



Alliance
of Rouge
Communities

OURS TO PROTECT

Working together, restoring the river

Executive Director 2010 Annual Report



Submitted by:

ECT
Environmental Consulting & Technology, Inc.

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EXECUTIVE DIRECTOR 2010 ANNUAL REPORT

TASK 1: MEETINGS

A. FULL ALLIANCE MEETINGS

Staff support was provided for each meeting, including preparation of the agenda (under the direction of the Chair), distribution of the materials prior to the three (3) full ARC meetings, facilitation of the meetings (including note-taking and tallying of votes at the meeting), and preparation/distribution of meeting summaries to members and other interested parties.

Alliance of Rouge Communities meetings were held on:

March 25, 2010 in Farmington Hills

Kelly Cave, Wayne County made the Rouge 2009 presentation, which was also presented at the Friends of the Rouge Annual Meeting. Nina Ignaczak, Oakland County Planning and Economic Development and Lisa McGill presented “Walled Lake, Cool City by the Lake.” Sally Petrella presented results from the FOTR survey of ARC members about FOTR services, and Executive Director James Ridgway presented the 2009 Executive Directors Annual Report.

September 9, 2010 in Southfield

Chuck Hersey, SEMCOG, spoke about SSO and SRF Voodoo Reform and Mark Mikesell, Ph.D. made a presentation about the Lower Rouge Great Lakes Legacy Act Site and the Rouge River AOC. The following policies were adopted: Officer Appointment Policy, Record Retention Policy, Property Management Policy, Travel Reimbursement Policy and the amended Purchasing Policy to include sole source as presented. Henry Ford Community College was accepted as an ARC Associate Member and Cranbrook Educational Community was accepted as an ARC Cooperating partner. The attorneys involved in the Michigan Department of Natural Resources and Environment (formerly Michigan Department of Environmental Quality) permit contested case gave an update to the ARC.

October 26, 2010 in Redford Township

The 2010 ARC budget amendments were approved. The 2011 ARC budget of \$2,002,097 was approved. The budget includes the following line items:

Executive Director Services: \$	169,771
Finance Committee:	11,500
PIE Committee:	137,840
Technical Committee:	207,100
GLRI Grants:	1,329,255
Rouge Round X:	133,308
SPAC Grant:	13,323
Total:	\$2,002,097

The amendment to the ARC Purchasing Policy to include the determination of debarment or suspension status was approved.

B. EXECUTIVE COMMITTEE

Staff support was provided for five (5) Executive Committee meetings. Staff support for each meeting included (under the direction of the ARC Officers), preparation of the agenda, distribution of the materials prior to the meetings, facilitation of the meetings (including note-taking and documenting recommendations considered and actions taken), and meeting summary preparation and distribution. This subtask also included ongoing support services for the committee outside of the regular meetings.

The Executive Committee discusses and approves items in advance of full ARC meetings. Agendas and meeting summaries are available on www.allianceofrougecommunities.com. ARC Executive Committee Meetings were held on the following dates:

- ◆ February 2, 2010, Canton Twp.
- ◆ March 23, 2010, Canton Twp.
- ◆ June 29, 2010, Canton Twp.
- ◆ August 26, 2010, Canton Twp.
- ◆ October 14, 2010, Southfield

C. ORGANIZATION COMMITTEE

Staff support was provided for five (5) Organization Committee meetings which were held on the following dates:

- ◆ March 11, 2010, Wayne County
Commerce Court
- ◆ May 19, 2010, Southfield
- ◆ July 13, 2010, Southfield
- ◆ September 1, 2010, Wayne County
Commerce Court
- ◆ November 3, 2010, Southfield

The Organization Committee spent 2010 working on an update of the strategic plan, writing and approving ARC policies and procedures, updating the ARC Bylaws and reviewing and recommending ARC Cooperating and Associate members. Additionally, the committee reviewed and recommended the 2011 Executive Director Services and Operations and ARC Membership Meeting Support budgets.

D. PUBLIC INVOLVEMENT AND EDUCATION (PIE) COMMITTEE

Staff support was provided for four (4) regular meetings, including preparation of the agenda (under the direction of the PIE Committee Chair), distribution of the materials prior to the meetings, facilitation of the meetings (including note-taking and record of actions taken), and preparation/distribution of meeting summaries to members and other interested parties. Staff provided ongoing support services for the committee outside of regular meetings. PIE meetings were held on the following dates:

- ◆ February 25, 2010, Southfield
- ◆ April 14, 2010, Canton Twp.
- ◆ July 15, 2010, Beverly Hills
- ◆ October 28, 2010, Wayne County
Commerce Court

Specific PIE Committee activities are listed under Task 3.

E. TECHNICAL COMMITTEE

Staff support was provided for three (3) regular committee meetings and two (2) subcommittee meetings. Activities included preparation of the agenda (under the direction of the Technical Committee Chair), distribution of the materials prior to the meetings, facilitation of the meetings (including note-taking and record of actions taken), and preparation/distribution of meeting summaries to members and other interested parties. Ongoing committee support services were also provided. Technical Committee Meetings were held on the following dates:

- ◆ June 16, 2010, Plymouth Township
- ◆ August 24, 2010, Northville Township
- ◆ October 25, 2010, Southfield

Additional special subcommittee meetings were held. They were:

- ◆ June 9, 2010, ECT– Ann Arbor Beta Users Meeting – Permit Reporting System
- ◆ October 5, 2010, Phone Conference Collaborative Action Plan

Specific Technical Committee activities are listed under Task 4.

F. SUBWATERSHED ADVISORY GROUPS (SWAGS)

Staff support was provided for two (2) meetings each for the Lower 1/Middle 1 SWAGs and one meeting for the Middle 3/Lower 2 and Main 3-4 SWAG. Staff support included preparation of the agenda (under direction of each SWAG Chair), distribution of materials prior to the meetings, facilitation of the meetings (including note-taking and record of actions taken), and preparation/distribution of meeting summaries to members and other interested parties. Staff also facilitated ranking activities for SWAG grants submitted for the Rouge Round X grants and discussion about revisions to the draft Rouge River Watershed Management Plan. ECT provided technical assistance to members in meeting their Watershed Based Storm Water NPDES permit requirements. Staff also provided ongoing support services for the committee outside of the regular meetings.

SWAG meetings were held on the dates listed below:

- ◆ Lower 1/Middle 1 SWAG: March 30, 2010 in Northville Township and April 21, 2010 in Northville Township
- ◆ Middle 3/Lower 2 and Main 3-4 SWAG: March 31, 2010 in Livonia (Note: There was not a quorum, so grant ranking was done via e-mail)
- ◆ Main 1-2/Upper SWAG: March 27, 2010 in Farmington Hills and April 27, 2010 in Southfield.

G. FINANCE COMMITTEE

ECT worked with the Finance Committee to develop and administer the annual budget and work plan. ECT prepared monthly financial reports, mailed dues invoices to members, collected dues and paid the ARC's bills. ECT facilitated four (4) Finance Committee meetings by preparing

the agenda, distributing materials prior to the meetings, and preparing/distributing meeting summaries to appropriate parties.

Finance Committee meetings were held at Wayne County's Commerce Court office in Wayne on the following dates except were indicated:

- ◆ February 1, 2010, Bloomfield Township
- ◆ June 7, 2010, Wayne County Commerce Court
- ◆ August 17, 2010, Wayne County Commerce Court
- ◆ September 21, 2010, Wayne County Commerce Court

H. ADMINISTRATIVE OVERSIGHT/ONGOING SUPPORT SERVICES

ECT provided ongoing support services to the above committees and SWAGs on an as-needed basis.

TASK 2: ADVOCACY AND ADMINISTRATION

A. FREEDOM OF INFORMATION ACT (FOIA) AND OPEN MEETINGS ACT – STATE LAW REQUIREMENTS

The ARC did not receive any FOIA requests in 2010.

B. ROUTINE DISTRIBUTION OF MATERIALS

Materials distributed in 2010 included all meeting materials for the ARC Executive Committee, the ARC, the PIE, Technical, Organization, and Finance committees and all special meetings. Staff also distributed materials related to permit discussions with MDNRE, watershed management planning documents and flyers for upcoming events.

C. ARC WEBSITE MAINTENANCE

Please see PIE Committee Tasks, 3.d., in this report.

D. ADVOCATE FOR ROUGE RIVER WATERSHED & PRIMARY LIAISON

ECT promoted the ARC as the advocate for the Rouge River Watershed, served as the primary spokesperson for the ARC, responded to requests for information and sought opportunities to promote ARC awareness. ECT served as the ARC primary liaison to all members, including both formal and informal interaction with government officials, legislators and staff on a regular basis. The Executive Director participated in the following activities:

Great Lakes Restoration Initiative Grants (GLRI)

The Executive Director reviewed and edited two ARC GLRI submittals due January 29, 2010 to the EPA and provided support letters for GLRI applications by SEMCOG and Cranbrook Institute of Science. Additionally, once GLRI grants were awarded to the ARC, the Executive Director responded to a variety of questions from the EPA regarding the application.

Grant Applications

The Executive Director reviewed grant applications to the Great Lakes Basin Program for Soil Erosion and Sediment Control, the EPA Targeted Watershed Program, the Rouge Program Office Round X grant program and the Statewide Public Advisory Council.

U.S. Army Corps of Engineers

The Executive Director and staff met with US Army Corps of Engineers on April 2, 2010 in Detroit to discuss potential projects.

Cities of the Future/Urban River Restoration 2010 Conference, Boston MA

The Executive Director presented the paper: *The Rouge River National Wet Weather Demonstration Project Eighteen Years of Documented Success* in Boston in March, 2010.

Gateway Partnership

The Executive Director met with Gateway Partnership representatives from Wayne County and the University of Michigan-Dearborn on April 19, 2010 to discuss partnership opportunities.

Statewide Public Advisory Council (SPAC)

The Executive Director and staff attended the SPAC meeting in Port Huron on June 8-9, 2010 for GLRI awardees and met with EPA officials in attendance.

Member Requests

ARC staff responded to inquiries from Walled Lake about existing fertilizer ordinances and Beverly Hills about possible projects.

Storm Water Permit Activities/ Michigan Department of Natural Resources and Environment

The Executive Director staff met with MDNRE to discuss ARC member audits on June 16, 2010. Staff attended the MDNRE information meeting about revocation of the 2008 permit on December 20, 2010 in Lansing. Staff provided an update of the meeting to ARC members and facilitated planning of a meeting with a subcommittee of ARC members regarding the revocation of the 2008 storm water permit.

More information about 2009 ARC grant submittals is located under Technical Committee Tasks, 4.c. in this report.

E. QUICK BOOKS MONTHLY TRACKING AND REPORTING

The ARC ED staff performs the ARC's financial responsibilities, including Quickbooks, dues collection, bill payments, grant reimbursement submittals, audit preparations and other financial activities.

F. ADMINISTRATIVE OVERSIGHT & CONTRACTOR MANAGEMENT

ECT provided administrative oversight of the ARC day-to-day activities, staff, consultants and contractors, and external relationships with other agencies, organizations, and individuals to meet the goals of the ARC. Specific activities were discussed in monthly invoice summaries.

G. ARC MARKETING & COMMUNICATIONS STRATEGY

Erb Foundation

ARC Staff and the ARC chair met with the Erb Foundation in Detroit on June 15, 2010 to discuss the potential for providing match to the ARC's GLRI application: *Transforming the Rouge AOC from Mowed Down to Grown Up*. ARC staff in partnership with FOTR developed a successful proposal to the Erb Foundation to fund the benthics macroinvertebrate sampling activities in the GLRI grant Transforming the Rouge AOC from Mowed Down to Grown Up. The grant is from 2011-12 for \$80,000. The Executive Director and staff met with the Erb Foundation in Birmingham on October 4, 2010 to discuss potential funding opportunities.

GLRI Grants

Staff drafted a press release regarding the GLRI award to the ARC for green infrastructure and the Danvers Pond dam removal.

ARC Benefits Brochure

Staff began drafting a marketing brochure for ARC members (completed in 2011)

ARCommunications Newsletter

The ARCommunications newsletter was written and sent to members in July, 2010.

H. ANNUAL REPORT

The 2009 ARC annual report was completed and submitted to the ARC in March, 2010.

TASK 3: PIE COMMITTEE TASKS

A. GREEN INFRASTRUCTURE CAMPAIGN

Grow Zone Projects

The ARC PIE Committee developed a Request for Proposals (RFP) for communities and organizations to submit project sites for the 2010 Green Infrastructure (Grow Zone) projects. ARC staff provided design, plant material and signage for the approved projects. The Grow Zone Subcommittee received nine proposals and funded all of them. They are:

1. Village of Bingham Farms (14 Mile Road/Bingham Lane): Turf grass replace with native plants



2. E.L. Johnson Nature Center (Bloomfield Township): Riparian Buffer
3. Canton Township Public Library: Roadway easement native planting
4. Canton Township Trailhead (Lower Rouge Trail): Wetland buffer
5. Canton Township (Sheldon/Warren roads): Wetland buffer
6. Cleveland Elementary School (Livonia): Schoolyard Habitat
7. Bicentennial Park (Livonia): Upland habitat and riparian buffer
8. Carpenter Lake (Southfield): Native Meadow
9. Northville Township (Six Mile and Sheldon roads): Grow Zone adjacent to foot path.



Total 2010 ARC grow zones acreage: 1.84 acres

ARC staff also visited 2009 and 2010 Grow Zone sites on July 8 and September 16, 2010 to inventory and assess plantings.

Wayne County Water Quality Management Division staff implemented Fall ARC Grow Zone workshop events for Cleveland Elementary School (2010 grow zone) in Livonia and Miller Elementary School (2009 grow zone) in Canton Township. Activities included presentations on “What is a Grow Zone,” “What is a Watershed,” and how the Grow Zones relate water quality, specifically benthic macro-invertebrate communities. The students learned how all three of these topics are interrelated and how they can help create a healthy environment.

Additionally Wayne County staff conducted volunteer work days at Bennett Arboretum and Newburgh Lake.

Fact sheets about the work days and school workshops are included in Attachment A.

Workshops

ARC Staff, in conjunction with Wayne County, the Alliance of Downriver Watersheds, SEMCOG, Lawrence Tech and others held a series of planning meetings to present a workshop for local communities regarding green infrastructure projects being conducted in Southeast Michigan. The workshop was planned for September, 2010, however, other workshops being held provided the same information. It is intended that this workshop will be presented in 2011. Remaining budget was used to promote and staff rain barrel sales and create a database of rain barrel purchasers for promotion of upcoming ARC events, including future rain barrel sales.

2010 Rain Barrel Sales

Two rain barrel sales were held in conjunction with Enviro-World. Dates, locations and number of participating residents are below.

- ◆ July 10, 2010 in Redford Township, 382 people bought 612 rain barrels.
- ◆ September 18, 2010 in Troy, 433 people bought 660 rain barrels (sold out)

The number of rain barrel purchasers by hometown is attached as Appendix B.

Additionally, ARC staff made a presentation about grow zones in the Rouge Watershed and the ARC Grow Zone Program at the DROM (schools facilities management) conference on June 23, 2010.



Green Schools

Wayne County staff facilitates the Green Schools program in Wayne and Oakland Counties for the PIE Committee. The state of Michigan has an official Michigan Green School Law, which



encourages all public and private schools to administer energy-saving and environmental activities in a suggested plan with 20 points. Any school that achieves 10 of these points in an academic year will receive an official Michigan Green School Designation. This year Wayne County's Green School program elected to provide additional environmental points for schools to receive higher designations under this program. The Emerald designation can be achieved by successfully participating in 15 points and the Evergreen designation can be achieved by successfully participating in 20

points. PIE Committee budget for this task was used to purchase 75 trees for schools that were new to the Green Schools program in 2010.

Wayne County Water Quality Management Division offered trees to 39 recognized Green Schools and Oakland County offered trees to 33 Green Schools in the Rouge Watershed. Of the 39 WC schools 23 (60%) accepted a tree and 12 of these accepted two trees. Of the 33 OC schools 12 (40%) accepted a tree and all 12 schools accepted two trees. Each school was provided tree planting instructions, the *Value of Trees flyer*, and information on registering the tree through the ARC website. The 18 remaining trees were given to Wayne County DPS-Roads

Forestry for planting within the Rouge River watershed. These sites will also be registered on the ARC website.

Staff visited the planting site of the 18 extra trees that were given to Wayne County DPS-Roads Forestry for planting within the Rouge River Watershed. These planting sites were registered on the ARC website and staff initiated the development of a project summary. The trees were planted on the County right of way at the intersection of Hines Drive, Farmington Road and Ann Arbor Trail.

The list of Rouge River Watershed Green Schools is attached as Appendix C.

B. RIPARIAN CORRIDOR MANAGEMENT BOOKLET

This task was postponed for much of the year for budget reasons. Ultimately, budget from this task was used to cover increased effort to write grants under the Technical Committee budget and budget needs related to management of the successful Great Lakes Restoration Initiative grants.

C. PUBLIC ED MATERIALS

Detention Pond Maintenance Manual Reprint

Canceled because there were approximately 1,500 manuals remaining from the previous year.

Pollution Prevention Materials

The PIE Committee used budget to purchase seedlings to distribute at area events rather than spend budget on printed materials. Wayne County used its ARC budget to purchase 1,500 seedlings to distribute. ARC staff used budget to coordinate a giveaway of 1,000 seedlings at Westland Mall during Wayne County's Household Hazardous Waste Event on August 28, 2010. Another 500 seedlings were distributed at the ARC rain barrel sale in the City of Troy on September 18, 2010. People were asked to register their planting location on the ARC Website. To date, 138 trees have been registered on the ARC Website



Management and Distribution

Staff developed labels, tree planting instructions and packaged the seedlings for the August 28 and September 18 events. Staff also distributed Detention Pond Maintenance Manuals to ARC members who requested them.

D. WEBSITE MAINTENANCE

Staff performed design, writing, editing and general maintenance of the ARC website (www.allianceofrougecommunities.com)

E. FRIENDS OF THE ROUGE WATERSHED STEWARDSHIP AND REPORTING

Local & Regional Outreach

In the course of its work, FOTR attends a variety of local and regional meetings and community events to build partnerships, increase awareness of and promote Rouge River activities and volunteer opportunities, and educate the public. This task provides for FOTR staff to attend these meetings and events and provide promotional materials and other educational information, as necessary. The promotional/educational materials will include ARC, FOTR, and Rouge River Watershed information.

This task also includes distribution of an e-newsletter and use of a survey tool to ensure communities' needs are being met. Strong partnerships are necessary to establish and enhance local & regional outreach with communities, other non-profits and governmental agencies to educate and inform the public about key issues within the Rouge River Watershed and change behaviors that directly affect the health of the Rouge River Watershed. In the course of its work, FOTR promotes activities and attends a variety of local and regional meetings to build partnerships and promote Rouge River activities.

Annual Report

The Friends of the Rouge developed and generated an annual report of the activities it conducted in 2010 that assist ARC members to fulfill storm water permit requirements. The report includes the Frog and Toad Survey, Benthics Monitoring, Schoolyard Habitat, Rouge Education Project (REP), River Restoration, and Rouge Rescue. Information includes meeting or event dates; workshop dates; number of volunteers attending each event; residency of volunteers, REP Schools, number of students per school, number of teachers per school, monitoring locations for each school; a list of dates, locations for REP workshops and a list of schools that participated. **The Friends of the Rouge Annual Report is attached as Appendix D.**

F. WMP REVISIONS

Staff met with the ARC SWAGS to discuss the revisions requested by MDNRE. Additionally, ARC staff completed many of the revisions/corrections requested by MDNRE. The largest revision requested by MDNRE was in Chapter 6, the Rouge River Watershed Action Plan. Staff continued to revise that chapter based on MDNRE comments which involved choosing priority areas by pollutant based on modeling and also designating watershed-wide priority protection and restoration areas.

TASK 4: TECHNICAL COMMITTEE TASKS

A. ROUGE RIVER WATERSHED MONITORING ACTIVITIES

DO/Flow Monitoring

During 2007, the Technical Committee drafted a new set of goals for the new Five-year monitoring plan that were based on the assumption that grant funding would not be available to continue the extensive monitoring program previously undertaken in the watershed. In 2008, the Technical Committee drafted a Five-year Monitoring Plan for the watershed, which reduced the amount and type of monitoring occurring throughout the watershed. The Five-Year Plan summarizes the manner in which restoration progress will be measured in the watershed and is included in the draft Watershed Management Plan. The 2010 activities specified in the Five-Year Plan included biological, physical and hydrologic monitoring at specified locations. In 2010, flow and dissolved oxygen monitoring was completed by USGS at site U05 on the Upper Branch. A summary of this data is included in the Water Quality Summary.

Geomorphology

A Geomorphology Survey was completed by Wayne County that provided baseline data regarding channel stability at multiple sites throughout the watershed. In December, staff prepared and began summarizing the Rouge geomorphology data. Ten sites were surveyed in 2010, three in the Main Rouge, one in the Upper Rouge, four in the Middle Rouge and two along the Lower Rouge River. Using the tractive force ratio calculation four sites were calculated to be “aggrading”, five sites were “stable”, and one site was calculated to be “eroding”. WQMD staff also reviewed and commented on the Friends of the Rouge’s draft 2010 Frog and Toad Survey report. Data was also reviewed and formatted in preparation for mapping of the results of the Fall, 2010 Rouge benthic monitoring.

Water Quality Summary

A Water Quality Summary, describing the results of the 2009 flow and DO data collection effort and an assessment of historic data trends, was completed by CDM and include the following components:

- ◆ Acquiring the rainfall, flow and continuous temperature and dissolved oxygen data,
- ◆ Reviewing the data for anomalies,
- ◆ Loading the data into the ARC web-based water quality database and maintaining the database,
- ◆ Analyzing the data for temporal trends,
- ◆ Assigning the data to wet and dry weather conditions, and
- ◆ Graphing of the data.

The final report is available at www.allianceofrougecommunities.com.

Macroinvertebrate Monitoring

Friends of the Rouge coordinated volunteers in monitoring Rouge streams for benthic macroinvertebrates from January-December, 2010. Friends of the Rouge (FOTR) coordinated

volunteers in monitoring wadable Rouge streams for benthic macroinvertebrates from January-December, 2009. Activities include training team leaders and organizing sampling events twice a year (spring and fall) and an additional sampling event for winter stoneflies only in January, 2010. A minimum of 20-24 sites at each event were sampled with the potential for additional sites dependent on available team leaders. The spring and fall events include a habitat survey and identification of any outfalls. Each event included field identification backed by specimen collection at each site, verification in the lab, and a data report covering number of volunteers involved, sites sampled and monitoring results.

- ◆ Ninety-four volunteers attended FOTR's 2010 Winter Stonefly Search on January 23, 2010 hosted at the University of Michigan-Dearborn Environmental Interpretive Center. A group of students from Eastern Michigan University participated for the second year in a row. Wayne County Department of Public Services Water Quality Management Division (WC) sampled an additional two sites and Schoolcraft College students sampled one site on their campus. Stoneflies were found for the first time in the Main Branch and the type found is a new species for this program. After eight years of sampling tributaries and major branches of the Main Rouge, a broadbacked stonefly (Taeniopterygidae) was found on February 9, 2010 at Eight Mile and Telegraph by Wayne County staff.
- ◆ In the spring of 2010, benthic macroinvertebrate sampling at 48 sites on Rouge River tributaries and branches was completed. Twenty-six sites were sampled by FOTR volunteers and staff, 21 sites were sampled by Wayne County Department of Public Service Water Quality Management Division, and one site was sampled by Schoolcraft College students. Most of FOTR's sites were sampled on April 24-25, 2010 during the Spring Bug Hunt in which 110 volunteers participated.
- ◆ In the fall of 2010, benthic macroinvertebrate sampling at 47 Rouge tributary and river sites was completed. Twenty-two sites were sampled by 69 volunteers, 21 sites were sampled by Wayne County Department of Public Services, and one site was sampled by Schoolcraft College students.

Reports for the 2010 Winter Stonefly Search, the 2010 Spring Bug Hunt and the 2010 Fall Bug hunt are available at www.allianceofrougecommunities.com and www.therouge.org

Monitoring Brochure

This activity was canceled and budget was transferred to TC3 (Pursuing Grant Opportunities).

B. COLLABORATIVE STORM WATER ACTION PLAN IMPLEMENTATION

The main purpose of this initiative is to implement the proposed ARC Storm Water Action Plan by focusing on efforts that can be completed on a watershed-wide basis, thereby reducing workload and costs to individual ARC members associated with the NPDES Phase II permit. The two focus areas addressed under this initiative are 1) illicit discharge elimination and 2) storm water reporting.

The Collaborative Illicit Discharge Elimination Plan (IDEP) and Action Plan

Wayne County completed the Storm Water Action Plan for submittal to ARC members. The Plan outlines the watershed-wide activities and strategies needed to reduce *E. coli* in the Rouge River. ARC staff worked with Wayne County to collaborate the WMP plan actions with a Collaborative IDEP plan to address the MS4 permit requirements.

Outfall Mapping

Wayne County staff completed a watershed-wide GIS map of known outfalls/discharge points for the watershed. This was accomplished by collecting all electronic data outfall/discharge point data to create a database/map with known information such as ownership, size, material, etc. An electronic database is available to all ARC members with the location and ownership (if known) of Rouge outfalls discharging to waters of the state.

