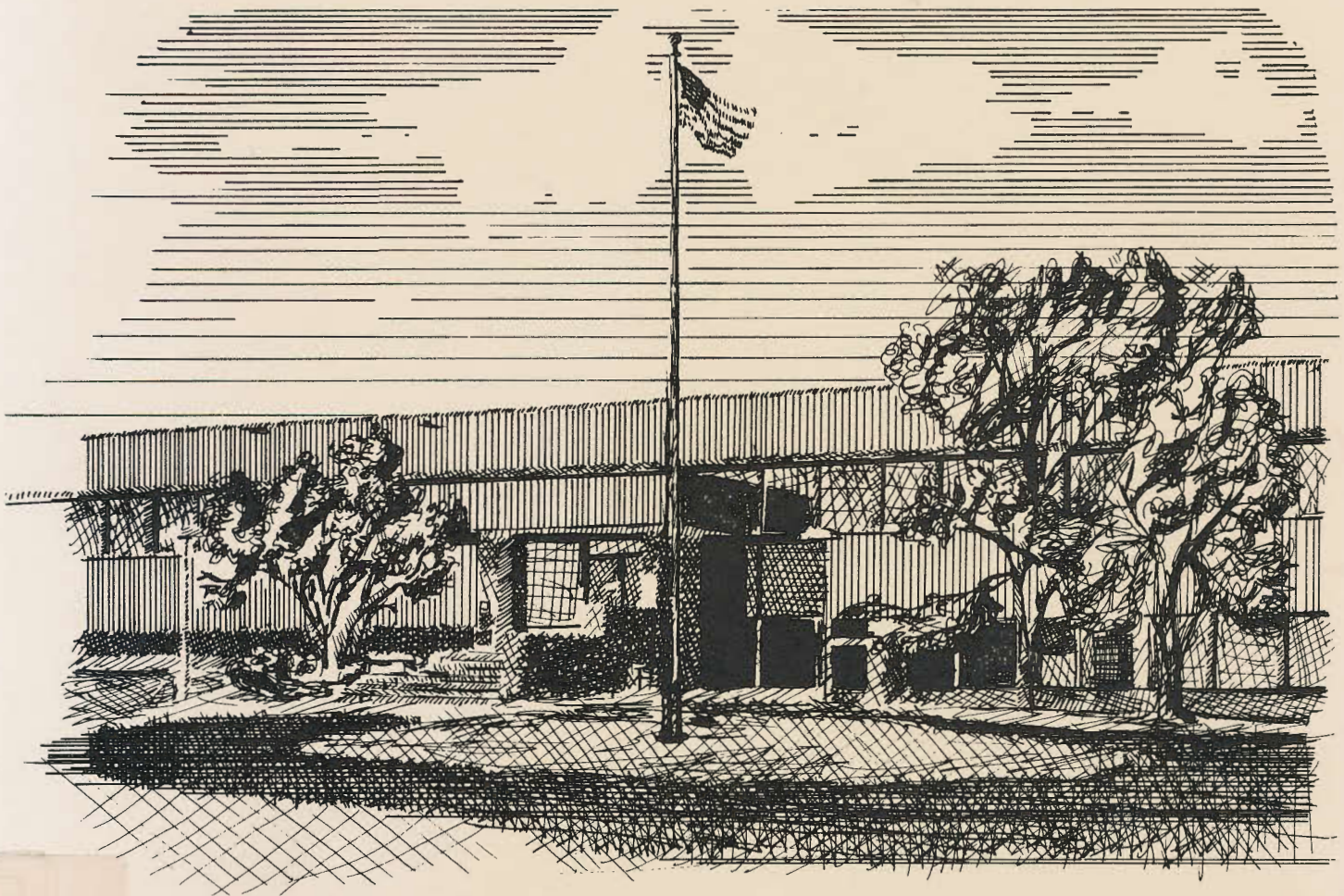


1988 ANNUAL REPORT



GEORGE W. KUHN
DRAIN COMMISSIONER
OAKLAND COUNTY, MICHIGAN
V O L U M E I

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1988 ANNUAL REPORT

OF THE

OAKLAND COUNTY DRAIN COMMISSIONER

VOLUME I

~~REFERENCE BOOK~~

~~For Room Use Only~~



ROBERT H. FREDERICKS
Chief Deputy Commissioner
858-0970

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

H. JAMES LUEDERS
Deputy and Chief Engineer
858-1081

April 1, 1989

OAKLAND COUNTY

MAY 11 1989

Reference Library

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

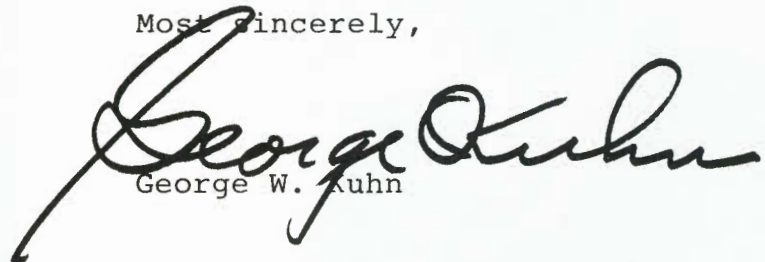
Mr. Chairman, Ladies & Gentlemen:

As required by the Michigan Drain Code, I enclose the Annual Report of the operations of the Drain Commissioner's Office during the period of January 1, 1988 through December 31, 1988.

The Drain Office continued to experience a significant increase in the number of new projects during 1988. The taking over of several former DPW projects such as Amy Relief Sanitary Sewer, Wixom Waste-Water Treatment Plant, North Huron Valley project, Evergreen-Farmington Pollution Control Facility, Walled Lake Project, River Rouge project, and the construction of the Milford Waste-Water Treatment Plant are highlights of the many new programs started last year.

I wish to extend my thanks and appreciation to all of the members of the Board of Commissioners for the excellent cooperation and assistance extended to this office during the past year.

Most sincerely,



George W. Kuhn

GWK:nh
enc.

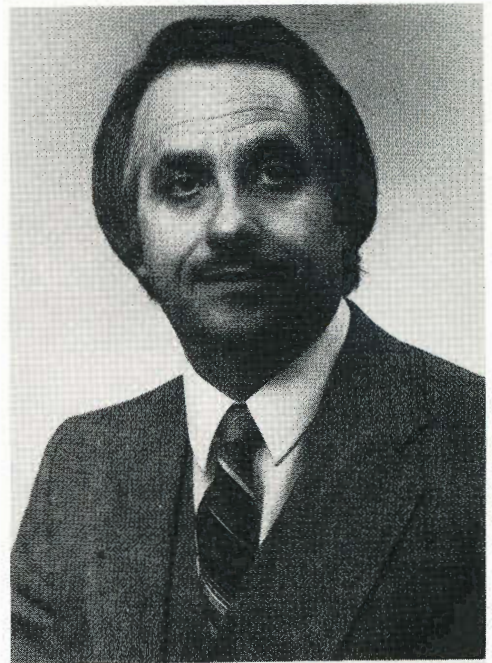
Oakland County Drainage Board



George W. Kuhn
Drain Commissioner



Roy Rewold
*Chairman
Board of Commissioners*



G. William Caddell
*Chairman
Finance Committee*

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ORGANIZATION CHART

OAKLAND COUNTY DRAIN COMMISSIONER'S ORGANIZATIONAL CHART

1988 BUDGETED POSITIONS
65 Governmental Positions
10 Special Revenue Positions
75 Total Positions

ADMINISTRATION
1 Drain Commissioner
1 Chief Deputy Commissioner
1 Financial Assistant
1 Administrative Assistant
1 Secretary II
5 Total Positions

ENGINEERING
1 Chief Engineer
1 Asst Chief Engineer
6 Civil Engineer III
3 Civil Engineer II
1 Eng Systems Coordinator
3 Engineering Technician
1 Engineering Aide
1 Secretary I
1 Account Clerk
1 ADAPT
1 Typist I
2 Student Engineer
22 Total Positions

RIGHT OF WAY
1 Supv Right of Way
1 Survey Party Crew Leader
1 Right of Way Technician
3 Engineering Technician
2 Engineering Aide II
1 Engineering Aide I
9 Total Positions

INSPECTION
1 Supv of Const Insp Svcs
5 Const Inspector IV
2 Const Inspector III
1 Const Inspector II
6 Const Inspector I
15 Total Positions

S.O.C.S.D.S.
1 Asst Chief Engineer
1 Chief - SOC Pol Ctl Fac
1 Drn & Pol Ctl Maint Supv
3 Pump Maint Mech II
1 Pump Maint Mech I
1 Chemist Assistant
1 Lab Technician I
1 Typist II
10 Total Positions

MAINTENANCE
1 Civil Engineer III
1 Supv Drn & Lk Lvl Maint
1 Lake Level Technician
5 Gen Maint Mech - Drain
2 Maint Mechanic I
4 Maint Laborer
14 Total Positions

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 Subdivision Control Act, Act 288 of 1967; the Soil Erosion and Sedimentation Control Act, Act 347 of 1972; the Inland Lake Improvement Act, Act 345 of 1966; and various other statutes.

For purposes of organization, the functions of the Drain Commissioner as a part of Oakland County government are delegated to five operating units: Engineering, Right of Way, Inspection, Maintenance and S.O.C.S.D.S. The employees in each of these units perform a multitude of tasks necessary for 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, Herold J. Lueders, and the Assistant Chief Engineer, Glen A. Yrjanainen, supervise the engineering functions of the unit. At the end of 1988 there were 20 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 1988 is provided later in this report.

Plat Review

Under the provisions of the Subdivision Control Act, Act 288 of 1967, 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. In addition, the Mobile Home Commission Act, Act 419 of 1976, requires the Drain Commissioner to review and approve the outlet drainage for new mobile home developments.

In 1988, 45 preliminary plats, 61 sets of subdivision construction plans, 72 final subdivision plats, and the outlet drainage for one mobile home development were reviewed by the engineering staff of the Drain Commissioner. A total of 22 Oakland County communities were represented in the projects reviewed. The final subdivision plats contained 71 commercial lots and 2,667 residential lots. Total revenue generated from plat review fees in 1988 was \$27,204.22. Joseph P. Kozma, P.E. is the Drain Office engineer in charge of the plat review program.

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 lakes under the jurisdiction of the Drain Commissioner in Oakland County appears on the two following pages of this report.

Ronald R. Karttunen, P.E. was responsible for the lake level program which involves the operation and maintenance of 30 lake level control structures, and six lake level augmentation pumps.

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. A good illustration of this is shown on page 6 of this report in the form of Sylvan-Otter Lake's 1988 hydrograph. These hydrographs are available for each lake level system.

Regular inspection also assures that the structures are in good operating condition, and permits scheduled maintenance and re-

**SUMMARY OF OAKLAND COUNTY LAKES
WITH COURT ESTABLISHED LEGAL LEVELS**

LAKE	AREA (ACRES)	YEAR ESTABLISHED	LOCATION	
<u>CLINTON RIVER BASIN</u>				
Lakeville Lake	Lakeville*	492	1961	Addison Twp
Oxford Multi-Lakes	Mickelson	61	1973	Oxford Twp
	Squaw	29		
	Clear	32		
	Long	33		
	Cedar	15		
	Tan	58		
	Mill Pond*	2		
Waterford Multi-Lakes	Cemetery	28	1966	Independence & Waterford Twps
	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 Twp
	Oakland*	235		
Watkins Lake	Watkins* (pump)	229	1960	Waterford Twp
Cass Lake	Cass*	1280	1969	Waterford Twp & Keego Harbor
Orchard Lake	Orchard* (pump)	850	1966	Orchard Lake & W Blmfld Twp
Indianwood	Indianwood*	122	1986	Orion Twp
Sylvan-Otter	Otter	81	1986	Waterford Twp,
	Sylvan	458		Pontiac,
	Dawson Mill	8		Sylvan Lake &
	Pond*			Keego Harbor

* Lake level structures are located at the outlet of the lakes marked with an asterisk

**SUMMARY OF OAKLAND COUNTY LAKES
WITH COURT ESTABLISHED LEGAL LEVELS**

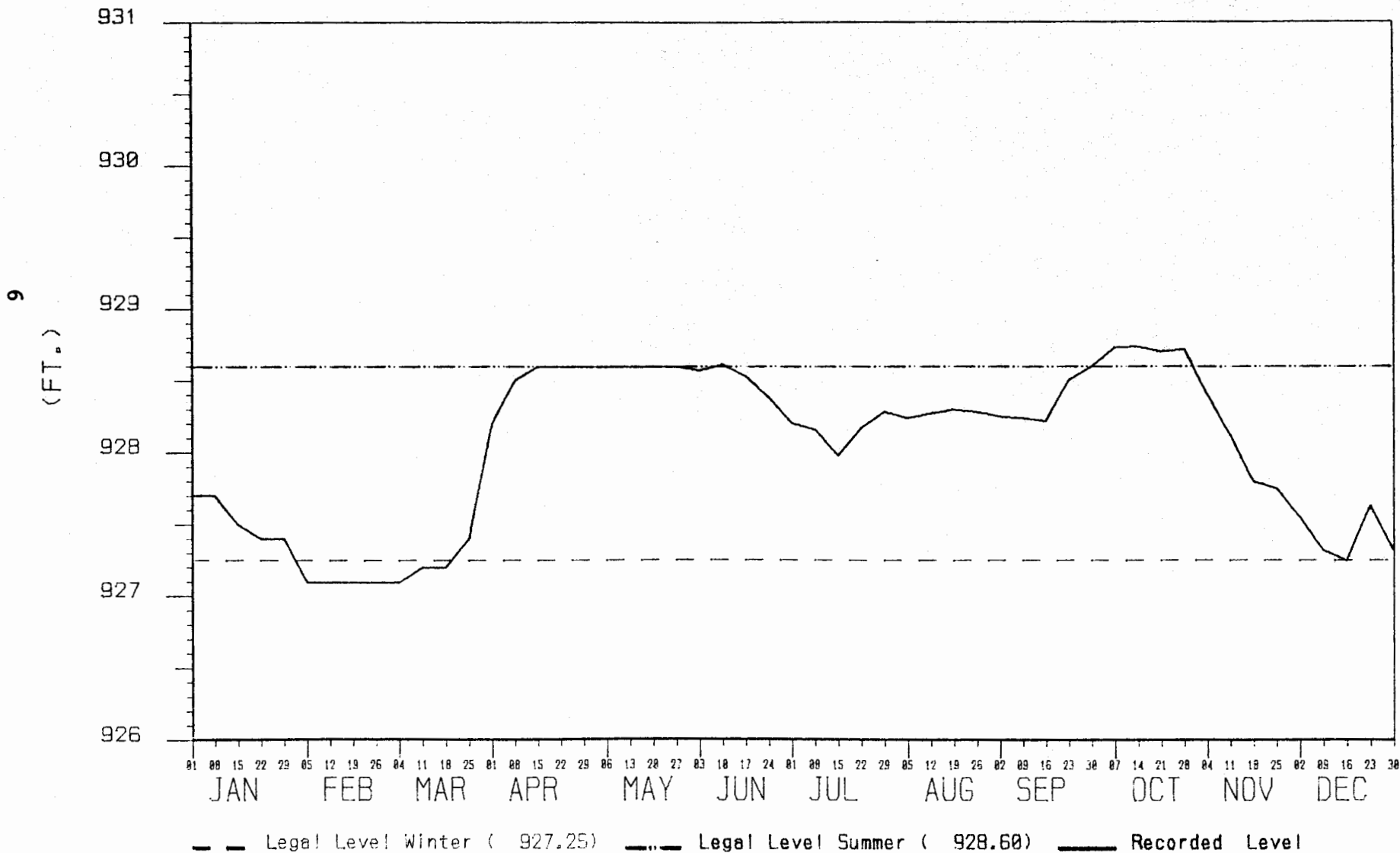
LAKE	AREA (ACRES)	YEAR ESTABLISHED	LOCATION	
<u>HURON RIVER BASIN</u>				
Big Lake	Big*	220	1967	Springfld Twp
White Lake	White* (pump)	540	1965	White Lake & Highland Twps
Duck Lake	Duck* (pump)	307	1962	Highland Twp
Pontiac Lake	Pontiac*	615	1944	White Lake Twp
Oxbow Lake	Oxbow*	286	1963	White Lake 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* (pump)	175	1964	Commerce Twp
Upper Straits Lake	Upper Straits*	378	1964	W Blmfld Twp
Middle & Lower Straits Lake	Middle Straits Lower Straits* (pump)	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	Novi & Walled Lake
<u>SHIAWASSEE RIVER BASIN</u>				
Bevins Lake	Bevins*	31	1964	Holly Twp
Tipsico Lake	Tipsico*	301	1954	Rose Twp

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

Note: Hydrograph derive
from lake level elevatio
record readings, U.S.G.S
datum.

