 1987, with completion scheduled for late 1987.

West Bloomfield Water Supply System - Section IX

West Bloomfield Township has requested Oakland County to proceed with the development of a project to complete the construction of the water transmission main along Pontiac Trail westerly from Mirror Lake to Green Lake Road, and southerly along Halstead Road to Walnut Lake Road in Sections 20 and 21 of the Township.

An agreement between West Bloomfield Township and the County of Oakland was approved by the Township Board on October 27, 1986. The Oakland County Board of Commissioners approved the agreement on December 11, 1986, and assigned the project development and construction to the Drain Commissioner as County Agency. The Township is paying the entire cost of the project, currently estimated to be \$1,409,000, by advancing cash installments to the County as the project develops.

The project is composed of approximately 16,000 lineal feet of 20" diameter transmission main and appurtenances.

The firm of Hubbell, Roth & Clark, Inc. was retained to design the system and prepare construction plans and specifications. Donald L. Mills, P.E., was selected as the Drain Office project engineer.

Preliminary construction plans have been completed by Hubbell, Roth & Clark, Inc. Acquisition of rights-of-way should begin in the spring of 1987, with actual construction to be underway by year end.

FINANCIAL STATEMENTS

Summary financial statements for the Southeastern Oakland County Sewage Disposal System and for major projects discussed in the Annual Report are included here. Complete financial statements for each drainage district and itemized statements of all of the various accounts maintained by the Oakland County Drain Commissioner in connection with the construction, operation, and maintenance of all of the projects under the jurisdiction of the Oakland County Drain Commissioner are available for inspection on request. The County Clerk also has on file a complete set of financial statements for all projects.

Reference should be made to the Table of Contents of the Financial Statements Volume for reference to any specific project or fund account not included in these summary statements.

OAKLAND COUNTY DRAIN COMMISSIONER
SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM
COMBINED BALANCE SHEET, DECEMBER 31, 1986

ASSETS	87700 OPERATION & MAINTENANCE SEWAGE DISPOSAL	87710 OPERATION & MAINTENANCE POLLUTION CONTROL	TOTAL
Current Assets:			
Cash - Operating	\$ 59,200.34	\$ 146,509.75	\$ 205,710.09
- Investments	2,412,835.33	1,550,000.00	3,962,835.33
Due from Municipalities	1,493,613.47	1,318,556.09	2,812,169.56
Due from Other Funds	16,299.29	9,995.45	26,294.74
Accrued Interest Receivable	3,242.08	2,122.49	5,364.57
Prepaid Expenses	<u>11,086.80</u>	<u>5,401.44</u>	<u>16,488.24</u>
Total Current Assets	<u>3,996,277.31</u>	<u>3,032,585.22</u>	<u>7,028,862.53</u>
Property and Equipment at Cost:			
Facility	8,599,939.81	21,193,543.09	29,793,482.90
Buildings	83,558.46	2,701,974.43	2,785,532.89
Equipment	109,478.09	181,182.23	290,660.32
Land	<u>1,533.25</u>	<u>611,995.93</u>	<u>613,529.18</u>
	8,794,509.61	24,688,695.68	33,483,205.29
Less: Allowance for Depreciation	<u>5,091,487.61</u>	<u>8,097,122.84</u>	<u>13,188,610.45</u>
Property and Equipment - Net	<u>3,703,022.00</u>	<u>16,591,572.84</u>	<u>20,294,594.84</u>
TOTAL ASSETS	<u>\$ 7,699,299.31</u>	<u>\$ 19,624,158.06</u>	<u>\$ 27,323,457.37</u>
LIABILITIES AND FUND EQUITY			
Current Liabilities:			
Accounts Payable - Detroit	\$ 1,961,150.89	\$ 1,382,808.51	\$ 3,343,959.40
Due to Municipalities	465,478.50	539,388.50	1,004,867.00
Due to Other Funds	12,603.81	17,562.77	30,166.58
Undistributed Funds	44,765.29		44,765.29
Vouchers Payable	8,408.08	13,320.05	21,728.13
Accrued Payroll	<u>4,407.48</u>	<u>5,166.63</u>	<u>9,574.11</u>
Total Current Liabilities	<u>2,496,814.05</u>	<u>1,958,246.46</u>	<u>4,455,060.51</u>
Fund Equity:			
Contributed Capital	<u>3,703,022.00</u>	<u>16,591,572.84</u>	<u>20,294,594.84</u>
Retained Earnings			
Reserved For:			
Operations and Maintenance	900,000.00	700,000.00	1,600,000.00
Replacement	<u>150,000.00</u>		<u>150,000.00</u>
	1,050,000.00	<u>700,000.00</u>	<u>1,750,000.00</u>
Undesignated Retained Earnings	<u>449,463.26</u>	<u>374,338.76</u>	<u>823,802.02</u>
Total Retained Earnings	<u>1,499,463.26</u>	<u>1,074,338.76</u>	<u>2,573,802.02</u>
Total Fund Equity	<u>5,202,485.26</u>	<u>17,665,911.60</u>	<u>22,868,396.86</u>
TOTAL LIABILITIES AND FUND EQUITY	<u>\$ 7,699,299.31</u>	<u>\$ 19,624,158.06</u>	<u>\$ 27,323,457.37</u>