IDEP Field Investigations

Wayne and Oakland County IDEP staff conducted concentrated field investigations in Rouge River Watershed priority areas to further isolate problem areas, identify illicit connections, and take corrective action to remove them. Oakland County identified seven illicit connections during their 2010 efforts. Wayne County Water Quality Management Division (WCWQMD) staff continued implementing the Clean Michigan Initiative grant project *IDEP Rouge River Watershed from Residential Areas* and providing IDEP services under the ARC's 2010 TC2 budget line item. Significant effort was conducted in the Perrin Drain, City of Inkster. Meetings were held with the City of Inkster and the City agreed to assist in the investigation including providing trained staff to perform confined space entry. Storm sewer manholes were investigated. Twenty-one samples were collected and analyzed. Elevated ammonia and surfactant concentrations were present in storm sewer manholes along the Magnolia Street. Additional investigation will occur in 2011 to try and identify and eliminate the source of these elevated pollution concentrations. WCWQMD staff also prepared for IDEP advanced investigation work within Plymouth Township as a result of the suspicious discharges identified during the routine Tonquish Creek drain inspection performed in 2010. Tributary drainage areas were identified and a facilities list compiled in preparation for dye-testing inspections to be performed in 2011. **The Oakland County and Wayne County IDEP Reports are attached as Appendix E.**

IDEP Training

Wayne County and ARC staff held one IDEP training for the ARC held in Canton Township on May 12, 2010. ARC staff also updated the graphics and formatting of the IDEP training PowerPoint presentation to look more professional and to be compatible with Microsoft Office 2007 software. **The revised presentation is attached as Appendix F.**

Storm Water Reporting System

ARC Staff continued to refine the web-based Rouge River Storm Water Reporting System developed in 2009. The system offers ARC members a web-based mechanism for Phase II permit reporting to the Michigan Department of Natural Resources and Environment. The

Online Storm Water Reporting System is a step towards having one ARC storm water report for the MDEQ, which will ease the burden on community staff. The reporting system allows for comments on each entry and for back-up files to the uploaded report, which will be beneficial during an audit. Reporting will be available on an individual member basis and on a watershed-wide basis. Activities for 2010 included:

- ◆ The system was beta-tested and refined in 2010 using actual reporting data from ARC members.
- ◆ One ARC member (The City of Troy) submitted its Annual Report using the Online Reporting System) to the MDNRE, soliciting feedback for the rest of the ARC members. No response has been received, as of January 2011, and
- ◆ ARC Staff gave a presentation of the Online Reporting System at the Michigan Water and Environment Association, Watershed Committee Conference on December 9, 2010.

The watershed-wide reporting feature will be functional by the end of 2011. ARC staff will conduct a training session at each SWAG meeting to demonstrate how to use the system in 2011. The draft reporting system can be found at <http://www.arcswpqi.com>.

C. PURSUING GRANT OPPORTUNITIES

ARC staff worked throughout the 2010 budget year to pursue federal and local grants. The ARC wrote five successful grant applications for awards totaling \$1,473,547. They are:

Org	Project	Total Cost	Grant Funds	Match	Success?
GLRI	Danvers Pond Dam Removal	\$499,255	\$499,255	\$0	Yes
GLRI	Transforming the Rouge AOC (Green Infrastructure)	\$830,000	\$648,750	\$181,250 (ARC: \$15,000)	Yes
RPO	Wayne Road Dam Removal Design	\$115,100	\$57,550	ARC: \$57,550	Yes
RPO	Urban Habitat Improvement – Rouge Green Corridor	\$15,869	\$7,349	ARC: \$0 Other: \$8,520	Yes
GLC/PAC	BUI Delisting	\$22,405	\$22,405	\$0	Yes

The ARC also submitted two grant applications to the Great Lakes Basin Program for Soil Erosion and Sediment Control and both were denied. Additionally, the ARC submitted a grant application to the EPA Targeted Watersheds program which was also denied.

D. LAND COVER INVENTORY

Work began in 2009 to create a land cover inventory for the Rouge River Watershed. A land cover inventory allows for an analysis of aerial photography to determine the extent of pervious (green) and impervious (gray) land cover across the watershed. This information enables the ARC to better quantify and communicate the economic and environmental benefits of using green infrastructure in the watershed, as well as provide the ARC a method to evaluate the impact of future development using traditional engineering methods versus more “green” engineering methods.

Wayne County Water Quality Management Division staff provided support to the ARC for the Land Cover dataset acquisition and continues to provide ongoing data handling and analysis services. CityGreen© software is being used to assess and summarize the percentage of green infrastructure and the storm water benefits for each of the seven storm water management areas.

In 2010, datasets were distributed to all ARC members for areas within the Rouge River Watershed boundaries. Those municipalities with land area outside of the Rouge were given the option to purchase additional non-Rouge data. The original data is housed on a server that can be accessed by ARC staff.

APPENDIX A

Alliance of Rouge Communities – Ford Motor Company Wayne County DPS Hines Park Green Infrastructure Volunteer Work Day June 7 & 14, 2010

On June 7, 2010 the work efforts were concentrated on establishing a native plant flower garden at Newburgh Pointe adjacent to the Rain Garden (RG – 1). Eighteen (18) Ford employee volunteers participated in weeding, leveling, laying landscape fabric, planting native plants and mulching an area previously planted with wandering yews but overgrown with thistle. Two hundred twenty (220) plants were planted in the area. Ten (10) yards of mulch was placed around the plants. The volunteers weeded around the comfort station and removed invasive species from the Newburgh Pointe rain garden. Thirty-three (33) garbage bags were filled with invasive species. Seventeen (17) Grow Zone signs were than installed at five different sites along Hines Drive by the volunteers.

On June 14, 2010, seven (7) Ford employee volunteers completed the work at Newburgh Pointe. The efforts included invasive specie removal from around the trees adjacent to Hines Drive, the Newburgh Pointe Park Sign and the front garden. Six (6) yards of mulch was placed around the trees, the park sign and in the garden. Approximately 20 native plants were planted in the front garden. The work efforts continued at GZ - 7 and 8a east of Newburgh Pointe. At these locations, the split rail fence was repaired, invasive species were pulled and the remaining plants were planted. At this location, one hundred eighty-seven (187) plants were planted and fifteen (15) bags of invasives were filled. Also, two Grow Zone signs were installed at GZ – 8b and one at GZ – 4.

In total, the 2010 Ford Motor Company GI workday events involved 25 volunteers, removed 51 bags of invasive species and planted 407 native plants. Over 1080 yards of landscape fabric was installed and 16 cubic yards of mulch was spread to minimize weed growth and help the native plants thrive. Twenty Grow Zone signs were installed at seven different Grow Zones sites along Hines Drive.





Alliance of Rouge Communities - Commissioner Cox Wayne County DPS Hines Park Green Infrastructure Volunteer Work Day May 8, 2010

Bennett Arboretum

On May 8, 2010 over 50 volunteers from Ladywood, Master Gardeners, community residents and the Livonia Marine Recruiting volunteered to work at the Bennett Arboretum along Hines Drive in Northville. The volunteers participated in efforts that included pulling Garlic Mustard and thistle; weeding around the trees, kiosk, and interpretive signs; hauling 5 yards of cedar mulch to place around the trees, kiosk and signs; and clearing out the buckthorn around a large tree and bush at the south end of the pond. Thirty-three (33) garbage bags were filled with invasive species.



Alliance of Rouge Communities - Wayne County DPS Lathers Elementary Green Infrastructure K-Kids Work Day June 15, 2010

Lathers Elementary Grow Zone

On June 15th, 2010 over 20 Kiwanis Club student volunteers (K-kids) from Lathers Elementary School in Garden City worked at the Grow Zone located within the courtyard of the school. The Grow Zone was installed by the K-Kids in 2009 with support from the Alliance of Rouge Communities and Wayne County's Department of Public Services Water Quality Management Division. On the 2010 work day the K-Kids installed an ARC Grow Zone sign along with two bird boxes donated by Friends of the Rouge. Pictured below are the results of the work day. Weeding of the native plant Grow Zone was also performed.



Alliance of Rouge Communities Grow Zone Workshops

Cleveland Elementary and Miller Elementary October 2010

As part of the Alliance of Rouge Communities (ARC) 2010 Green Infrastructure Education Campaign Wayne County's Water Quality Management Division (WQMD) developed a three part Grow Zone education workshop targeted to students. The workshop explains the importance of grow zones - green infrastructure and the relationship between the native plant grow zones, insects and macro-invertebrate monitoring and watershed restoration. Wayne County staff presented the workshop using two of the ARC's 2009 schoolyard grow zone project sites. Cleveland Elementary in Livonia was the first to host this workshop. The event took place on October 15th and involved three 3rd grade classes totaling 94 students. Miller Elementary in Canton was the second to host the workshop. This event took place on October 22nd and involved two 4th grade classes consisting of 60 students.

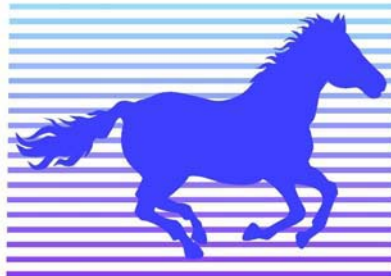


Each class split into three groups and spent 15-20 minutes at each of three presentations. The presentations are: *What is a Grow Zone*; *What is a Watershed*; and *Don't Bug Me-Benthic Macro-Invertebrates and Water Quality*. The students also received pollution prevention (P2) information to take home and share with their families. The P2 information included: *Grow Zone Information Sheet*; the *Landscaping, Car Care, Pet Waste, and Lawn Care tip cards*; and *Bio-Assessment Poster and Macro-Invertebrate Identification Flyer*. Through the presentations and the informational materials the students learn how these three topics are interrelated and how they can help create a healthy environment.

For more information on the ARC's Green Infrastructure Education Campaign please contact Ms. Zachare Ball, ARC Executive Director Services call her at (734)769-3004 or email her at zball@ectinc.com. For more information on the Grow Zone Workshops please contact Ms. Nancy Gregor, Wayne County Water Quality Management Division at (734)326-4607 or email her at ngregor@co.wayne.mi.us.



MILLER MUSTANGS



ON THE GROW!

CLEVELAND



EAGLES

APPENDIX B

RAIN BARREL SALES

July 10, 2010

RESIDENCY	NUMBER OF PURCHASERS
Allen Park	2
Ann Arbor	4
Berkley	1
Birmingham	2
Bloomfield Hills	1
Brighton	1
Canton	13
Center Line	1
Clarkston	2
Commerce Township	1
Dearborn	9
Dearborn Heights	35
Detroit	16
Farmington	8
Farmington Hills	17
Ferndale	8
Garden City	21
Grosse Pointe	1
Grosse Pointe Farms	1
Grosse Pointe Park	1
Grosse Pointe Woods	1
Highland	1
Huntington Woods	3
Lansing	1
Lathrup Village	6
Livonia	79
Macomb	1
Northville	3
Novi	1
Oak Park	2
Oxford	1
Pleasant Ridge	1
Plymouth	4
Redford	78
Rochester Hills	1
Royal Oak	3
Saline	1
Southfield	4
Taylor	2
Warren	3
Wayne	5
West Bloomfield	1
Westland	34

**LOCATION OF SALE:
Redford Township**

**RAIN BARRELS
SOLD TOTAL
612**

RAIN BARREL SALES

September 18, 2010

RESIDENCY	NUMBER OF PURCHASERS
Auburn Hills	1
Berkley	7
Beverly Hills	7
Birmingham	28
Bloomfield Hills	24
Clawson	6
Columbus	1
Dearborn	1
Farmington	2
Farmington Hills	1
Ferndale	2
Hazel Park	1
Highland Park	1
Inkster	1
Lake Orion	2
Lincoln Park	3
Livonia	1
Madison Heights	2
Milford	1
Miscellaneous	16
Oakland	5
Oak Park	1
Pleasant Ridge	1
Redford	1
Roseville	1
Rochester Hills	77
Royal Oak	17
St. Clair Shores	2
Southfield	1
Troy	214
Warren	2
Waterford	2
Westland	1
Total:	433

LOCATION OF SALE:
City of Troy

**RAIN BARRELS
SOLD TOTAL
660**

APPENDIX C

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School	School District	Address	City	Zip	County	phone	School Coordinator	Principal	Coordinators e-mail
1 Administrative Service Center office	Dearborn	18700 Audette	Dearborn	48124	Wayne	313.827.3006	David Mustonen	Ron Gutkowski	muston@dearborn.k12.mi.us
2 Advanced Technology Academy	Dearborn - PSA	4801 Oakman	Dearborn	48126	Wayne	313.625.4700	Nadia Yespa	Jim Lundie	nvespa@atafordpacs.org
3 Allen Elementary	Plymouth-Canton	11100 Haggerty	Plymouth	48170	Wayne	734.416.3092	Julie Johnson	Julie Johnson	julie.johnstone@pccsmail.net
4 Becker Elementary	Dearborn	10821 Henson	Dearborn	48126	Wayne	313.827.6950	Jennifer Murray	Nada Fouani	murray@dearborn.k12.mi.us
5 Bird Elementary	Plymouth-Canton	220 Sheldon	Plymouth	48170	Wayne	734.416.3100	Mary Starr	Susan Kelly	mistarr@pccsmail.net
6 Cleveland Elementary	Livonia	28030 Cathedral	Livonia	48150	Wayne	734.744.2700	Linda Eastman	Michael Daraskavich	leasman@lvniapublicschools.org
7 David Ellis Academy	Redford - PSA	19800 Beech Daly	Redford	48240	Wayne	313.450.0300	Mary Dyer	Machon Jackson	mdyer@davidellisacademywest.com
8 Edsel Ford High	Dearborn	20601 Rotunda	Dearborn	48124	Wayne	313.827.1500	Tara Haddad	Hassane Jaafar	haddad@dearborn.k12.mi.us
9 Farand Elementary	Plymouth-Canton	41400 Greenbrae	Plymouth	48170	Wayne	734.582.6943	Dana Jones	Dana Jones	dana.jones@pccsmail.net
10 Field Elementary	Plymouth-Canton	14041 Stark Road	Canton	48187	Wayne	734.744.2670	Marianne Ervin	Peter Kudlak	marianne_ervin@pccsmail.net
11 Frost Middle	Livonia	8375 N. Sheldon	Livonia	48154	Wayne		Carim Calkins	Christina Berry	ccalkins@lvniapublicschools.org
12 Gallimore Elementary	Plymouth-Canton	6500 Middlebelt	Canton	48187	Wayne		Jennifer Rogers	Kimberly May	jennifer.rogers@pccsmail.net
13 Garden City High	Garden City	14767 Prospect	Garden City	48135	Wayne	734.762.8350	Yvonne Coogan	Jerry Perttunen	coogan@dcity.k12.mi.us
14 Geer Park Elementary	Dearborn	9300 Hubbard	Dearborn	48126	Wayne	313.827.2300	Kimberly Donoghue	Andrea Awada	donoghk@dearborn.k12.mi.us
15 Grant Elementary	Livonia	601 N Sivey Lane	Livonia	48150	Wayne	734.425.8595	Kellie Drummer	Kristin Waddell	kdrummer@sbcglobal.net
16 Haight Elementary	Dearborn	16140 Driscoll	Dearborn	48128	Wayne	313.827.6200	Evelyn Smith	Kathleen Kochler	moughnmat@dearborn.k12.mi.us
17 Henry Ford Elementary	Dearborn	16140 Driscoll	Dearborn	48126	Wayne	313.827.4700	Dr. Agnien Moughni	Heyam Alcodray	runnemi@dearborn.k12.mi.us
18 Henry Ford Early college	Dearborn	22586 Ann Arbor Trail	Dtn Hgls	48127	Wayne	313.317.1588	Mark Rummel	Dawn Eule	truax@dearborn.k12.mi.us
19 Howe Elementary	Dearborn	18000 Oakwood	Dearborn	48124	Wayne	313.827.7000	Carrie Truxal	DeAnn Urso	gdclaborne@att.net
20 Kennedy Elementary	Livonia	14201 Hubbard	Livonia	48154	Wayne	734.427.2769	Denise Claiborne	Veronica Jakubus	jakubuv@dearborn.k12.mi.us
21 Long Elementary	Dearborn	3100 Westwood	Dearborn	48124	Wayne		Veronica Jakubus	Dr. Samir Makki	bervya@dearborn.k12.mi.us
22 Lowery Elementary	Dearborn	6601 Jonathon	Dearborn	48126	Wayne	313.827.1802	Angie Bondie	fordc@dearborn.k12.mi.us	
23 McDonald Elementary	Dearborn	10151 Diversity	Dearborn	48126	Wayne	313.827.6700	Catherine Ford	Megdiah Jawad	wilferch@northville.k12.mi.us
24 Moraine Elementary	Northville	46811 Eight Mile	Northville	48167	Wayne	248.344.8473	Christina Witter	Denise Bryan	detrieanca@gmail.com
25 Muslim American Youth	Dearborn - non-public	19500 Ford	Dearborn	48128	Wayne	313.441.0362	Sr. Heidi Ban	Dr. Albert Harp	bitnel@dearborn.k12.mi.us
26 O.L. Smith Middle	Dearborn	23851 Yale	Dearborn	48124	Wayne		Lisa Bittner	Scott Casebolt	dakroun1@dearborn.k12.mi.us
27 Oakman Elementary	Dearborn	7545 Chase Rd	Dearborn	48126	Wayne		Nadia Dakrou	Radewin Awada	barbara.johnson@pccsmail.net
28 Pioneer Middle	Plymouth-Canton	46061 Ann Arbor road	Plymouth	48170	Wayne	734.416.2772	Barbara Johnson	Phil Freeman	rmrowat@mi.rr.com
29 Rosedale Elementary	Livonia	36651 Ann Arbor Trail	Livonia	48150	Wayne	734.427.4661	Michael Nowak	Tammy Spangler-Timm	hammond@wvcs.k12.mi.us
30 Roosevelt McGrath Elementary	Wayne Westland	36075 Currier	Wayne	48184	Wayne	313.827.2720	Kathy Stener	Linda Hammond	school@dearborn.k12.mi.us
31 Salina (grades K-3) Elementary	Dearborn	2700 Furney	Dearborn	48120	Wayne	313.827.8009	Carrie Schoolmaster	Nadia Youmans	ml_mckee@yahoo.com
32 Silver Springs Elementary	Northville	19801 Silver Springs	Northville	48167	Wayne	248.596.9896	Mary McKee	Scott Snyder	mckmod1@southmedford.net
33 Thomas Jefferson Elementary	South Redford	21555 Westfield	Redford	48239	Wayne	313.937.2330	Monica Nick	Deborah Greenwood	kurt.tyszkewicz@pccsmail.net
34 Tonda Elementary	Plymouth-Canton	46501 Warren	Canton	48187	Wayne	734.416.6101	Kurt Tyszkewicz	Kurt Tyszkewicz	judasa01@southredford.net
35 Vandenberg Elementary	South Redford	24901 Cathedral	Redford	48239	Wayne	313.532.0300	Sarah Judge	Sydney Malek	lvilus@westvilleacademy.org
36 West Village Academy	Dearborn - PSA	3530 Westwood	Dearborn	48124	Wayne	313.274.9200	Jennifer Wilusz	Donita White	woods@dearborn.k12.mi.us
37 William Ford Elementary	Dearborn	14749 Alber	Dearborn	48126	Wayne		Laura Turk	Mahmoud Abu-Rus	kligor@northvilleschools.org
38 Winchester Elementary	Northville	16141 Winchester Dr.	Northville	48168	Wayne	248.344.8415	Kendra Kilgore	Patricia Messing	patent@dearborn.k12.mi.us
39 Woodworth Middle	Dearborn	4951 Ternes	Dearborn	48126	Wayne	313.827.7100	Troy Patterson	Troy Patterson	
40 Avondale Meadows Upper Elementary	Avondale	1435 W Auburn Rd	Rochester Hills	48309	Oakland				
41 Beverly Elementary School	Birmingham	18305 Beverly Rd	Beverly Hills	48025	Oakland				
42 Greenfield Elementary School	Birmingham	31200 Fairfax Ave	Beverly Hills	48025	Oakland				
43 Harlan Elementary School	Birmingham	3595 N Adams Rd	Bloomfield Hills	48094	Oakland				

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School	School District	Address	City	Zip	County	phone	School Coordinator	Principal	Coordinators e-mail
44 Pembroke Elementary School	Birmingham	955 N Eaton Dr	Troy	48084	Oakland				
45 Pierce Elementary School	Birmingham	1829 Pierce St	Birmingham	48009	Oakland				
46 West Maple Elementary School	Birmingham	6275 Inkster Rd	Bloomfield Hills	48301	Oakland				
47 Birmingham Covington School	Bloomfield Hills	1525 Covington Rd	Bloomfield Hills	48301	Oakland				
48 Eastover Elementary School	Bloomfield Hills	1101 Westview Rd	Bloomfield Hills	48304	Oakland				
49 Lorne Pine Elementary School	Bloomfield Hills	3100 Lorne Pine Rd	Orchard Lake	48323	Oakland				
50 Way Elementary School	Bloomfield Hills	765 W Long Lk Rd	Bloomfield Hills	48302	Oakland				
51 Flanders Elementary School	Farmington	32600 Flanders St	Farmington	48336	Oakland				
52 Forest Elementary School	Farmington	34545 Old Timber Rd	Farmington	48331	Oakland				
53 Gill Elementary School	Farmington	21195 Gill Rd	Farmington	48335	Oakland				
54 Hillside Elementary School	Farmington	36801 W 11 Mile Rd	Farmington Hills	48335	Oakland				
55 Kenbrook Elementary School	Farmington	32120 Bonnet Hill Rd	Farmington	48334	Oakland				
56 Longacre Elementary School	Farmington	34650 Arundel St	Farmington	48335	Oakland				
57 William Grace Elementary School	Farmington	29040 Shawassee Rd	Farmington	48336	Oakland				
58 Wood Creek Elementary School	Farmington	28400 Harwich Dr	Farmington	48334	Oakland				
59 Wooddale Elementary School	Farmington	34275 Oak Forest Dr	Farmington	48331	Oakland				
60 Cranbrook Brookside	Private/Other	39221 Woodward Ave	Bloomfield Hills	48303	Oakland				
61 Detroit Country Day Jr. School	Private/Other	3600 S Bradway Blvd	Bloomfield Hills	48301	Oakland				
62 Our Lady of Sorrows School	Private/Other	24040 Raphael Rd	Farmington	48336	Oakland				
63 Our Lady Queen of Martyrs School	Private/Other	32460 Pierce St	Beverly Hills	48025	Oakland				
64 Roeper City and Country Elementary School	Private/Other	41190 Woodward Ave	Bloomfield Hills	48303	Oakland				
65 St. Fabian Catholic Elementary & Middle School	Private/Other	32200 W 12 Mile Rd	Farmington Hills	48334	Oakland				
66 St. Hugo of the Hills School	Private/Other	380 E Hickory Grv	Bloomfield Hills	48304	Oakland				
67 Woodmont Academy	Private/Other	25175 Coode Rd	Southfield	48304	Oakland				
68 Hamlin Elementary School	Rochester	270 W Hamlin Rd	Rochester Hills	48307	Oakland				
69 Hampton Elementary School	Rochester	530 Hampton Cir	Rochester Hills	48307	Oakland				
70 Long Meadow Elementary School	Rochester	450 Aliston Dr	Rochester Hills	48309	Oakland				
71 Musson Elementary School	Rochester	3500 Dutton Rd	Rochester Hills	48306	Oakland				
72 University Hills Elementary School	Rochester	600 Croyden Rd	Rochester Hills	48309	Oakland				
73 Barnard Elementary School	Troy	3601 Forge Dr	Troy	48063	Oakland				
74 Bemis Elementary School	Troy	3571 Northfield Pkwy	Troy	48084	Oakland				
75 Costello Elementary	Troy	1333 Hamman Dr	Troy	48098	Oakland				
76 Hamilton Elementary School	Troy	9525 Northfield Pkwy	Troy	48098	Oakland				
77 Hill Elementary School	Troy	4600 Forsyth	Troy	48098	Oakland				
78 Schroeder Elementary School	Troy	3541 Jack Dr	Troy	48084	Oakland				
79 Troy Union Elementary School	Troy	1340 E Square Lk Rd	Troy	48098	Oakland				
80 Wass Elementary School	Troy	2340 Willard Dr	Troy	48098	Oakland				
81 Commerce Elementary School	Walled Lake	520 Fair St	Commerce	48362	Oakland				
82 Glengary Elementary School	Walled Lake	3070 Woodbury St	Walled Lake	48390	Oakland				
83 Hickory Woods Elementary School	Walled Lake	30665 Novi Rd	Novi	48377	Oakland				
84 Keith Elementary School	Walled Lake	2800 Keith Rd	West Bloomfield	48324	Oakland				
85 Loon Lake Elementary School	Walled Lake	2151 Loon Lk Rd	Wixom	48393	Oakland				
86 Maple Elementary School	Walled Lake	7389 W Maple Rd	West Bloomfield	48322	Oakland				