SYLVAN-OTTER LAKE

HYDROGRAPH for 1988



pairs when needed. In order to more effectively keep pace with the inspection and maintenance needs of the lake level program, one additional Lake Level Control Technician was added to the staff in 1988. There are now two technicians available to monitor the lake levels.

Special assessment districts were established by the Circuit Court for each project and, as necessary, annual assessment rolls are prepared to reimburse the cost of necessary maintenance expenditures. During 1988, maintenance work was performed on 27 lake level projects, and the Board of Commissioners approved assessments in the amount of \$142,835.44 to assess property for the maintenance costs of 20 Lake Level Control Projects. In addition to these assessments, three lake level projects were assessed in the amount of \$116,472.73 for a portion of the cost of construction of the Price Dam, the Indianwood Dam and the Pontiac Lake Dam.

Other significant maintenance repairs performed on lake levels in 1988 include:

- 1) Grouted voids beneath east level control structure at Lake Oakland.
- 2) Re-built the pump motor for Watkins Lake level augmentation facility.
- 3) Constructed a service drive to Cass Lake and repaired the inlet/outlet structure at Cass Lake which operates as a pumping system for Orchard Lake level augmentation.

SUMMARY OF 1988 EXPENDITURES FOR ALL LAKE LEVEL PROJECTS

LAKE LEVEL	SALARIES & FRINGES	MATERIAL & SUPPLIES	MISC CHARGES	MILEAGE CHARGES	INSURANCE	ELECTRICAL SERVICE	CONTRACTED SERVICES	TOTAL EXPENDITURES
OAKLAND-WOODHULL	\$7,559.03	\$1,893.62	\$316.68	\$967.80	\$1,379.28	\$0.00	\$22,571.46	\$34,687.87
ORCHARD	\$5,605.69	\$1,111.91	\$1,000.14	\$932.90	\$491.94	\$237.40	\$24,289.44	\$33,669.42
WHITE	\$1,514.56	\$198.57	\$82.99	\$974.80	\$1,227.93	\$16,971.40	\$0.00	\$20,929.87
WATERFORD-MULTI	\$10,137.89	\$446.36	\$67.54	\$914.30	\$3,742.43	\$0.00	\$0.00	\$15,308.52
WATKINS	\$2,909.63	\$330.50	\$813.44	\$932.50	\$183.90	\$5,421.71	\$3,950.00	\$14,541.68
DUCK	\$2,028.51	\$213.97	\$208.91	\$943.10	\$798.61	\$6,860.74	\$0.00	\$11,013.84
INDIANWOOD	\$6,501.95	\$1,830.35	\$737.04	\$610.90	\$551.71	\$0.00	\$0.00	\$10,231.95
MIDDLE & LOWER STRAITS	\$2,072.77	\$144.01	\$94.33	\$928.40	\$570.10	\$5,408.79	\$0.00	\$9,218.42
LONG	\$3,331.47	\$561.25	\$768.22	\$975.00	\$326.42	\$2,655.42	\$0.00	\$8,617.78
CASS	\$4,953.36	\$262.57	\$211.59	\$940.80	\$1,126.40	\$0.00	\$0.00	\$7,494.72
SYLVAN-OTTER	\$4,078.72	\$366.65	\$224.11	\$20.00	\$1,609.16	\$0.00	\$0.00	\$6,298.64
PONTIAC	\$2,280.26	\$396.86	\$69.94	\$980.30	\$1,370.07	\$0.00	\$0.00	\$5,097.43
OXFORD-MULTI	\$2,548.99	\$475.53	\$22.54	\$831.20	\$1,094.23	\$0.00	\$0.00	\$4,972.49
COMMERCE	\$2,374.47	\$560.02	\$87.58	\$1,146.10	\$455.15	\$0.00	\$0.00	\$4,623.32
OXBOW	\$2,234.68	\$184.99	\$102.54	\$941.70	\$381.59	\$0.00	\$0.00	\$3,845.50
CEDAR ISLAND	\$2,096.78	\$267.13	\$77.54	\$919.50	\$355.62	\$0.00	\$0.00	\$3,696.57
FOX	\$1,676.30	\$214.02	\$97.54	\$941.50	\$266.67	\$0.00	\$0.00	\$2,671.45
BIG	\$1,391.53	\$168.28	\$109.64	\$959.00	\$160.91	\$0.00	\$0.00	\$2,789.36
UNION	\$1,394.53	\$118.90	\$67.53	\$894.80	\$262.06	\$0.00	\$0.00	\$2,737.82
BEVINS	\$1,523.43	\$161.19	\$107.59	\$955.10	\$124.14	\$0.00	\$0.00	\$2,671.45
UPPER STRAITS	\$1,209.65	\$177.66	\$222.55	\$860.80	\$68.96	\$0.00	\$0.00	\$2,539.62
LAKEVILLE	\$1,084.25	\$113.05	\$25.24	\$794.80	\$179.31	\$0.00	\$0.00	\$2,196.65
CRYSTAL	\$1,727.95	\$54.39	\$105.32	\$33.20	\$0.00	\$0.00	\$0.00	\$1,920.86
BUNNY RUN DAM	\$1,606.30	\$0.00	\$155.82	\$133.60	\$0.00	\$0.00	\$0.00	\$1,897.72
WALLED & SHAWOOD	\$1,240.59	\$70.72	\$22.52	\$0.00	\$445.95	\$0.00	\$0.00	\$1,779.78
TIPSICO	\$685.45	\$189.25	\$22.54	\$796.80	\$36.78	\$0.00	\$0.00	\$1,730.82
SCOTT	\$351.96	\$26.25	\$10.21	\$0.00	\$0.00	\$0.00	\$0.00	\$388.42
TOTAL	\$75,920.70	\$10,498.00	\$5,831.65	\$20,330.90	\$17,148.94	\$37,553.46	\$50,810.90	\$218,096.55

CONTRACTED SERVICES INCLUDE: WATKINS LAKE - \$ 3,950.00 FOR PUMP MOTOR REPAIRS
 ORCHARD LAKE - \$24,289.44 FOR CONSTRUCTION EXPENDITURES
 OAKLAND-WOODHULL - \$13,570.09 FOR STUMP REMOVAL SERVICES
 \$ 2,901.37 FOR WELL REPAIRS DUE TO LAKE DRAWDOWN
 \$ 5,000.00 FOR GROUTING
 \$ 1,100.00 FOR DAM REPAIRS

Soil Erosion and Sedimentation Control

The Drain Commissioner's Office is the designated enforcing agency in Oakland County for the Soil Erosion and Sedimentation Control Act, Act 347 of 1972.

In 1988, both the number of permits processed and the revenue generated from these permits increased substantially over 1987 figures. The 920 permits processed in 1988 represents a 16.75% increase over the 1987 total of 788, while total revenue jumped from \$154,426.83 to \$252,725.86, an increase of 63.65%. Also significant, was the fact that total revenue collected from permit fees exceeded total payroll costs of \$201,510.46 for employees assigned to the soil erosion program. As indicated on the bar graphs on the following page, the majority of permits are for single family homes, and are located in areas such as West Bloomfield Township and Rochester Hills.

As in previous years, the Drain Commissioner continued informal instructional meetings with builders, developers, engineers, architects and property owners to improve soil erosion mitigation efforts in Oakland County.

The Department of Natural Resources reviewed and evaluated the Oakland County soil erosion program on July 20, 1988. The DNR graded the enforcement program "Acceptable", which is the highest rating used by the DNR in these evaluations. The Department evaluation letter stated that the soil erosion program was very effectively administered and fulfills the intent of the Soil Erosion and Sedimentation Control Act.

Ronald R. Karttunen, P.E. was in charge of the Drain Commissioner's Soil Erosion & Sedimentation Control program in 1988. During the year, one Engineer and three Inspectors passed the course and examination given by the DNR and received their State Certification.

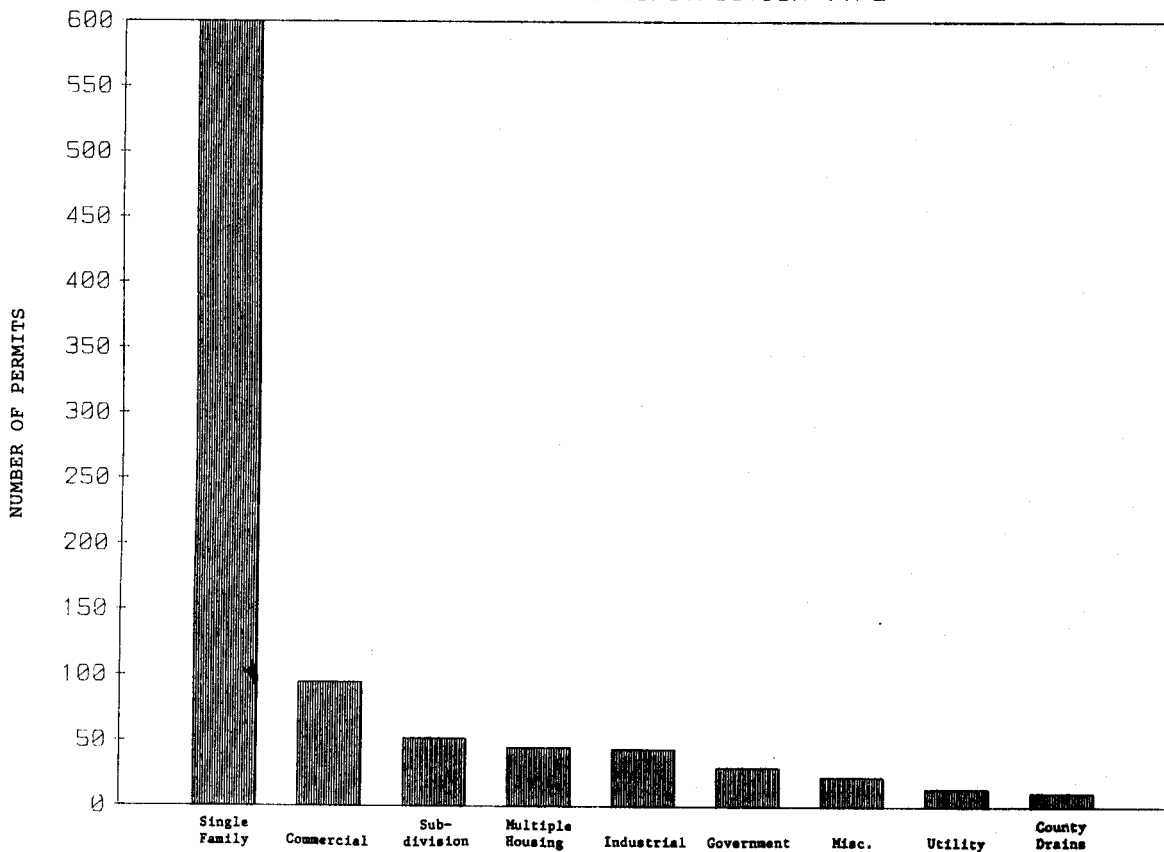
Construction Permits

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 1988 a total of 69 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.