OAKLAND COUNTY DRAIN COMMISSIONER
 SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM
 COMBINED STATEMENT OF REVENUES, EXPENSES
 AND CHANGES IN RETAINED EARNINGS
 FOR THE YEAR ENDED DECEMBER 31, 1986

	87700 SEWAGE DISPOSAL	87710 POLLUTION CONTROL	TOTAL
Revenue from Service Sales	\$ 8,971,397.89	\$ 6,100,000.02	\$15,071,397.91
Less: Treatment Costs	<u>8,766,861.20</u>	<u>5,616,579.90</u>	<u>14,383,441.10</u>
Gross Gain on Sales	204,536.69	483,420.12	687,956.81
Less: Operating Expenses	<u>579,322.23</u>	<u>522,776.98</u>	<u>1,102,099.21</u>
Gain or (Loss) on Operations	(374,785.54)	(39,356.86)	(414,142.40)
Add Other Revenues:			
Reimbursement - Salary and Accounting Service	50,069.30	19,946.56	70,015.86
Income on Investments	139,875.07	91,472.34	231,347.41
Miscellaneous	16,662.92	156.05	16,818.97
Adjustment of Prior Years Revenue	<u>(43,496.18)</u>	<u>23,652.56</u>	<u>(19,843.62)</u>
Total Other Revenues	<u>163,111.11</u>	<u>135,227.51</u>	<u>298,338.62</u>
Net Gain or (Loss) Before Depreciation on Assets	(211,674.43)	95,870.65	(115,803.78)
Depreciation on Assets Acquired from Contributed Capital	<u>271,507.80</u>	<u>610,979.04</u>	<u>828,486.84</u>
Net Gain or (Loss) After Depreciation	(429,182.23)	(515,108.39)	(944,290.62)
Transfer of Depreciation on Assets Acquired from Contributed Capital	<u>225,726.00</u>	<u>620,525.28</u>	<u>846,251.28</u>
Net Gain or (Loss)	(203,456.23)	105,416.89	(98,039.34)
Retained Earnings at January 1, 1986	<u>1,702,919.49</u>	<u>968,921.87</u>	<u>2,671,841.36</u>
Retained Earnings at December 31, 1986	<u>\$ 1,499,463.26</u>	<u>\$ 1,074,338.76</u>	<u>\$ 2,573,802.02</u>

**OAKLAND COUNTY
 REFERENCE LIBRARY**

OAKLAND COUNTY DRAIN COMMISSIONER
SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM
COMBINED SCHEDULE OF OPERATING EXPENSES
FOR THE YEAR ENDED DECEMBER 31, 1986