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School	School District	Address	City	Zip	County	phone	School Coordinator	Principal	Coordinators e-mail
87 Mary Helen Guest Elementary School	Walled Lake	1655 Decker Rd	Walled Lake	48390	Oakland				
88 Meadowbrook Elementary School	Walled Lake	29200 Meadowbrook Rd	Novi	48377	Oakland				
89 Oakley Park Elementary School	Walled Lake	2015 Oakley Pk Rd	Walled Lake	48390	Oakland				
90 Pleasant Lake Elementary School	Walled Lake	4900 Halsted Rd	West Bloomfield	48323	Oakland				
91 Twin Beach Elementary	Walled Lake	7145 Oakley Pk	West Bloomfield	48323	Oakland				
92 Walled Lake Elementary School	Walled Lake	1055 W Maple Rd	Walled Lake	48390	Oakland				
93 Roosevelt Elementary School	West Bloomfield	2065 Cass Lk Rd	Keego Harbor	48320	Oakland				
e et ed trees in									
1 Amerman Elementary	Northville	847 N. Center Street	Northville	48167	Wayne	248.344.8405	David Babich	Steve Anderson	anderss@northville.k12.mi.us
2 Bryant Middle	Dearborn	460 N. Vernon	Dearborn	48124	Wayne	313.827.2900	Ruth Tozzi	Shannon Peterson	lozzr@dearborn.k12.mi.us
3 Buchanan Elementary	Livonia	16400 Hubbard	Livonia	48154	Wayne	734.744.2680	Jennifer Medelin	Marjorie Moore	medell@livoniaschools.org
4 Dearborn High	Dearborn	19501 Outer Drive	Dearborn	48124	Wayne	313.827.1600	Kathleen Malone	Chuck Baughtman	malonek@dearborn.k12.mi.us
5 DuVall Elementary	Dearborn	22561 Beech	Dearborn	48124	Wayne	313.827.2750	Susan Doman	Glenn Maleyko	domans@dearborn.k12.mi.us
6 Fordson High	Dearborn	13800 Ford Road	Dearborn	48124	Wayne	313.827.1412	Janine Wilcox	Danene Charles	wilcox@dearborn.k12.mi.us
7 Hillside Middle	Northville	775 North Center	Northville	48167	Wayne	248.344.8493	Stacy Elyer	James Cracraft	elyers@northville.k12.mi.us
8 Howard Elementary	Dearborn	1611 N. York Street	Dearborn	48128	Wayne	313.827.6354	Andrew Denison	Andrew Denison	denisa@dearborn.k12.mi.us
9 Ladywood High	Livonia - non-public	14680 Newburgh	Livonia	48154	Wayne	734.591.4214	Mike Gaule	Sr. Mary Ann Smith	mgaule@ladywood.org
10 Lathers Elementary	Garden City	28351 Marquette	Garden City	48135	Wayne	734.762.8490	Nicole Mullett	Susan Ford	nkanerva@gmail.com
11 Lindberg Elementary	Dearborn	600 N. Waverly	Dearborn	48124	Wayne	313.827.6300	Susan Doman	Pamela DeNeen	domans@dearborn.k12.mi.us
12 Maples Elementary	Dearborn	6801 Mead	Dearborn	48126	Wayne	313.827.6454	Lisa Napolitin	Lisa Napolitin	napoll@dearborn.k12.mi.us
13 McCollough/Unis School	Dearborn	7801 Maple	Dearborn	48124	Wayne	313.827.1700	Fady Soueidan	Rita Rauch	soueid@dearborn.k12.mi.us
14 Memorial Elementary	Garden City	30001 Marquette	Garden City	48135	Wayne	734.762.8480	Deborah Gabrion	Mary Planter	gabrac@ccs.k12.mi.us
15 Miller Elementary	Plymouth-Canton	43721 Hanford	Canton	48167	Wayne	734.416.2099	Ms. Mary Distel	Lynn Hairre	distelm@pscs.k12.mi.us
16 Nowlin Elementary	Dearborn	23600 Penn	Dearborn	48124	Wayne	313.827.6900	Keili Blamer	blamerk@dearborn.k12.mi.us	
17 Our Lady of Good Counsel	Plymouth - Private	1062 Church Street	Plymouth	48170	Wayne	734.453.3053	Nancy Carapellotti	Kay Relliy	carapellotin@olcparish.net
18 River Oaks Elementary	Dearborn	20755 Ann Arbor Trail	Dearborn	48127	Wayne	313.827.6750	Jeanette Fowler	Youssef Mossalim	fwf@dearborn.k12.mi.us
19 Sacred Heart School	Dearborn - non-public	22513 Garrison Street	Dearborn	48124	Wayne	313.561.9192	Jackie Bietur	Lisa Powasser	jackieb@dearborn.k12.mi.us
20 Salina (grade 4-8) Intermediate	Dearborn	2623 Salina	Dearborn	48120	Wayne	313.663.9622	Hebat Abdelbaki	Majed Fadlallah	abdelbh@dearborn.k12.mi.us
21 Snow Elementary	Dearborn	2000 Culver	Dearborn	48124	Wayne	313.827.6250	Kathleen Klee	Kathleen Klee	kleek@dearborn.k12.mi.us
22 St Valentine School	Redford non-public	25875 Hope	Redford	48239	Wayne	313.533.7149	Lisa Adams	Rachel Dammuth	lsak1218@yahoo.com
23 Stout Middle	Dearborn	18500 Oakwood Blvd	Dearborn	48124	Wayne	313.827.4601	Fatima Tekko	Julia Maconochie	tekko@dearborn.k12.mi.us
24 Thomson Creek Elementary	Northville	46180 W. Nire Mile	Novi	48374	Wayne	248.344.8475	Chris Modrack	Sharon Irvin	modrach@northville.k12.mi.us
25 Whitmore-Bolles Elementary	Dearborn	21501 Whitmore	Dearborn	48124	Wayne	313.827.6800	Dara Edgerton	Jill Chacho	edentd@dearborn.k12.mi.us

APPENDIX D



Friends of the Rouge

Final Report for the Alliance of Rouge Communities

January 1, 2010 through December 31, 2010

**FRIENDS OF THE ROUGE
ANNUAL REPORT 2010
For the
ALLIANCE OF ROUGE COMMUNITIES**

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Task 2: Rouge Rescue	Page 4
Task 3: River Restoration	Page 5
Task 4: Frog and Toad Survey	Page 6
Task 5: Benthic Macroinvertebrate Sampling	Page 7
Task 6: Local and Regional Outreach	Page 8

**Friends of the Rouge
2010 Annual Report for ARC
ROUGE EDUCATION PROJECT**

Schools - Spring Monitoring 2010

	Community/School	# Teachers	# Students	Monitoring Location
1	Allen Park			
	Intercity Baptist High School	1	48	Melvindale Civic Center Ice Arena & Gaudy Park in Wayne
2	Beverly Hills			
	Detroit Country Day Middle School	6	365	On school grounds.
3	Bloomfield Hills			
	Birmingham Covington School	3	220	Linden Park-Birmingham
4	Canton			
	Plymouth High School	1	64	On school grounds.
	Tonda Elementary School	1	47	On school grounds.
5	Dearborn			
	Dearborn High School	1	5	On school grounds.
	Divine Child High School	1	10	Gulley Road overpass in Dearborn Heights
	Long Elementary School	2	12	Valley View Recreation Area -Westland
	Unis Middle School	2	230	Parkland Park in Dearborn Heights
6	Dearborn Heights			
	Crestwood High School	1	28	Parr Recreation Area in Dearborn Heights
	Riverside Middle School	4	300	Wallaceville Recreation Area-B in Dearborn Heights
7	Detroit			
	Coffey Elementary/Middle School	1	50	Eliza Howell Park-Detroit
	Detroit Academy of Arts and Sciences	1	25	Helms Haven Recreation Area-Dearborn Heights
	Logan Elementary School	1	24	Superior Township Park-Superior Township
	O.W. Holmes Elementary School	6	60	Ford Field-Dearborn
8	Farmington Hills			
	Steppingstone School	5	65	Shiawassee Park-Farmington
9	Garden City			
	Garden City High School	1	75	Inkster Wetlands-Inkster
10	Harper Woods			
	Chandler Park Academy	1	40	Lola Valley Park-Redford
11	Livonia			
	Ladywood High School	1	30	Between Newburgh lake and I-275 in Plymouth Twp.
	Riley Upper Elementary School	1	10	Private Residence in Livonia
12	Madison Heights			
	Japhet School	1	21	Private Residence in Farmington Hills
13	Northville			
	Amerman Elementary School	2	52	Ford Field in Northville
	Salem Elementary School	2	72	On school grounds
14	Oak Park			
	Center for Advanced Studies and the Arts	1	18	Brookfarm Park in Novi
15	Redford			
	St. Valentine School	1	15	Lola Valley Park-Redford
	Lee M. Thurston High School	2	30	Nankin Mills Recreation Area-Westland
16	Riverview			
	Riverview High School	1	25	Northville Recreation Area-Northville
17	Rochester Hills			
	Avondale Meadows Elementary	1	82	Firefighters Park in Troy
18	Romulus			
	Romulus Middle School	1	30	Heritage Park in Canton
19	Royal Oak			
	Oakland Schools Technical Campus Southeast	3	12	OCC Orchard Ridge Campus
20	Southfield			
	Bradford Academy	3	80	Lola Valley Park, Redford
	Southfield High School	1	25	Civic Center Drive and Telegraph in Southfield
	Thompson Middle School	1	140	Civic Center Drive and Telegraph in Southfield
	Brace Lederle K-8 School	2	30	Douglas Evans-Beverly Hills
21	Troy			
	Smith Middle School	1	30	Quarton Lake Park, Birmingham
	Troy High School	1	48	Coolidge Road north of Long Lake in Troy
22	West Bloomfield			
	Ealy Elementary School	1	95	West Bloomfield Nature Preserve-West Bloomfield
	West Hills Middle School	1	30	EL Johnson Nature Center in Bloomfield Hills
23	Westland			
	Huron Valley Lutheran School	1	28	Nankin Mills Recreation Area-Westland
24	Wyandotte			
	Roosevelt High School	2	30	Hix Park in Westland
	Wilson Middle School	1	35	Holiday Nature Preserve in Westland
	TOTALS	71	2636	

**Friends of the Rouge
2010 Annual Report for ARC
SCHOOLYARD HABITAT**

Schoolyard Habitat	Number of Student Participants	Number of Teachers	Number of Plant Species	Number of Plugs Planted	Size of habitat
Rosedale Elementary School Planting: 9/24/2010	300	10	11	392	1056 sq/ft
Thomas Jefferson Elementary School Planting: 8/28/2010	13	1	10	325	354 sq/ft
Chandler Park Academy Planting: 9/25/2010	9	1	9	222	486 sq/ft
TOTALS	322	12		939	1,896 sq/ft

**Friends of the Rouge
2010 Annual Report for ARC
ROUGE RESCUE**

Site Coordinator Events

Event	Location	City	Attendance
Rouge Rescue Kick-off Training	Summit on the Park Environmental Interpretive Center, University of Michigan-DeARBorn	Canton	12
Rouge Rescue Wrap-up Meeting		DeARBorn	3

Rouge Rescue Event

Rouge Rescue Site	Sponsoring Community or Organization	City	2010 Participation
Douglas Evans Nature Preserve	Village of Beverly Hills	Beverly Hills	18
Linden Park	City of Birmingham	Birmingham	35
Cranbrook Institute of Science	Cranbrook Institute of Science	Bloomfield Hills	8
El Johnson Nature Center	Bloomfield Twp, Bloomfield Hills Public Schools	Bloomfield Hills	23
The Roeper School	The Roeper School	Bloomfield Hills	9
Lower Rouge Recreation Trail	Canton Twp	Canton	269
Meadows of Canton	Meadows of Canton Subdivision	Canton	115
DeARBorn Gateway Trail	Christ Church DeARBorn	DeARBorn	32
Ford Action Accelerator Day	Ford Motor Company	DeARBorn	127
Henry Ford Community College	Henry Ford Community College	DeARBorn	13
Henry Ford Estate	Henry Ford Estate	DeARBorn	14
University of Michigan DeARBorn	Volunteer DeARBorn	DeARBorn	33
Hines Dr & Outer Dr	Teacher, Lindbergh Elementary	DeARBorn Heights	14
Parkland Park	DeARBorn Heights Watershed Stewards	DeARBorn Heights	55
Eliza Howell Park	Brightmoor Alliance	Detroit	34
Fordson Island	Southwest Detroit Environmental Vision	Detroit	31
Rouge Park	Friends of Rouge Park, City of Detroit, Detroit Aeromodelers	Detroit	133
Shawassee Park	Friends of the Rouge	Farmington	18
Heritage Park	City of Farmington Hills	Farmington Hills	34
Oakland Community College	Oakland Community College	Farmington Hills	19
Inkster	Commissioner Joan Gebhardt	Inkster	16
Bicentennial Park	City of Livonia	Livonia	61
Botsford Park	Trinity Church	Livonia	53
Coventry Gardens Park	Coventry Gardens Improvement Association	Livonia	11
Allen Drive Park	Northville Residents	Northville	3
Hines Drive (Boy Scout Troop 755)	Boy Scout Troop 755	Northville	18
Stonewater Community	Stonewater Community	Northville	23
Fish Hatchery Park	Northville Twp	Northville Twp	26
Rotary Park	City of Novi	Novi	85
Smith School	City of Plymouth	Plymouth	24
Plymouth Twp Park	Charter twp of Plymouth	Plymouth Twp	22
Lola Valley Park	Redford Twp, General Oil Co.	Redford	56
Beech Woods Rec Center	City of Southfield	Southfield	86
Bennett Arboretum	Commissioner Laura Cox	Northville	49
Berberian Woods	Six Rivers Regional Land Conservancy	Southfield	5
DENSO	DENSO International America	Southfield	110
Stage Nature Center	Lloyd Stage Nature Center	Troy	105
Dynamite Park	Resident, City of Wayne	Wayne	50
Holiday Nature Preserve	City of Westland, Holiday Nature Preserve Association	Westland	59
Kosch Headwaters Preserve	Southeast Michigan Land Conservancy	Ypsilanti	8
	Total Participation		1,904

Volunteer Residency

City/Township	Total Number of Volunteers	City/Township	Total Number of Volunteers
Canton	283	Canton	283
Unknown	251	Unknown	251
Livonia	164	Livonia	164
Detroit	126	Detroit	126
Novi	106	Novi	106
DeARBorn	79	DeARBorn	79
Farmington Hills	63	Farmington Hills	63
Northville/ Northville Twp	62	Northville/ Northville Twp	62
Plymouth/ Plymouth Twp	58	Plymouth/ Plymouth Twp	58
Redford	58	Redford	58
Southfield	58	Southfield	58
DeARBorn Heights	50	DeARBorn Heights	50
Westland	41	Westland	41
West Bloomfield	33	West Bloomfield	33
Birmingham	27	Birmingham	27
Troy	27	Troy	27
Farmington	24	Farmington	24
Wayne	23	Wayne	23
Bloomfield Hills	18	Bloomfield Hills	18
Beverly Hills	15	Beverly Hills	15
Royal Oak	13	Royal Oak	13
Ann Arbor	12	Ann Arbor	12
Garden City	11	Garden City	11
Commerce Twp	8	Commerce Twp	8
Inkster	8	Inkster	8
Oak Park	8	Oak Park	8
Taylor	8	Taylor	8
Brighton	6	Brighton	6
Superior Twp	6	Superior Twp	6
Wixom	6	Wixom	6
Belleville	5	Belleville	5
Clinton Twp	5	Clinton Twp	5
Macomb	5	Macomb	5
Rochester Hills	5	Rochester Hills	5
Lake Orion	4	Lake Orion	4
Lansing	4	Lansing	4
Lincoln Park	4	Lincoln Park	4
Milford	4	Milford	4
Sterling Heights	4	Sterling Heights	4
Walled Lake	4	Walled Lake	4
Warren	4	Warren	4
Waterford	4	Waterford	4
Bloomfield	3	Bloomfield	3

**Friends of the Rouge
2010 Annual Report for ARC
RIVER RESTORATION**

Events

Date	Event	Location	City	Attendance
2/23/2010	How to Build a Volunteer Program Coordinated with the LakeplainCluster of the Stewardship Network	Environmental Interpretive Center, U of M- Dearborn	Dearborn	20
3/6/2010	Presented for Rain Garden Workshop Coordinated by the City of Dearborn Heights & the Dearborn Heights Watershed Stewards Commission	Caroline Kennedy Public Library	Dearborn Heights	55
7/10/2010	Phragmites Control Workshop Coordinated with the LakeplainCluster of the Stewardship Network	Oakwood Commons	Dearborn	9
9/14/2010	Presented on woody debris management techniques to Saline River Greenway Alliance	Milan Twp Hall	Milan	18
11/11/2010	Grow Zone Maintenance Round-table Discussion	Environmental Interpretive Center, U of M- Dearborn	Dearborn	12
			TOTALS	114

Restoration Projects

Date	Event	Location	City	Attendance
5/14/2010	Buffer Planting	Oakland Community College Campus	Farmington Hills	9
9/18/2010	Native Plant Demonstration Garden	Bloomfield Twp Municipal Complex	Bloomfield Twp	6
10/2/2010	Rain Garden Wrokday	Redford CSO Basin	Redford	4
10/10/2010	10/10/10 Work Party	Riverside Park	Beverly Hills	15
10/24/2010	Newberg Church Native Planting	Ann Arbor Trail at Levan	Livonia	11
			TOTALS	45

Volunteer Residency

Buffer Planting, Farmington Hills		10/10/10 Work Party, Beverly Hills	
# Volunteers	City/Twp	# Volunteers	City/Twp
3	Farmington Hills	1	Berkley
1	New Boston	2	Beverly Hills
1	Novi	2	Dearborn Heights
1	Rochester Hills	1	Farmington Hills
1	West Bloomfield	1	Garden City
2	Wixom	2	Huntington Woods
9	TOTAL	1	Redford
		2	Royal Oak
		2	Southfield
		1	West Bloomfield
		15	TOTAL

Native Plant Demonstration Garden, Bloomfield Twp		Newburgh Church Native Planting, Livonia	
# Volunteers	City/Twp	# Volunteers	City/Twp
2	Bloomfield Twp	1	Dearborn Heights
1	Dearborn	2	Livonia
1	Grand Blanc	5	Redford
1	Holly	1	Taylor
1	West Bloomfield	1	Walled Lake
6	TOTAL	11	TOTAL

Rain Garden Workday, Redford	
# Volunteers	City/Twp
1	Dearborn
3	Redford
4	TOTAL

**Friends of the Rouge
2010 Annual Report for ARC
FROG TOAD SURVEY**

Training Workshop Date	2/27/2010	3/3/2010	3/13/2010	3/20/2010	
Time	10am-12pm	7-9pm	10am-12pm	10am-12pm	
City/Township	Plymouth	Canton	Livonia	Bloomfield Twp	Veteran Surveyors who did not attend a workshop
Location	Township Hall	Summit on the Park	Civic Ctr Library	Township Hall	
Attendee Residency					
Allen Park		1			
Ann Arbor					
Belleville					1
Berkley	3			2	
Beverly Hills					1
Birmingham					7
Bloomfield Hills				11	1
Bloomfield Twp				12	4
Bloomfield Village				1	
Brighton					
Canton	1	68	10	2	20
Clawson	4				
Commerce Twp	3	2	3		
Dearborn	10	2	2		5
Dearborn Heights				6	
Detroit	4		1	4	2
Farmington			4	1	1
Farmington Hills			11	3	19
Franklin					4
Garden City	3	2	2		1
Grosse Pointe Woods					
Highland		2			
Huntington Woods					
Lake Orion					
Lathrup Village			3	6	
Lincoln Park					
Livonia	8		22	5	13
Melvindale					2
Milford			2		
Northville	44	5	14		24
Novi	2	1			4
Oak Park					
Ortonville				1	
Plymouth	11	11	10		7
Redford	6		19		2
Rochester Hills				4	2
Romulus					2
Royal Oak		3	1	6	
Saline					
TOTALS	99	97	104	64	122

Training Workshop Date	2/27/2010	3/3/2010	3/13/2010	3/20/2010	
Time	10am-12pm	7-9pm	10am-12pm	10am-12pm	
City/Township	Plymouth	Canton	Livonia	Bloomfield Twp	Veteran Surveyors who did not attend a workshop
Location	Township Hall	Summit on the Park	Civic Ctr Library	Township Hall	
Attendee Residency					
Southfield		1	6		6
Sterling Heights			2		
Superior Twp					2
Sylvan Lake					2
Taylor					
Troy		3	2		8
Walled Lake	3		6		
Waterford				2	1
Wayne			1	3	
West Bloomfield	3	1		11	1
Westland	1		1		3
White Lake Township	1			4	
Wixom					
Wolverine Lake					
Ypsilanti	1		2		
Unknown					
TOTALS	9	5	20	20	23

	Plymouth	Canton	Livonia	Bloomfield Twp	Veteran Surveyors
GRAND TOTALS	108	102	124	84	145

2010 Blocks Surveyed	
Subwatershed	# blocks surveyed
Main 1-2	51
Upper	26
Middle 1	48
Lower 1	30
Lower 2	5
Middle 3	10
Main 3-4	8
TOTAL	178

Friends of the Rouge
2010 Annual Report for ARC
BENTHIC MACROINVERTEBRATE MONITORING

Event	Winter Stonefly Search	Spring Team Leader Training	Spring Bug Hunt	Spring Bug Identification	Summer Mussel Survey	Fall Team Leader Training	Fall Bug Hunt	Fall Bug Identification
Date	1/23/2010	3/21/2010	4/24/2010	5/10/2010	7/16/2010	10/3/2010	10/16/2010	10/29/2009
Time	9am-3pm	1-5 pm	9am-4pm	5-7 pm	10-3pm	12:30-5pm	9am-4pm	5-7:30 pm
City/Township	Dearborn	Troy	Dearborn	Dearborn	Troy, B'ham, B'ham, FF Pk, B'ham, Douglas, Evans	Troy	Livonia	Dearborn
Location	UMD-EIC	Nature Center	UMD-EIC	UMD-EIC		Nature Center	Schoolcraft College	UMD-EIC
Attendee Residency								
Ann Arbor	4							
Allen Park			2				2	
Belleville								
Berkley			1				1	
Beverly Hills	3	1	1		3		3	
Birmingham	2							
Bloomfield Hills								
Bloomfield Twp	1	1	4			2	4	
Brighton								
Brownstown Twp								
Canton	5	4	14	3			7	1
Commerce Twp								
Dearborn	2		6				1	1
Dearborn Heights	2						1	
Detroit	3		3				1	
Dryden								
Eastpointe	1		1					
Farmington	2	1	1				1	
Farmington Hills	3	1	2	1			2	
Franklin								
Garden City	1		4				1	
Grosse Pointe Woods								
Highland								
Huntington Woods			2					
Inkster			2				2	
Lake Orion								
Lansing	1				1			
Lathrup Village								
Lincoln Park			2					
Livonia	13		17	3			7	2
Luna Pier								
Melvindale								
Milan	1							
TOTALS	44	9	62	7	4	2	33	4

Winter Stonefly Search	Spring Team Leader Training	Spring Bug Hunt	Spring Bug Identification	Summer Mussel Survey	Fall Team Leader Training	Fall Bug Hunt	Fall Bug Identification
95	15	95	11	5	3	73	7
GRAND TOTALS	95	15	95	5	3	73	7

Event	Winter Stonefly Search	Spring Team Leader Training	Spring Bug Hunt	Spring Bug Identification	Summer Mussel Survey	Fall Team Leader Training	Fall Bug Hunt	Fall Bug Identification
Date	1/23/2010	3/21/2010	4/24/2010	5/10/2010	7/16/2010	10/3/2010	10/16/2010	10/29/2009
Time	9am-3pm	1-5 pm	9am-4pm	5-7 pm	10-3pm	12:30-5pm	9am-4pm	5-7:30 pm
City/Township	Dearborn	Troy	Dearborn	Dearborn	Troy, B'ham, B'ham, FF Pk, B'ham, Douglas, Evans	Troy	Livonia	Dearborn
Location	UMD-EIC	Nature Center	UMD-EIC	UMD-EIC		Nature Center	Schoolcraft College	UMD-EIC
Attendee Residency								
New Boston							1	
Northville	3	4	8	1			7	
Northville Twp	1							
Novi	1							
Oak Park								
Pinckney			3				3	
Plymouth	4		3	1	1		10	1
Port Huron			1					
Redford	5		3				3	1
Riverview								
River Rouge	1							
Rochester Hills	5							
Romulus								
Royal Oak			2			1		
Saline								
South Lyon								
Southfield	5		1	1			3	1
Sterling Heights	1							
Stockbridge	1							
Sylvan Lake								
Taylor	1							
Troy	1		1					
Warren	1							
Wayne		1	1	1				
West Bloomfield			1				1	
Westland	5	1	8				3	
White Lake							1	
Wixom								
Wolverine Lake								
Woodhaven			1					
Ypsilanti	14							2
Belle River, ON								
Greenville, OH	1							
Marion, OH								
Unknown	1						6	
TOTALS	51	6	33	4	1	1	40	3

**Friends of the Rouge
2010 Annual Report for ARC
LOCAL AND REGIONAL OUTREACH**

Date	Event/Meeting Name	Location	FOTR Staff	Display	Participation	Presentation
1/19/2010	Southeast Michigan Conservation Roundtable	Detroit	Petrella		Y	
1/20/2010	SEMCOG Partners for Clean Water	Detroit	Petrella		Y	
1/21/2010	UM-D Volunteer Fair	Dearborn	Ross	Y		
2/24/2010	DNRE Hearing on Detroit CSOs	Dearborn	Petrella		Y	
3/3/2010	Eliza Howell Park meeting	Detroit	Petrella		Y	
3/6/2010	Quiet Water Symposium	Lansing	Petrella	Y		
3/6/2010	Rain Garden Workshop	Dearborn Heights	Ross			Y
3/10/2010	Rouge Green Corridor Meeting	Birmingham	Petrella		Y	
3/11/2010	Eliza Howell Park meeting	Detroit	Petrella		Y	
3/22/2010	UM-D Organizational Behavior class panel discussion	Dearborn	Petrella			Y
3/23/2010	Guest on Commissioners Gershenson's cable television show	Bloomfield Twp	Ross, Hughes		Y	
4/17/2010	Earth Day at Heritage Park	Farmington Hills	Ross	Y		
4/22/2010	Detroit Free Press Green Leaders Breakfast	Detroit	Petrella, Hanna		Y	
4/22/2010	Fishbeck Earth Day Event	Farmington Hills	Petrella	Y		
4/22/2010	Rosedale Elementary School Earth Day event	Livonia	Ross, Hughes, Fires			Y
5/4/2010	SEMCOG Partners for Clean Water	Detroit	Petrella		Y	
5/6/2010	Water Festival at UM-D	Dearborn	Petrella, Ross			Y
5/11/2010	GI/LID meeting with ARC, ADW	Wayne	Ross		Y	
5/20/2010	Southeast Michigan Conservation Roundtable	Detroit	Petrella		Y	
6/18 - 6/20/2010	Detroit River Days	Detroit	Petrella, Ross, Hanna	Y		
6/22/2010	GI/LID workshop planning	Wayne	Ross		Y	
7/10/2010	ARC Rain Barrel Sale & Promotion	Redford	Petrella		Y	
7/20/2010	ARC/ADW GI-LID workshop planning committee	Wayne	Ross		Y	
7/23/2010	Rouge Park work days	Detroit	Petrella		Y	
8/29/2011	Southfield SomeMore Festival Participation	Southfield	Hanna	Y	Y	
9/9/2010	Detroit Parks Coalition	Detroit	Petrella		Y	
9/14/2010	Saline River Greenway Alliance Meeting	Milan	Ross		Y	Y
9/26/2010	Rouge Kayak Tour	Melvindale to River Rouge	Petrella, Hanna		Y	
10/3/2010	Presentation to church on Caring for the River	Southfield	Petrella			Y
10/4/2010	Bell Creek Public Meeting	Farmington Hills	Petrella		Y	
10/17/2010	Fall Canoe Trip	Wayne	Petrella, Ross, Hanna		Y	
11/10/2010	Detroit Parks Coalition	Detroit	Petrella		Y	

APPENDIX E

Illicit Discharge Elimination Program Activity Report
to the Alliance of Rouge Communities

Prepared by Wayne County Department of Public Services
Water Quality Management Division
March 7, 2011

City of Inkster, Perrin Drain Investigation

WQMD performed an illicit discharge monitoring project for the City of Inkster in 2008. During this investigation, a storm sewer manhole contained extremely high *E. coli* concentrations was discovered, along with elevated concentrations of other parameters indicative of an illicit discharge. The City of Inkster stated that this manhole was not part of their storm sewer system. Research revealed that this storm sewer is part of the enclosed Perrin Drain, a Wayne County Drain.