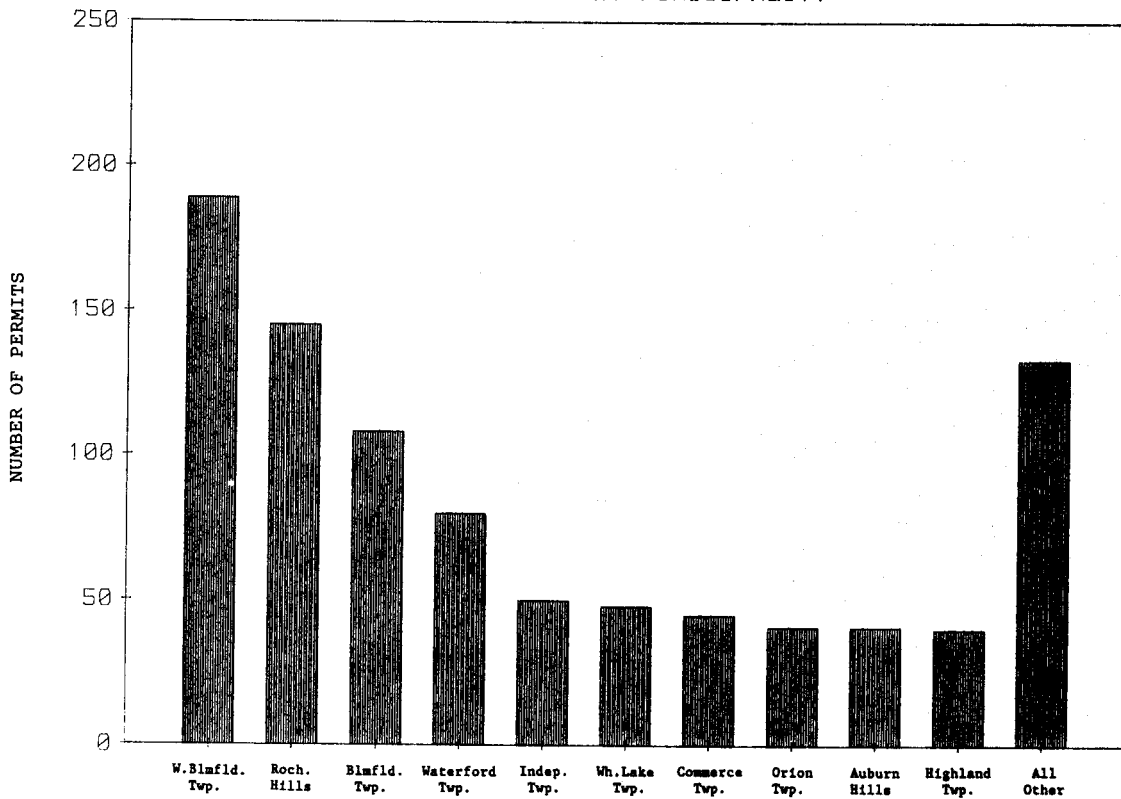
OAKLAND COUNTY DRAIN COMMISSIONER

1988 SOIL EROSION PERMITS BREAKDOWN BY CONSTRUCTION TYPE



OAKLAND COUNTY DRAIN COMMISSIONER

1988 SOIL EROSION PERMITS BREAKDOWN BY MUNICIPALITY



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, engineering firms, 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.

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 the Drain Commissioner 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 that proper and approved construction standards are used on new connections.

The Drain Commissioner works closely with local units of government. All plans sent to the Drain Office for review are transmitted through the municipality's engineer or Engineering Department, to assure that sewer lines conform to the local community master plan for sewer service. During 1988 the Engineering Unit received and reviewed 22 sets of sanitary and combined sewer plans for facilities that will outlet into the Southeastern Oakland County Sewage Disposal System.

RIGHT OF WAY UNIT

RIGHT OF WAY

The Oakland County Drain Commissioner employs a trained and experienced staff of six people in this unit supervised by James W. Isaacs, Jr., R.L.S. The primary purpose of this unit is the acquisition of easements for the construction of storm drains, sanitary sewer systems and water supply systems. Necessary easements for these projects are obtained, or purchased in fee from the owner(s). Easements are either permanent (land upon which facilities are located) or temporary (land required for use during construction only). Upon completion of a project, temporary easements revert back to the owner, while permanent easements remain under the control of the County.

The Right of Way staff becomes involved early in the planning stage of projects. It is necessary to accommodate possible route changes, land and soil conditions, landscaping, and the desires of the public. Any or all of these factors may affect the cost of a project. Staff members work closely with the engineer assigned to each project and make recommendations to help control or reduce costs.

Once the route and basic design of a project are determined, easement documents must be prepared to cover the area required for construction. A title search is necessary to determine the legal owners of record and all parties having an interest in the land, i.e., mortgage holders, land contract purchasers, etc. In many cases old records have to be researched, which can be both difficult and time consuming.

The easement description is written by calculating the exact location of the facility which will be constructed on private land. The description must be precise as it will become part of a recorded title document. After the easement documents are prepared, they are assigned to a Right of Way field agent who will contact the property owner. All signed easement documents are recorded at the Oakland County Register of Deeds.

In order to obtain an easement, it is often necessary to negotiate an acceptable agreement with the property owner. This process can be slow and difficult. It may be necessary to make several contacts with each owner, or in some cases with multiple owners.

When an easement cannot be obtained from a property owner, it is necessary to file a condemnation action in Circuit Court under the Uniform Condemnation Act, Act 87 of 1980. Right of Way staff work closely with the Oakland County Corporation Counsel or outside legal counsel in filing a condemnation action. In a condemnation proceeding, the Court, with the assistance of expert appraisers, awards the requested easement to the County and

awards the property owners a sum of money deemed to represent the diminution in value to the property caused by the easement.

During 1988, approximately 750 easement parcels were title searched, written and appraised by the Right of Way Staff. A total of 325 easement parcels were acquired. In addition to new construction projects, easements for county drains in many new subdivision and condominium projects throughout Oakland County are prepared or reviewed. As an example, West Bloomfield Township alone has 36 new projects in various stages of development.

INSPECTION UNIT

INSPECTION UNIT

The Oakland County Drain Commissioner employs trained inspection personnel to inspect drain, sewer and water projects. During 1988 there were fifteen 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 engineer responsible for the project.

The inspector insures 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.

The Drain Commissioner also strives 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.

Inspectors use radio and telephone communication with the office and local communities during working hours so that any complaints or inquiries or construction-related problems can be handled as quickly as possible.

Daily inspection reports and a log of the progress of construction are maintained by the inspector on each project. Daily records permit proper restoration of the construction site, and also assure that correct payment will be made to the contractors on the project.

Inspection staff also videotape 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 available 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.

An 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 at a lower cost with a minimum of disturbance to the existing facility.

The Inspection Unit is responsible 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 lakes and streams in Oakland County. The soil erosion inspection program is supervised by Dan MacLennan.

Inspection Staff 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 existing system is maintained, and that proper compliance with state and local regulations is observed. In addition, the Inspection Staff inspects new drainage facilities that will become county drains which are being built by private developers in conjunction with the construction of new condominium, apartment, or commercial and office complexes.

MAINTENANCE UNIT

MAINTENANCE UNIT

The Oakland County Drain Commissioner is responsible for the regular maintenance of established county storm drains located throughout Oakland County. The Drain Office engineer in charge of the Maintenance Unit is George A. Bondi. There were nine employees in this unit during 1988. 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.

Drain Inspection and Maintenance

Drains constructed prior to 1956 were financed by special assessment against the property served by the drain. Inspection and Maintenance charges for these drains are assessed against the special assessment district established when the drain was constructed. In 1988, the Board of Commissioners approved assessments in the amount of \$21,908.73 to assess property for the inspection and maintenance costs of Chapter 4 Drains.

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 1988 the Maintenance Unit inspected 34 Chapter 20 drains, one Chapter 21 drain and 35 Chapter 4 drains.

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 1988 general drain maintenance was performed on 77 Chapter 20 drains, two Chapter 21 drain and 61 Chapter 4 drains.

Maintenance of Lake Level Structures

The Maintenance Unit also maintains lake level control structures including dike repair, painting and repair of structures, repair of gates, and landscape maintenance. During 1988 maintenance was

performed at 24 lake level control locations.

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 a regular schedule. The result is decreased cost per job, and increased service to the public. Replaced in 1987, the Ford Vactor has a 250 H.P. Caterpillar engine with powerful suction and jetting capability.

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.

Rain Gauge Operations

There are 24 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.

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, Parks and Recreation, and the Oakland County Employees Credit Union utilized these available maintenance services during 1988.

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 separated sewer systems.

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. Overflows occurred approximately 25 times every year and were causing pollution of the Red Run Drain. The Red Run Drain is a large, open inter-county Chapter 21 drain, approximately seven miles in length, flowing east from Twelve Mile and Stephenson Highway through Macomb County until it outlets into the Clinton River.

To mitigate this pollution of the Red Run Drain and the Clinton River, the Drain Commissioner as agent for the County of Oakland constructed the Pollution Control Facility, a storage facility 65 feet wide and approximately two miles long with a capacity of 190 acre/feet, which now receives 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.

After a storm event, flows of combined sewage retained in the storage basin are pumped into the Dequindre Interceptor up to a capacity of 260 cubic feet per second. Only when the storage capacity of both the Twelve Towns Drain and the Pollution Control Facility are exceeded, will a spill 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 - 1988

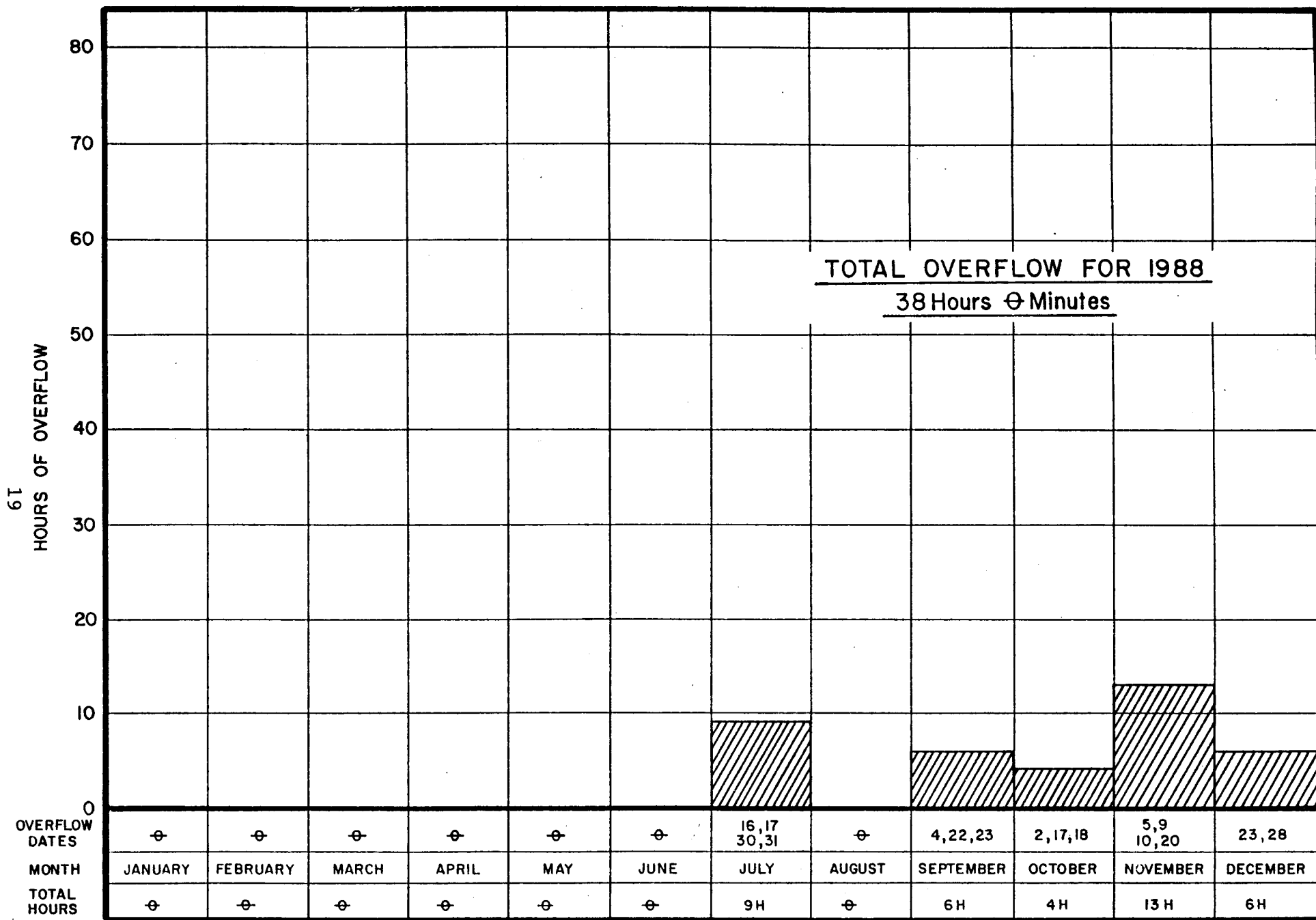
The Drain Commissioner currently employs nine people to maintain and operate the S.O.C.S.D.S. under the direction of William E. Klockow, P.E.

Laboratory staff collect and test samples to continually monitor 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 1988 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 strength of the effluent entering the system and later treated by the City of Detroit.

Field staff maintain and operate the Pollution Control Facility. Responsibilities 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.

During all of 1988 there were only 18 spills from the Twelve Towns system to the Pollution Control Facility, of which 11 were retained in the basin with no spill to the Red Run Drain. The remaining 7 spills were chlorinated before spilling to the Red Run Drain. The total overflows to the Red Run Drain were limited to a total period of only 38 hours for the year. The total volume of flow spilled was approximately 50,267,000 cubic feet or approximately 376 million gallons.

S.O.C.S.D.S. employees also operate and maintain the Red Run Drain, the outlet water course for the Pollution Control Facility, which begins at Thirteen Mile and Dequindre Road and runs northeasterly through Macomb County for approximately seven miles where it outlets into the Clinton River. This open water course is subject to erosion and 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.



SOUTHEASTERN OAKLAND COUNTY SEWAGE DISPOSAL SYSTEM
JANUARY 1, 1988 THRU DECEMBER 31, 1988

DRAIN CONSTRUCTION COMPLETED IN 1988

DRAIN CONSTRUCTION COMPLETED IN 1988

The Drain Commissioner, under the provisions of the Michigan Drain Code, Act 40 of 1956, constructs all 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.

DRAIN CONSTRUCTION PROJECTS

Keego Harbor Drain

On December 17, 1987, the Keego Harbor City Council adopted a petition to construct a new storm drain to alleviate flooding problems.

At a public hearing of the Drainage Board held on February 23, 1988, there were no objections to the project. The project was declared practicable and necessary for the public health, and the Final Order of Determination was authorized and executed. Rowe Engineering, Inc., the consulting engineer for the City of Keego Harbor, was employed to prepare bid plans and specifications, and Dickinson, Wright, Moon, VanDusen and Freeman were employed as Bond Counsel.

The project consists of a sediment basin and 2,608 lineal feet of 60" through 12" storm drain that generally runs along Willow Beach from Dollar Lake to Summers Street. In 1988, final engineering plans were completed and permit applications were filed with governing agencies. The project was financed with surplus construction funds from completed City of Keego Harbor water and sewer projects. Mr. Philip Sanzica, P.E. was designated as the project engineer.

Construction bids were received on July 12, 1988 and on July 26, 1988 the construction contract was awarded to the low bidder Drakeford, Inc. for their bid in the amount of \$372,897.00. The Contractor began construction in the summer of 1988. By December 1988, the project was substantially completed with only final restoration to be completed.



NELSON DRAIN - PHASE II

It is noteworthy that the drain included the construction of a permanent settling basin at the outlet of the pipe enclosure prior to flow discharging into Dollar Lake. This structure allows for the removal of pollutants and debris that might be part of the storm flow. It is anticipated that final payment will be made to the Contractor early in 1989.