	87700 SEWAGE DISPOSAL	87710 POLLUTION CONTROL	TOTAL
Salaries	\$ 157,241.36	\$ 152,529.65	\$ 309,771.01
Fringe Benefits	52,684.50	43,753.57	96,438.07
Contractual Services:			
Accounting Services	41,838.46	41,838.47	83,676.93
Administrative Overhead	294.22	63,372.72	63,666.94
Auditing Services	3,950.00	3,950.00	7,900.00
Building Maintenance Charges	7,503.30	5,458.91	12,962.21
Capacity Charges		540.00	540.00
Depreciation - Operating Equipment	8,218.20	9,546.24	17,764.44
Engineering and Survey	601.24	1,230.02	1,831.26
Equipment Repair - Operations	375.18	10,428.10	10,803.28
Equipment Repair - Motor Vehicles	239.46	2,514.34	2,753.80
Equipment Rental	234.12	882.85	1,116.97
Equipment Repairs and Maintenance	2,664.34	13,725.49	16,389.83
Garbage and Rubbish Disposal		158.40	158.40
Gas - Natural	4,164.09	8,945.22	13,109.31
Gas, Oil and Grease	878.69	3,306.45	4,185.14
Insurance - Liability and Property	5,582.79	6,619.35	12,202.14
Insurance - Vehicles	1,240.62	2,832.97	4,073.59
Investment Fees	307.23	183.58	490.81
Lands and Grounds Maintenance	365.07	416.77	781.84
Laundry and Cleaning	813.45	2,622.97	3,436.42
Legal Expenses	63,034.95	13,628.55	76,663.50
Light and Power	6,520.12	29,374.62	35,894.74
Maintenance Contracts	4,845.00	4,728.83	9,573.83
Membership, Dues and Publications	140.20	99.50	239.70
Protective Clothing	158.97	1,101.72	1,260.69
Sewer Maintenance	201,635.67		201,635.67
Travel and Conference	609.60	529.35	1,138.95
Trip Tickets	152.51	568.61	721.12
Water and Sewer Utilities	1,273.51	19,234.69	20,508.20
Total Contractual Services	\$ 357,640.99	\$ 247,838.72	\$ 605,479.71

Continued -

OAKLAND COUNTY DRAIN COMMISSIONER
SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM
COMBINED SCHEDULE OF OPERATING EXPENSES
FOR THE YEAR ENDED DECEMBER 31, 1986

	87700 SEWAGE DISPOSAL	87710 POLLUTION CONTROL	TOTAL
Commodities:			
Chlorination Supplies	\$	\$ 65,196.60	\$ 65,196.60
Laboratory Supplies	2,165.54		2,165.54
Office Supplies	690.50	1,904.85	2,595.35
Postage	69.28	34.87	104.15
Shop Supplies		2,255.53	2,255.53
Total Commodities	<u>2,925.32</u>	<u>69,391.85</u>	<u>72,317.17</u>
Internal Services:			
Stores - Housekeeping	58.81	508.77	567.58
Radio Communications	1,375.56	1,920.36	3,295.92
Equipment Rental - Office	156.36	156.24	312.60
Stores - Stock		8.86	8.86
Telephone Communications	1,152.48	1,290.31	2,442.79
Drain Equipment	6,086.85	5,378.65	11,465.50
Total Internal Services	<u>8,830.06</u>	<u>9,263.19</u>	<u>18,093.25</u>
TOTAL OPERATING EXPENSES	<u>\$ 579,322.23</u>	<u>\$ 522,776.98</u>	<u>\$ 1,102,099.21</u>

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
BALANCE SHEET
CADELL DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
81600

ASSETS

CASH	\$	120,905.27
INVESTMENTS		1,198,500.00
ASSESSMENTS RECEIVABLE		580,000.00
ACCRUED INTEREST RECEIVABLE		3,978.79
FIXED ASSETS		3,653,510.10

TOTAL ASSETS	\$	5,556,894.16
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	15,189.17
DEFERRED INCOME		435,000.00

TOTAL LIABILITIES		450,189.17

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		3,653,510.10
UNDESIGNATED		70,952.15
DESIGNATED		1,382,242.74

		5,106,704.99

TOTAL LIABILITIES & FUND BALANCE	\$	5,556,894.16
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 CHAPTER 20 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 CADDELL DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
 FUND NO
 81600

REVENUES

INCOME FROM INVESTMENTS	\$	146,595.04
PROPERTY TAX LEVY		565,000.00

TOTAL REVENUES		711,595.04

EXPENDITURES

SALARIES - REGULAR		65,165.28
PER DIEM		750.00
FRINGE BENEFITS		22,978.42
INVESTMENT FEES		1,472.25
LEGAL EXPENSE		8,582.82
APPRAISAL FEES		2,580.00
CONTRACTED SERVICES		2,095,757.26
COPIER MACHINE RENTAL		356.80
DESIGN FEES		16,406.08
EQUIPMENT RENTAL		283.73
INSPECTION		340.50
LAYOUT AND STAKING		27,694.82
OTHER ENGINEERING SERVICES		80,157.18
PUBLISHING LEGAL NOTICES		139.79
PURCHASE OF LAND & EASEMENT		59,471.00
RECORDING FEES		725.35
TRANSPORTATION		9,351.00
ENGINEERING SUPPLIES		750.98
FILM & PROCESSING		33.24
MATERIAL & SUPPLIES		193.66
OFFICE SUPPLIES		72.61