WQMD further researched the area and prepared an investigation plan that was transmitted to MDNRE in December 2008. WQMD initiated the Perrin Drain investigation and is attempting to identify the illicit discharge source(s) in the area. During 2009, nine samples were collected from storm sewer manholes in the drainage area for the Perrin Drain in the City of Inkster. Several storm sewer inlets appeared suspicious and several samples contained elevated IDEP parameters. Facility dye testing was performed in the area.

The Perrin Drain enclosure plans were obtained and reviewed to identify locations where there are sanitary sewer crossings and other potential problem areas. The crossings pose a high illicit discharge potential and are an investigative priority. There are five such crossings in the enclosed section of the Perrin Drain. An investigation and water quality sampling in the Perrin Drain downstream of the sanitary sewer crossings identified on the Perrin Drain plans was performed. Water samples were collected during this investigation and approximately 20 manholes surveyed. A sample collected at an inlet at Magnolia and Avondale contained elevated IDEP parameters that indicate an illicit discharge may be present in the nearby area. This inlet, in a storm sewer in the City of Inkster, was reported to the City.

On December 6, 2010, WQMD staff performed additional investigation of the Perrin Drain in the City of Inkster and surveyed storm sewer manholes and collected nine samples. Elevated IDEP parameters were found in the Magnolia Street storm sewer.

WQMD met with the City of Inkster on December 9 and 16, 2010. The City agreed to assist in the investigation of the Perrin Drain, including performing confined space entry at Perrin Drain manholes to collect samples and evaluate the sanitary sewer crossings where applicable. The Perrin Drain area and the inlets at street intersections were surveyed to identify additional sampling sites.

Additional investigation on the Perrin Drain took place on December 21, 2010 with the City of Inkster's assistance. The City of Inkster staff performed confined space entry at

four locations to evaluate the sanitary sewer crossings and survey the Perrin Drain and inlets for illicit discharge signs. Samples were collected during the confined space entry. A total of 12 samples were collected during this investigation. Elevated ammonia and surfactant concentrations were present in storm sewer manholes along the Magnolia Street storm sewer a block upstream of the Perrin Drain inlet. Weather conditions hampered further investigative efforts in 2010. Additional investigation of this area is planned for early 2011.

Plymouth Township

WQMD prepared a list of facilities in Plymouth Township for IDEP investigations. This list was reviewed to identify facilities in the drainage areas of outfalls identified as suspicious during the Tonquish Creek Annual Inspection and other IDEP investigation efforts.

Facility dye testing was performed in Plymouth Township during January 2011. Site evaluations were conducted at 43 facilities located in the target investigation area described above. Forty of these facilities were determined to be residential based businesses and were not dye tested. One facility, a pre school was dye tested and no illicit connections found. One facility in the investigation area needs dye testing, and will be investigated in early 2011.

WQMD prepared an investigation and follow up plan for four Plymouth Township outfalls identified for further investigation during the Tonquish Creek Annual Inspection performed in November 2009. Additional sampling and investigation of this area is planned for early 2011.

Wayne County 2010 Facility Dye-testing Results

Table 1 is a summary of facility dye test inspection activities in Wayne County by watershed for the calendar year 2010. *Table 2* is a summary of the types of illicit connections and illicit discharges found during 2010 by watershed. Wayne County Department of Public Health, Environmental Health Division (EHD) found 49 Onsite Disposal System (ODSD) failures as result of their program. Twenty-one of these failures resulted in the discharge of sewage. EHD does not track failed OSDs by watershed.

**Table 1: Wayne County Watersheds Facility (Dye Test) Inspection Summary
January 1 through December 31, 2010**

	Annual Total	Watershed			
		Rouge River Watershed	Ecorse Creek Watershed	Combined Downriver Watershed	Lower Huron Watershed
Number of Facilities Inspected	239	149	60	19	11
239 Number of Facilities with Illicit Connections	4	0	4	0	0
Number of Illicit Connections*	31	0	31	0	0
Number of Facilities with Illicit Discharges	6	0	6	0	0
Number of Illicit Discharges	10	0	10	0	0
Number of Environmental Concerns	5	1	0	2	2
Number of Facilities with Environmental Concerns	5	1	0	2	2
Number of Facilities with Confirmed Corrections	7	6	1	0	0
Number of Illicit Connections Corrected	21	2	0	0	0
Number of Illicit Discharges Corrected	9	5	4	0	0
Number of Environmental Concerns Corrected	0	0	0	0	0

**Table 2: Types of Illicit Discharges Found Within Wayne County
During Facility (Dye-Test) Inspections January 1 through December 31, 2010**

<i>Type of Illicit Connection</i>	<i>Percent of Total Identified</i>	<i>County Total</i>	Watershed		
			Rouge River	Ecorse Creek	Combined Downriver
Floor Drains	90	28	0	28	0
Sinks	10	3	0	3	0
Other	0	0	0	0	0
TOTAL	100			31	
<i>Type of Illicit Discharge</i>	<i>Percent of Total Identified</i>	<i>County Total</i>	Rouge River	Ecorse Creek	Combined Downriver
Outdoor Equipment washing	20	2	0	2	0
Inappropriate Floor Wash Water Disposal	50	5	0	5	0
Sump pump	10	1	0	1	0
Onsite Sewage Disposal System	0	0	0	0	0
Other trash compactor, milk discharge	20	2	0	2	0
TOTAL	100			10	

**CITY OF FARMINGTON HILLS
ILLICIT CONNECTION SOURCE
IDENTIFICATION**

**FINAL PROJECT SUMMARY REPORT
JANUARY, 2011**

Prepared By: Michael C. Walsh, P.E.

Oakland County Water Resources Commissioner's Office



**City of Farmington Hills Illicit Connection Source Identification
Final Project Summary Report
January, 2011**

I. BACKGROUND

This report is being submitted in accordance with the provisions of the Inter-Agency Agreement between the Alliance of Rouge Communities (ARC) and the Oakland County Water Resources Commissioner (WRC) dated June 30, 2010. The purpose of the project has been to identify illicit sanitary connections to the Chapter 4 Storm Drains within the project area and to develop certain deliverables defined in the Scope of Work in the Inter-Agency Agreement. The project has been funded by a grant from the ARC and has been implemented as a follow-up effort to recommendations made in the Rouge-Oakland Illicit Discharge Elimination Program Activities Project (RVIIIB-07) Final Project Report dated January 27, 2010. The ultimate goal of this effort is to reduce pollution to the Rouge River by eliminating the illicit connections found during the project as future funding permits.

The project area, identified on the maps contained within this report, is located in part of Section 36, T.1N. R.9E. in the City of Farmington Hills, bounded by Shiawassee Road on the north, Inkster Road on the east, Eight Mile Road on the south, and Waldron Street on the west. This area is served by five Chapter 4 Storm Drains under the jurisdiction of the WRC and includes the Clarenceville Drain (constructed 1924), the Clarenceville Drain Extension (constructed 1952), the Pearl Street Drain (constructed 1926), the Hazel Drain (constructed 1924), and the Oxford Avenue Drain (constructed 1926). Work tasks described in the Inter-Agency Agreement include CCTV Inspection, Dye Testing, and Mapping and Reporting. Project deliverables under the Mapping and Reporting task include a GIS-based map of storm drains, a GIS-based map of properties served by septic systems, and a GIS-based map of sanitary sewers.

Tables and maps referenced in this report are found in the **Appendix D**.

II. WORK TASKS

A. Task 1 – CCTV Inspection

Table 1, Map 1, and Map 2 identify the Chapter 4 Storm Drains televised within the project area. **Map 2** shows only the Chapter 4 Storm Drains in the project area for which the WRC has a

**City of Farmington Hills Illicit Connection Source Identification
Final Project Summary Report
January, 2011**

televising video record. Video records could not be found for some of the sections of Chapter 4 Storm Drain identified as being televised on the map provided with the report dated January 27, 2010. These sections are not shown on **Map 2**. Any section of Chapter 4 Storm Drain for which no video record exists will need to be televised in the future even if it has been listed as televised on the map in the January 27, 2010 report. In addition, any section of Chapter 4 Storm Drain shown on **Map 2** that has not been televised from manhole to manhole should be cleaned and re-televised to provide a complete and continuous record.

Televising for the project was prioritized based on monitoring results for E. coli identified in the RVIIB-07 report dated January 27, 2010. Approximately 5,680 feet of the Chapter 4 Storm Drains in the project area were televised under the current project for a total of 8,430 feet televised including the work completed under the RVIIB-07 project. Some of the Chapter 4 Storm Drains televised under the RVIIB-07 project were re-televised in 2010 to complete entire sections of the drain from manhole to manhole and to provide for a continuous record. This also allowed for further verification of some of the information provided in the January 27, 2010 report.

Televising progressed slowly as the drains were obstructed at many locations by roots, soil, and other debris and had to be cleaned. In some cases, as can be seen on **Map 2**, televising operations were completely abandoned due to severe obstruction. Copies of the televising reports are included in **Appendix A**. The report format varies as WinCanV7 software was used for the work performed in 2008, and WinCanV8 was used for the work performed in 2010.

42 open connections to the Chapter 4 Storm Drains were found during the 2010 televising and are identified on **Map 2** in green. If additional funds become available, an investigation should be performed to determine whether or not these open connections are conveying sanitary sewage.

B. Task 2 – Dye Testing

Letters were mailed to the owners of 42 properties in the project area on August 19, 2010. These properties represent all properties identified on the map in the report dated January 27, 2010 as having open connections. The letter explained the dye testing procedure and asked the property owner to contact the WRC to schedule an appointment for a dyed water test of their sanitary sewer

**City of Farmington Hills Illicit Connection Source Identification
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lead(s). An example letter is attached in **Appendix C**. The 42 properties are listed in **Table 2** and shown on **Map 2**.

The initial response to the letters was positive, and several appointments were made shortly after the letters were mailed. WRC followed up with non-responsive owners by attempting to make contact via telephone and in person by knocking on the door and attaching a copy of the letter to the door of the home. Ultimately, 17 of the 42 properties for which letters were mailed could not be tested. 15 properties could not be tested because of the lack of a response from the owner. Two properties with non-responsive owners were occupied by vacant buildings. One property could not be tested because there was no building on the property. A decision was made to not test the Botsford Hospital property at 28080 Grand River because of the magnitude of the testing that would have to be performed. In addition, WRC contacted hospital personnel who indicated they were not aware of any connections to the Chapter 4 Storm Drains. Video records of the Chapter 4 Storm Drain in the area surrounding the hospital should be reviewed further to determine if dye testing is actually necessary.

Dye testing was conducted with a three-person team. One team member flushed dye into plumbing fixtures inside the home while other team members watched for dye in the sanitary sewer and Chapter 4 Storm Drain. Yellow-green dye was used to test the sanitary fixtures, and red dye was used to test the sump pumps in the home if a sump pump was present. A copy of the dye testing procedure written for the project is included in **Appendix C** with the MSDS sheet for the dye and a photograph of the dye bottles.

Appropriate notifications were made prior to testing. The WRC filed a Notification of Intent with the MDNRE and notified the Local Emergency Planning Committee (LEPC) in Oakland County and the Oakland County Health Division. The Oakland County LEPC notified the LEPC in Wayne County. The City of Farmington Hills notified Police, Fire, and adjacent downstream communities about the dye testing.

Results of the dye testing effort are presented in **Table 2** and on **Map 2**. A total of 28 dye tests were conducted on 25 properties. One property (21206 St. Francis Avenue) had two homes on the site

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that were tested separately. Another property (21516 Oxford) consisted of one building with three separate apartments that were tested separately. The dye testing effort confirmed six properties with illicit sanitary connections to the Chapter 4 Storm Drain. A seventh property (20829 Pearl Street) was verified as being connected to the Chapter 4 Storm Drain by accident during cleaning operations when the resident informed the crew that water and other material was being ejected from the home's bathroom plumbing fixtures. Addresses of illicitly connected properties are presented in **Table 2**. 8.5" x 11" drawings of these properties are attached in **Appendix B**.

19 properties were verified as being connected to the sanitary sewer. Note that these properties were dye tested because they were listed as having open connections to the Chapter 4 Storm Drain in the report dated January 27, 2011. The property located at 21544 Oxford is connected to the sanitary sewer, but according to WRC records, this property is not presently receiving a sewer bill. The City of Farmington Hills should investigate this issue further.

III. MAPPING AND REPORTING

A. GIS-Based Map of Storm Drains

Map 3 is a GIS-based map of the storm drains in the project area. This map identifies the Chapter 4 Storm Drains under the jurisdiction of the WRC and storm drains under the City of Farmington Hill's jurisdiction. The map was developed based on as-built drawings, section maps, and GPS verification of the storm drainage structures by WRC Personnel. Pipe sizes for the City of Farmington Hills system remain to be identified as well the ownership of some of the structures. This work should be completed during a future project as funding becomes available.

B. GIS-Based Map of Properties Served by Septic Systems

Properties potentially served by septic systems in the project area are shown on **Map 2**. These properties were identified based on the WRC's current sewer billing records. The assumption with this approach is that if the property owner does not receive a sewer bill, they potentially have an active septic system. These properties could also be connected to the Chapter 4 Storm Drain.

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The WRC worked with the Oakland County Health Division to research the Division's septic system records, to verify the presence of a septic system for the properties suspected of having a septic system as shown on **Map 2**. The Health Division was able to locate records for only two properties (28035 Shiawassee and 28128 Independence). These records are attached in **Appendix E**. Further research should be done to locate and verify possible septic systems by on site inspections, dye testing, smoke testing, property owner interviews, and other means. The WRC had anticipated physically verifying some of the potential septic systems with this project; however, limited funding did not permit this to be accomplished. Septic system verification for the project area should be completed during a future project as funding becomes available. These properties should also be dye or smoke tested to verify a connection to the Chapter 4 Storm Drain if an open connection for the property exists.

C. GIS-Based Map of Sanitary Sewers

Map 4 identifies sanitary sewers in the project area. These sewers are operated and maintained by the WRC. This map was developed based on WRC records.

IV. RECOMMENDATIONS AND LESSONS LEARNED

- A.** All illicit connections should be disconnected from the Chapter 4 Storm Drain and properly connected to the nearest sanitary sewer as quickly as possible.

Three properties along Pearl Street were verified by dye testing as having illicit sanitary connections to the Chapter 4 Storm Drain. Letters were mailed to six property owners on Pearl, with only three responding favorably. It is likely that all six properties are connected to the storm drain since no sanitary sewer exists. Disconnection of the connected properties will require construction of a new sanitary sewer along Pearl or conversion of the Chapter 4 Storm Drain into a sanitary sewer. An eight-inch diameter sanitary stub exists at the South end of Pearl Street and flows to a 48-inch diameter sewer in Eight-Mile Road. A sewer could be constructed along Pearl and connected to the existing stub.

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- B.** The property located at 21544 Oxford was verified as being connected to the sanitary sewer; however, WRC records indicate they are not presently receiving a sewer bill. The City of Farmington Hills should investigate this issue.
- C.** The WRC completed a map (**Map 3**) of the storm drains in the project area including those owned and operated by the City of Farmington Hills. Pipe sizes for the Farmington Hills System could not be verified as well as ownership of some of the drainage structures due to a lack of funding. These items should be determined and added to the map with any other relevant information that might be found during subsequent work.
- D.** Review of WRC billing records identified several properties with the potential of having active septic systems. Possible septic systems in the project area should be verified. These properties should also be dye or smoke tested to determine whether or not the property is connected to a Chapter 4 Storm Drain.
- E.** 42 open connections to the Chapter 4 Storm Drains in the project area were found during the 2010 televising. 15 properties with open connections identified in the report dated January 27, 2010 could not be dye tested because of a lack of response from the property owner. A project should be undertaken to identify whether or not any of these open connections are illicitly connected to the Chapter 4 Storm Drains.
- F.** Follow-up procedures should be developed for contacting non-responsive property owners.
- G.** Dye testing to verify illicit connections is a labor intensive and costly process requiring permission from the homeowner to physically enter the home on the property. Another method of verifying illicit and other connections to the storm drain is smoke testing. Smoke testing is performed throughout the country, and a wealth of smoke testing information is available. Any future project to locate and verify illicit connections in the project area should consider smoke testing as alternative to dye testing as it could prove to be more efficient than dye testing and a better financial alternative.

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H. Any section of Chapter 4 Storm Drain shown on **Map 2** that has not been televised from manhole to manhole should be cleaned and re-televised to provide a complete and continuous record.

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**APPENDIX A
TELEVISION REPORTS**



INSPECTION REPORT

DATE: 08/28/2008	WORK #:	WEATHER: CLOUDY	OPERATOR: NOWRY	SECTION NR: 3	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: OXFORD	MAP #1:	MH: OXD-001
CITY: Oxford Ave. Drain	MAP #2:	MH: CLD-007
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 373.8 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 15"
SECTION TYPE: STORMWATER	MATERIAL: CLAY PIPE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
0.00	0	inspection begins at upstream manhole	00:00:11		0
<u>2.00</u>	0	service connection, at 02 o'clock	00:00:44		0
<u>53.70</u>	0	service connection capped, at 02 o'clock	00:02:07		0
<u>57.90</u>	0	service connection capped, at 10 o'clock	00:02:30		0
<u>107.50</u>	0	service connection, at 02 o'clock	00:04:04		0
<u>153.00</u>	0	service connection, at 02 o'clock	00:05:33		0
<u>155.20</u>	0	service connection capped, at 10 o'clock	00:06:06		0
<u>202.20</u>	0	service connection, at 02 o'clock	00:07:19		0
<u>226.80</u>	0	Multiple Cracks, from 03 to 12 o'clock	00:07:53		2
<u>259.00</u>	0	service connection, at 02 o'clock	00:08:37		0
<u>260.90</u>	0	service connection capped, at 10 o'clock	00:08:57		0
<u>301.40</u>	0	service connection capped, at 03 o'clock	00:09:55		0
<u>357.50</u>	0	service connection, at 02 o'clock	00:12:33		0
<u>359.30</u>	0	service connection capped, at 10 o'clock	00:12:58		0
<u>373.80</u>	0	inspection ends at downstream manhole	00:13:28		0



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INSPECTION REPORT

DATE: 08/28/2008	WORK #:	WEATHER: CLOUDY	OPERATOR: NOWRY	SECTION NR: 4	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 900

STREET: Collingham	MAP #1:	MH: CLD-008
CITY: Oxford Ave. Drain	MAP #2:	MH: CLD-007
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 260 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 15"
SECTION TYPE: STORMWATER	MATERIAL: CLAY PIPE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
CLD-008					
6.00	0	inspection begins at upstream manhole	00:00:11		0
7.20	0	service connection, at 03 o'clock	00:00:30		0
15.40	400	Multiple Cracks at joint, from 11 to 03 o'clock	00:01:00		3
60.00	0	service connection, at 01 o'clock	00:02:17		0
67.50	0	service connection, at 01 o'clock	00:03:00		0
98.60	0	service connection, at 09 o'clock	00:03:54		0
131.20	0	service connection, at 02 o'clock	00:04:47		0
213.80	0	service connection capped, at 10 o'clock	00:06:28		0
216.00	0	service connection, at 02 o'clock	00:06:55		0
239.10	500	pipe broken at joint, at 03 o'clock	00:08:27		3
260.00	0	inspection ends at downstream manhole	00:09:03		0
CLD-007					





INSPECTION REPORT

DATE: 09/02/2008	WORK #:	WEATHER: CLOUDY	OPERATOR: NOWRY	SECTION NR: 5	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Collingham	MAP #1:	MH: CLD-009
CITY: Clarenceville Drain	MAP #2:	MH: CLD-008
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 60.5 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 12"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
 6.00	0	inspection begins at upstream manhole	00:00:14		0
8.20	0	Hole in pipe at 01 o'clock	00:00:43		3
60.50	0	camera blocked, inspection abandoned	00:03:54		0
					



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INSPECTION REPORT

DATE: 09/02/2008	WORK #:	WEATHER: CLOUDY	OPERATOR: NOWRY	SECTION NR: 7	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Collingham	MAP #1:	MH: CLD-009
CITY: Clarenceville Drain	MAP #2:	MH: CLD-010
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 66.8 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 12"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
 6.00	0	inspection begins at downstream manhole	00:00:10		0
57.60	0	service connection, at 10 o'clock	00:01:11		0
66.80	0	inspection abandoned	00:02:04		0
					




INSPECTION REPORT

DATE: 09/02/2008	WORK #:	WEATHER: SUNNY, DRY	OPERATOR: NOWRY	SECTION NR: 8	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Collingham	MAP #1:	MH: CLD-008
CITY: Clarenceville Drain	MAP #2:	MH: CLD-009
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 23.8 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 15"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
 CLD-008 6.00	0	inspection begins at downstream manhole	00:00:10		0
 CLD-009 23.80	0	camera blocked, inspection abandoned mud	00:01:16		0



INSPECTION REPORT

DATE: 09/02/2008	WORK #:	WEATHER: SUNNY, DRY	OPERATOR: NOWRY	SECTION NR: 11	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Collingham	MAP #1:	MH: CLD-010
CITY: Clarenceville Drain	MAP #2:	MH: CLD-009
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 26.6 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 12"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
 0.00	0	inspection begins at upstream manhole	00:00:10		0
1.60	0	service connection, at 11 o'clock	00:00:42		0
26.60	0	camera blocked, inspection abandoned	00:01:29		0
					





INSPECTION REPORT

DATE: 09/04/2008	WORK #:	WEATHER: SUNNY	OPERATOR: NOWRY	SECTION NR: 13	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: St. Francis	MAP #1:	MH: HZD-025
CITY: Hazel Drain	MAP #2:	MH: HZD-026
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 215.6 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 10"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
 6.00	0	inspection begins at downstream manhole	00:00:10		0
_____ 11.00	0	service connection, at 10 o'clock	00:00:37		0
_____ 81.60	0	service connection, at 12 o'clock	00:02:33		0
_____ 83.20	0	service connection capped, at 12 o'clock	00:03:01		0
_____ 154.70	0	service connection, at 03 o'clock	00:06:50		0
_____ 199.00	0	service connection, at 02 o'clock	00:10:01		0
_____ 215.60	0	inspection ends at upstream manhole	00:11:10		0
					





INSPECTION REPORT

DATE: 09/05/2008	WORK #:	WEATHER: OVERCAST	OPERATOR: NOWRY	SECTION NR: 17	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Rensselaer	MAP #1:	MH: HZD-051
CITY: Hazel Drain	MAP #2:	MH: HZD-050
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TVD LGTH: 201.8 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 10"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
 6.00 22.70 49.80 171.00 201.80	0 0 0 0 0	inspection begins at upstream manhole service connection, at 12 o'clock service connection, at 11 o'clock service connection, at 02 o'clock inspection ends at downstream manhole	00:00:10 00:00:53 00:02:11 00:06:11 00:07:12		0 0 0 0 0
					



INSPECTION REPORT

DATE: 09/08/2008	WORK #:	WEATHER: SUNNY	OPERATOR: NOWRY	SECTION NR: 18	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Rensselaer	MAP #1:	MH: HZD-050
CITY: Hazel Drain	MAP #2:	MH: HZD-049
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 229.6 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 10"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
HZD-050					
6.00	0	inspection begins at upstream manhole	00:00:11		0
76.80	0	service connection, at 02 o'clock	00:01:48		0
91.70	0	service connection, at 02 o'clock	00:02:54		0
184.60	0	service connection, at 01 o'clock	00:05:15		0
229.60	0	inspection ends at downstream manhole	00:10:30		0
HZD-049					