Ireland Drain

A petition for the establishment of this drain was filed by the City of Rochester Hills with the Oakland County Drain Commissioner on November 6, 1986. The project was constructed to provide the necessary 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.

At a Drainage Board meeting on January 6, 1987, a public hearing was held at which time no objections to the project were received. The Drainage Board adopted a Final Order of Determination and selected Hubbell, Roth and Clark, Inc. as the Consulting Engineer and Dickinson, Wright, Moon, VanDusen and Freeman as Bond Counsel. William E. Klockow, Assistant Chief Engineer, was selected as the Drain Office project engineer.

Engineering plans were prepared by Hubbell, Roth and Clark, Inc. and easement acquisition began in July of 1987. On December 8, 1987, the Gabler Drainage Board adopted a resolution to transfer surplus construction funds to the Ireland Drain in the amount of \$13,021.39 to finance a portion of preliminary costs.

On February 9, 1988, final plans and specifications for the Ireland Drain were received and approved. The cost estimate of \$2,350,000 was submitted with the plans. On March 15, 1988, a condemnation resolution was adopted. Construction bids were received on March 29, 1988 with the contract being awarded to the low bidder, L. D'Agostini & Sons, Inc., in the amount of \$1,387,411.92. On May 9, 1988, the Contractor began construction on the north side of Auburn Road. Later, a second crew began on the south side of Auburn Road, with all construction being completed by the completion date of July 31, 1988.

The cost of the project was financed by the sale of Oakland County drain bonds, in the amount of \$1,925,000, for which the City of Rochester Hills pledged its full faith and credit for repayment. The bonds were sold on June 28, 1988 at an average effective interest rate of 7.42% over 22 years.

This completion of the Ireland Drain has allowed the City of Rochester Hills to proceed with their paving of the Brooklands Subdivision on the north side of Auburn Road. It is expected in the Spring of 1989 that the paving of the Brooklands area south of Auburn Road will take place with final restoration to be completed at that time.

DRAINS UNDER CONSTRUCTION

DRAINS UNDER CONSTRUCTION

Beechmont Drain

On December 17, 1987, the Keego Harbor City Council adopted a petition to construct a new storm drain to alleviate flooding problems.

At a public hearing of the Drainage Board held on February 23, 1988, there were no objections to the project. The project was declared practicable and necessary for the public health and the Final Order of Determination was authorized and executed. Rowe Engineering, Inc., the consulting engineer for the City of Keego Harbor, was employed to prepare bid plans and specifications, and Dickinson, Wright, Moon, VanDusen and Freeman were employed as Bond Counsel.

The project consists of a submersible duplex pumping station and approximately 700 lineal feet of 36" through 24" storm drain which runs along Beechmont Street from Wall Street to Schroeder. In 1988, final engineering plans were completed and permit applications were filed with governing agencies. The project is being financed with surplus construction funds from completed City of Keego Harbor water and sewer projects. Philip Sanzica, P.E. was designated as the project engineer.

Construction bids were received on July 12, 1988 and on July 26, 1988 the construction contract was awarded to the low bidder P & R Contracting, Inc. for their low bid in the amount of \$260,793.00. The Contractor began laying pipe in the Fall of 1988. By December 1988, the drain installation was substantially complete with only the submersible pumping station and final restoration to be completed early in 1989.

Borden Drain

On June 23, 1987, a petition for the establishment of a drain was filed by the City of Rochester Hills with the Oakland County Drain Commissioner. On July 14, 1987, the first meeting of the Drainage Board was held and the project was formally named the Borden Drain.

On September 1, 1987, 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. Hubbell, Roth and Clark, Inc. was employed as Consulting Engineer and Dickinson, Wright, Moon, VanDusen and Freeman were employed as Bond counsel. William E. Klockow, Assistant Chief Engineer, was selected as the Drain Office project engineer.

The cost of the project was financed by the sale of Oakland County drain bonds, in the amount of \$345,000, for which the City of Rochester Hills pledged its full faith and credit for repayment. The bonds were sold on November 15, 1988, at an average effective interest rate of 6.65% over ten years.

Plans and specifications were received and approved on June 28, 1988. The drain is entirely located on property owned by the City of Rochester Hills where a new golf course, already under contract, was being constructed. To reduce the risk of damage by a third party contractor to the golf course construction, a contract was approved between the City of Rochester Hills and Golf Concepts to construct the necessary drainage structures.

Construction began in August of 1988, only to be halted due to problems concerning the Consumers Power easement which had conditions unacceptable to this office. On August 16, 1988, a condemnation resolution was adopted by the Drainage Board.

It is expected that construction of the drain will be completed early in 1989.

Karas Drain

A petition for the establishment of a drain was filed by the City of Rochester Hills with the Oakland County Drain Commissioner on November 6, 1986.

The first meeting of the Drainage Board was held on November 18, 1986. At this meeting, the project was tentatively determined to be practical and necessary for the public health and was formally named the Karas Drain.

At a meeting held on January 6, 1987, the Drainage Board adopted the Final Order of Determination, Hubbell, Roth and Clark, Inc. was employed as Consulting Engineer and Dickinson, Wright, Moon, VanDusen and Freeman was named Bond Counsel for the project. William E. Klockow, Assistant Chief Engineer, was selected as the Drain Office project engineer.

Engineering plans for the portion of the Karas Drain which traverses the Lutheran High School were prepared and construction followed in September of 1987. The City of Rochester Hills made payment to the Contractor for this early construction and were to be reimbursed by the Drainage District once bonds were sold.

On June 28, 1988, plans and specifications for the balance of the project were received, adopted and approved. The cost estimate submitted with the plans totaled \$1,146,788. The project was advertised and construction bids were received with the contract being awarded to the low bidder, Roz-L Equipment Company, Inc., in the amount of \$488,000 on August 16, 1988.

The cost of the project was financed by the sale of Oakland County drain bonds, in the amount of \$875,000, for which the City of Rochester Hills pledged its full faith and credit for repayment. The bonds were sold on November 15, 1988, at an average effective interest rate of 6.64% over ten years.

By the end of 1988, 70% of the Karas Drain had been completed. It is anticipated that the balance of the work will be completed in the Spring of 1989 with final restoration to follow.

SEWER & WATER CONSTRUCTION COMPLETED IN 1988

SEWER & WATER CONSTRUCTION COMPLETED IN 1988

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 the I-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 with a connection to be made at Giddings and Lake Angelus Roads.

A Contract between the City of Auburn Hills and the County of Oakland was approved by the Oakland County Board of Commissioners on February 5, 1987. Philip Sanzica, P.E., was selected as the Drain Office project engineer. Dickinson, Wright, Moon, VanDusen and Freeman was employed as Bond Counsel.

Orchard, Hiltz & McCliment, Inc. was employed to design the system and prepare construction plans and specifications. The system is composed of approximately 21,000 lineal feet of 6" through 24" sanitary sewer and 14,000 lineal feet of 12" through 20" water mains.

The cost of both the sewer and water projects was financed by the sale of Oakland County combined water and sewer bonds for which the City of Auburn Hills pledged its full faith and credit for repayment. Bonds in the amount of \$2,850,000 were sold on January 14, 1988, at the effective net interest rate of 7.10% over 15 years.

All rights-of-way for water and sewer construction were acquired by voluntary grant and condemnation proceedings were not required. Construction bids were received on July 8, 1987 and December 14, 1987 and contracts were awarded to the low bidders, Lawrence M. Clarke, Inc. of Ypsilanti, Michigan in the amount of \$391,300; Fairfield Construction Co. of Roseville, Michigan in the amount of \$894,390; and P & R Contracting, Inc. of Washington, Michigan in the amount of \$616,315. Construction started in August of 1987. By December of 1988 the projects were substantially completed with only final restoration to be completed in the Spring of 1989.

Milford Sewage Disposal System - Extension No. 2

An agreement between the Village of Milford, to improve the existing sewage treatment plant constructed by Oakland County in 1967, 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 1939.

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.

Federal funds for 55% of the grant eligible portions, plus an additional 20% for innovative technology will total approximately 3.6 million dollars when all of the project work is completed. Oakland County bonds were sold on September 11, 1986, in the amount of \$3,550,000, at the effective net interest rate of 6.66% over 20 years.

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.

An interceptor sewer, consisting of both new construction and rehabilitation, was completed and ready for service in August 1987. This first phase of the treatment plant was completed and ready for service in December 1987. The remainder of the treatment plant was substantially completed and ready for service in 1988.

West Bloomfield Water Supply System - Section IX

An agreement between West Bloomfield Township and the County of Oakland to construct approximately 16,000 lineal feet of 20" diameter water transmission main along Pontiac Trail westerly from Mirror Lake to Green Lake Road and southerly along Halstead Road to Walnut Lake Road was approved by the Township Board on October 27, 1985. The Oakland County Board of Commissioners approved the agreement on December 11, 1986. The Township is paying the entire cost of the project, currently estimated to be \$1,409,000, by advancing cash installments to the County.



MILFORD WASTEWATER TREATMENT PLANT

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 bids were received on December 1, 1987, and the contract was awarded to the low bidder Adamo Contracting Corporation in the amount of \$940,204.00. Actual construction began in the Spring of 1988 and was completed in the Fall of 1988. Minor cleanup and restoration remain to be completed early in 1989.

SEWER AND WATER PROJECTS UNDER CONSTRUCTION

SEWER & WATER PROJECTS UNDER CONSTRUCTION

Walled Lake Water Supply System Ext No.1

The City of Walled Lake requested Oakland County to proceed with the development of a project to extend the City of Detroit's water into the City of Walled Lake. In addition to approximately 5600 L.F. of 16" and 12" diameter transmission main, the project consists of a metered connection to the existing D.W.S.D. main at the intersection of 14 Mile Road and Decker Road and a closed connection between the existing Walled Lake and Commerce Township systems on Maple Road east of Decker.

An agreement between the City of Walled Lake and the County of Oakland was approved by the City Council on November 17, 1987, and by the Oakland County Board of Commissioners on December 10, 1987. The firm of McNamee, Porter & Seeley was retained to design the system and prepare the construction plans and specifications. Dickinson, Wright, Moon, VanDusen and Freeman was employed as Bond Counsel and Bendzinski & Company, Inc. was named Financial Consultant for the project. Donald L. Mills, P.E. was designated the Drain Office project engineer.

The entire cost of the project is to be financed by the sale of Oakland County bonds for which the City of Walled Lake pledged its full faith and credit. The bonds were sold on December 15, 1988, in the amount of \$815,000, at the effective net interest rate of 7.21% over 15 years.

Construction bids were received on August 25, 1988 and the contract was awarded to the low bidder, ROZ-L Equipment Co., Inc., in the amount of \$510,000.00. Actual construction began in October of 1988 with completion scheduled for the Spring of 1989.

West Bloomfield Water Supply System - Section XI

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 Haggerty Road northerly from Maple Road to Pontiac Trail, and easterly along Pontiac Trail to Green Lake Road in Sections 19 and 30 of the Township.

In addition to approximately 13,000 lineal feet of 20" diameter transmission main along Haggerty Road and Pontiac Trail, the project consists of a 400,000 gallon elevated storage tank to be constructed on Commerce Road east of Keith Road and a metered connection to the existing D.W.S.D. main to be built at the intersection of 14 Mile Road and Haggerty Road.

An agreement between West Bloomfield Township and the County of Oakland was approved by the Township Board on June 15, 1987, and by the Oakland County Board of Commissioners on July 23, 1987.

The Township is paying the entire cost of the project, currently estimated to be \$1,819,000.00, by advancing cash installments to the County.

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.

Contract No. 1 will cover construction on the 400,000 gallon elevated storage tank. Construction bids were received on October 4, 1988 and the contract was awarded to the low bidder, CBI Na-Con, Inc. in the amount of \$597,500.00. Actual erection of the tank is scheduled to begin in the Spring of 1989 with completion due by September 30, 1989.

Contract No. 2 deals with the metered connection to the existing D.W.S.D. main. Preliminary construction plans have been completed by Hubbell, Roth & Clark, Inc. Easement and permit acquisition should begin shortly with actual construction to be underway by the Fall of 1989.

Contract No. 3 will cover the construction of the 13,000 L.F. of 20" diameter transmission main along Haggerty Road. Construction plans and easement acquisition are nearing completion with actual construction to be underway by the Spring of 1989.

Coleman Friedman Extension Improvements

In December, 1987, the Drain Commissioner received a request from the Charter Township of Waterford to remove infiltration and inflow from the sanitary sewer system in the Coleman-Friedman Subdivision located near the intersection of Cass Lake Road and Pontiac Lake Road, based on an engineering study prepared by Johnson and Anderson, Inc., Waterford Township's consulting engineer. The project will be constructed utilizing surplus funds currently on deposit with the County.

An agreement between Waterford Township and the County of Oakland was approved by Waterford Township on January 11, 1988, and by the Oakland County Board of Commissioners on February 11, 1988. The Board also authorized the transfer of \$484,000 in surplus funds from prior sewer construction to finance the work. Philip Sanzica, P.E. was selected as the project engineer for the Coleman-Friedman Extension Improvement Project.

The consulting engineer firm of Johnson and Anderson, Inc. was retained to design the system and prepare construction plans and specifications. The system improvements consist of replacement of 2,820 lineal feet of 10" through 8" sanitary sewer and the rehabilitation of approximately 1,550 lineal feet of 8" and 10" sanitary sewers by relining using the Insituform process.

Construction bids were received on September 8, 1988 for Contract I. On September 29, 1988, the construction contract was awarded to the low bidder, Pacer Contracting Company, for the sewer replacement portion in the amount of \$236,405.20. The Contractor began work in the Fall of 1988. The project was substantially complete by December of 1988 with only final restoration and road resurfacing to be completed in the Spring of 1989.