TOTAL EXPENDITURES		2,393,262.77

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (1,681,667.73) -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES		\$ (1,681,667.73) =====
--	--	-----------------------------

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
BALANCE SHEET
HOLLAND DRAIN

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
81618

ASSETS

CASH	\$	9,178.21
INVESTMENTS		1,474,000.00
ACCRUED INTEREST RECEIVABLE		2,164.09
FIXED ASSETS		135,686.82

TOTAL ASSETS	\$	1,621,029.12
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	10,415.05

TOTAL LIABILITIES		10,415.05

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		135,686.82
UNDESIGNATED		405,373.25
DESIGNATED		1,069,554.00

		1,610,614.07

TOTAL LIABILITIES & FUND BALANCE	\$	1,621,029.12
		=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
STATEMENT OF REVENUE & EXPENDITURES
HOLLAND DRAIN

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
21618

REVENUES

DEPOSITS - ENG PLANS & SPECS	\$	675.00
INCOME FROM INVESTMENTS		96,386.50
REIMBURSEMENTS-GENERAL		3,110.00

TOTAL REVENUES		100,171.50

EXPENDITURES

SALARIES - REGULAR		66,004.01
PER DIEM		275.00
FRINGE BENEFITS		22,447.81
INVESTMENT FEES		699.96
COPIER MACHINE RENTAL		505.85
EQUIPMENT RENTAL		543.85
LAYOUT AND STAKING		2,470.00
LICENSES AND PERMITS		1,650.00
MISCELLANEOUS		1.00
PUBLISHING LEGAL NOTICES		673.13
PURCHASE OF LAND & EASEMENT		20,022.37
RECORDING FEES		580.15
SOIL TEST BORINGS		1,734.92
TRANSPORTATION		3,240.02
ENGINEERING SUPPLIES		755.13
MAINTENANCE SUPPLIES		27.83
MATERIAL & SUPPLIES		18.49
OFFICE SUPPLIES		469.23

TOTAL EXPENDITURES		122,118.75

EXCESS (DEFICIENCY) OF REVENUES		
OVER EXPENDITURES	(	21,947.25)

EXCESS (DEFICIENCY) OF REVENUES		
AND OTHER SOURCES OVER	\$ (	21,947.25)
EXPENDITURES AND OTHER USES		-----

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
BALANCE SHEET
JACKSON DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
81599

ASSETS

CASH	\$	5,386.57
INVESTMENTS		537,000.00
ACCRUED INTEREST RECEIVABLE		738.38
FIXED ASSETS		1,782,007.96

TOTAL ASSETS	\$	2,325,132.91
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	1,728.04

TOTAL LIABILITIES		1,728.04

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		1,782,007.96
UNDESIGNATED		541,396.91

TOTAL FUND BALANCE		2,323,404.87

TOTAL LIABILITIES & FUND BALANCE	\$	2,325,132.91
		=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
STATEMENT OF REVENUE & EXPENDITURES
JACKSON DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
81599

REVENUES

INCOME FROM INVESTMENTS	\$	47,805.79
REIMBURSEMENTS-GENERAL		11,400.88

TOTAL REVENUES		59,206.67

EXPENDITURES

SALARIES - REGULAR	32,182.09
PER DIEM	400.00
FRINGE BENEFITS	11,333.09
INVESTMENT FEES	504.47
CONTRACTED SERVICES	805,385.22
COPIER MACHINE RENTAL	229.80
DESIGN FEES	5,948.85
EQUIPMENT RENTAL	163.75
OTHER ENGINEERING SERVICES	9,743.64
SOIL TEST BORINGS	462.90
TRANSPORTATION	5,651.30
ENGINEERING SUPPLIES	27.31
MATERIAL & SUPPLIES	0.64

TOTAL EXPENDITURES	872,039.66

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (812,832.99) -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$(812,832.99) =====
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OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 CHAPTER 20 CONSTRUCTION FUNDS
 BALANCE SHEET
 MAINLAND DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
 FUND NO
 81544