INSPECTION REPORT

DATE: 09/08/2008	WORK #:	WEATHER: SUNNY	OPERATOR: NOWRY	SECTION NR: 20	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Colwell	MAP #1:	MH: HZD-019
CITY: Hazel Drain	MAP #2:	MH: HZD-005
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 312.5 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 18"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE																								
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px; margin-right: 10px;">HZD-019</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 15%;">6.00</td> <td style="text-align: center; width: 10%;">0</td> <td style="width: 45%;">inspection begins at upstream manhole</td> <td style="text-align: center; width: 15%;">00:00:10</td> <td style="width: 10%;"></td> <td style="text-align: center; width: 5%;">0</td> </tr> <tr> <td style="text-align: center;">147.80</td> <td style="text-align: center;">0</td> <td>service connection, at 11 o'clock</td> <td style="text-align: center;">00:02:06</td> <td></td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">249.90</td> <td style="text-align: center;">0</td> <td>service connection, at 11 o'clock</td> <td style="text-align: center;">00:03:56</td> <td></td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">312.50</td> <td style="text-align: center;">0</td> <td>inspection ends at downstream manhole</td> <td style="text-align: center;">00:05:33</td> <td></td> <td style="text-align: center;">0</td> </tr> </table> </div>						6.00	0	inspection begins at upstream manhole	00:00:10		0	147.80	0	service connection, at 11 o'clock	00:02:06		0	249.90	0	service connection, at 11 o'clock	00:03:56		0	312.50	0	inspection ends at downstream manhole	00:05:33		0
6.00	0	inspection begins at upstream manhole	00:00:10		0																								
147.80	0	service connection, at 11 o'clock	00:02:06		0																								
249.90	0	service connection, at 11 o'clock	00:03:56		0																								
312.50	0	inspection ends at downstream manhole	00:05:33		0																								
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px; margin-right: 10px;">HZD-005</div> </div>																													



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INSPECTION REPORT

DATE: 09/08/2008	WORK #:	WEATHER: SUNNY	OPERATOR: NOWRY	SECTION NR: 21	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Colwell	MAP #1:	MH: HZD-019
CITY: Hazel Drain	MAP #2:	MH: HZD-020
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TVD LGTH: 321.8 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 18"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px; margin-right: 5px;">HZD-019</div> <div style="flex-grow: 1;"> <hr style="border: 0.5px solid black; margin-bottom: 2px;"/> <div style="display: flex; justify-content: space-between; margin-bottom: 2px;"> 6.00 0 inspection begins at downstream manhole 00:00:10 0 </div> <hr style="border: 0.5px solid black; margin-bottom: 2px;"/> <div style="display: flex; justify-content: space-between; margin-bottom: 2px;"> 18.50 0 service connection, at 01 o'clock 00:00:44 0 </div> <hr style="border: 0.5px solid black; margin-bottom: 2px;"/> <div style="display: flex; justify-content: space-between; margin-bottom: 2px;"> 115.60 0 service connection, at 03 o'clock 00:02:02 0 </div> <hr style="border: 0.5px solid black; margin-bottom: 2px;"/> <div style="display: flex; justify-content: space-between; margin-bottom: 2px;"> 321.80 0 inspection ends at upstream manhole 00:05:19 0 </div> </div> </div>					
<div style="border: 1px solid black; border-radius: 50%; padding: 2px; margin-bottom: 5px;">HZD-020</div>					





INSPECTION REPORT

DATE: 09/08/2008	WORK #:	WEATHER: SUNNY	OPERATOR: NOWRY	SECTION NR: 23	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Colwell	MAP #1:	MH: HZD-021
CITY: Hazel Drain	MAP #2:	MH: HZD-020
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 335 ft
INSPECT REASON: IDEP INV	PIPE SIZE: 18"	
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE	JT LGTH:
AREA: FAT	LINING:	
	RSRVD:	

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
		inspection begins at upstream manhole	00:00:11		0
6.00	0				
93.90	0	service connection, at 11 o'clock	00:01:50		0
127.60	0	service connection, at 12 o'clock	00:02:47		0
335.00	0	inspection ends at downstream manhole	00:05:24		0
					



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INSPECTION REPORT

DATE: 09/08/2008	WORK #:	WEATHER: SUNNY	OPERATOR: NOWRY	SECTION NR: 24	SECTION NAME:
PRESENT:	VEHICLE: 97909	CAMERA: PAN/TILT	PRESET:	CLEANED:	RATE: 0

STREET: Colwell	MAP #1:	MH: HZD-021
CITY: Hazel Drain	MAP #2:	MH: HZD-022
LOCALE: MAIN RESIDENTIAL STREET	TAPE #:	TV'D LGTH: 322 ft

INSPECT REASON: IDEP INV	PIPE SIZE: 18"
SECTION TYPE: STORMWATER	MATERIAL: CONCRETE JT LGTH:
AREA: FAT	LINING:
	RSRVD:

REMARK:

POSITION	CODE	OBSERVATION	MPEG	PH	RATE
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px; margin-right: 5px;">HZD-021</div> <div style="margin-left: 20px;"> <u>6.00</u> </div> </div>	0	inspection begins at downstream manhole	00:00:10		0
<div style="margin-left: 20px;"> <u>253.80</u> </div>	0	service connection, at 01 o'clock	00:03:10		0
<div style="margin-left: 20px;"> <u>322.00</u> </div>	0	inspection ends at upstream manhole	00:04:26		0
<div style="border: 1px solid black; border-radius: 50%; padding: 2px; margin-top: 10px;">HZD-022</div>					

Inspection Report / Inspection: 1

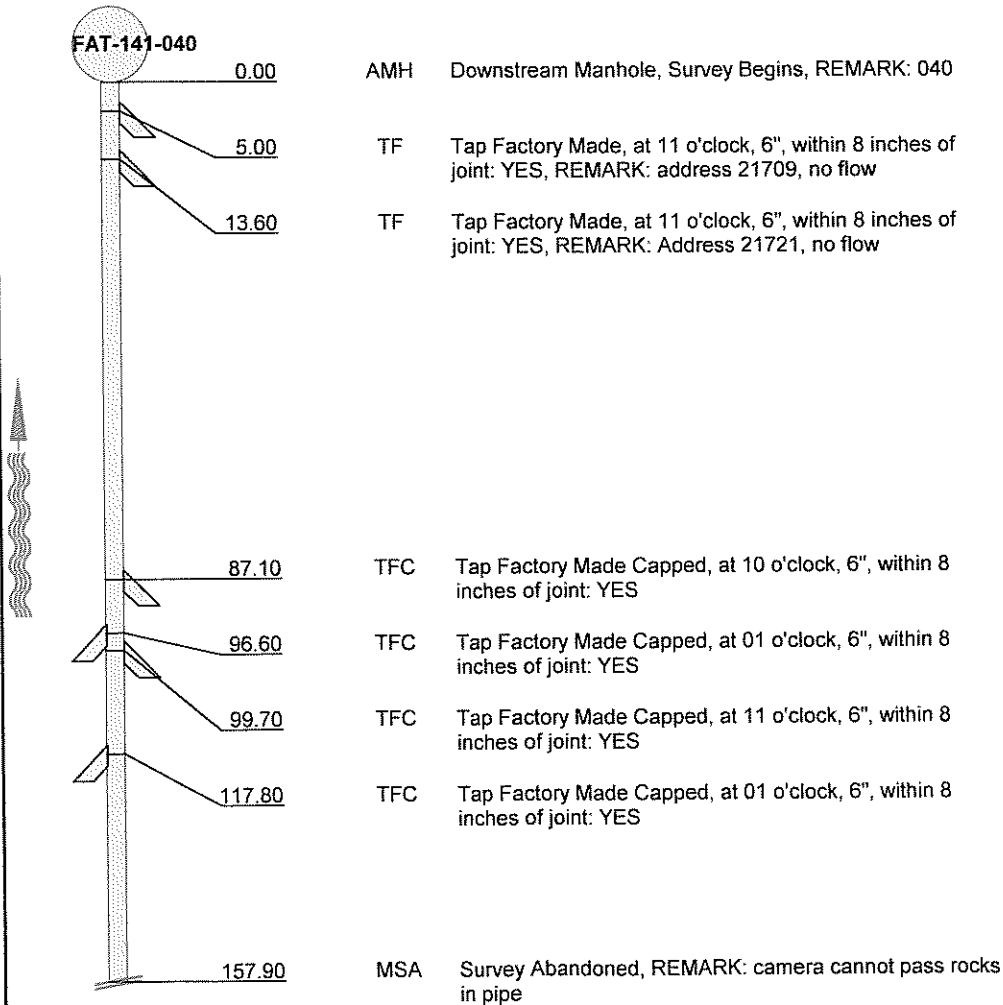
Date 9/23/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 1
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 157.90 ft	Upstream MH FAT-141-043 Dowstream MH FAT-141-040 Dir. of Survey Upstream Section Length 157.90 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 12 inch Concrete
--	--	--	---

Add. Information :

1:405	Position	Code	Observation	Photo
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QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 9/23/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 4
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 109.30 ft	Upstream MH FAT-141-037 Downstream MH FAT-144-036 Dir. of Survey Downstream Section Length 115.30 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 12 inch Concrete
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Add. Information :

1:300	Position	Code	Observation	Photo
	FAT-141-037			
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 037	
	14.30	TF	Tap Factory Made, at 02 o'clock, 6", within 8 inches of joint: YES	
	51.10	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: NO	
	69.70	TF	Tap Factory Made, at 02 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21567, no flow	
	96.80	TF	Tap Factory Made, at 02 o'clock, 6", within 8 inches of joint: YES, REMARK: heavy calcium in lead. Not sure if it's capped	
	115.00	MSA	Survey Abandoned, REMARK: camera cannot pass calcium	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 5
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123	City Oxford	Use of Sewer	Upstream MH FAT-141-033
City Farmington	Loc. details	Drainage Area	Dowstream MH FAT-141-031
Location Code		Flow Control	Dir. of Survey Upstream
		Length surveyed 4.00 ft	Section Length 10.00 ft

Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 12 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:50	Position	Code	Observation	Photo
		AMH	Downstream Manhole, Survey Begins, REMARK: 031	
		RBC	Roots Ball Connection, from 02 to 09 o'clock, 75 %, within 8 inches of joint: YES, REMARK: Address 21619, can't get camera up to lead due to roots	
		MSA	Survey Abandoned, REMARK: roots in line	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	0	4	4	0	4	4

Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 7
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123 Oxford	Use of Sewer	Upstream MH FAT-141-031
City Farmington	Drainage Area	Dowstream MH FAT-141-029
Loc. details	Flow Control	Dir. of Survey Upstream
Location Code	Length surveyed 132.60 ft	Section Length 138.60 ft

Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 12 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:360	Position	Code	Observation	Photo			
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 029				
	26.00	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES				
	44.20	TF	Tap Factory Made, at 11 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21515, no flow or evidence of past flow				
	58.60	MGO	General Observation, within 8 inches of joint: YES, REMARK: sewer evidence				
	60.40	TFA	Tap Factory Made Active, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21516, flow from lead				
	78.40	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES				
	80.30	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES				
	84.40	TB	Tap Break-In, at 12 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21516B, no flow or evidence of past flow				
	138.60	RMJ	Roots Medium Joint, from 06 to 11 o'clock, 40 %, within 8 inches of joint: YES				
	138.60	MSA	Survey Abandoned, REMARK: camera cannot pass roots				
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	0	4	4	0	4	4

Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 8
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Oxford Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 74.40 ft	Upstream MH FAT-141-029 Downstream MH FAT-144-043 Dir. of Survey Downstream Section Length 80.40 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	15 inch Clay
--	--	--	------------------------

Add. Information : print say 15" line, looks 12"

1:210	Position	Code	Observation	Photo
	FAT-141-029			
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 029	
	7.30	TF	Tap Factory Made, at 02 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21511, no flow or evidence of past flow	
	61.50	TB	Tap Break-In, at 12 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21506, no flow or evidence of past flow	
	67.50	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	69.40	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	79.80	TBI	Tap Break-In Intruding, at 02 o'clock, 6", 1", within 8 inches of joint: YES, REMARK: Address 21507, no flow or evidence of past flow	
	80.40	DSF	Deposits Settled Fine. 20 %of cross sectional area, from 04 to 08 o'clock. within 8 inches of joint. YES	
	80.40	MSA	Survey Abandoned, REMARK: camera cannot pass through debris	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3121	0	5	5	0	2.5	2.5

Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 9
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123 Oxford	Use of Sewer	Upstream MH FAT-141-029
City Farmington	Drainage Area	Dowstream MH FAT-144-043
Loc. details	Flow Control	Dir. of Survey Upstream
Location Code	Length surveyed 15.30 ft	Section Length 21.30 ft

Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 15 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:60	Position	Code	Observation	Photo
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 144-043	
	21.30	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	21.30	DSGV	Deposits Settled Gravel, 20 % of cross sectional area from 04 to 08 o'clock, within 8 inches of joint. YES	
	21.30	MSA	Survey Abandoned, REMARK: camera cannot pass gravel	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	0	3	3	0	3	3

Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 10
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123 Oxford	Use of Sewer	Upstream MH FAT-144-043
City Farmington	Drainage Area	Dowstream MH FAT-144-042
Loc. details	Flow Control	Dir. of Survey Downstream
Location Code	Length surveyed 156.00 ft	Section Length 162.00 ft

Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 15 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:405	Position	Code	Observation	Photo
	FAT-144-043			
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-043	
	37.80	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	39.60	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: YES	
	48.10	TBI	Tap Break-In Intruding, at 02 o'clock, 6", 1", within 8 inches of joint: YES, REMARK: Address 21409, no flow or evidence of past flow	
	94.30	TBI	Tap Break-In Intruding, at 03 o'clock, 6", 1", within 8 inches of joint: NO, REMARK: Address 21395, no flow has flow evidence	
	141.40	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	143.40	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	162.00	DSF	Deposits Settled Fine, 35 %of cross sectional area, from 04 to 08 o'clock, , within 8 inches of joint: YES	
	162.00	MSA	Survey Abandoned, REMARK: camera cannot pass debris	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5122	0	9	9	0	3	3

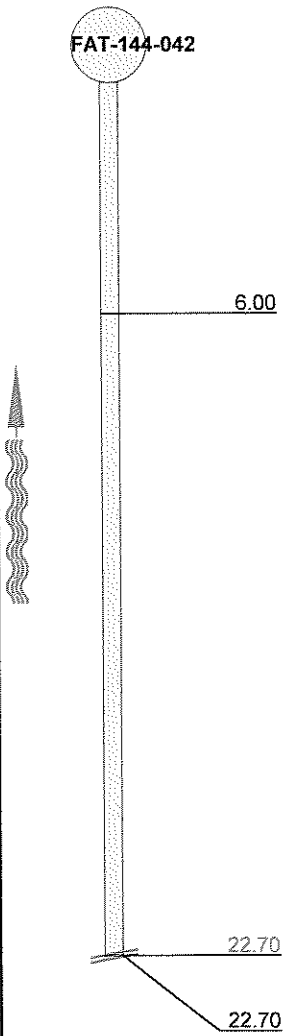
Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 11
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123 Oxford	Use of Sewer	Upstream MH FAT-144-043
City Farmington	Drainage Area	Dowstream MH FAT-144-042
Loc. details	Flow Control	Dir. of Survey Upstream
Location Code	Length surveyed 16.70 ft	Section Length 22.70 ft

Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 15 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:60	Position	Code	Observation	Photo
				
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 144-042	
	22.70	RMJ	Roots Medium Joint, from 01 to 11 o'clock, 35 %, within 8 inches of joint: YES, REMARK: w/ heavy debris	
	22.70	MSA	Survey Abandoned, REMARK: camera cannot pass roots and debris	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	0	4	4	0	4	4

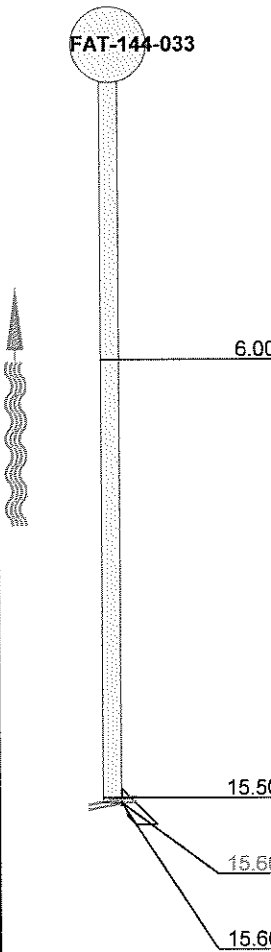
Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 12
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 9.60 ft	Upstream MH FAT-144-036 Downstream MH FAT-144-033 Dir. of Survey Upstream Section Length 15.60 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 15 inch Concrete
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Add. information :

1:50	Position	Code	Observation	Photo
				
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 144-033	
	15.50	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	15.60	DSC	Deposits Settled Compacted, 30 %of cross sectional area, from 04 to 07 o'clock, , within 8 inches of joint: YES	
	15.60	MSA	Survey Abandoned, REMARK: camera cannot pass debris	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	0	4	4	0	4	4

Inspection Report / Inspection: 1

Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 13
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 4.60 ft	Upstream MH Downstream MH Dir. of Survey Section Length	FAT-144-033 FAT-144-030 Downstream 10.60 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	15 inch Concrete
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Add. Information :

1:50	Position	Code	Observation	Photo
		<p>AMH</p> <p>TBI</p> <p>MSA</p>	<p>Upstream Manhole, Survey Begins, REMARK: 144-033</p> <p>Tap Break-In Intruding, at 10 o'clock, 6", 8", within 8 inches of joint: YES, REMARK: Address 21410, noflow or evidence of past flow</p> <p>Survey Abandoned, REMARK: camera cannot pass</p>	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	0	2	2	0	2	2

Inspection Report / Inspection: 1

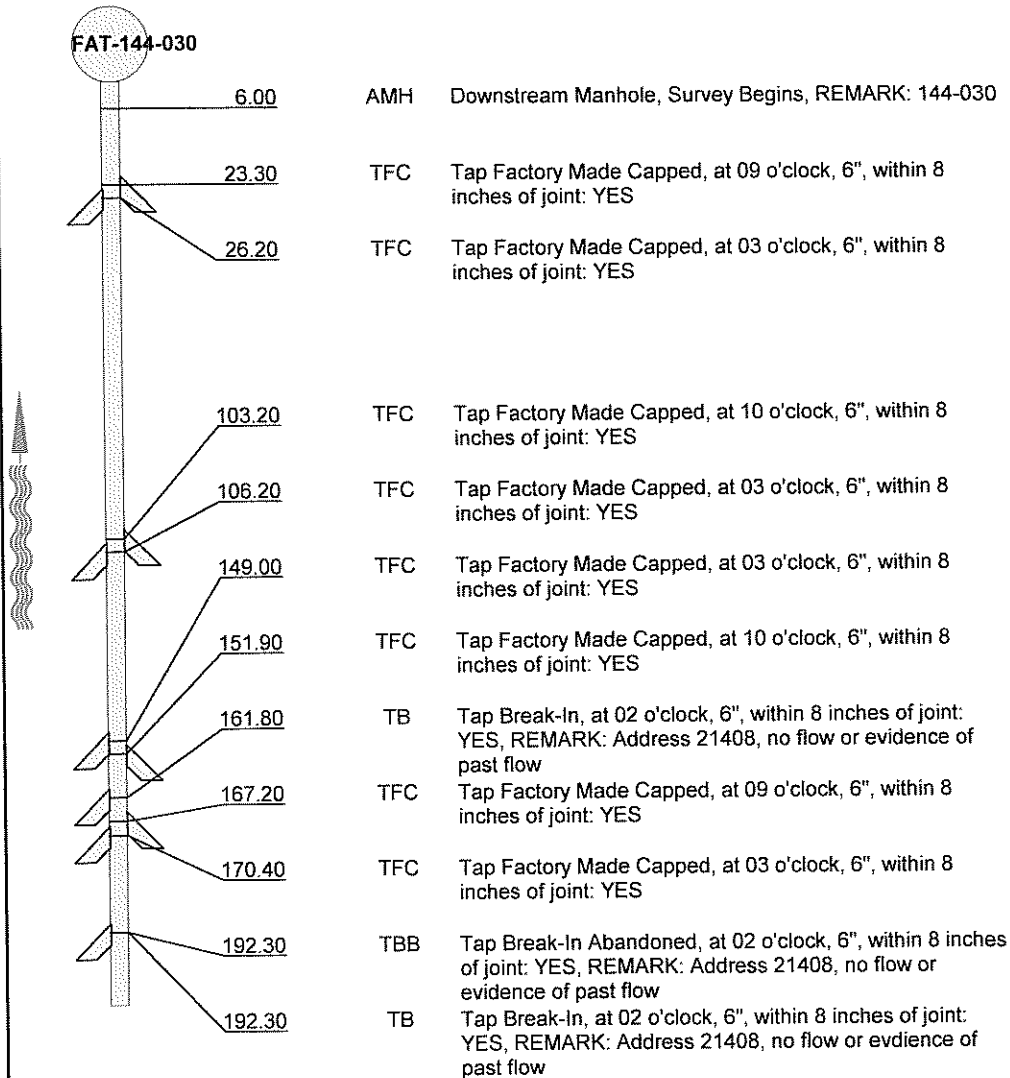
Date 9/24/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 14
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 277.00 ft	Upstream MH Downstream MH Dir. of Survey Section Length	FAT-144-033 FAT-144-030 Upstream 283.00 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	15 inch Concrete
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Add. Information :

1:522	Position	Code	Observation	Photo
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Inspection Report / Inspection: 1

Date :	Job number :	Weather : Dry	Operator : Nowry	Counter : 14	Section name :
Present :	Vehicle :	Camera :	Preset :	Cleaned : No Pre-Cleaning	Rate :

1:522	Position	Code	Observation	Photo
	<u>222.20</u>	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	<u>225.00</u>	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	<u>270.90</u>	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	<u>273.90</u>	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	<u>283.00</u>	TBI	Tap Break-In Intruding, at 02 o'clock, 6", 8", within 8 inches of joint: YES, REMARK: Address 21410, no flow or evidence of past flow	
	<u>283.00</u>	MSA	Survey Abandoned, REMARK: reversal complete, camera cannot pass	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	0	2	2	0	2	2

Inspection Report / Inspection: 1

Date 9/27/2010	P/O. No.	Weather Cloudy	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 15
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 299.30 ft	Upstream MH FAT-144-030 Downstream MH FAT-144-027 Dir. of Survey Downstream Section Length 305.30 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 12 inch Concrete
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Add. Information :

1:765	Position	Code	Observation	Photo
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-030	
	31.80	TB	Tap Break-In, at 11 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21320, no flow or evidence of past flow	
	78.10	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21313, no flow or evidence of past flow	
	203.30	TB	Tap Break-In, at 12 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21305, no flow or evidence of past flow	
	305.30	AMH	Downstream Manhole, Survey Ends, REMARK: 144-027	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 9/27/2010	P/O. No.	Weather Cloudy	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 16
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123 Oxford (esmt.)	City Farmington	Use of Sewer	Upstream MH FAT-144-020
Loc. details		Drainage Area	Dowstream MH FAT-144-019
Location Code		Flow Control	Dir. of Survey Downstream
		Length surveyed 142.40 ft	Section Length 148.40 ft

Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 24 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information : **Print shows line being 15"**

1:375	Position	Code	Observation	Photo
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-020	
	10.00	BSV	Broken Soil Visible, from 03 to 09 o'clock, within 8 inches of joint: YES	
	111.00	TB	Tap Break-In, at 10 o'clock, 8", within 8 inches of joint: YES, REMARK: Address 28100 Grand River (batsford) no flow or evidence of past flow	
	148.40	JOL	Joint Offset Large	
	148.40	MSA	Survey Abandoned, REMARK: camera won't pass through off-set. Will try reversal	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5121	0000	7	0	7	3.5	0	3.5

Inspection Report / Inspection: 1

Date 9/30/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 19
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Grand River (esmt.) Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 44.10 ft	Upstream MH FAT-144-052 Downstream MH FAT-144-051 Dir. of Survey Downstream Section Length 50.10 ft
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Purpose of Survey Idep project/locating service leads	Joint Length 30 inch
Year Laid	Dia./Height Concrete
Year Rehabilitated	Material
Tape / Media No. Na	Lining Method

Add. Information :

1:135	Position	Code	Observation	Photo
		AMH	Upstream Manhole, Survey Begins, REMARK: 144-052	
		DSC	Deposits Settled Compacted, 15 % of cross sectional area, from 04 to 08 o'clock, , within 8 inches of joint YES	
		MSA	Survey Abandoned, REMARK: camera cannot drive over obstruction	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	0	3	3	0	3	3

Inspection Report / Inspection: 1

Date 9/30/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 20
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Grand River (esmt.) Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 295.40 ft	Upstream MH FAT-144-053 Downstream MH FAT-144-052 Dir. of Survey Upstream Section Length 301.40 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idcp project/locating service leads Na
Joint Length Dia./Height Material Lining Method	30 inch Concrete

Add. Information :

1:765	Position	Code	Observation	Photo
		AMH	Downstream Manhole, Survey Begins, REMARK: 144-052	
	138.40	MGO	General Observation, within 8 inches of joint: YES, REMARK: manhole structure not on print	
	301.40	AMH	Upstream Manhole, Survey Ends, REMARK: 144-053	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 9/30/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 21
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Grand River (esmt.) Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 249.80 ft	Upstream MH FAT-144-052 Downstream MH FAT-144-051 Dir. of Survey Upstream Section Length 255.80 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	30 inch Concrete
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Add. Information :

1:645	Position	Code	Observation	Photo
		AMH	Downstream Manhole, Survey Begins, REMARK: 144-051	
		DSC	Deposits Settled Compacted. 15 % of cross sectional area, from 04 to 08 o'clock. . within 8 inches of joint. YES	
		MSA	Survey Abandoned, REMARK: Reversal complete at obstruction	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	0	3	3	0	3	3