PROJECT EXPENDITURE SUMMARIES

**OAKLAND COUNTY DRAIN COMMISSIONER
PROJECT EXPENDITURE SUMMARY FOR THE YEAR 1988**

PROJECT	EXPENDITURE
DRAINS:	
IRELAND	\$ 725,582.32
NELSON	\$ 686,138.61
KEEGO HARBOR	\$ 364,199.37
INDEPENDENCE M-15	\$ 358,111.40
KARAS	\$ 352,303.36
CADDELL	\$ 163,522.31
BEECHMONT	\$ 160,927.35
PONTIAC CREEK EXTENSION	\$ 108,854.47
FREDERICKS	\$ 56,672.79
THORNTON	\$ 25,824.62
HOLLAND	\$ 8,346.40
MOORE	\$ 6,810.75
DRAYTON PLAINS	\$ 6,000.00
BARNARD	\$ 5,884.06
DOROTHY WEBB	\$ 2,009.56
LAW	\$ 1,479.80
TWELVE TOWNS RELIEF	\$ 639.26
BORDEN	\$ 230.00
TOTAL	\$ 3,033,536.43
SEWER:	
AUBURN HILLS #2	\$ 1,247,959.98
MILFORD #2	\$ 645,960.89
EVERGREEN/FARMINGTON	\$ 413,777.88
COLEMAN/FRIEDMAN	\$ 209,615.40
AMY RELIEF	\$ 163,987.08
EVERGREEN/FARMINGTON - WALNUT LK EXT	\$ 48,815.46
WEST BLOOMFIELD #2	\$ 18,139.58
ORION TOWNSHIP #3	\$ 6,672.39
S.O.C.S.D.S.	\$ 3,904.14
HURON/ROUGE - WALLED LK ARM	\$ 917.24
TOTAL	\$ 2,759,750.04
WATER:	
WEST BLOOMFIELD SECTION IX	\$ 880,384.21
AUBURN HILLS #3	\$ 429,410.17
WALLED LAKE #1	\$ 395,066.50
WEST BLOOMFIELD SECTION XI	\$ 39,057.80
WATERFORD #3	\$ 28,064.90
LAPEER/BROWN ROAD	\$ 1,655.15
WEST BLOOMFIELD SECTION VIII	\$ 1,137.54
TOTAL	\$ 1,774,776.27
GRAND TOTAL	\$ 7,568,062.74

**OAKLAND COUNTY DRAIN COMMISSIONER
SUMMARY OF CONSTRUCTION EXPENDITURES
FOR THE YEAR 1988**

CONTRACTOR	PROJECT	\$\$ PAID BY PROJECT	TOTAL \$\$ PAID
FAIRFIELD CONST	AUBURN HILLS SWR #2	\$ 852,597.00	
	AUBURN HILLS WTR #3	\$ 40,415.25	\$ 893,012.25
ADAMO CONTRACTING	W BLMFLD WTR SECT IX		\$ 846,381.80
CLARK CONSTRUCTION	MILFORD SEWER #2		\$ 521,439.76
P & R CONTRACTING	AUBURN HILLS WTR #3	\$ 300,921.10	
	AUBURN HILLS SWR #2	\$ 246,223.15	
	BEECHMONT DRAIN	\$ 142,191.35	\$ 689,335.60
RICHARD MANCINI	CADDELL DRAIN		\$ 160,952.83
YATES CONSTRUCTION	PONTIAC CREEK EXT DRN		\$ 108,854.47
ROZ-L EQUIPMENT	WALLED LK WATER #1	\$ 347,165.00	
	KARAS DRAIN	\$ 295,985.75	\$ 643,150.75
DRAKEFORD INC	KEEGO HARBOR DRAIN		\$ 339,445.65
L D'AGOSTINI	NELSON DRAIN	\$ 607,514.25	
	IRELAND DRAIN	\$ 586,919.46	\$1,194,433.71
PACER CONTRACTING	COLEMAN/FRIEDMAN SWR		\$ 174,712.87
DAN'S EXCAVATING	M-15 DRAIN	\$ 344,217.03	
	FREDERICKS DRAIN	\$ 22,257.59	\$ 366,474.62
O'LAUGHLIN CONST	EV/FRM SWR-WALNUT LK		\$ 46,029.00
V.I.L. CONST	TWELVE TOWNS DRAIN		\$ 639.26
TOTAL CONSTRUCTION EXPENDITURES			\$5,984,862.57

**OAKLAND COUNTY DRAIN COMMISSIONER
SUMMARY OF CONSULTING ENGINEER EXPENDITURES
FOR THE YEAR 1988**

CONSULTING ENGINEER	PROJECT	\$\$ PAID BY PROJECT	TOTAL \$\$ PAID
HUBBELL, ROTH & CLARK	EVER/FARM SEWER	\$ 413,647.88	
	AMY RELIEF SEWER	\$ 135,110.86	
	IRELAND DRAIN	\$ 104,803.81	
	KARAS DRAIN	\$ 55,177.61	
	W BLMFLD WTR SECT XI	\$ 39,057.80	
	NELSON DRAIN	\$ 30,887.11	
	FREDERICKS DRAIN	\$ 28,962.15	
	W BLMFLD WTR SECT IX	\$ 25,941.68	
	THORNTON DRAIN	\$ 24,324.62	
	BARNARD DRAIN	\$ 5,501.06	
	EV/FRM SWR-WALNUT LK	\$ 2,786.46	
	S.O.C.S.D.S.	\$ 2,550.42	
	W BLMFLD WTR SECT 8	\$ 1,137.54	\$ 869,889.00
ORCHARD, HILTZ	AUBURN HILLS SWR #2	\$ 129,618.14	
	AUBURN HILLS WTR #3	\$ 77,411.84	
	ORION TWP SEWER #3	\$ 6,672.39	
	LAPEER/BROWN RD WTR	\$ 1,655.15	\$ 215,357.52
WADE-TRIM & ASSOC	MILFORD SEWER #2		\$ 124,241.63
ROWE ENGINEERING	KEEGO HARBOR DRAIN	\$ 22,284.32	
	BEECHMONT DRAIN	\$ 16,440.40	\$ 38,724.72
JOHNSON & ANDERSON	COLEMAN/FRIEDMAN SWR	\$ 34,902.53	
	DRAYTON PLAINS DRAIN	\$ 6,000.00	\$ 40,902.53
MCNAMEE, PORTER	WALLED LAKE WATER #1		\$ 43,609.90
SPALDING-DEDECKER	HURON/ROUGE SDS (Walled Lk Arm)		\$ 917.24
TOTAL CONSULTING ENGINEER EXPENDITURES			\$1,333,642.54

**OAKLAND COUNTY DRAIN COMMISSIONER
SUMMARY OF ENGINEERING SERVICES & ATTORNEY EXPENDITURES
FOR THE YEAR 1988**

ENGINEERING SERVICES & ATTORNEYS	TOTAL \$\$ PAID
ENGINEERING SERVICES:	
TESTING ENGINEERS & CONSULTANTS, INC	\$ 37,923.50
PROFESSIONAL ENGINEERING ASSOC, INC	\$ 10,025.41
GIFFELS-WEBSTER ENGINEERING, INC	\$ 2,864.56
NEYER, TISEO & HINDO LTD	\$ 1,345.30
HUBBELL, ROTH & CLARK, INC	\$ 1,353.72
TOTAL ENGINEERING SERVICES	\$ 53,512.49
ATTORNEYS:	
DICKINSON, WRIGHT, MOON, VANDUSEN & FREEMAN	\$ 117,719.19
KOHL, SECREST, WARDLE, LYNCH, CLARK & HAMPTON	\$ 46,204.48
SCHLUSSEL, LIFTON, SIMON, RANDS, GALVIN & JACKIER	\$ 32,121.47
TOTAL ATTORNEY FEES	\$ 196,045.14
TOTAL ENGINEERING, CONSTRUCTION AND ATTORNEY EXPENDITURES	\$7,568,062.74

PROJECTS UNDER DEVELOPMENT

DRAINS UNDER DEVELOPMENT

During 1988, there were many new projects in various phases of preliminary engineering design and easement acquisition. Twelve Chapter 20 drain projects were in active development in various municipalities within Oakland County. Each of these projects were initiated with a petition from the local municipalities involved requesting a drainage district to be established. The Drainage Board subsequently held a meeting at which time the project was determined practical and necessary for the public health. These drain projects are listed below.

<u>Project Name</u>	<u>Municipality</u>	<u>Consulting Engineer</u>	<u>Estimated Cost</u>
Calandro	Roch Hills	Hubbell, Roth	\$1,200,000
Crake	Roch Hills	Hubbell, Roth	\$1,500,000
Dorothy Webb	W Blmfld Twp	Giffels-Webster	\$400,000
Fredericks II	City of Troy	Hubbell, Roth	\$1,550,000
Hampton	Roch Hills	MCS Associates	\$250,000
Jensen	Roch Hills	Hubbell, Roth	\$725,000
Johnson	Auburn Hills	Orchard, Hiltz	\$3,000,000
Kemp	W Blmfld Twp	Drain Commissioner	\$52,000
King	City of Troy	Hubbell, Roth	\$820,000
Lueders	Roch Hills	Hubbell, Roth	N/A
Paint Creek	Orion Twp	R K Engineering	\$65,000
Van Tassel	Orion Twp	Giffels-Webster	N/A

SEWER & WATER PROJECTS UNDER DEVELOPMENT

During 1988, there were many new water and sewer projects in various phases of preliminary engineering design and easement acquisition. A brief summary of the more significant projects follows.

Evergreen-Farmington Pollution Control Facilities

The Evergreen-Farmington Sewage Disposal District is an area of approximately 130 square miles within southern Oakland County which serves all or part of sixteen communities.

Due to population growth over the years, the regional interceptors and local sanitary sewage collection systems within the Evergreen-Farmington District have been subject to excessive infiltration/inflow, and lack the necessary capacity to collect and transport peak wastewater flows. Early in 1976, the sixteen communities requested Oakland County to apply for a Facilities Planning Grant, and provided the local share as an advance to finance the studies. The Facilities Plan studies were completed in October of 1982. Preparation of construction plans for portions of Evergreen-Farmington Pollution Control Facility have now begun. The majority of the project will be completed in two segments.

Segment I includes the construction of a 2.26 million gallon retention facility, improvements to the existing Muirwood Pumping Station and construction of approximately 6,300 lineal feet of 54" diameter tunnel sewer and 7,400 lineal feet of 30" force main to relieve the existing Eight Mile Road Interceptor. A short summary of other pertinent project information follows.

- Consulting Engineer - Hubbel, Roth & Clark, Inc.
- General Contractor - Advertised for bid in April, 1989
- Drain Office Project Eng. - Gary Aho, P.E.

- Existing Population Served - 309,354
- Ultimate Population Served - 494,022

	<u>Segment I</u>	<u>Segment II</u>
Estimated Project Cost	\$21.4 mil	\$17.0 mil
Estimated Federal Grant Share	\$ 8.5 mil	Not available
Estimated Local Share	\$12.9 mil	Not available

Segment II is now under design with construction scheduled to begin in 1990.

Wixom Sewage Disposal System - Ext. No. 2

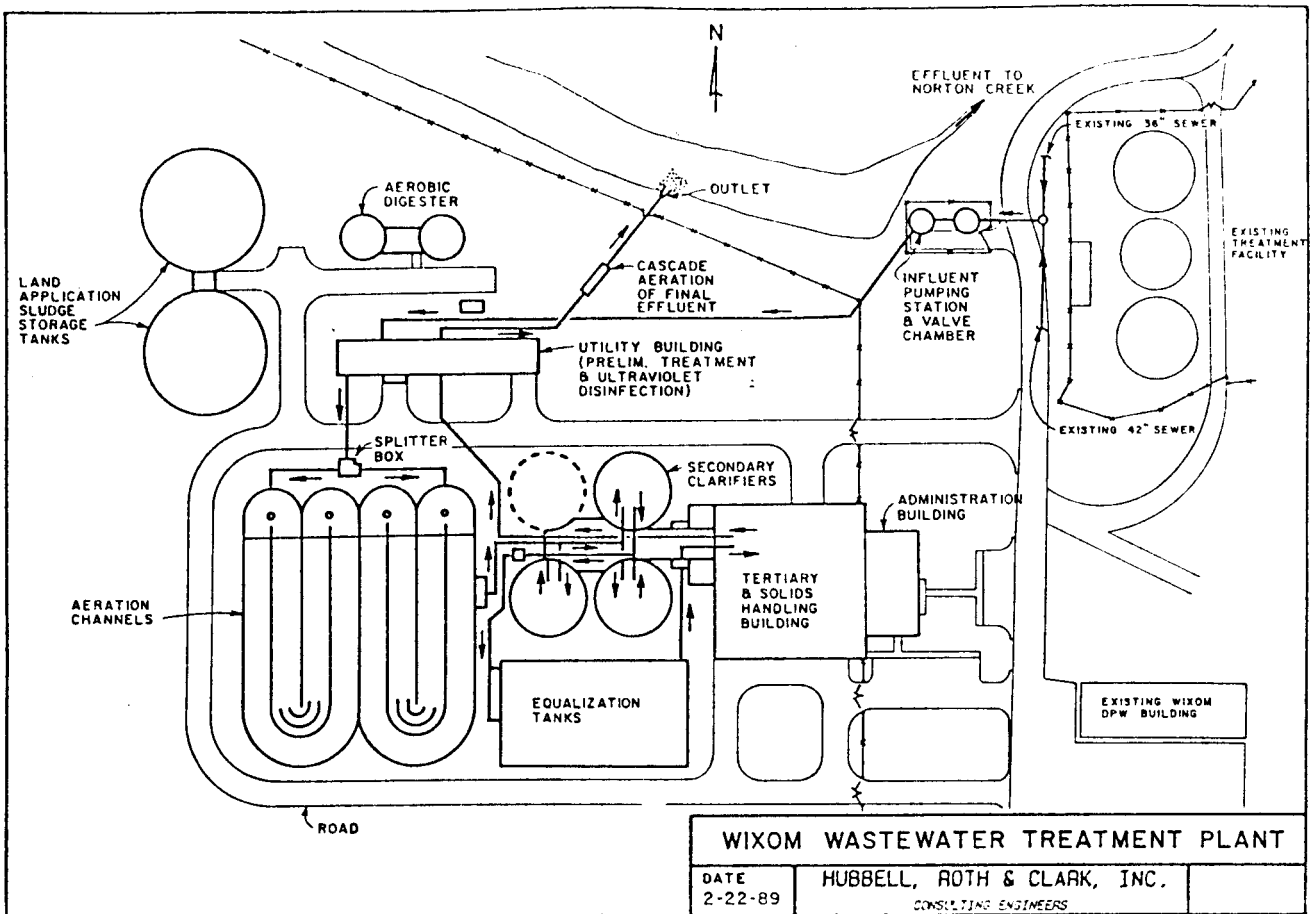
The City of Wixom has requested Oakland County to construct an activated sludge wastewater treatment plant to treat an average flow of 3.0 million gallons per day. The plant will be constructed in the northeast corner of the existing Wixom seepage cell site. A short summary of other pertinent project information and a layout of the project follows.

Consulting Engineer - Hubbell, Roth & Clark, Inc.
 General Contractor - Lerner-Linden, Inc./C.A. Hull Co.
 Major Indus. Contributor - Ford Motor Company
 Drain Office Project Eng. - Philip Sanzica, P.E.

Existing Population Served - 8,500
 Ultimate Population Served - 17,000

Total Project Cost - \$20,000,000
 EPA Construction Grant - \$ 9,230,000
 Local Share Cost - \$10,770,000

Construction is to begin in February, 1989.