ASSETS

CASH	\$	2,123.90
INVESTMENTS		18,000.00
ACCRUED INTEREST RECEIVABLE		34.13
FIXED ASSETS		267,609.54

TOTAL ASSETS	\$	287,767.57
		=====

LIABILITIES

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		267,609.54
UNDESIGNATED		20,158.03

TOTAL FUND BALANCE		287,767.57

TOTAL LIABILITIES & FUND BALANCE	\$	287,767.57
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 CHAPTER 20 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 MAINLAND DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
 FUND NO
 81544

REVENUES

INCOME FROM INVESTMENTS	\$	3,672.47

TOTAL REVENUES		3,672.47

EXPENDITURES

SALARIES - REGULAR	306.99
PER DIEM	200.00
FRINGE BENEFITS	110.52
INVESTMENT FEES	31.98
CONTRACTED SERVICES	143,098.50
EQUIPMENT RENTAL	6.00
LICENSES AND PERMITS	250.00
MISCELLANEOUS	200.00
RECORDING FEES	11.00
TRANSPORTATION	29.60

TOTAL EXPENDITURES	144,244.59

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (140,572.12) -----
--	--	---------------------------------

OTHER FINANCING SOURCES(USES)

OPERATING TRANSFERS OUT	(	5,598.83)

TOTAL OTHER FINANCING SOURCES(USES)	(	5,598.83)

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$ (146,170.95) =====
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OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
BALANCE SHEET
NELSON DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
81605

ASSETS

CASH	\$	852.20
INVESTMENTS		51,000.00
ACCRUED INTEREST RECEIVABLE		197.98
FIXED ASSETS		1,756,553.59

TOTAL ASSETS	\$	1,808,603.77
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	8,965.23

TOTAL LIABILITIES		8,965.23

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		1,756,553.59
UNDESIGNATED		526.06
DESIGNATED		42,558.89

		1,799,638.54

TOTAL LIABILITIES & FUND BALANCE	\$	1,808,603.77
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 CHAPTER 20 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 NELSON DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
 FUND NO
 81605

REVENUES

INCOME FROM INVESTMENTS	\$	39,182.03
REIMBURSEMENTS-GENERAL		281.00

TOTAL REVENUES		39,463.03

EXPENDITURES

SALARIES - REGULAR		48,990.36
PER DIEM		550.00
FRINGE BENEFITS		17,623.08
INVESTMENT FEES		488.85
LEGAL EXPENSE		16,207.35
APPRAISAL FEES		12,035.00
CONTRACTED SERVICES		814,931.35
COPIER MACHINE RENTAL		371.80
EQUIPMENT RENTAL		40.50
LAYOUT AND STAKING		18,182.60
OTHER ENGINEERING SERVICES		20,428.66
PROPERTY TAXES		251.15
PURCHASE OF LAND & EASEMENT		275,379.06
RECORDING FEES		256.30
TRANSPORTATION		6,110.95
ENGINEERING SUPPLIES		27.52
FILM & PROCESSING		14.66
OFFICE SUPPLIES		65.16

TOTAL EXPENDITURES		1,231,954.85

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		(1,192,491.82)

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES		\$(1,192,491.82)
		=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
BALANCE SHEET
SKARRITT DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
81611

ASSETS

CASH	\$	613.71
INVESTMENTS		29,600.00
ACCRUED INTEREST RECEIVABLE		99.29
FIXED ASSETS		196,759.37

TOTAL ASSETS	\$	227,072.37
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	662.46

TOTAL LIABILITIES		662.46

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		196,759.37
UNDESIGNATED		18,904.25
DESIGNATED		10,746.29

		226,409.91

TOTAL LIABILITIES & FUND BALANCE	\$	227,072.37
		=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
CHAPTER 20 CONSTRUCTION FUNDS
STATEMENT OF REVENUE & EXPENDITURES
SKARRITT DRAINAGE DISTRICT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
81611

REVENUES

INCOME FROM INVESTMENTS	\$	3,258.93

TOTAL REVENUES		3,258.93

EXPENDITURES

SALARIES - REGULAR		12,546.85
PER DIEM		300.00
FRINGE BENEFITS		3,215.83
INVESTMENT FEES		30.32
CONTRACTED SERVICES		108,376.17
COPIER MACHINE RENTAL		64.80
EQUIPMENT RENTAL		2,990.00
LAYOUT AND STAKING		2,559.00
MISCELLANEOUS		16.92
PURCHASE OF LAND & EASEMENT		200.00
TRANSPORTATION		623.25
OFFICE SUPPLIES		19.88