Inspection Report / Inspection: 1

Date 9/30/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 22
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street 123	Grand River (esmt.) Farmington	Use of Sewer	Upstream MH FAT-144-051
City		Drainage Area	Dowstream MH FAT-144-019
Loc. details		Flow Control	Dir. of Survey Downstream
Location Code		Length surveyed 82.90 ft	Section Length 88.90 ft

Purpose of Survey Idep project/locating service leads	Joint Length	Dia./Height	Material	Lining Method
Year Laid	30 inch	Concrete		
Year Rehabilitated				
Tape / Media No. Na				

Add. Information :

1:225	Position	Code	Observation	Photo
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-051	
	88.90	AMH	Downstream Manhole, Survey Ends, REMARK: 144-019	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 10/5/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 23
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	Colwell Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 130.60 ft	Upstream MH FAT-141-011 Downstream MH FAT-141-010 Dir. of Survey Upstream Section Length 136.60 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	18 inch Clay
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Add. Information :

1:345	Position	Code	Observation	Photo
		AMH	Downstream Manhole, Survey Begins, REMARK: 141-010	
		DAE	Deposits Attached Encrustation. 15 %of cross sectional area. from 02 to 05 o'clock, , within 8 inches of joint YES	
		MSA	Survey Abandoned, REMARK: camera cannot pass calcium	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	0	3	3	0	3	3

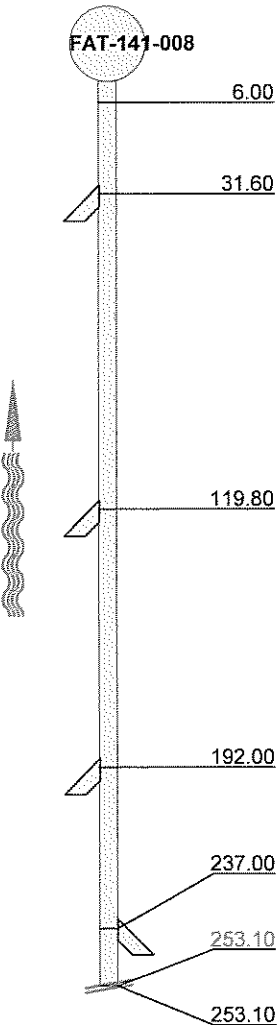
Inspection Report / Inspection: 1

Date 10/5/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 25
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	Colwell Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 247.10 ft	Upstream MH FAT-141-010 Downstream MH FAT-141-008 Dir. of Survey Upstream Section Length 253.10 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 18 inch Clay
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Add. Information :

1:645	Position	Code	Observation	Photo
				
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 141-008	
	31.60	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 27780 Independence, no flow or evidence of past flow. Roots in lead	
	119.80	TF	Tap Factory Made, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21514 Colwell, no flow or evidence of past flow	
	192.00	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21522 Colwell, no flow or past evidence of past flow	
	237.00	TB	Tap Break-In, at 10 o'clock, 6", within 8 inches of joint: YES, REMARK: 27835 Shiawassee Church looks like past flow	
	253.10	DSC	Deposits Settled Compacted, 25 % of cross sectional area, from 04 to 09 o'clock, , within 8 inches of joint: YES	
	253.10	MSA	Survey Abandoned, REMARK: camera cannot pass	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	0	4	4	0	4	4

Inspection Report / Inspection: 1

Date 10/7/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 27
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	St. Francis Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 64.40 ft	Upstream MH FAT-144-126 Downstream MH FAT-144-128 Dir. of Survey Upstream Section Length 70.40 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 10 inch Concrete
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Add. Information :

1:180	Position	Code	Observation	Photo			
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 144-128				
	28.90	TB	Tap Break-In, at 02 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21340, no flow or evidence of past flow				
	70.40	RBJ	Roots Ball Joint, from 02 to 10 o'clock, 70 %, within 8 inches of joint: YES				
	70.40	MSA	Survey Abandoned, REMARK: camera cannot pass roots				
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5100	0	5	5	0	5	5

Inspection Report / Inspection: 1

Date 10/7/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 29
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Grand River (esmt.) Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 138.40 ft	Upstream MH FAT-144-020 Downstream MH FAT-144-019 Dir. of Survey Upstream Section Length 144.40 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 24 inch Concrete
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Add. Information : **print shows pipe 15"**

1:375	Position	Code	Observation	Photo
		AMH	Downstream Manhole, Survey Begins, REMARK: 144-019	
		JOL	Joint Offset Large, REMARK: pipe changes from clay to concrete	
		MSA	Survey Abandoned, REMARK: reversal complete at off set	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
2100	0000	2	0	2	2	0	2

Inspection Report / Inspection: 1

Date 10/7/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 30
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	St. Francis Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 110.90 ft	Upstream MH FAT-144-126 Downstream MH FAT-144-128 Dir. of Survey Downstream Section Length 116.90 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 10 inch Concrete
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Add. Information :

1:300	Position	Code	Observation	Photo
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-126	
	33.90	TB	Tap Break-In, at 11 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21448, no flow or evidence of past flow	
	34.40	TB	Tap Break-In, at 02 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21447, no flow or evidence of past flow. Mud in line	
	116.90	MSA	Survey Abandoned, REMARK: Root mass ahead. Jet nozzle stuck	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 10/8/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 31
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	St. Francis Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 201.40 ft	Upstream MH FAT-144-070 Downstream MH FAT-144-065 Dir. of Survey Downstream Section Length 207.40 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 10 inch Concrete
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Add. Information :

1:525	Position	Code	Observation	Photo
	FAT-144-070			
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-070	
	16.90	TB	Tap Break-In, at 10 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21206, has flow	
	68.20	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: botsford property	
	68.20	MGO	General Observation, within 8 inches of joint: YES, REMARK: no flow or evidence of past flow	
	150.90	MCU	Camera Underwater	
	154.30	TB	Tap Break-In, at 11 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21202, no flow or evidence of past flow	
	178.50	H	Hole, from 07 to 11 o'clock, within 8 inches of joint: YES, REMARK: brick behind pipe	
	207.40	AOC	Drop Connection, Survey Ends, REMARK: 144-065	
	FAT-144-065			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5100	4100	5	4	9	5	4	4.5

Inspection Report / Inspection: 1

Date 10/12/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 32
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123 St. Francis	City St. Francis Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 184.40 ft	Upstream MH FAT-144-128 Downstream MH FAT-144-132 Dir. of Survey Downstream Section Length 184.40 ft
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Purpose of Survey Idemp project/locating service leads	Joint Length 10 inch
Year Laid	Dia./Height Concrete
Year Rehabilitated	Material
Tape / Media No. Na	Lining Method

Add. Information :

1:465	Position	Code	Observation	Photo
	FAT-144-128			
	0.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-128	
	4.00	TB	Tap Break-In, at 02 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21339, no flow or evidence of past flow	
	56.00	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21331, no flow possible evidence or just calcium at wye	
	95.40	TBI	Tap Break-In Intruding, at 10 o'clock, 6", 2", within 8 inches of joint: NO, REMARK: Address 21332, no flow or evidence of past flow	
	108.60	TBI	Tap Break-In Intruding, at 11 o'clock, 6", 2", within 8 inches of joint: YES, REMARK: Address 21326, no flow or evidence of past flow	
	147.90	FM	Fracture Multiple, from 04 to 08 o'clock, within 8 inches of joint: YES	
	184.40	AMH	Downstream Manhole, Survey Ends, REMARK: 144-132	
	FAT-144-132			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
4100	2200	4	4	8	4	2	2.67

Inspection Report / Inspection: 1

Date 10/19/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 34
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123 Collingham	City Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 233.80 ft	Upstream MH FAT-141-043 Downstream MH FAT-141-040 Dir. of Survey Downstream Section Length 239.80 ft
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Purpose of Survey Idemp project/locating service leads	Joint Length
Year Laid	Dia./Height 12 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:600	Position	Code	Observation	Photo
	FAT-141-043			
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 141-043	
	15.50	TFC	Tap Factory Made Capped, at 01 o'clock, 6", within 8 inches of joint: NO	
	27.80	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: YES	
	61.50	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: NO	
	113.30	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: NO	
	116.60	TF	Tap Factory Made, at 11 o'clock, 6", within 8 inches of joint: NO	
	167.90	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: NO	
	186.30	TFC	Tap Factory Made Capped, at 01 o'clock, 4", within 8 inches of joint: YES	
	189.20	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: NO	
	198.60	TFC	Tap Factory Made Capped, at 01 o'clock, 6", within 8 inches of joint: NO	
	239.70	DSC	Deposits Settled Compacted, 35 %of cross sectional area, from 04 to 08 o'clock, , within 8 inches of joint: YES	
	239.80	MSA	Survey Abandoned, REMARK: camera cannot pass debris	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5100	0	5	5	0	5	5

Inspection Report / Inspection: 1

Date 10/19/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 35
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123	City Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 340.50 ft	Upstream MH FAT-141-040 Downstream MH FAT-141-037 Dir. of Survey Downstream Section Length 340.50 ft
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Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 12 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:855	Position	Code	Observation	Photo
	FAT-141-040			
	0.00	AMH	Upstream Manhole, Survey Begins, REMARK: 141-040	
	4.00	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: YES	
	49.80	TF	Tap Factory Made, at 10 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21640, no flow or evidence of past flow	
	67.90	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	113.90	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: NO	
	117.20	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	138.60	TF	Tap Factory Made, at 02 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21621, no flow now, evidence of past flow	
	159.30	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	205.00	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: NO	
	211.20	TF	Tap Factory Made, at 02 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21617, no flow or past evidence of past flow	
	269.20	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	330.20	TF	Tap Factory Made, at 02 o'clock, 6", within 8 inches of joint: NO, REMARK: Na, no flow or evidence of past flow	
	340.50	AMH	Downstream Manhole, Survey Ends, REMARK: 037	
	FAT-141-037			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 10/26/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 37
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 245.70 ft	Upstream MH FAT-141-037 Downstream MH FAT-144-036 Dir. of Survey Upstream Section Length 251.70 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idemp project/locating service leads Joint Length Dia./Height Material Lining Method
	12 inch Concrete

Add. Information :

1:630	Position	Code	Observation	Photo
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 144-036	
	38.20	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	41.30	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	74.70	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	83.40	MGO	General Observation, within 8 inches of joint: YES, REMARK: possible evidence of sewer	
	111.90	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	123.00	TB	Tap Break-In, at 11 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21505, no flow or evidence of past flow	
	138.70	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	151.10	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	193.50	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	196.40	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	242.50	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES	
	245.90	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES	
	251.70	OBR	Obstacles Rocks, 15 %of cross sectional area, from 05 to 07 o'clock	
	251.70	MSA	Survey Abandoned, REMARK: camera cannot pass rocks. 45' shy of completing reversal	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	0	3	3	0	3	3

Inspection Report / Inspection: 1

Date 10/27/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 39
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	Pearl St. Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 337.40 ft	Upstream MH FAT-143-003 Downstream MH FAT-143-002 Dir. of Survey Downstream Section Length 343.40 ft
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idemp project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 10 inch Clay
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Add. Information :

1:450	Position	Code	Observation	Photo
	FAT-143-003			
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 143-003	
	7.10	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	9.20	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	51.70	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	53.60	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	59.70	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Vacant lot west side, no flow or evidence of past flow	
	95.80	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	98.10	TF	Tap Factory Made, at 10 o'clock, 6", within 8 inches of joint: YES	
	140.10	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	142.10	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	167.70	TB	Tap Break-In, at 12 o'clock, 4", within 8 inches of joint: NO, REMARK: Address 20794 Vacant lot accross. can't tell witch way lead goes	

Inspection Report / Inspection: 1

Date :	Job number :	Weather : Dry	Operator : Nowry	Counter : 39	Section name :
Present :	Vehicle :	Camera :	Preset :	Cleaned : Jetting	Rate :

1:450	Position	Code	Observation	Photo
	<u>183.60</u>	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	<u>185.90</u>	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	<u>229.40</u>	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	<u>231.40</u>	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	<u>286.90</u>	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	<u>289.00</u>	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	<u>343.40</u>	AMH	Downstream Manhole, Survey Ends, REMARK: 143-002	

FAT-143-002

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 10/28/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 42
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123 Pearl St.	City Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 343.00 ft	Upstream MH FAT-143-006 Downstream MH FAT-143-003 Dir. of Survey Downstream Section Length 349.00 ft
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Purpose of Survey Idemp project/locating service leads	Joint Length
Year Laid	Dia./Height 10 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:378	Position	Code	Observation	Photo
	FAT-143-006			
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 143-006	
	24.80	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	26.90	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	46.00	BSV	Broken Soil Visible, from 01 to 05 o'clock, within 8 inches of joint: YES	
	46.40	MGO	General Observation, within 8 inches of joint: YES, REMARK: Possible lead at broken pipe. located on property line between 28333 Gran River and 20909 Pearl	
	50.50	TFA	Tap Factory Made Active, at 02 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 28333 Grand River, has flow looks like infiltration	
	52.50	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: NO	
	86.70	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	86.90	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	94.80	TF	Tap Factory Made, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 20909, no flow possible past flow	
	135.00	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	151.20	TF	Tap Factory Made, at 10 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 28125 Grand River lead comes from east vacant area. no flow . looks like newer plastic pipe	

Inspection Report / Inspection: 1

Date :	Job number :	Weather : Dry	Operator : Nowry	Counter : 42	Section name :
Present :	Vehicle :	Camera :	Preset :	Cleaned : Jetting	Rate :

1:378	Position	Code	Observation	Photo			
	183.30	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES				
	191.10	TBA	Tap Break-In Active, at 12 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 20829 or 20827 flow coming from lead. lead is on property line				
	197.00	TF	Tap Factory Made, at 11 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 28125 Grand River. No flow, line comes from east vacant area				
	203.60	TBA	Tap Break-In Active, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 20827, flow coming from lead				
	227.10	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES				
	229.20	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES				
	255.00	TF	Tap Factory Made, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 20823 no flow evidence of past flow				
	273.10	TFC	Tap Factory Made Capped, at 01 o'clock, 6", within 8 inches of joint: YES				
	275.20	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: YES				
	313.30	TFA	Tap Factory Made Active, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: address 20819, flow coming from lead				
	319.10	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: YES				
	335.20	TB	Tap Break-In, at 11 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 28125 parking lot to east. no flow				
	349.00	AMH	Downstream Manhole, Survey Ends, REMARK: 143-003				
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5100	0000	5	0	6	5	0	5

Inspection Report / Inspection: 1

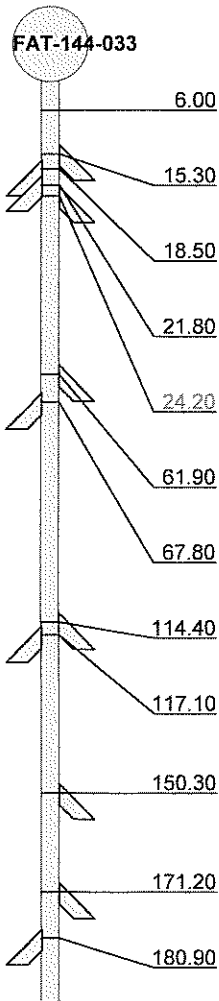
Date 11/2/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 44
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123	City Collingham Farmington	Use of Sewer	Upstream MH FAT-144-036
Loc. details	Location Code	Drainage Area	Dowstream MH FAT-144-033
		Flow Control	Dir. of Survey Upstream
		Length surveyed 247.20 ft	Section Length 253.20 ft

Purpose of Survey Idep project/locating service leads	Year Laid	Year Rehabilitated	Tape / Media No. Na	Joint Length	Dia./Height 15 inch
				Material Concrete	Lining Method

Add. Information :

1:486	Position	Code	Observation	Photo
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	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 144-033
	15.30	TFC	Tap Factory Made Capped, at 09 o'clock, 6", within 8 inches of joint: YES
	18.50	TFC	Tap Factory Made Capped, at 03 o'clock, 6", within 8 inches of joint: YES
	21.80	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21416, no flow or evidence of past flow
	24.20	TBI	Tap Break-In Intruding, at 11 o'clock, 6", 3", within 8 inches of joint: NO, REMARK: Address 21417, no flow or evidence of past flow
	61.90	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES
	67.80	TFC	Tap Factory Made Capped, at 01 o'clock, 6", within 8 inches of joint: YES
	114.40	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES
	117.10	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES
	150.30	TB	Tap Break-In, at 11 o'clock, 4", within 8 inches of joint: NO, REMARK: Address 21431, no flow or evidence of past flow
	171.20	TFC	Tap Factory Made Capped, at 10 o'clock, 4", within 8 inches of joint: YES
	180.90	TF	Tap Factory Made, at 01 o'clock, 4", within 8 inches of joint: YES, REMARK: Address 21434, no flow or evidence of past flow

Inspection Report / Inspection: 1

Date :	Job number :	Weather : Dry	Operator : Nowry	Counter : 44	Section name :
Present :	Vehicle :	Camera :	Preset :	Cleaned : Jetting	Rate :

1:486	Position	Code	Observation	Photo
		TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	253.10	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	253.20	OBR	Obstacles Rocks, 45 %of cross sectional area, from 03 to 09 o'clock	
	253.20	MSA	Survey Abandoned, REMARK: camera cannot pass rocks. Will try reversal	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5121	0	7	7	0	3.5	3.5

Inspection Report / Inspection: 1

Date 11/2/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 45
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	Collingham Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 56.00 ft	Upstream MH FAT-144-036 Downstream MH FAT-144-033 Dir. of Survey Downstream Section Length 62.00 ft
--	----------------------------------	--	--

Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 15 inch Concrete
--	--	--	-------------------------------------

Add. Information :

1:165	Position	Code	Observation	Photo
		AMH	Upstream Manhole, Survey Begins, REMARK: 144-036	
	29.10	TFC	Tap Factory Made Capped, at 02 o'clock, 6", within 8 inches of joint: YES	
	31.40	TFC	Tap Factory Made Capped, at 10 o'clock, 6", within 8 inches of joint: YES	
	62.00	TFC	Tap Factory Made Capped, at 11 o'clock, 6", within 8 inches of joint: YES	
	62.00	MSA	Survey Abandoned, REMARK: reversal complete	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 11/2/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 46
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123 Colwell	City Farmington	Use of Sewer	Upstream MH FAT-141-010
Loc. details		Drainage Area	Dowstream MH FAT-141-008
Location Code		Flow Control	Dir. of Survey Downstream
		Length surveyed 54.10 ft	Section Length 60.10 ft

Purpose of Survey Idep project/locating service leads	Joint Length	Year Laid
Year Rehabilitated	Dia./Height 18 inch	Year Rehabilitated
Tape / Media No. Na	Material Clay	
	Lining Method	

Add. Information :

1:165	Position	Code	Observation	Photo
	FAT-141-010			
	<u>6.00</u>	AMH	Upstream Manhole, Survey Begins, REMARK: 141-010	
	<u>60.10</u>	TB	Tap Break-In, at 02 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 27835 Shiawassee, no flow could be evidence of past flow. Reversal complete	
	<u>60.10</u>	MSA	Survey Abandoned, REMARK: reversal complete	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Inspection Report / Inspection: 1

Date 11/3/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 47
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	Colwell Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 82.90 ft	Upstream MH FAT-141-011 Downstream MH FAT-141-010 Dir. of Survey Downstream Section Length 88.90 ft
--	-------------------------------	--	--

Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 15 inch Clay
--	---	--	---------------------------------------

Add. Information :

1:225	Position	Code	Observation	Photo
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 141-011	
	8.60	LR	Alignment Right, 45 %	
	88.90	DAE	Deposits Attached Encrustation, 20 % of cross sectional area, from 02 to 05 o'clock , within 8 inches of joint: YES	
	88.90	MSA	Survey Abandoned, REMARK: camera cannot pass calcium	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4131	0	7	7	0	3.5	3.5

Inspection Report / Inspection: 1

Date 11/3/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 48
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street123 City Loc. details Location Code	St. Francis Farmington	Use of Sewer Drainage Area Flow Control Length surveyed 206.10 ft	Upstream MH FAT-144-132 Downstream MH FAT-144-133 Dir. of Survey Downstream Section Length 212.10 ft
--	-----------------------------------	---	---

Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Idep project/locating service leads Na	Joint Length Dia./Height Material Lining Method	 10 inch Concrete
--	---	--	---

Add. Information :

1:540	Position	Code	Observation	Photo
	6.00	AMH	Upstream Manhole, Survey Begins, REMARK: 144-132	
	89.30	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21311, no flow or evidence of past flow. Debris in lead	
	94.20	TB	Tap Break-In, at 12 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21312, no flow or evidence of past flow	
	158.40	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: YES, REMARK: Address 21305, no flow or evidence of past flow	
	203.90	JOM	Joint Offset Medium	
	204.50	TFC	Tap Factory Made Capped, at 12 o'clock, 6", within 8 inches of joint: YES, REMARK: pipe material changed to clay	
	212.10	AMH	Downstream Manhole, Survey Ends, REMARK: 144-133	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
1100	0000	1	0	1	1	0	1

Inspection Report / Inspection: 1

Date 11/4/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 50
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123 City St. Francis Farmington Loc. details Location Code	Use of Sewer Drainage Area Flow Control Length surveyed 132.90 ft	Upstream MH FAT-144-133 Downstream MH FAT-144-136 Dir. of Survey Upstream Section Length 138.90 ft
--	---	---

Purpose of Survey idep project/locating service leads	Joint Length
Year Laid	Dia./Height 10 inch
Year Rehabilitated	Material Clay
Tape / Media No. Na	Lining Method

Add. Information :

1:360	Position	Code	Observation	Photo			
	6.00	AMH	Downstream Manhole, Survey Begins, REMARK: 144-136				
	56.90	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21234, no flow possible evidence of past flow				
	98.90	TB	Tap Break-In, at 01 o'clock, 4", within 8 inches of joint: NO, REMARK: Address 21242, no flow possible evidence of past flow				
	134.40	TB	Tap Break-In, at 01 o'clock, 6", within 8 inches of joint: NO, REMARK: Address 21254 no flow, roots coming from lead. Cannot tell if any evidence of past flow				
	138.90	RBC	Roots Ball Connection, from 02 to 10 o'clock, 70 %, within 8 inches of joint: YES				
	138.90	MSA	Survey Abandoned, REMARK: camera cannot pass root mass				
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	0	4	4	0	4	4

Inspection Report / Inspection: 1

Date 11/4/2010	P/O. No.	Weather Dry	Surveyor's Name Nowry	Pipe Segment Reference	Section No. 52
Certificate No. U-909-9354	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning Jetting	Sewer Category

Street 123 St. Francis	City Farmington	Use of Sewer	Upstream MH FAT-144-133
Loc. details		Drainage Area	Dowstream MH FAT-144-136
Location Code		Flow Control	Dir. of Survey Downstream
		Length surveyed 54.20 ft	Section Length 60.20 ft

Purpose of Survey Idep project/locating service leads	Joint Length
Year Laid	Dia./Height 10 inch
Year Rehabilitated	Material Concrete
Tape / Media No. Na	Lining Method

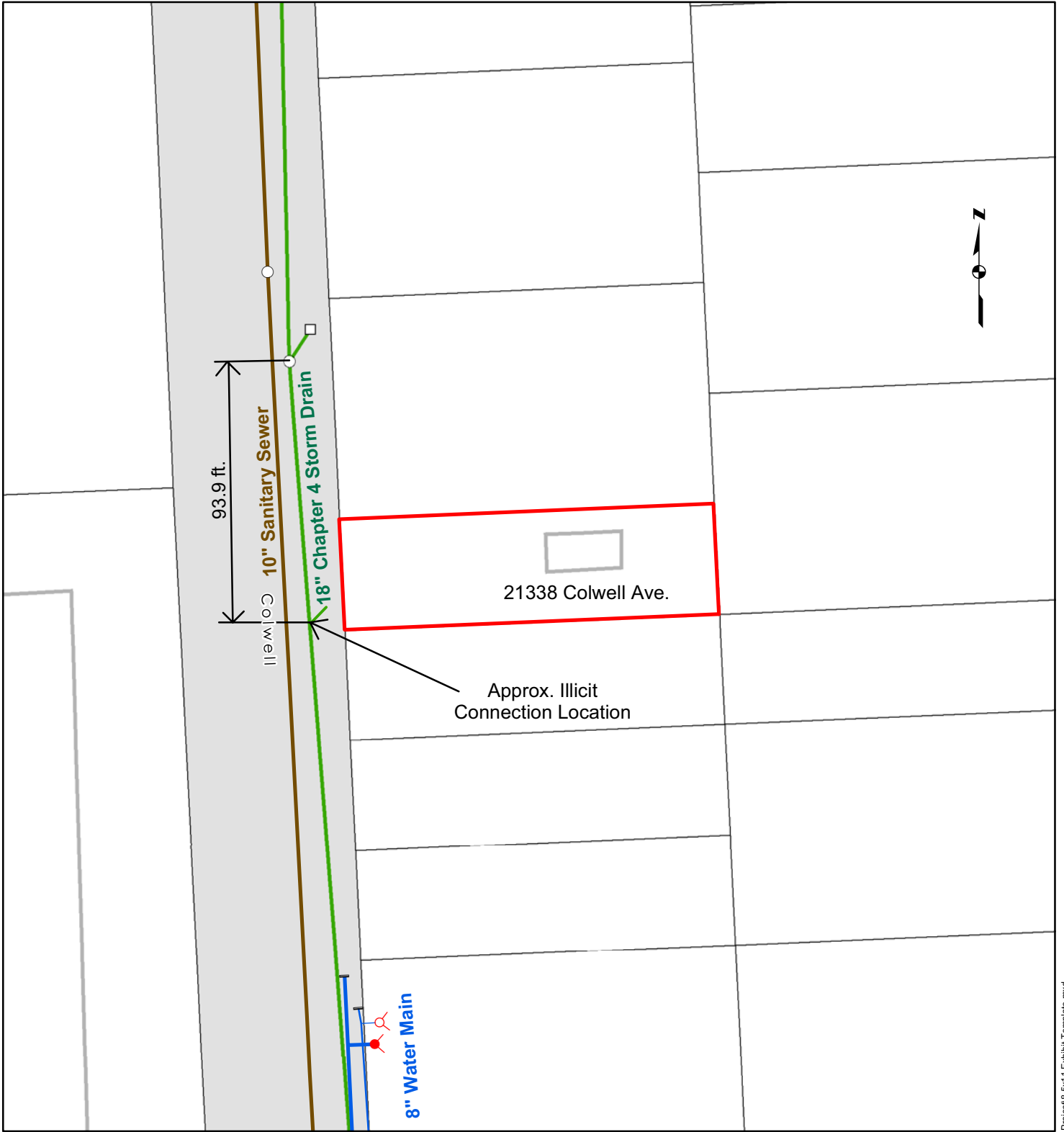
Add. Information :