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 the City of Novi in Oakland County. All wastewater accepted by the system will be treated by the City of Detroit Wastewater Treatment Plant.

Wayne County and City of Detroit facilities are to be constructed in a 3-segment program starting in mid-year 1989 with a target completion date in June of 1993. No construction will take place in Oakland County. H. James Lueders, Chief Engineer, will serve as project engineer.

The present discharge capacity of the City of Novi into the Wayne County Interceptor is 4.00 cfs; as the result of construction of this project, the ultimate discharge capacity of the City of Novi into the Wayne County Interceptor will be increased to 20.48 cfs. The following table identifies the estimated project cost for each segment which has been allocated to the City of Novi.

	<u>Project Cost</u>
Segment 1	\$ 8,214,000
Segment 2	1,446,000
Segment 3	638,000
	<hr/>
Total	\$10,298,000

Included within these figures are approximately \$200,000 in Oakland County costs for the sale of bonds to finance the City of Novi's share in the project. The total cost of the North Huron Valley-Rouge Valley Wastewater Control System improvements is approximately \$57,000,000, with approximately 19% of that cost allocated to the City of Novi.

Huron-Rouge Sewage Disposal System
Walled Lake-Novi Wastewater Treatment Plant 1989 Enlargement

The cities of Walled Lake and Novi have requested Oakland County to construct a new activated sludge treatment unit, a new administration building and a new blower building to house the process blowers, sludge pumps and rotary sludge thickener. The proposed improvements also include necessary site revisions to accommodate these additions and a sludge storage tank for stabilization of sludge. Listed below are other pertinent facts concerning this project which is scheduled for construction in 1989.

Consulting Engineer - McNamee, Porter and Seeley
Estimated Bid Date - October, 1989
Drain Office Project Eng. - Gary Aho, P.E.

Total Estimated Project Cost - \$ 5,550,000

Oakland County Water Supply and Sewage Disposal System
For Rochester Hills 1988 Extensions

The City of Rochester Hills has requested Oakland County to proceed with acquiring right of way, constructing and financing the above-referenced project. A short summary of other pertinent information concerning the project follows.

Consulting Engineer - Hubbell, Roth & Clark, Inc.
General Contractor - Adamo Contracting Corporation
Drain Office Project Eng. - William E. Klockow, P.E.
Bid Date - November 10, 1988
1st Phase of Construction - \$ 1,570,630

Total Estimated Project Cost - \$12,000,000

This project is to be financed by surplus funds held by Oakland County from prior water and sewer construction projects, and bond sale when these funds are exhausted.

Amy Relief Sewers/Evergreen-Farmington S.D.S.

This project is being developed under a contractual agreement *between the Drain Commissioner and the following municipalities:* The Township of Bloomfield, the City of Bloomfield Hills and the City of Auburn Hills.

The project consists of approximately 25,000 lineal feet of 10" through 24" diameter sanitary sewer, a 4,500 GPM pumping station and miscellaneous appurtenances. The project is designed to provide sanitary relief for the North Evergreen Interceptor within the above communities.

During 1988, the scope of this project was modified by the Department of Natural Resources. The DNR modifications will necessitate contract and plan revisions. It is anticipated that these revisions, and the resulting delays in obtaining the necessary easements and permits, will postpone the start of construction until the Fall of 1989. A short summary of other pertinent information concerning the project follows.

Consulting Engineer - Hubbell, Roth and Clark, Inc.
Drain Office Project Eng. - Donald L. Mills, P.E.
Project To Be Financed By - Available Local Funds & Bond Sale

Total Estimated Project Cost - \$ 5,000,000

LAKE LEVEL PROJECTS UNDER DEVELOPMENT

Under the provisions of the Inland Lake Level Act, Act No. 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. During 1988, proceedings for two new lake level projects were initiated by petition.

Crystal Lake - Walter Moore Dam

On May 13, 1986, petitions were received by the Oakland County Drain Commissioner to establish a legal level for Crystal Lake. The petitions also requested that a dam be constructed at the outlet of Crystal Lake sufficient to keep and maintain the level of the lake at its normal elevation. Crystal Lake is located in Section 32 of the City of Pontiac and has a surface area of approximately 51 acres.

In a resolution dated June 7, 1988, the City of Pontiac authorized the advance of \$200,000 to finance the entire cost of constructing a new dam which is to be known as the Walter Moore Dam. On August 1, 1988, the engineering services of Professional Engineering Associates, Inc., were retained to prepare the construction plans and specifications for the new dam. Mr. Ronald R. Karttunen, P.E. has been assigned the Drain Office project engineer for the construction of the Walter Moore Dam.

On September 22, 1988, the Oakland County Board of Commissioners approved a resolution authorizing the establishment of a lake level for Crystal Lake. The Office of the Prosecuting Attorney will file in Circuit Court, a civil complaint to establish the lake level.

Bunny Run Lake Dam

On August 30, 1988, petitions were received by the Drain Commissioner requesting that a legal level be established for Bunny Run Lake. The petitions also request that a new dam be constructed, to replace the existing deteriorated structure, at the outlet of Bunny Run Lake sufficient to maintain the level of the lake at its current elevation. Bunny Run Lake is located in Section 1 of Orion Township and has a surface area of approximately 11.0 acres.

The Drain Commissioner's engineering staff is presently preparing a preliminary design and cost estimate for the new dam structure. If a method of financing is determined, it is anticipated that construction of the new dam may be possible in late 1989.

CANAL CLEANOUT PROJECTS UNDER DEVELOPMENT

The Oakland County Drain Commissioner has received several inquiries regarding canal cleanout projects. The Drain Commissioner has recommended that the residents adjacent to each canal file a petition, under the provisions of the Drain Code, to establish each canal as a county drain. The engineering and permits necessary to deepen the canal will be undertaken by the Drain Commissioner, and the cost of the work will be assessed against the real property that benefits from the canal improvement. Petitioners from the Townships of Oxford, West Bloomfield and the City of Wixom have made application to establish special assessment districts for the following projects:

Oxford Township

- Beemer Drain
- Tan Lake Drain

City of Wixom

- Loon Lake Drain

West Bloomfield Township

- Pine Lake Drain
- Upper Long Lake Drain
- Walnut Lake Drain

The location of a site to dispose of dredged material removed from the canal is a critical factor. It is extremely difficult to obtain the necessary permits to proceed with work in these canals, and the cost of any proposed work is hard to determine in advance of bidding.

Mr. Philip Sanzica, P.E. has been designated the Drain Office project engineer for these canal projects.

STORM DRAIN PROGRAMS

STORM DRAIN PROGRAMS

West Bloomfield Storm Drain Program

The Charter Township of West Bloomfield by an ordinance adopted on February 7, 1986 now requires that proposed storm drainage facilities in new subdivisions and commercial developments be constructed as county drains to be operated and maintained by the Oakland County Drain Commissioner. Accordingly, the Drain Commissioner, under the provisions of Section 433 of the Drain Code, has entered into agreements 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 subdivision or development bear the future costs of operation and maintenance of the drain by special assessment.

Construction of thirteen new West Bloomfield Township drains under Section 433 of the Drain Code was completed in 1988. An additional 10 West Bloomfield Township drain projects established under Section 433 of the Drain Code started construction in 1988. Michael J. Lamb, is the engineer responsible for the supervision of this program.

Oakland Township Storm Drain Program

Oakland Township by an ordinance adopted on September 27, 1987 now requires that proposed storm drainage facilities in new subdivisions be constructed as county drains and operated and maintained by the Oakland County Drain Commissioner. Accordingly, the Drain Commissioner, under the provisions of Section 433 of the Drain Code, has entered into agreements 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 subdivision bear the future costs of operation and maintenance of the drain by special assessment.

Construction of one new Oakland Township drain under Section 433 of the Drain Code was completed in 1988. One additional Oakland Township drain project established under Section 433 of the Drain Code started construction in 1988. Michael J. Lamb is the engineer responsible for the supervision of this new program.

LAKE IMPROVEMENT BOARDS

LAKE IMPROVEMENT BOARDS

There has been a substantial increase in the number of Lake Improvement Boards in Oakland County during the last several years. At the present time there are 30 Lake Improvement Boards operating in 12 townships and the City of Troy. Ten members of the Board of Commissioners serve on one or more Lake Improvement Boards. C. Hugh Dohany, the Oakland County Treasurer, serves as the Treasurer for 17 of the Lake Improvement Boards. The Township Treasurers of Bloomfield, Waterford and White Lake Townships serve as the Treasurer for 13 Lake Improvement Boards.

Each Lake Improvement Board may determine to pursue one or more lake improvement projects on a lake. Most frequently, the Lake Improvement Board project will be designed to improve water quality and clarity by the mechanical harvesting of aquatic weeds or the chemical treatment of weeds in the lake. During 1988, Lake Improvement Boards on 10 lakes were involved in the mechanical harvesting of weeds from their lake. Lake Improvement Boards on 10 lakes used a program of chemical treatment to kill aquatic weed growth. On 7 lakes, both mechanical weed harvesting and chemical treatment were used. Information containing data on Lake Improvement Board expenditures for 1988 has been summarized on the two pages that follow.

Engineering studies on several lakes have also identified the value of a lake dredging program to remove muck and bottom sediments from all or a portion of several lakes. However, several factors make proceeding with a lake dredging project extremely difficult. First of all, there is an extremely high cost associated with a dredging project. Secondly, locating and obtaining a disposal site for material dredged from the bottom of the lake can be very difficult. Finally, problems can be encountered when trying to obtain the necessary permits from the Michigan Department of Natural Resources.

All Lake Improvement Board programs are financed by special assessment rolls against real property abutting the lake or having access to the lake. During 1988, 24 Lake Improvement Boards in Oakland County spread a special assessment for lake improvement work on their lake. The total amount of the special assessment rolls spread in 1988 on the 17 lakes for which Oakland County is the Treasurer was \$446,645.22.

**OAKLAND COUNTY DRAIN COMMISSIONER
LAKE IMPROVEMENT PROJECTS FOR 1988
SUMMARY OF ENGINEERING, HARVESTING & TREATMENT EXPENDITURES**

SERVICE PROVIDER	PROJECT	\$\$ PROJECT	TOTAL \$\$ PAID
ENGINEER SERVICES:			
PROGRESSIVE ARCHITECTURAL ENGINEERING PLANNERS	CHARNWOOD LOUISE	\$ 18,345.32 \$ 4,500.00	
	DIXIE	\$ 3,331.27	\$ 26,176.59
CLEARY ENGINEERS	PONTIAC VAN NORMAN WALTERS WHITE DIXIE	\$ 6,942.60 \$ 4,300.00 \$ 3,800.00 \$ 2,240.00 \$ 400.00	
ECOLOGICAL RESEARCH SERVICES OLE ANDERSON P.E.	BLUE HERON DUCK		\$ 17,682.60 \$ 898.73 \$ 844.92
GROUP TOTAL			\$ 45,602.84
WEED HARVESTING SERVICES:			
THE WITTBOLD COMPANY	PONTIAC INDIANWOOD WHITE	\$ 29,920.00 \$ 24,535.00 \$ 24,000.00	\$ 78,455.00
BIG LAKE QUALITY WATER ASSOC LAKE RESTORATION ASSOC	BIG LAKEVILLE		\$ 32,087.50 \$ 27,862.50
CLEARWATER WEED HARVESTING	DIXIE VAN NORMAN LOUISE	\$ 13,100.00 \$ 7,380.00 \$ 4,000.00	\$ 24,480.00
INLAND LAKES LANDSCAPING ENVIRONMENTAL AQUATIC	DUCK DUCK		\$ 11,250.00 \$ 11,250.00
AQUATIC NUISSANCE PLANT CTL AQUATIC PLANT CUTTERS	WALTERS VAN NORMAN PONTIAC		\$ 9,399.00 \$ 3,200.00 \$ 3,000.00
GROUP TOTAL			\$ 200,984.00
CHEMICAL TREATMENT SERVICES:			
AQUATIC TECHNOLOGIES	PONTIAC LOUISE WALTERS	\$ 31,779.20 \$ 9,330.00 \$ 7,335.00	\$ 48,444.20
AQUA WEED CONTROL OF OAK CTY	WHITE DUCK VAN NORMAN	\$ 24,407.50 \$ 15,150.00 \$ 4,735.00	\$ 44,292.50
LAKE WEED-A-WAY ROSE EXTERMINATORS	DIXIE CHARLICK WOODRUFF TOMAHAWK		\$ 9,200.00 \$ 3,938.00 \$ 3,864.00 \$ 1,287.00
GROUP TOTAL			\$ 111,025.70
GRAND TOTAL			\$ 357,612.54

OAKLAND COUNTY DRAIN COMMISSIONER
LAKE IMPROVEMENT EXPENDITURE SUMMARY
FOR THE YEAR OF 1988

PROJECT	ENGINEER SERVICES	HARVESTING SERVICES	TREATMENT SERVICES	PUB LEGAL NOTICES	DETROIT EDISON	MISC CHARGES	ATTORNEY FEES	TOTAL EXPENDITURES
PONTIAC LAKE	\$6,942.60	\$32,920.00	\$31,779.20	\$0.00	\$0.00	\$14,112.88	\$791.25	\$86,545.93
WHITE LAKE	\$2,240.00	\$24,000.00	\$24,407.50	\$0.00	\$0.00	\$3,173.25	\$791.25	\$54,612.00
DUCK LAKE	\$844.92	\$22,500.00	\$15,150.00	\$98.94	\$0.00	\$3,665.70	\$0.00	\$42,259.56
BIG LAKE	\$0.00	\$32,087.50	\$0.00	\$149.50	\$0.00	\$8.15	\$0.00	\$32,245.15
LAKEVILLE LAKE	\$0.00	\$27,862.50	\$0.00	\$73.50	\$0.00	\$76.90	\$0.00	\$28,012.90
BIXIE LAKE	\$3,731.27	\$13,100.00	\$9,200.00	\$103.50	\$0.00	\$43.75	\$0.00	\$26,178.52
INDIANWOOD LAKE	\$0.00	\$24,535.00	\$0.00	\$0.00	\$0.00	\$4.20	\$0.00	\$24,539.20
LAKE CHARNWOOD	\$18,345.32	\$0.00	\$0.00	\$395.50	\$0.00	\$4,160.84	\$0.00	\$22,901.66
WALTERS LAKE	\$3,800.00	\$9,399.00	\$7,335.00	\$0.00	\$0.00	\$126.07	\$0.00	\$20,660.07
VAN NORMAN LAKE	\$4,300.00	\$10,580.00	\$4,735.00	\$0.00	\$0.00	\$130.33	\$0.00	\$19,745.33
LOUISE LAKE	\$4,500.00	\$4,000.00	\$9,330.00	\$0.00	\$0.00	\$0.00	\$0.00	\$17,830.00
WOODRUFF LAKE	\$0.00	\$0.00	\$3,864.00	\$0.00	\$2,164.84	\$0.00	\$0.00	\$6,028.84
CHARLICK LAKE	\$0.00	\$0.00	\$3,938.00	\$36.32	\$1,199.45	\$0.00	\$0.00	\$5,173.77
TOMAHAWK LAKE	\$0.00	\$0.00	\$1,287.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,287.00
BLUE HERON LAKE	\$898.73	\$0.00	\$0.00	\$0.00	\$0.00	\$3.85	\$0.00	\$902.58
	\$45,602.84	\$200,984.00	\$111,025.70	\$857.26	\$3,364.29	\$25,505.92	\$1,582.50	\$388,922.51

NOTE - MISCELLANEOUS CHARGES INCLUDE:

- COPIER CHARGES
- PHOTO COPY EXPENSES
- POSTAGE EXPENSES
- EQUIPMENT RENTAL CHARGES
- MILEAGE CHARGES

- ## WHITE LAKE INCLUDES PAYMENT TO WHITE LAKE TWP FOR MAINTAINING HARVEST EQUIPMENT OF \$3,000
- ## DUCK LAKE INCLUDES \$3,000 PAYMENT TO HIGHLAND TWP FOR REPAIR AND MAINT OF HARVEST EQUIPMENT
- ## PONTIAC LAKE INCLUDES \$14,103.08 PAYMENT TO WHITE LAKE TWP FOR USE AND MAINT OF HARVESTING EQUIPMENT
- ## LAKE CHARNWOOD INCLUDES \$3,344.84 IN SALARIES AND FRINGE BENEFITS

FINANCIAL STATEMENTS

FINANCIAL STATEMENTS

Summary financial statements for the Southeastern Oakland County Sewage Disposal System and for major current projects discussed in the Annual Report are included in this volume. Volume II and Volume III of this Annual Report contain complete financial statements for every County drainage district, and itemized statements of all of the various accounts maintained in connection with the construction, operation, and maintenance of all of the projects under the jurisdiction of the Oakland County Drain Commissioner.