TOTAL EXPENDITURES		130,943.02

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		-----
	(	127,684.09)

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES		-----
	\$ (	127,684.09)
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 ACT 342 CONSTRUCTION FUNDS
 BALANCE SHEET
 EVERGREEN SDS-BINGHAM F.EXT#3

DECEMBER 31, 1986

CONSTRUCTION
 FUND NO
 87387

ASSETS

CASH	\$	181.76
FIXED ASSETS		21,318.24

TOTAL ASSETS	\$	21,500.00
		=====

FUND-BALANCE

INVESTMENT IN FIXED ASSETS	\$	21,318.24
UNDESIGNATED		181.76

TOTAL FUND BALANCE		21,500.00

TOTAL LIABILITIES & FUND BALANCE	\$	21,500.00
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 EVERGREEN SDS-BINGHAM F.EXT#3

DECEMBER 31, 1936

CONSTRUCTION
 FUND NO
 37387

EXPENDITURES

SALARIES - REGULAR	2,706.71
FRINGE BENEFITS	974.43
CONTRACTED SERVICES	12,359.00
DESIGN FEES	1,321.50
LICENSES AND PERMITS	60.00
PURCHASE OF LAND & EASEMENT	61.25
DRAIN EQUIPMENT	61.80

TOTAL EXPENDITURES	17,544.69

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	-----
	(17,544.69)

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	-----
	\$(17,544.69)
	=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
ACT 342 CONSTRUCTION FUNDS
BALANCE SHEET
LAPEER-BROWN RD WATER MAIN EXT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
87386

ASSETS

CASH	\$	854.60
INVESTMENTS		148,000.00
ACCRUED INTEREST RECEIVABLE		293.95
FIXED ASSETS		891,390.69

TOTAL ASSETS	\$	1,040,539.24
		=====

LIABILITIES

VOUCHERS PAYABLE		547.17

TOTAL LIABILITIES		547.17

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		891,390.69
UNDESIGNATED		145,193.38
DESIGNATED		3,408.00

		1,039,992.07

TOTAL LIABILITIES & FUND BALANCE	\$	1,040,539.24
		=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
ACT 342 CONSTRUCTION FUNDS
STATEMENT OF REVENUE & EXPENDITURES
LAPEER-BROWN RD WATER MAIN EXT

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
87386

REVENUES

INCOME FROM INVESTMENTS	\$	15,343.01
REFUND-PRIOR YEARS EXPENDITURE		113.22

TOTAL REVENUES		15,456.23

EXPENDITURES

SALARIES - REGULAR	21,242.46
FRINGE BENEFITS	7,647.29
CONTRACTED SERVICES	441,442.00
DESIGN FEES	5,189.27
LAYOUT AND STAKING	10,933.97
LICENSES AND PERMITS	3,838.14
TRANSPORTATION	85.50
MATERIAL & SUPPLIES	17.76
OFFICE SUPPLIES	54.00
DRAIN EQUIPMENT	2,822.00

TOTAL EXPENDITURES	493,272.39

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (477,816.16) -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$(477,816.16) =====
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OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
ACT 342 CONSTRUCTION FUNDS
BALANCE SHEET
MILFORD S.D.S. EXT. #2

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
87388

ASSETS

CASH		\$ (	92,218.03)
INVESTMENTS			2,900,000.00
DUE FROM FEDERAL GOVERNMENT			3,647,534.00
ACCRUED INTEREST RECEIVABLE			10,190.28
FIXED ASSETS			998,556.28

TOTAL ASSETS		\$	7,464,062.53
			=====

LIABILITIES

DUE TO OTHER FUNDS		\$	6,069.66
VOUCHERS PAYABLE			216,704.01
DEFERRED INCOME			3,647,534.00

TOTAL LIABILITIES			3,870,307.67

FUND-BALANCE

INVESTMENT IN FIXED ASSETS			998,556.28
UNDESIGNATED		(	2,778,481.81)
DESIGNATED			5,373,680.39

			3,593,754.86

TOTAL LIABILITIES & FUND BALANCE		\$	7,464,062.53
			=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
ACT 342 CONSTRUCTION FUNDS
STATEMENT OF REVENUE & EXPENDITURES
MILFORD S.D.S. EXT. #2