1:165	Position	Code	Observation	Photo
	<u>6.00</u>	AMH	Upstream Manhole, Survey Begins, REMARK: 144-133, reversal insp.	
	<u>58.20</u>	RBJ	Roots Ball Joint, from 12 to 12 o'clock, 95 %, within 8 inches of joint: YES	
	<u>60.20</u>	MSA	Survey Abandoned, REMARK: cannot pass roots	

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5100	0	5	5	0	5	5

**City of Farmington Hills Illicit Connection Source Identification
Final Project Summary Report
January, 2011**

**APPENDIX B
SITE PLANS FOR PROPERTIES
WITH ILLICIT CONNECTIONS**



Maps prepared by:



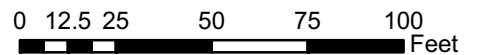
1 Public Works Drive, Bldg 95W
Waterford, Michigan
48328-1907

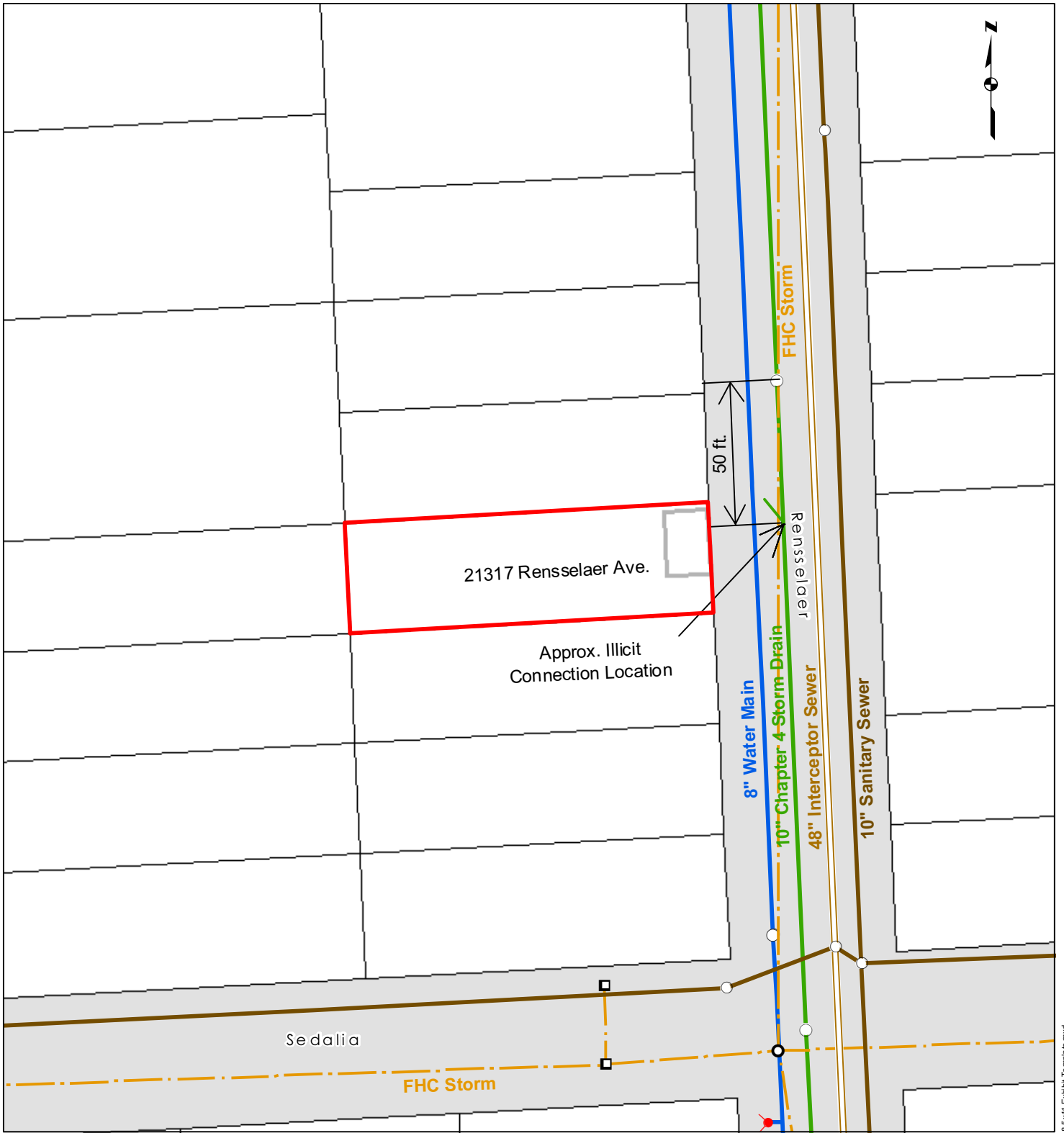
21338 Colwell Ave. City of Farmington Hills Illicit Connection Source Identification Project

Legend

- Standard MH
- San Lateral
- Catch Basin
- Standard Manhole / Access Point
- Online Storm Pipe / Culvert
- Prop Water Hydrant
- On Line Water Hydrant
- On Line Water Main
- Prop Water Main

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Maps prepared by:



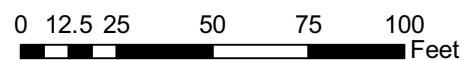
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48328-1907

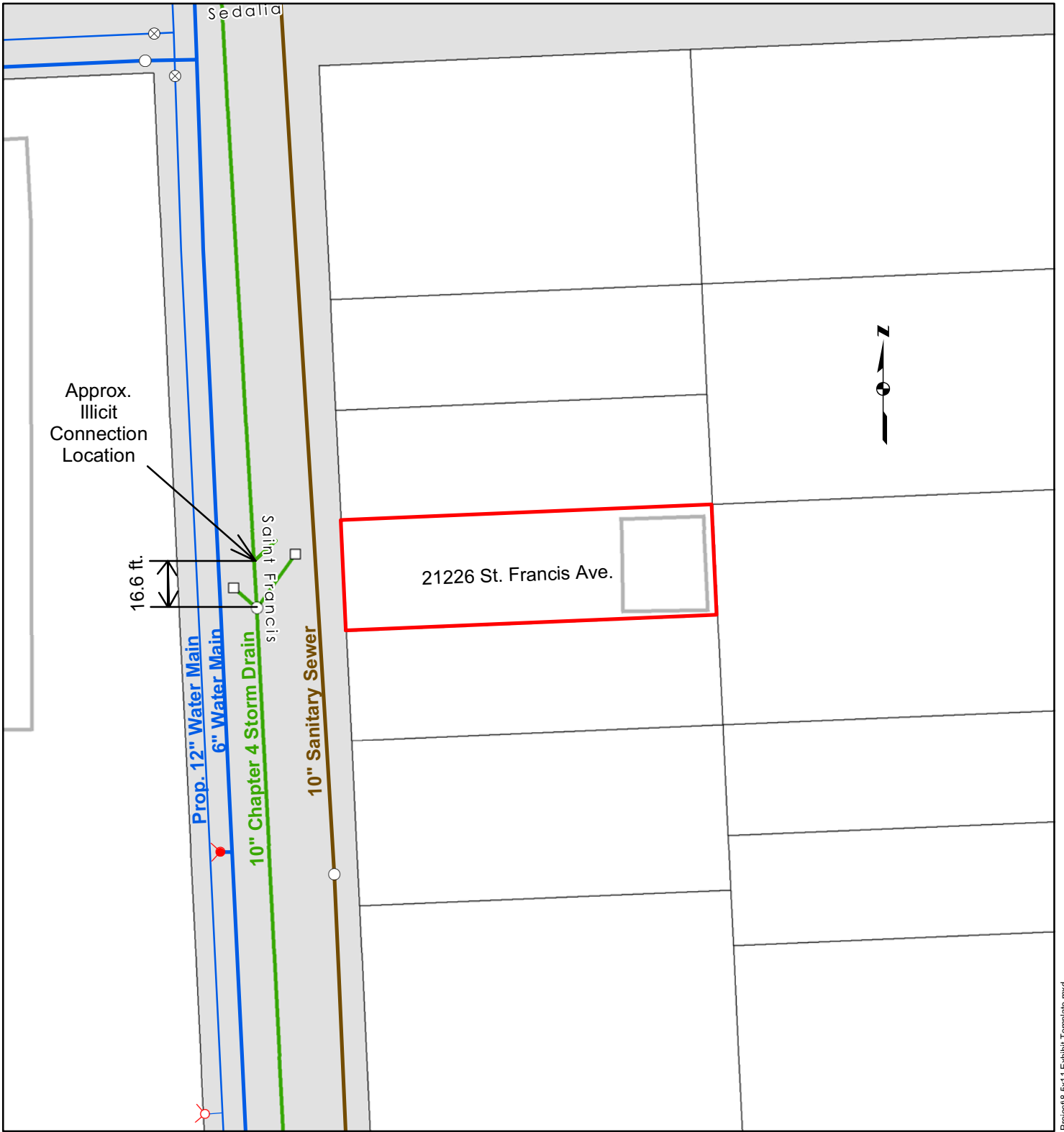
21317 Rensselaer Ave. City of Farmington Hills Illicit Connection Source Identification Project

Legend

- Standard MH
- San Interceptor
- San Lateral
- On Line Water Hydrant
- On Line Water Main
- Catch Basin
- Std Manhole / Access Pt
- Online Storm Pipe / Culvert
- SUBTYPE
- FH Pipe / Culvert

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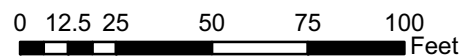


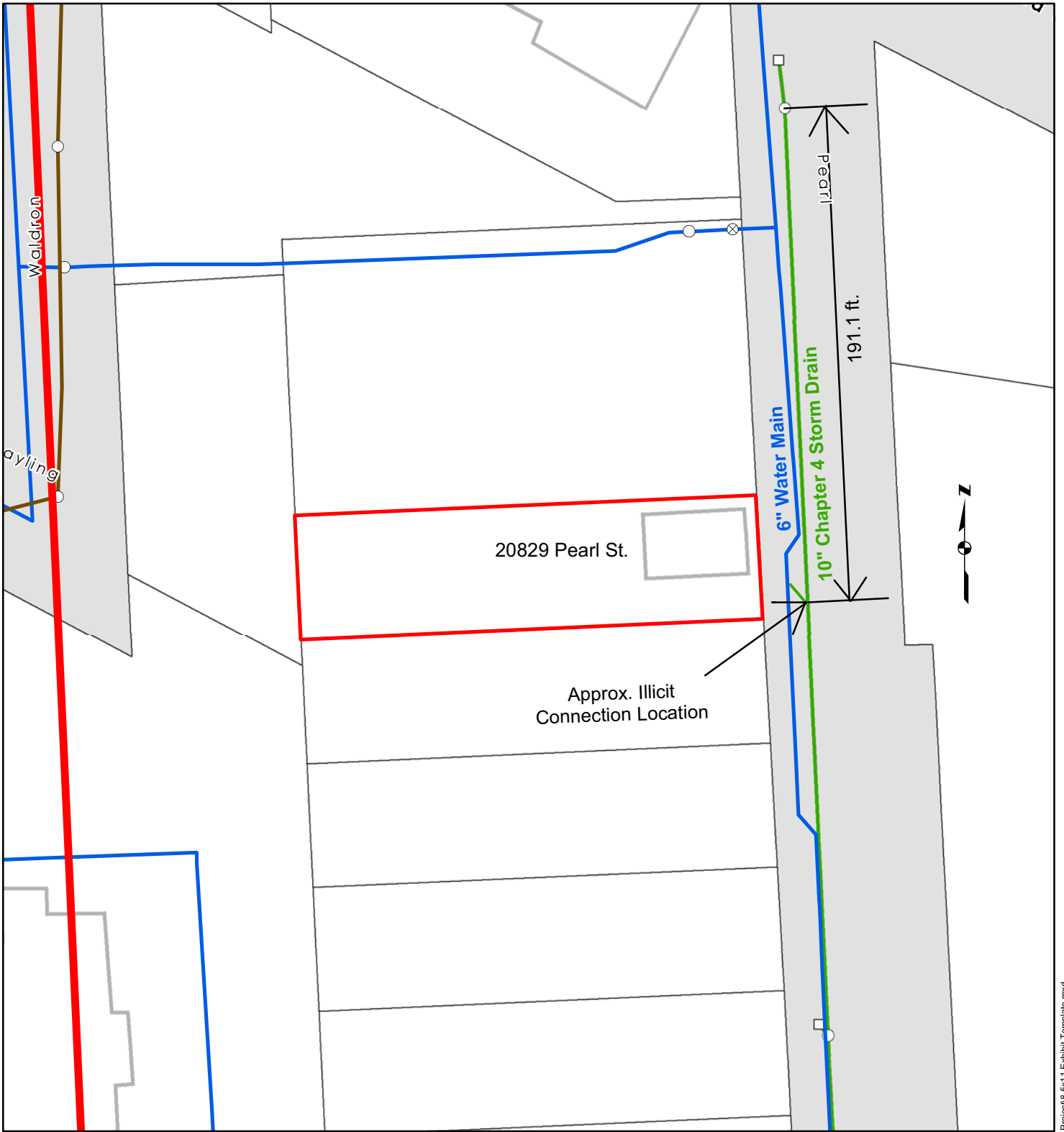
Maps prepared by:
WRC
 WATER RESOURCES COMMISSIONER
John P. McCulloch
 1 Public Works Drive, Bldg 95W
 Waterford, Michigan
 48328-1907

**21226 St. Francis Ave.
 City of Farmington Hills
 Illicit Connection
 Source Identification Project**

- Legend**
- Standard MH
 - San Lateral
 - ⊗ Prop Water Hydrant
 - On Line Water Hydrant
 - On Line Water Main
 - Prop Water Main
 - Catch Basin
 - Std Manhole / Access Pt
 - Online Storm Pipe / Culvert

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Maps prepared by:

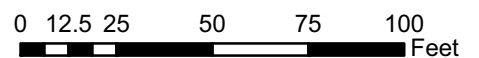


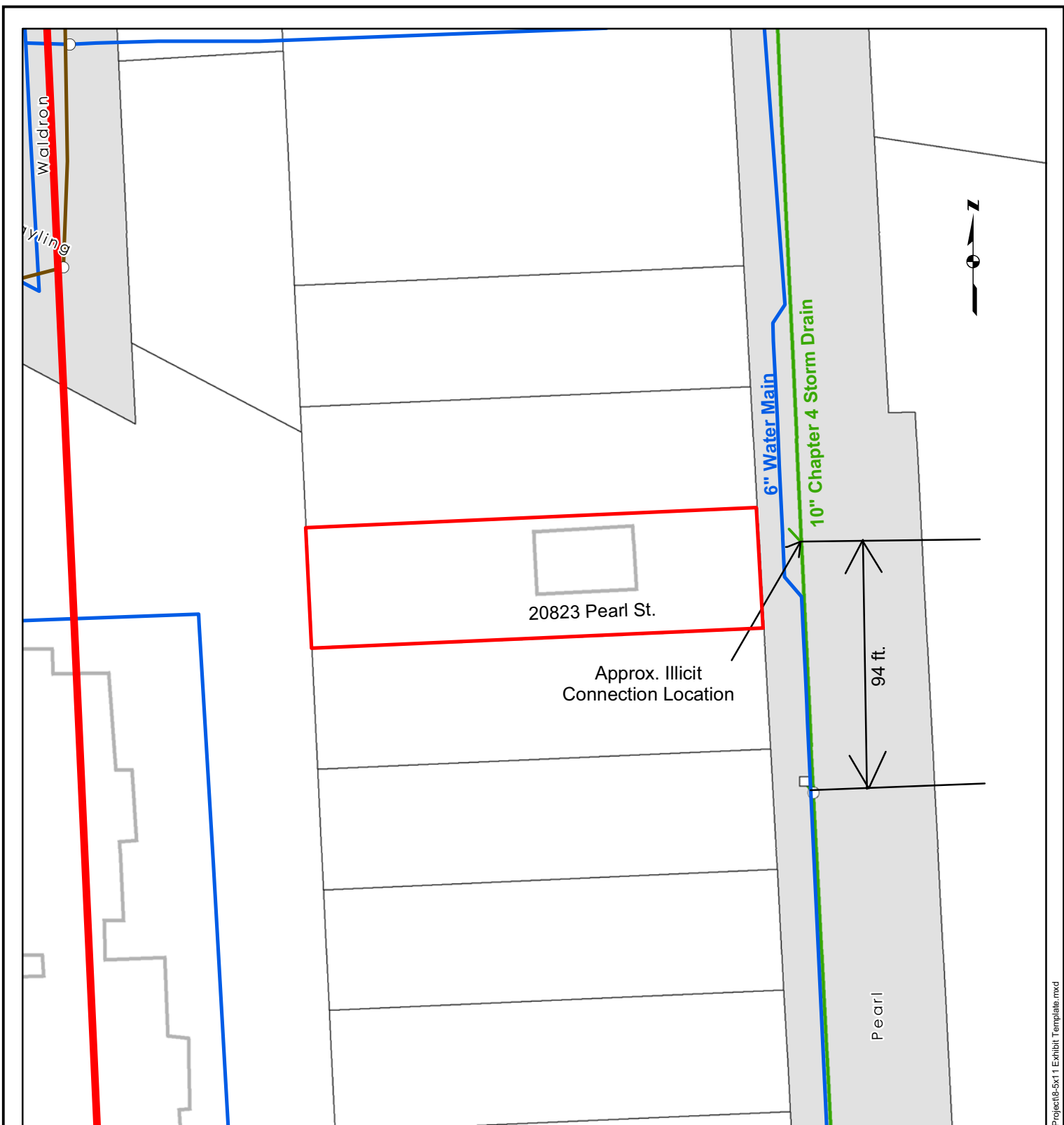
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20829 Pearl St. City of Farmington Hills Illicit Connection Source Identification Project

- Legend**
- Standard MH
 - San Lateral
 - On Line Water Hydrant
 - On Line Water Main
 - Catch Basin
 - Std Manhole / Access Pt
 - Online Storm Pipe / Culvert

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Maps prepared by:

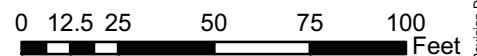


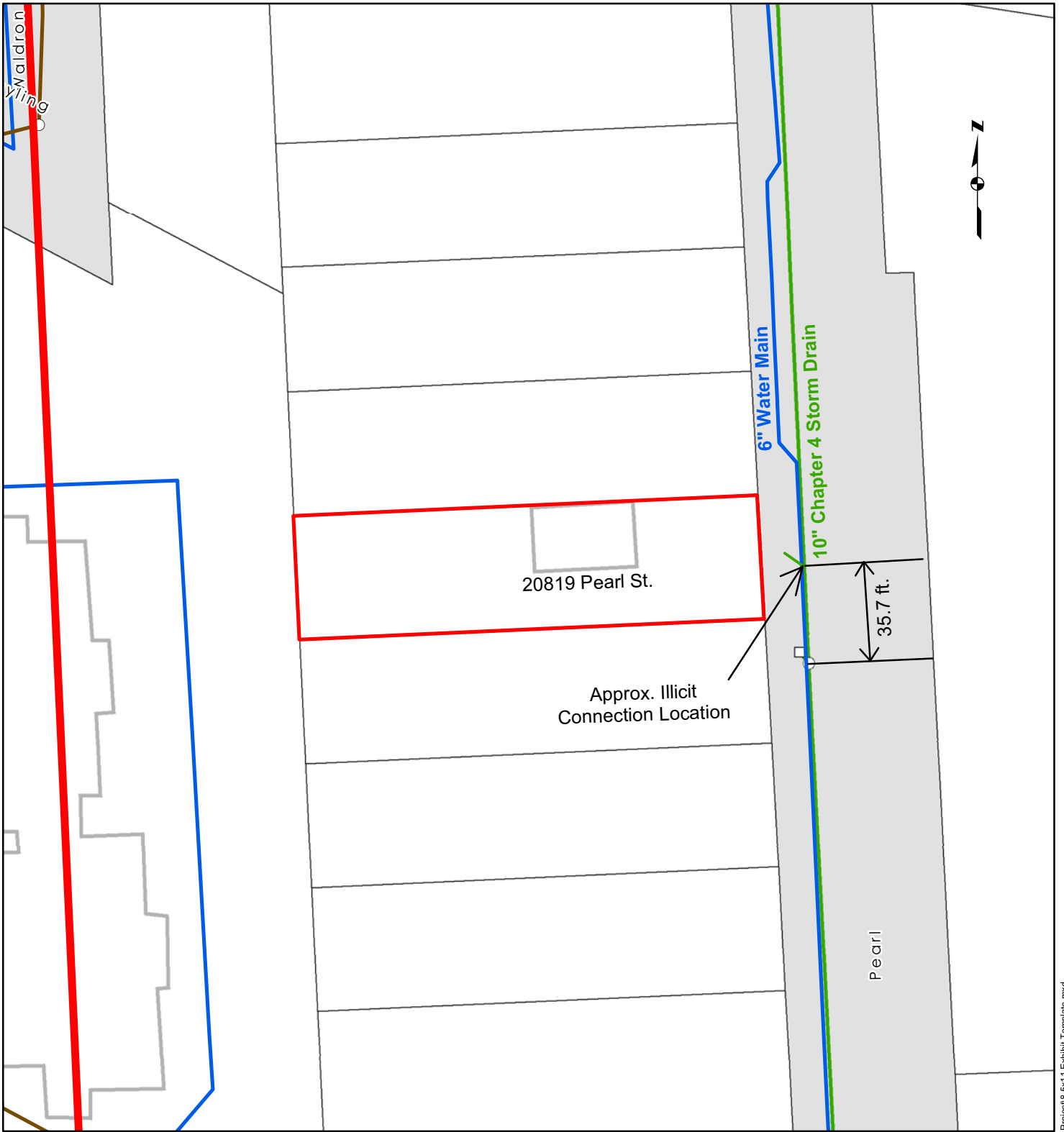
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20823 Pearl St. City of Farmington Hills Illicit Connection Source Identification Project

- Legend**
- On Line Water Main
 - Catch Basin
 - Standard Manhole / Access Point
 - Online Storm Pipe / Culvert

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Maps prepared by:

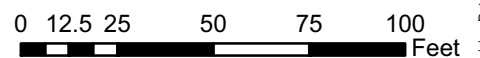


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**20819 Pearl St.
 City of Farmington Hills
 Illicit Connection
 Source Identification Project**

- Legend**
- On Line Water Main
 - Catch Basin
 - Standard Manhole / Access Point
 - Online Storm Pipe / Culvert

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Maps prepared by:

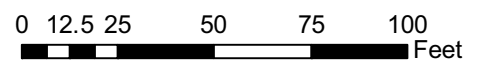


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Waterford, Michigan
48328-1907

21516 Oxford Ave. City of Farmington Hills Illicit Connection Source Identification Project

- | Legend | |
|----------------------|-------------------------------|
| ○ Standard MH | ○ Std Manhole / Access Pt |
| — San Lateral | — Online Storm Pipe / Culvert |
| — On Line Wtr Main | ○ FH Standard MH |
| ✕ Abandoned Wtr Main | ▣ FH Inlet |
| | — FH Pipe / Culvert |