Reference should be made to the Table of Contents of the Financial Statement Volumes (Volume II and Volume III) for reference to any specific project or fund account not included in these summary statements.

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 BALANCE SHEET
 SOCSDS OPERATION AND MANT SD

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87700

ASSETS

CASH	\$(	27,316.01)
INVESTMENTS		2,650,000.00
DUE FROM MUNICIPALITIES		1,032,890.60
DUE FROM OTHER DRAIN FUNDS		4,646.93
DUE FROM OTHER FUNDS		26,395.36
ACCRUED INTEREST RECEIVABLE		6,396.10
PREPAID EXPENSES		12,043.30
FIXED ASSETS-BUILDINGS		87,038.46
FIXED ASSETS		8,599,939.81
FIXED ASSETS-EQUIPMENT		109,809.78
FIXED ASSETS-LAND & IMPROVEMNT		1,533.25
ALLOWANCE FOR DEPRECIATION	(	5,541,198.84)

TOTAL ASSETS	\$	6,962,178.74
		=====

LIABILITIES

ACCOUNTS PAYABLE	\$	.00
DUE TO MUNICIPALITIES		2,023,227.28
DUE TO OTHER FUNDS		15,808.66
VOUCHERS PAYABLE		1,196.98

TOTAL LIABILITIES		2,040,232.92

FUND-BALANCE

RESERVES		1,050,000.00
INVESTMENT IN FIXED ASSETS		3,247,462.45
UNDESIGNATED		624,483.37

TOTAL FUND BALANCE		4,921,945.82

TOTAL LIABILITIES & FUND BALANCE	\$	6,962,178.74
		=====

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 BALANCE SHEET
 SOCSDS OPERATION AND MANT PC

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87710

ASSETS

CASH	\$	54,522.44
INVESTMENTS		1,975,000.00
DUE FROM MUNICIPALITIES		1,162,086.28
DUE FROM OTHER FUNDS		26,611.26
ACCRUED INTEREST RECEIVABLE		4,243.09
PREPAID EXPENSES		2,837.16
FIXED ASSETS-BUILDINGS		2,726,730.28
FIXED ASSETS		21,193,543.09
FIXED ASSETS-EQUIPMENT		203,681.95
FIXED ASSETS-LAND & IMPROVEMNT		624,465.22
ALLOWANCE FOR DEPRECIATION	(	9,329,093.65)

TOTAL ASSETS	\$	18,644,627.12
		=====

LIABILITIES

DUE TO MUNICIPALITIES	\$	1,793,461.08
DUE TO OTHER FUNDS		16,245.08
VOUCHERS PAYABLE		7,050.99

TOTAL LIABILITIES		1,816,757.15

FUND-BALANCE

RESERVES		700,000.00
INVESTMENT IN FIXED ASSETS		15,356,859.21
UNDESIGNATED		771,010.76

TOTAL FUND BALANCE		16,827,869.97

TOTAL LIABILITIES & FUND BALANCE	\$	18,644,627.12
		=====

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 SOCSOS OPERATION AND MANT SD

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87700

REVENUES

DISPOSAL PERMITS	\$	13,145.00
INCOME FROM INVESTMENTS		152,015.43
LOOK BACK ADJUSTMENT		206,572.15
MISCELLANEOUS		350.00
REFUND-PRIOR YEARS EXPENDITURE		12,482.38
REIMBURSEMENT-ACCOUNTING SERV.		19,173.86
REIM FOR SALARIES-DRAIN PROJ		21,304.94
SEWAGE DISPOSAL SERVICES		9,580,073.87

TOTAL REVENUES		10,005,117.63

EXPENDITURES

SALARIES - REGULAR		132,042.56
OVERTIME		1,382.40
HOLIDAY		8,721.22
HOLIDAY OVERTIME		149.51
ANNUAL LEAVE		12,516.44
HOLIDAY COMP.		812.26
SICK LEAVE		7,755.95
SHIFT PREMIUM		18.97
SERVICE INCREMENT		13,139.67
SUMMER HELP		6,885.60
DEATH LEAVE		404.23
FRINGE BENEFITS	(	5,522.10)
FRINGE BENEFITS-WORKERS COMP		1,873.36
FRINGE BENEFITS-GROUP LIFE		488.52
FRINGE BENEFITS-RETIREMENT		34,268.16
FRINGE BENEFITS-HOSPITALIZATIO		22,350.28
FRINGE BENEFIT-SOCIAL SECURITY		14,188.55
FRINGE BENEFIT-DENTAL		3,808.40
FRINGE BENEFITS-DISABILITY		1,807.90
FRINGE BENEFIT-UNEMP INSURANCE		286.93
INVESTMENT FEES		277.52
AUDITING SERVICE		4,350.00
BUILDING MAINTENANCE CHARGES		197.53
DEPRECIATION		217,512.72
DEPRECIATION-EQUIP-OPERATING		6,567.48
EQUIPMENT REPAIR - OPERATING		2,869.95
EQUIPMENT REPAIR - MTR VEHICLE		405.83

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 SOCSDS OPERATION AND MANT SD

DECEMBER 31, 1988

	CONSTRUCTION FUND NO 87700
ENGINEERING AND SURVEY	157.98
EQUIPMENT REPAIRS & MAINT.	2,365.20
GAS - NATURAL	2,563.27
INSURANCE	3,904.14
LANDS & GROUNDS MAINTENANCE	818.81
LAUNDRY & CLEANING	622.52
LIGHT AND POWER	7,629.23
MAINTENANCE CONTRACT	3,374.00
MEMBERSHIP DUES & PUBLICATIONS	147.50
PROTECTIVE CLOTHING & EQUIP.	313.41
SEWAGE DISPOSAL SERVICES	9,328,218.94
SEWER MAINTENANCE	19,515.57
TRAVEL & CONFERENCE	(135.51)
WATER AND SEWAGE CHARGES	1,030.55
FILM & PROCESSING	77.93
LABORATORY SUPPLIES	2,159.03
OFFICE SUPPLIES	4.20
POSTAGE	49.07
DPW WATER & SEWER EQUIPMENT	962.70
CENTRAL STORES-HOUSKEEPING SUP	198.25
RADIO COMMUNICATIONS	1,375.56
LEASED VEHICLES	2,018.84
EQUIPMENT RENTAL	120.00
TELEPHONE COMMUNICATIONS	1,101.65
DRAIN EQUIPMENT	3,437.18

TOTAL EXPENDITURES	9,871,589.86

EXCESS (DEFICIENCY) OF REVENUES	-----
OVER EXPENDITURES	133,527.77

OTHER FINANCING SOURCES(USES)

TRANSFERS TO MUNICIPALITIES	(213,821.15)

TOTAL OTHER FINANCING SOURCES(USES)	(213,821.15)

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$(80,293.38)
	=====

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 SOCSDS OPERATION AND MANT PC

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87710

REVENUES

INCOME FROM INVESTMENTS	\$	100,547.03
LOOK BACK ADJUSTMENT		521,461.85
POLLUTION CONTROL SERVICES		5,899,999.98
REFUND-PRIOR YEARS EXPENDITURE		21,103.83
REIMBURSEMENT-ACCOUNTING SERV.		19,173.86
REIM FOR SALARIES-DRAIN PROJ		103.19

TOTAL REVENUES		6,562,389.74

EXPENDITURES

SALARIES - REGULAR	151,823.89
OVERTIME	5,325.36
HOLIDAY	7,867.77
HOLIDAY OVERTIME	64.41
ANNUAL LEAVE	10,621.57
HOLIDAY COMP.	693.84
SICK LEAVE	6,767.41
SHIFT PREMIUM	76.90
SERVICE INCREMENT	6,456.21
SUMMER HELP	4,936.99
DEATH LEAVE	145.26
FRINGE BENEFITS	5,803.30
FRINGE BENEFITS-WORKERS COMP	3,232.97
FRINGE BENEFITS-GROUP LIFE	476.65
FRINGE BENEFITS-RETIREMENT	30,763.22
FRINGE BENEFITS-HOSPITALIZATIO	17,592.26
FRINGE BENEFIT-SOCIAL SECURITY	12,816.28
FRINGE BENEFIT-DENTAL	2,781.64
FRINGE BENEFITS-DISABILITY	1,628.96
FRINGE BENEFIT-UNEMP INSURANCE	249.62
INVESTMENT FEES	197.75
AUDITING SERVICE	4,350.00
BUILDING MAINTENANCE CHARGES	4,469.72
DEPRECIATION	610,897.80
DEPRECIATION-EQUIP-OPERATING	13,827.97
EQUIPMENT REPAIR - OPERATING	6,092.03
EQUIPMENT REPAIR - MTR VEHICLE	934.61
ENGINEERING AND SURVEY	1,821.70
EQUIPMENT RENTAL	702.80

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 SOCSDS OPERATION AND MANT PC

DECEMBER 31, 1988

	CONSTRUCTION FUND NO 87710
EQUIPMENT REPAIRS & MAINT.	12,413.45
GARBAGE & RUBBISH DISPOSAL	609.05
GAS - NATURAL	5,686.50
INSURANCE	5,469.44
LANDS & GROUNDS MAINTENANCE	3,950.47
LAUNDRY & CLEANING	1,404.72
LIGHT AND POWER	23,374.51
MAINTENANCE CONTRACT	5,370.25
MAINTENANCE EQUIPMENT RENTAL	1,151.73
MEMBERSHIP DUES & PUBLICATIONS	55.00
POLLUTION CONTROL SERVICES	5,387,632.08
PROTECTIVE CLOTHING & EQUIP.	1,896.78
TRAVEL & CONFERENCE	1,754.50
WATER AND SEWAGE CHARGES	10,216.44
CHLORINATION SUPPLIES	32,740.26
FILM & PROCESSING	77.94
OFFICE SUPPLIES	329.07
POSTAGE	13.29
SHOP SUPPLIES	6,263.65
DPW WATER & SEWER EQUIPMENT	962.71
CENTRAL STORES-HOUSKEEPING SUP	779.45
RADIO COMMUNICATIONS	1,920.36
LEASED VEHICLES	4,548.81
EQUIPMENT RENTAL	120.00
STATIONERY STOCK	15.10
TELEPHONE COMMUNICATIONS	1,266.12
DRAIN EQUIPMENT	3,437.16

TOTAL EXPENDITURES	6,426,877.73

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	----- 135,512.01 -----
OTHER FINANCING SOURCES(USES)	
TRANSFERS TO MUNICIPALITIES	(521,461.84)

TOTAL OTHER FINANCING SOURCES(USES)	(521,461.84)

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$(385,949.83) =====

OAKLAND COUNTY
 CHAPTER 20 CONSTRUCTION FUNDS
 BALANCE SHEET
 KEEGO HARBOR DRAIN

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81662

ASSETS

CASH	\$	115,161.82
FIXED ASSETS		509,331.11

TOTAL ASSETS	\$	624,492.93
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	6,050.86

TOTAL LIABILITIES		6,050.86

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		509,331.11
UNDESIGNATED		109,110.96
DESIGNATED		14,806.50

		633,248.57

UNDESIGNATED	(	14,806.50)

TOTAL FUND BALANCE	(	14,806.50)

TOTAL LIABILITIES & FUND BALANCE	\$	624,492.93
		=====

OAKLAND COUNTY
 CHAPTER 20 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 KEEGO HARBOR DRAIN

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81662

REVENUES

DEPOSITS - ENG PLANS & SPECS	\$	525.00
INCOME FROM INVESTMENTS		15,767.37
PROPERTY TAX LEVY		37,149.70

TOTAL REVENUES		53,442.07

EXPENDITURES

SALARIES - REGULAR		21,487.14
PER DIEM		575.00
FRINGE BENEFITS		7,735.42
INVESTMENT FEES		131.95
LEGAL EXPENSE		2,469.40
CONTRACTED SERVICES		358,665.50
LICENSES AND PERMITS		1,083.00
OTHER ENGINEERING SERVICES		22,284.32
PUBLISHING LEGAL NOTICES		1,103.02
RECORDING FEES		75.00
SOIL TEST BORINGS		437.50
TRANSPORTATION		116.00
FILM & PROCESSING		23.85
MATERIAL & SUPPLIES		102.00
MICROFILM & REPRODUCTIONS		48.36
DRAIN EQUIPMENT		1,993.65

TOTAL EXPENDITURES		418,331.11

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (364,889.04) -----
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OTHER FINANCING SOURCES(USES)

OPERATING TRANSFERS IN		565,000.00
OPERATING TRANSFERS OUT	(91,000.00)