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
87388

REVENUES

INCOME FROM INVESTMENTS	\$	43,754.86
SALE OF BONDS		3,550,000.00

TOTAL REVENUES		3,593,754.86

EXPENDITURES

SALARIES - REGULAR	33,315.46
FRINGE BENEFITS	11,165.58
BOND ATTORNEY FEES	16,579.07
BOND PRINTING EXPENSE	8,287.00
LEGAL EXPENSE	16.25
APPRAISAL FEES	4,200.00
CONTRACTED SERVICES	704,915.61
COPIER MACHINE RENTAL	28.50
DESIGN FEES	177,208.00
FINANCIAL CONSULTANT FEES	19,175.99
LICENSES AND PERMITS	3,902.00
PUBLISHING LEGAL NOTICES	3,215.10
PURCHASE OF LAND & EASEMENT	14,153.00
RECORDING FEES	235.60
R/W NEGOTIATION AND EXPENSE	24.92
TRANSPORTATION	561.00
OFFICE SUPPLIES	54.00
DRAIN EQUIPMENT	1,519.20

TOTAL EXPENDITURES	998,556.28

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	----- 2,595,198.58 -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$ 2,595,198.58 =====
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OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 ACT 185 CONSTRUCTION FUNDS
 BALANCE SHEET
 CLIN OAK SDS ORION TWP EXT #3

DECEMBER 31, 1986

CONSTRUCTION
 FUND NO
 83621

ASSETS

CASH	\$	24,534.95
INVESTMENTS		225,000.00
ACCRUED INTEREST RECEIVABLE		446.88
FIXED ASSETS		1,245,001.03

TOTAL ASSETS	\$	1,494,982.86
		=====

LIABILITIES

VOUCHERS PAYABLE		460.79

TOTAL LIABILITIES		460.79

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		1,245,001.03
UNDESIGNATED		201,804.64
DESIGNATED		47,716.40

		1,494,522.07

TOTAL LIABILITIES & FUND BALANCE	\$	1,494,982.86
		=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
ACT 185 CONSTRUCTION FUNDS
STATEMENT OF REVENUE & EXPENDITURES
CLIN OAK SDS ORION TWP EXT #3

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
83621

REVENUES

INCOME FROM INVESTMENTS	\$	13,676.65
REFUND-PRIOR YEARS EXPENDITURE		212.28

TOTAL REVENUES		18,888.93

EXPENDITURES

SALARIES - REGULAR	14,799.23
FRINGE BENEFITS	5,183.72
INVESTMENT FEES	41.01
CONTRACTED SERVICES	216,106.10
DESIGN FEES	2,443.14
INSPECTION	1,387.82
LAYOUT AND STAKING	5,364.84
LICENSES AND PERMITS	4,461.94
RECORDING FEES	16.00
SOIL TEST BORINGS	116.25
DRAIN EQUIPMENT	3,128.20

TOTAL EXPENDITURES	253,048.25

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (234,159.32) -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$ (234,159.32) =====
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OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
ACT 135 CONSTRUCTION FUNDS
BALANCE SHEET
COSDS ORION TWP EXT #4

DECEMBER 31, 1986

CONSTRUCTION
FUND NO
83964

ASSETS

CASH	\$C	1,274.29)
INVESTMENTS		1,065,000.00
ACCRUED INTEREST RECEIVABLE		2,721.67
FIXED ASSETS		44,604.83

TOTAL ASSETS	\$	1,111,052.21
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	3,554.88
VOUCHERS PAYABLE		315.55

TOTAL LIABILITIES		3,870.43

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		44,604.83
UNDESIGNATED		1,062,576.95

TOTAL FUND BALANCE		1,107,181.78

TOTAL LIABILITIES & FUND BALANCE	\$	1,111,052.21
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 ACT 185 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 COSDS ORION TWP EXT #4

DECEMBER 31, 1986

CONSTRUCTION
 FUND NO
 83964

REVENUES

INCOME FROM INVESTMENTS	\$	62,348.45

TOTAL REVENUES		62,348.45

EXPENDITURES

SALARIES - REGULAR		22,073.19
FRINGE BENEFITS		7,946.36
INVESTMENT FEES		125.25
COPIER MACHINE RENTAL		240.56
LICENSES AND PERMITS		1,260.00
PURCHASE OF LAND & EASEMENT		8,644.46
RECORDING FEES		377.90
R/W NEGOTIATION AND EXPENSE		83.60
SOIL TEST BORINGS		1,164.00
TRANSPORTATION		1,361.25
OFFICE SUPPLIES		54.00
DRAIN EQUIPMENT		801.80

TOTAL EXPENDITURES		44,132.37

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		18,216.08

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$	18,216.08
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 DAM REPLACEMENT FUNDS
 BALANCE SHEET
 INDIANWOOD LAKE DAM

DECEMBER 31, 1986

DAM
 IMPROVEMENT
 FUND NO
 80902

ASSETS

CASH	\$	80,457.18
ASSESSMENTS RECEIVABLE		121,001.37

TOTAL ASSETS	\$	201,458.55
		=====

LIABILITIES

ADVANCES AND LOANS PAYABLE	\$	100,000.00
DUE TO OTHER FUNDS		4,296.40
VOUCHERS PAYABLE		34,276.75
DEFERRED INCOME		103,715.46

TOTAL LIABILITIES		242,288.61

FUND-BALANCE

UNDESIGNATED	(	103,778.06)
DESIGNATED		62,948.00

	(	40,830.06)

TOTAL LIABILITIES & FUND BALANCE	\$	201,458.55
		=====

OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 DAM REPLACEMENT FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 INDIANWOOD LAKE DAM

DECEMBER 31, 1986

DAM
 IMPROVEMENT
 FUND NO
 80902

REVENUES

DEPOSITS - ENG PLANS & SPECS	\$	135.00
PROPERTY TAX LEVY		17,285.91

TOTAL REVENUES		17,420.91

EXPENDITURES

SALARIES - REGULAR		13,856.44
FRINGE BENEFITS		4,988.32
CONTRACTED SERVICES		34,593.00
FILING FEES		67.10
PUBLISHING LEGAL NOTICES		950.60
PURCHASE OF LAND & EASEMENT		1,002.00
TRANSPORTATION		3.75
ENGINEERING SUPPLIES		88.00
FILM & PROCESSING		14.33
POSTAGE		17.28
PRINT SHOP		66.75
DRAIN EQUIPMENT		2,603.40

TOTAL EXPENDITURES		58,250.97

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (40,830.06) -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$ (40,830.06) =====
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OAKLAND COUNTY
 SPECIAL ASSESSMENT FUNDS
 DAM REPLACEMENT FUNDS
 BALANCE SHEET
 PRICE DAM

DECEMBER 31, 1986

DAM
 IMPROVEMENT
 FUND NO
 80904

ASSETS

CASH	\$	404,992.12
ASSESSMENTS RECEIVABLE		377,153.11

TOTAL ASSETS	\$	782,145.23
		=====

LIABILITIES

ADVANCES AND LOANS PAYABLE	\$	400,000.00
DUE TO OTHER FUNDS		537.32
VOUCHERS PAYABLE		9,500.00
DEFERRED INCOME		342,865.98

TOTAL LIABILITIES		752,903.30

FUND-BALANCE

UNDESIGNATED		29,241.93

TOTAL FUND BALANCE		29,241.93

TOTAL LIABILITIES & FUND BALANCE	\$	782,145.23
		=====

OAKLAND COUNTY
SPECIAL ASSESSMENT FUNDS
DAM REPLACEMENT FUNDS
STATEMENT OF REVENUE & EXPENDITURES
PRICE DAM

DECEMBER 31, 1986

DAM
IMPROVEMENT
FUND NO
80904

REVENUES

PROPERTY TAX LEVY	\$	34,287.13

TOTAL REVENUES		34,287.13

EXPENDITURES

SALARIES - REGULAR	4,896.98
FRINGE BENEFITS	1,762.93
CONTRACTED SERVICES	16,423.20
ENGINEERING AND SURVEY	1,600.00
PUBLISHING LEGAL NOTICES	2,433.26
ENGINEERING SUPPLIES	51.43
POSTAGE	153.00
PRINT SHOP	45.00
DRAIN EQUIPMENT	536.60

TOTAL EXPENDITURES	27,902.40

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	6,384.73

OTHER FINANCING SOURCES(USES)

OPERATING TRANSFERS IN	22,857.20

TOTAL OTHER FINANCING SOURCES(USES)	22,857.20

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$	29,241.93
		=====