TOTAL OTHER FINANCING SOURCES(USES)		474,000.00

EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$	109,110.96 =====
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OAKLAND COUNTY
 CHAPTER 20 CONSTRUCTION FUNDS
 BALANCE SHEET
 NELSON DRAINAGE DISTRICT

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81605

ASSETS

CASH	\$	18,731.12
INVESTMENTS		873,500.00
ACCRUED INTEREST RECEIVABLE		2,577.71
FIXED ASSETS		1,864,968.31

TOTAL ASSETS	\$	2,759,777.14
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	20,185.22

TOTAL LIABILITIES		20,185.22

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		1,864,968.31
UNDESIGNATED		874,623.61
DESIGNATED		2,573.85

		2,742,165.77

UNDESIGNATED	(	2,573.85)

TOTAL FUND BALANCE	(	2,573.85)

TOTAL LIABILITIES & FUND BALANCE	\$	2,759,777.14
		=====

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

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81605

REVENUES

INCOME FROM INVESTMENTS	\$	89,009.89

TOTAL REVENUES		89,009.89

EXPENDITURES

SALARIES - REGULAR		26,506.00
PER DIEM		450.00
FRINGE BENEFITS		9,542.16
INVESTMENT FEES		808.10
LEGAL EXPENSE		37,355.40
APPRAISAL FEES		10,445.00
CONTRACTED SERVICES		647,487.90
LICENSES AND PERMITS		1,875.00
OTHER ENGINEERING SERVICES		38,981.11
PUBLISHING LEGAL NOTICES		161.50
PURCHASE OF LAND & EASEMENT		7,500.00
RECORDING FEES		7.00
R/W NEGOTIATION AND EXPENSE		365.00
TRANSPORTATION		75.50
ENGINEERING SUPPLIES		5.91
MAINTENANCE SUPPLIES		44.20
MATERIAL & SUPPLIES		8.19
OFFICE SUPPLIES		71.57
DRAIN EQUIPMENT		4,086.29

TOTAL EXPENDITURES		785,775.83

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (696,765.94) -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$ (696,765.94) =====
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OAKLAND COUNTY
 CHAPTER 20 CONSTRUCTION FUNDS
 BALANCE SHEET
 M-15 DRAIN

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81581

ASSETS

CASH	\$	2,260.72
INVESTMENTS		176,000.00
ACCRUED INTEREST RECEIVABLE		1,844.80
FIXED ASSETS		480,276.23

TOTAL ASSETS	\$	660,381.75
		=====

LIABILITIES

ACCOUNTS PAYABLE	\$	17,367.94
DUE TO OTHER FUNDS		5,063.08

TOTAL LIABILITIES		22,431.02

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		480,276.23
UNDESIGNATED		157,674.50

		637,950.73

TOTAL LIABILITIES & FUND BALANCE	\$	660,381.75
		=====

OAKLAND COUNTY
 CHAPTER 20 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 M-15 DRAIN

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81581

REVENUES

DEPOSITS - ENG PLANS & SPECS	\$	820.00
INCOME FROM INVESTMENTS		9,498.37
PROPERTY TAX LEVY		645,000.00

TOTAL REVENUES		655,318.37

EXPENDITURES

SALARIES - REGULAR		26,633.91
PER DIEM		500.00
FRINGE BENEFITS		9,588.19
INVESTMENT FEES		66.37
LEGAL EXPENSE		12,679.07
APPRAISAL FEES		1,900.00
CONTRACTED SERVICES		379,899.16
EQUIPMENT RENTAL		105.69
LICENSES AND PERMITS		1,690.20
OTHER ENGINEERING SERVICES		1,345.30
PUBLISHING LEGAL NOTICES		1,312.35
PURCHASE OF LAND & EASEMENT		10,912.00
RECORDING FEES		42.75
TRANSPORTATION		375.50
MATERIAL & SUPPLIES		167.75
OFFICE SUPPLIES		39.20
MICROFILM & REPRODUCTIONS		127.44
DRAIN EQUIPMENT		2,163.45

TOTAL EXPENDITURES		449,548.33

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- 205,770.04 -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$	205,770.04 =====
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OAKLAND COUNTY
 CHAPTER 20 CONSTRUCTION FUNDS
 BALANCE SHEET
 IRELAND DRAIN

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81639

ASSETS

CASH	\$	4,933.11
INVESTMENTS		240,000.00
ACCRUED INTEREST RECEIVABLE		700.00
FIXED ASSETS		15,465.87

TOTAL ASSETS	\$	261,098.98
		=====

LIABILITIES

DUE TO OTHER FUNDS	\$	10,642.16

TOTAL LIABILITIES		10,642.16

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		15,465.87
UNDESIGNATED		234,990.95
DESIGNATED	(	28,896.21)

		221,560.61

UNDESIGNATED		28,896.21

TOTAL FUND BALANCE		28,896.21

TOTAL LIABILITIES & FUND BALANCE	\$	261,098.98
		=====

OAKLAND COUNTY
 CHAPTER 20 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 IRELAND DRAIN

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 81639

REVENUES

INCOME FROM INVESTMENTS	\$	7,458.11
PERMITS		50.00
PRINCIPAL FROM MUNICIPALITIES		53,011.00
SALE OF BONDS		1,925,000.00

TOTAL REVENUES		1,985,519.11

EXPENDITURES

SALARIES - REGULAR		62,072.46
PER DIEM		500.00
FRINGE BENEFITS		22,346.10
BOND PRINTING EXPENSE		8,304.00
BOND RATING EXPENSE		5,000.00
INVESTMENT FEES		21.07
LEGAL EXPENSE		31,741.75
APPRAISAL FEES		4,350.00
CONTRACTED SERVICES		1,416,492.13
DISCOUNT ON BONDS		48,125.00
FINANCIAL CONSULTANT FEES		8,993.14
LICENSES AND PERMITS		2,690.00
OTHER ENGINEERING SERVICES		107,051.11
PUBLISHING LEGAL NOTICES		5,193.24
PURCHASE OF LAND & EASEMENT		16,613.00
RECORDING FEES		303.45
TRANSPORTATION		834.75
MATERIAL & SUPPLIES		797.25
OFFICE SUPPLIES		72.72
MICROFILM & REPRODUCTIONS		26.04
DRAIN EQUIPMENT		7,159.30

TOTAL EXPENDITURES		1,748,686.51

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- 236,832.60 -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$	236,832.60 =====
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OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 BALANCE SHEET
 AUBURN HILLS WSS EXT. NO.3

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87410

ASSETS

CASH	\$	19,001.52
INVESTMENTS		225,000.00
ACCRUED INTEREST RECEIVABLE		483.75
FIXED ASSETS		944,362.30

TOTAL ASSETS	\$	1,188,847.57
		=====

LIABILITIES

ACCOUNTS PAYABLE	\$	2,554.00
DUE TO OTHER FUNDS		394.67

TOTAL LIABILITIES		2,948.67

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		944,362.30
UNDESIGNATED		200,768.60
DESIGNATED		40,768.00

		1,185,898.90

TOTAL LIABILITIES & FUND BALANCE	\$	1,188,847.57
		=====

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 AUBURN HILLS WSS EXT. NO.3

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87410

REVENUES

INCOME FROM INVESTMENTS	\$	22,898.90
SALE OF BONDS		1,163,000.00

TOTAL REVENUES		1,185,898.90

EXPENDITURES

SALARIES - REGULAR		13,472.31
FRINGE BENEFITS		4,661.05
BOND ATTORNEY FEES		8,337.72
BOND PRINTING EXPENSE		402.62
BOND PROSPECTUS EXPENSE		1,384.98
BOND RATING EXPENSE		2,952.00
INVESTMENT FEES		48.22
CONTRACT ADMINISTRATION		4,265.21
CONTRACTED SERVICES		362,845.00
DESIGN FEES		52,662.81
ENGINEERING ADMINISTRATION		3,500.00
FINANCIAL CONSULTANT FEES		7,585.00
LAYOUT AND STAKING		10,748.00
LICENSES AND PERMITS		3,168.38
PERSONAL MILEAGE		22.00
PHOTOCOPY EXPENSE		91.87
PUBLISHING LEGAL NOTICES		1,161.43
SOIL TEST BORINGS		6,274.63
MATERIAL & SUPPLIES		390.42
POSTAGE		.69
DRAIN EQUIPMENT		1,764.55

TOTAL EXPENDITURES		485,738.89

EXCESS (DEFICIENCY) OF REVENUES		
OVER EXPENDITURES		700,160.01

EXCESS (DEFICIENCY) OF REVENUES		
AND OTHER SOURCES OVER		
EXPENDITURES AND OTHER USES	\$	700,160.01
		=====

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 BALANCE SHEET
 C.O.S.D.S. AUBURN HILLS EXT.#2

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87415

ASSETS

CASH	\$	58,313.57
INVESTMENTS		100,000.00
ACCRUED INTEREST RECEIVABLE		215.00
FIXED ASSETS		1,568,037.52

TOTAL ASSETS	\$	1,726,566.09
		=====

LIABILITIES

ACCOUNTS PAYABLE	\$	13,218.03
DUE TO OTHER FUNDS		1,188.71

TOTAL LIABILITIES		14,406.74

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		1,568,037.52
UNDESIGNATED		79,607.83
DESIGNATED		64,514.00

		1,712,159.35

TOTAL LIABILITIES & FUND BALANCE	\$	1,726,566.09
		=====

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 C.O.S.D.S. AUBURN HILLS EXT.#2

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87415

REVENUES

INCOME FROM INVESTMENTS	\$	25,159.35
SALE OF BONDS		1,687,000.00

TOTAL REVENUES		1,712,159.35

EXPENDITURES

SALARIES - REGULAR		65,842.04
FRINGE BENEFITS		23,388.16
BOND ATTORNEY FEES		11,998.19
BOND PRINTING EXPENSE		579.38
BOND PROSPECTUS EXPENSE		1,993.02
BOND RATING EXPENSE		4,248.00
INVESTMENT FEES		59.47
LEGAL EXPENSE		2,301.20
CONTRACT ADMINISTRATION		10,734.56
CONTRACTED SERVICES		1,172,922.34
DESIGN FEES		77,192.70
EQUIPMENT RENTAL		25.70
FINANCIAL CONSULTANT FEES		10,915.00
LAYOUT AND STAKING		36,644.50
LICENSES AND PERMITS		4,227.92
PERSONAL MILEAGE		189.25
PHOTOCOPY EXPENSE		126.12
PUBLISHING LEGAL NOTICES		1,671.32
PURCHASE OF LAND & EASEMENT		5,000.00
SOIL TEST BORINGS		10,268.68
MATERIAL & SUPPLIES		423.36
OFFICE SUPPLIES		67.00
DRAIN EQUIPMENT		6,620.45

TOTAL EXPENDITURES		1,447,438.36

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- 264,720.99 -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	\$	264,720.99 =====
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OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 BALANCE SHEET
 MILFORD S.D.S. EXT. #2

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87388

ASSETS

CASH	\$	37,502.00
INVESTMENTS		175,000.00
DUE FROM FEDERAL GOVERNMENT		187,817.00
ACCRUED INTEREST RECEIVABLE		974.17
FIXED ASSETS		6,938,828.03

TOTAL ASSETS	\$	7,340,121.20
		=====

LIABILITIES

ACCOUNTS PAYABLE	\$	13,872.00
DUE TO OTHER FUNDS		15.00
DEFERRED INCOME		187,817.00

TOTAL LIABILITIES		201,704.00

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		6,938,828.03
UNDESIGNATED		199,589.17

		7,138,417.20

TOTAL LIABILITIES & FUND BALANCE	\$	7,340,121.20
		=====

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

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87388

REVENUES

GARNISHMENT FEES	\$	6.00
GRANTS		369,927.00
INCOME FROM INVESTMENTS		13,374.04

TOTAL REVENUES		383,307.04

EXPENDITURES

SALARIES - REGULAR		3,890.63
FRINGE BENEFITS		140.62
INVESTMENT FEES		28.38
LEGAL EXPENSE		279.50
CONTRACT ADMINISTRATION		90,525.99
CONTRACTED SERVICES		504,439.39
INSPECTION		9,581.04
TRANSPORTATION		.75
OFFICE SUPPLIES		2.20
DRAIN EQUIPMENT		58.30

TOTAL EXPENDITURES		608,946.80

EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES		----- (225,639.76) -----
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EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES		\$ (225,639.76) =====
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OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 BALANCE SHEET
 WEST BLOOMFIELD WSS SEC. IX

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87405

ASSETS

CASH	\$	17,402.89
INVESTMENTS		200,000.00
DUE FROM OTHER FUNDS		25,400.75
ACCRUED INTEREST RECEIVABLE		1,066.94
FIXED ASSETS		1,086,019.18

TOTAL ASSETS	\$	1,329,889.76
		=====

LIABILITIES

ACCOUNTS PAYABLE	\$	35,000.00
DUE TO OTHER FUNDS		1,103.31

TOTAL LIABILITIES		36,103.31

FUND-BALANCE

INVESTMENT IN FIXED ASSETS		1,086,019.18
UNDESIGNATED		195,955.27
DESIGNATED		11,812.00

		1,293,786.45

TOTAL LIABILITIES & FUND BALANCE	\$	1,329,889.76
		=====

OAKLAND COUNTY
 ACT 342 CONSTRUCTION FUNDS
 STATEMENT OF REVENUE & EXPENDITURES
 WEST BLOOMFIELD WSS SEC. IX

DECEMBER 31, 1988

CONSTRUCTION
 FUND NO
 87405

REVENUES

INCOME FROM INVESTMENTS	\$	34,596.06

TOTAL REVENUES		34,596.06

EXPENDITURES

SALARIES - REGULAR		19,204.20
FRINGE BENEFITS		6,661.52
INVESTMENT FEES		75.87
LEGAL EXPENSE		8,074.73
APPRAISAL FEES		1,800.00
CONTRACT ADMINISTRATION		4,430.34
CONTRACTED SERVICES		928,392.00
DESIGN FEES		8,886.20
EQUIPMENT RENTAL		38.55
LAYOUT AND STAKING		12,625.14
PERSONAL MILEAGE		37.25
PHOTOCOPY EXPENSE		21.95
PURCHASE OF LAND & EASEMENT		75.00
MATERIAL & SUPPLIES		179.56
OFFICE SUPPLIES		67.00
DRAIN EQUIPMENT		1,962.65

TOTAL EXPENDITURES		992,531.96

EXCESS (DEFICIENCY) OF REVENUES		-----
OVER EXPENDITURES	(	957,935.90)

EXCESS (DEFICIENCY) OF REVENUES		
AND OTHER SOURCES OVER	\$ (	957,935.90)
EXPENDITURES AND OTHER USES		=====