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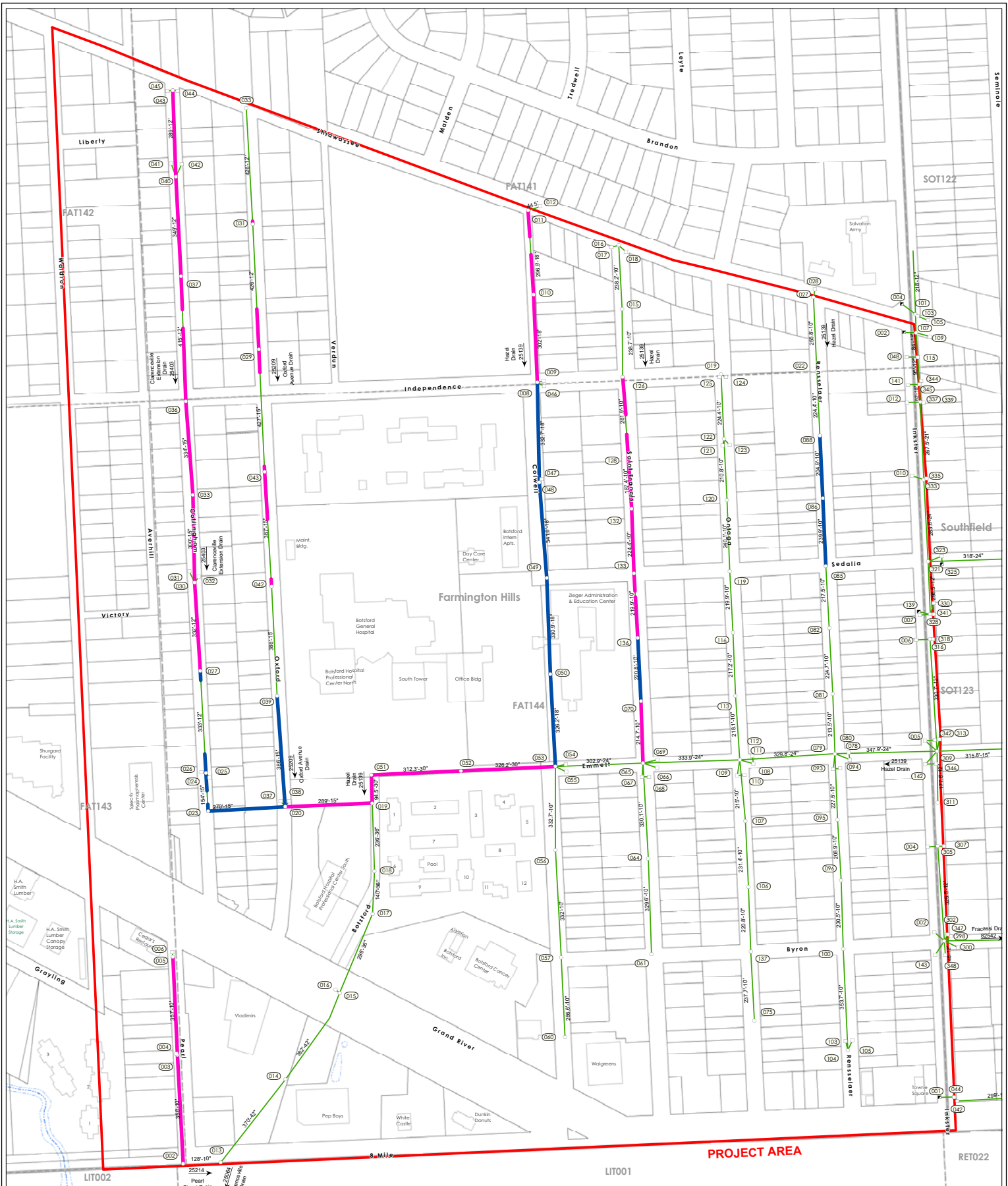


**APPENDIX D
MAPS AND TABLES**

e
F r i n t o n i s i t o n n e t i o n o r e d e n t i f i c a t i o n
e e i s i n r

te	treet	e tion		en th e e ised feet
		e in	nd	
08/28/08	Oxford	FAT-144-039 (OXD-001)	FAT-144-020 (CLD-007)	373.8
08/28/08	Collingham	FAT-144-023 (CLD-008)	FAT-144-020 (CLD-007)	260.0
09/02/08	Collingham	FAT-144-024 (CLD-009)	FAT-144-023 (CLD-008)	60.5
09/02/08	Collingham	FAT-144-024 (CLD-009)	FAT-144-027 (CLD-010)	66.8
09/02/08	Collingham	FAT-144-023 (CLD-008)	FAT-144-024 (CLD-009)	23.8
09/02/08	Collingham	FAT-144-027 (CLD-010)	FAT-144-024 (CLD-009)	26.6
09/04/08	St. Francis	FAT-144-070 (HZD-025)	FAT-144-136 (HZD-026)	215.6
09/05/08	Rensselaer	FAT-144-088 (HZD-051)	FAT-144-086 (HZD-050)	201.8
09/08/08	Rensselaer	FAT-144-086 (HZD-050)	FAT-144-085 (HZD-049)	229.6
09/08/08	Colwell	FAT-144-050 (HZD-019)	FAT-144-053 (HZD-005)	312.5
09/08/08	Colwell	FAT-144-050 (HZD-019)	FAT-144-049 (HZD-020)	321.8
09/08/08	Colwell	FAT-144-048 (HZD-021)	FAT-144-049 (HZD-020)	335.0
09/08/08	Colwell	FAT-144-048 (HZD-021)	FAT-141-008 (HZD-022)	322.0
09/23/10	Collingham	FAT-141-040	FAT-141-043	157.9
09/23/10	Collingham	FAT-141-037	FAT-144-036	115.3
09/24/10	Oxford	FAT-141-031	FAT-141-033	10.0
09/24/10	Oxford	FAT-141-029	FAT-141-031	138.6
09/24/10	Oxford	FAT-141-029	FAT-144-043	80.4
09/24/10	Oxford	FAT-144-043	FAT-141-029	21.3
09/24/10	Oxford	FAT-144-043	FAT-144-042	162.0
09/24/10	Oxford	FAT-144-042	FAT-144-043	22.7
09/24/10	Collingham	FAT-144-033	FAT-144-036	15.6
09/24/10	Collingham	FAT-144-033	FAT-144-030	10.6
09/24/10	Collingham	FAT-144-030	FAT-144-033	283.0
09/27/10	Collingham	FAT-144-030	FAT-144-027	305.3
09/27/10	Oxford	FAT-144-020	FAT-144-019	148.4
09/30/10	Grand River	FAT-144-052	FAT-144-051	50.1
09/30/10	Grand River	FAT-144-052	FAT-144-053	301.4
09/30/10	Grand River	FAT-144-051	FAT-144-052	255.8
09/30/10	Grand River	FAT-144-051	FAT-144-019	88.9
10/05/10	Colwell	FAT-141-010	FAT-141-011	136.6
10/05/10	Colwell	FAT-141-008	FAT-141-010	253.1
10/07/10	St. Francis	FAT-144-128	FAT-144-126	70.4
10/07/10	Grand River	FAT-144-019	FAT-144-020	144.4
10/07/10	St. Francis	FAT-144-126	FAT-144-128	116.9
10/08/10	St. Francis	FAT-144-070	FAT-144-065	207.4
10/12/10	St. Francis	FAT-144-128	FAT-144-132	184.4
10/19/10	Collingham	FAT-141-043	FAT-141-040	239.8
10/19/10	Collingham	FAT-141-040	FAT-141-037	340.5
10/26/10	Collingham	FAT-144-036	FAT-141-037	251.7
10/27/10	Pearl St.	FAT-143-003	FAT-143-002	343.4
10/28/10	Pearl St.	FAT-143-006	FAT-143-003	349.0
11/02/10	Collingham	FAT-144-033	FAT-144-036	253.2
11/02/10	Collingham	FAT-144-036	FAT-144-033	62.0
11/02/10	Colwell	FAT-141-010	FAT-141-008	60.1
11/03/10	Colwell	FAT-141-011	FAT-141-010	88.9
11/03/10	St. Francis	FAT-144-132	FAT-144-133	212.1
11/04/10	St. Francis	FAT-144-136	FAT-144-133	138.9
11/04/10	St. Francis	FAT-144-133	FAT-144-136	60.2

8,430.1



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 48328-1907



Map 1 City of Farmington Hills Illicit Connection Source Identification Project Chapter 4 Storm Drain Televising Summary

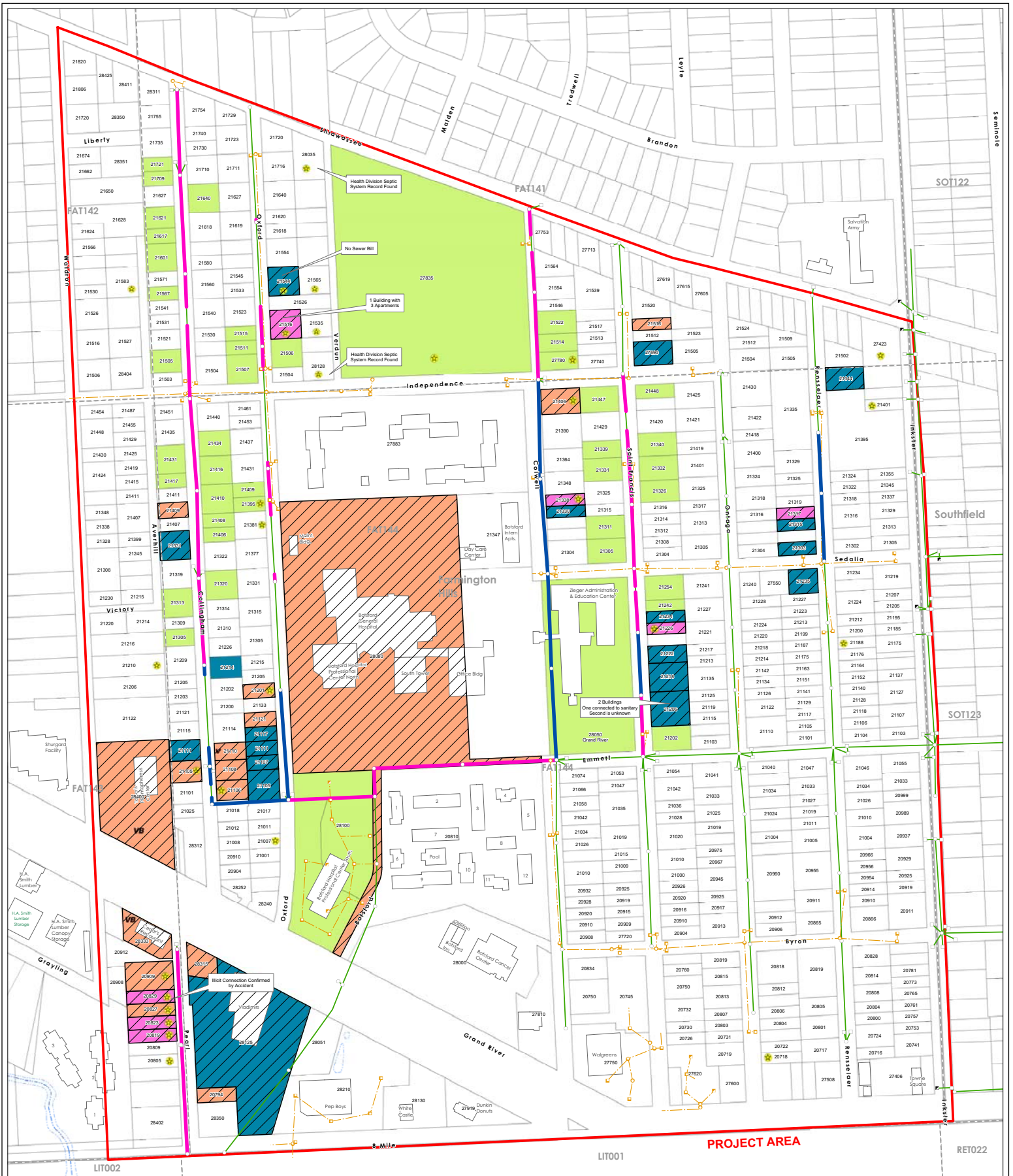
Storm Drain Legend

	2010 Televised Storm		2008 Televised Storm		Storm Pipe / Culvert		Stream / River
	Inlet		Catch Basin		Manhole		Lake/Pond
	QuarterGrid		Parcels				

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0 75 150 300 Feet

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Map 2
City of Farmington Hills
Illicit Connection Source
Identification Project
Open Connections and Dye
Testing Results

Maps prepared by
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John P. McCulloch
 1 Public Works Drive, Bldg 95W
 Waterford, Michigan
 48328-1907



Storm Drain Legend

Confirmed Connection to San Sewer per 2010 Dye Test	Manhole WRC	Stream / River
Illicit Connection to Ch 4 Storm per 2010 Dye Test	Manhole FHC	Lake/Pond
Open Connection to Ch 4 Storm per 1/27/10 Report - Not Tested	Catch Basin WRC	QuarterGrid
Open Connection to Ch 4 Storm per 2010 Telesighting	Inlet WRC	Parcels
Possible Septic System (ie. no sewer bill)	Catch Basin FHC	
Vacant Building	Inlet FHC	
Verified Vacant Parcel	End Section Inlet FHC	
Letter Mailed to Property Owner 8/19/10	Storm Pipe/Culvert WRC	
2010 Telesighted Ch.4 Storm	Storm Pipe/Culvert FHC	
2008 Telesighted Ch.4 Storm		

Note: Parcels with no addresses are assumed vacant

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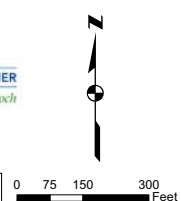


Map 3

City of Farmington Hills Illicit Connection Source Identification Project Chapter 4 and FHC Storm Drain

Maps prepared by:

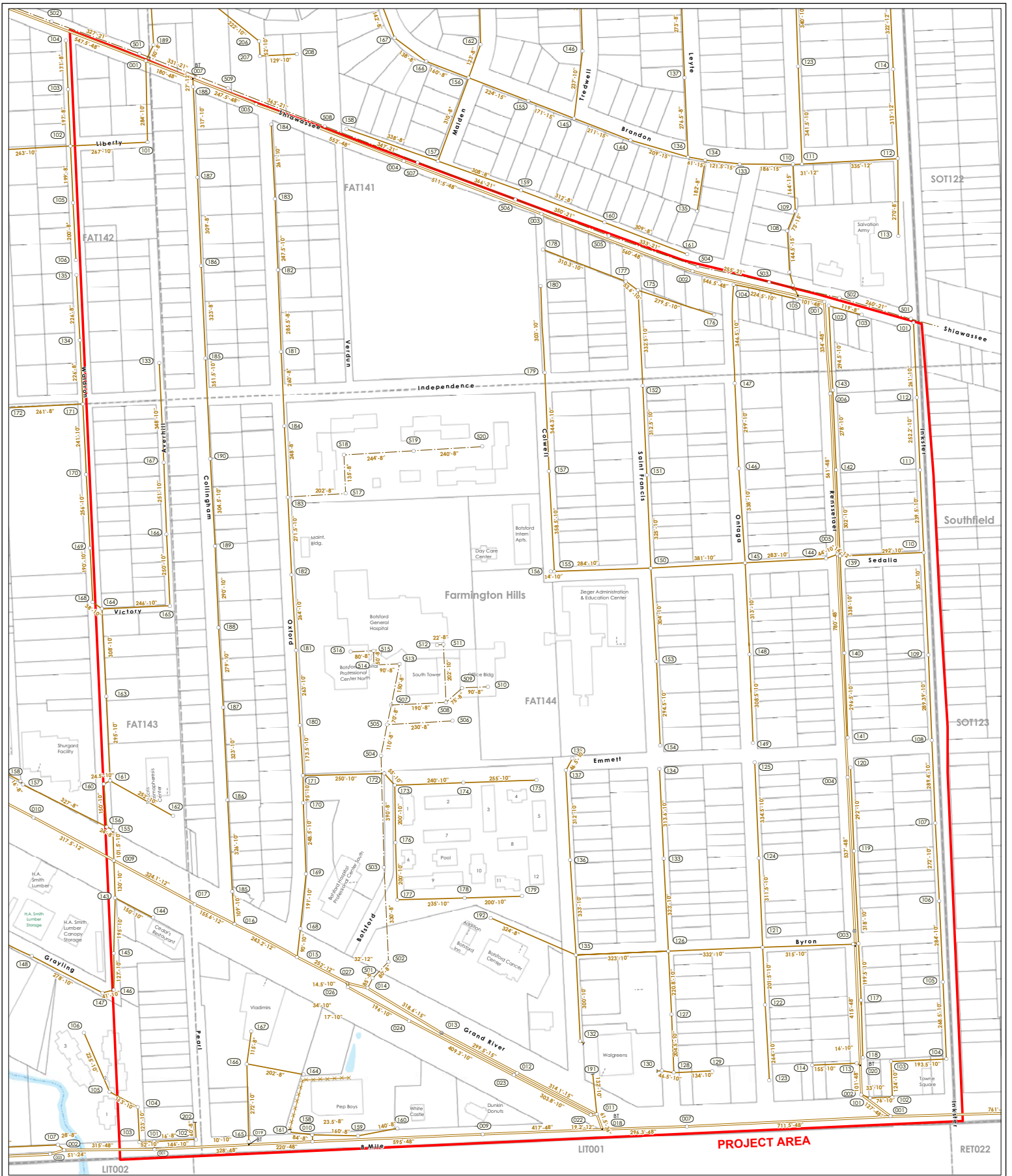
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John P. McCulloch
1 Public Works Drive, Bldg 95W
Waterford, Michigan
48328-1907



Storm Drain Legend			
	Manhole WRC		Storm Pipe/Culvert WRC
	Manhole FHC		Storm Pipe/Culvert FHC
	Catch Basin WRC		Stream / River
	Inlet WRC		Lake/Pond
	Catch Basin FHC		QuarterGrid
	Inlet FHC		Parcels
	End Section Inlet FHC		

DISCLAIMER: The information displayed in this map is compiled from recorded deeds, plats, tax maps, surveys and other public records. Although this information is provided to encourage better public information, it is not a legally recorded instrument and is not intended to be used as such. Users should consult their legal counsel for more information.

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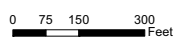
Maps prepared by
WRC
 WATER RESOURCES COMMISSIONER
 John P. McCulloch

1 Public Works Drive, Bldg 95W
 Waterford, Michigan
 48328-1907

DISCLAIMER
 The information displayed on this map is compiled from recorded deeds, plats, the maps, surveys and other public records. Although this information is provided for your convenience, it is not intended to constitute a warranty of accuracy or to be used in any way that would constitute a professional engineering or surveying service. Users should consult the appropriate public records for more information.

Map 4 City of Farmington Hills Illicit Connection Source Identification Project Sanitary Sewer

Sanitary Sewer Legend		
⊖	Flow Meter	— San Interceptor
⊕	Bulkhead/Plug	— San Lateral
•	Barrel Tap	⊗ Aband San Lateral
○	Standard MH	— Private or Maint. by Others San
⊙	Built Over Line MH	- - - QuarterGrid
		▭ Parcels
		▭ Lake/Pond
		⋯ Stream/River



**City of Farmington Hills Illicit Connection Source Identification
Final Project Summary Report
January, 2011**

**APPENDIX C
DYE TESTING INFORMATION**

e estin ener ro ed re

1. Locate the nearest outside sanitary and storm manhole for continuous observation of dye. Denote these MH's on a map for future reference. Other common observations points may include sumps and cleanouts, as applicable.
2. Set up appropriate traffic control measures for manholes located in street.
3. Upon entry to house pour green dye into the toilets, showers, bathtubs, sinks (sanitary fixtures) and flush with adequate water as needed.
4. Wait approximately 15-minutes while observing outside manholes (& other observation points) to verify where the green dye shows up (sanitary or storm).
5. Next, pour red dye into the sump pump and floor drain (storm fixtures) and flush with adequate water as needed.
6. Observe outside manholes (& other observation points) to verify where red dye shows up (sanitary or storm).
7. Clearly identify where red and green dye show up.
8. Make a note of the following, if applicable:
 - a. Cleanout location
 - b. Sump location
 - c. Other relevant information
9. For addresses identified as having septic tanks and receiving no sewer bills the following applies:
 - a. Extra flushing water is needed as septic tank will attenuate flow to drain or sewer.
 - b. Longer wait times for dye testing observations are needed.
 - c. Location of septic tank, access lid, field and tank pump out history, etc.
 - d. Well or city water?

10. Equipment needed may include the following:
 - a. Tracer dye.
 - b. Rubber hose.
 - c. Five-gallon pail.
 - d. Rubber gloves, safety glasses, and/or any safety equipment required per tracer dye label and/or MSDS sheet.
 - e. MSDS sheet for tracer dye.
11. Note – This is a generalized procedure only and site specific circumstances will require site specific modifications as needed.



WRC
WATER RESOURCES COMMISSIONER

John P. McCulloch

August 19, 2010

DONNA HARBOURNE
21222 SAINT FRANCIS AVE
FARMINGTON HILLS, MI 48336-6161

**Re: DYED WATER TESTING OF SANITARY SEWER LEAD AT:
21222 SAINT FRANCIS AVE, FARMINGTON HILLS, MI 48336-6161
TAX ID NUMBER: 2336431006**

Dear Ms. Harbourne:

A preliminary investigation of the storm drainage system in your neighborhood has shown that the sanitary sewer leads from some of the homes in your area are connected to the storm drain instead of a sanitary sewer. Connection of the sanitary service leads to the storm drains is a direct source of pollution to the Rouge River. To determine if this is the case with your residence, our office must perform a dyed water test of your sanitary sewer lead.

This testing will require entry into your house and will take approximately one hour to complete. A field inspector from this office will flush environmentally safe tracing dye through a representative number of plumbing fixtures in your home. During the test, the sanitary sewer and storm drain pipes in the roadway will be monitored for the presence of the dye. The result will be verification of your plumbing system connection. Improper connections found as a result of this testing will be corrected in the future as funding sources for this work are identified.

This test is being done in cooperation with the City of Farmington Hills and is important to protect and improve the water quality in the Rouge River Watershed.

Please contact our Inspection Department at 248-858-1105 between the hours of 8:30 a.m. and 5 p.m. before September 1, 2010 to schedule an appointment for dye testing.

Your cooperation in this matter is greatly appreciated.

Sincerely,



Steven Korth, P.E.
Manager



LIQUID POWDER TRACING DYE
Material Safety Data Sheet
(United States + Canada)

www.norlabdyes.com

N/A = Not Applicable (does not apply)

Section I - Identification

COMPANY NAME Norlab Inc
EMERGENCY PHONE 800-247-9422
EMERGENCY FAX 440-282-5498
EFFECTIVE DATE 01-10-2010

KEY:

01-- CHEMICAL NAME
02-- PHYSICAL STATE
03-- CHEMICAL FAMILY
04-- CHEMICAL FORMULA
05-- C.A.S. NUMBER
06-- HAZARDOUS CLASS
07-- RQ NUMBER
08-- UN NUMBER
09-- NA NUMBER
09-- US DOT SHIP NAME
10-- PACKAGING SIZE

	YELLOW-GREEN	RED	BLUE	VIOLET	ORANGE
01 -- Acid Yellow 73	Acid Rhodamine	Acid Rhodamine	Blue AZO	Acid Violet 17	Eosin Y
02 -- aqueous solution	aqueous solution	aqueous solution	aqueous solution	aqueous solution	aqueous solution
03 -- Xanthene	Xanthene	Xanthene	Triphenlmethane	Triphenlmethane	Xanthene
04 -- 45350	45100	45100	42090	42650	45380
05 -- 518-47-8	3520-42-1	3520-42-1	3849-45-9	4129-84-4	17372-87-1
06 -- N/A	N/A	N/A	N/A	N/A	N/A
07 -- N/A	N/A	N/A	N/A	N/A	N/A
08 -- N/A	N/A	N/A	N/A	N/A	N/A
09 -- N/A	N/A	N/A	N/A	N/A	N/A
10 -- Coal Tar Dyestuff	Coal Tar Dyestuff	Coal Tar Dyestuff	Coal Tar Dyestuff	Coal Tar Dyestuff	Coal Tar Dyestuff
11 -- Various	Various	Various	Various	Various	Various

Section II - Hazardous Ingredients

ALL INGREDIENTS LISTED WITH TSCA
NONE as per Part 29 CFR 1910.1200

Section III - Physical Data

Key:

01-- BOILING POINT (F)
02-- FREEZING POINT (F)
03-- VOLATILITY/VOLUME %
04-- MELTING POINT
05-- VAPOR PRESSURE (mm Hg)
06-- VAPOR DENSITY (Air=1)
07-- SOLUBILITY IN H2O
08-- APPEARANCE
09-- ODOR
10-- SPECIFIC GRAVITY (H2O=1)
11-- EVAPORATION RATE
12-- ACIDITY

	YELLOW-GREEN	RED	BLUE	VIOLET	ORANGE
01 -- N/A	N/A	N/A	N/A	N/A	N/A
02 -- 30 F	30 F	30 F	30 F	30 F	30 F
03 -- N/A	N/A	N/A	N/A	N/A	N/A
04 -- N/A	N/A	N/A	N/A	N/A	N/A
05 -- N/A	N/A	N/A	N/A	N/A	N/A
06 -- N/A	N/A	N/A	N/A	N/A	N/A
07 -- 100%	100%	100%	100%	100%	100%
08 -- BROWN	DARK RED	DARK RED	DARK BLUE	DARK PURPLE	DARK ORANGE

09 -- N/A	N/A	N/A	N/A	N/A
10 -- Approximately 1	Approximately 1	Approximately 1	Approximately 1	Approximately 1
11 -- N/A	N/A	N/A	N/A	N/A
12 -- N/A	N/A	N/A	N/A	N/A

Section IV - Fire and Explosion Hazard Data

FLASH POINT	N/A
LOWER FLAME LIMIT	N/A
HIGHER FLAME LIMIT	N/A
EXTINGUISH MEDIA FOR FIRE	N/A

Section V - Health Hazard Data

THRESHOLD LIMIT VALUE Ingestion in rats LD 50>6,800 mg/kg

OVER EXPOSURE EFFECTS
 Contact with eyes may result in severe irritation
 Contact with skin may result in irritation
 Ingestion may result in gastric disturbances

FIRST AID PROCEDURES
 Flush eyes with flowing water at least 15 minutes. If irritation develops, consult a physician.
 Wash affected skin areas thoroughly with soap and water. If irritation develops, consult a physician.
 Remove and launder contaminated clothes before reuse.
 If swallowed, dilute with water and induce vomiting.
****NEVER GIVE FLUIDS OR INDUCE VOMITING, IF PATIENT IS UNCONSCIOUS OR HAS CONVULSIONS****

Section VI - Reactivity Data

CHEMICAL STABILITY	STABLE
CONDITIONS TO AVOID	N/A
INCOMPATIBLE MATERIALS	N/A
DECOMPOSITION PRODUCTS	CARBON MONOXIDE, CARBON DIOXIDE, AND OXIDES OF NITROGEN
HAZARDOUS POLYMERIZATION	DOES NOT OCCUR
POLYMERIZATION TO AVOID	N/A

Section VII - Spill or Leak Procedure

FOR SPILL	Spills should be contained and placed in suitable containers.
WASTE DISPOSAL METHOD	Dispose in accordance with local regulations.

Section VIII - Special Protection

RESPIRATORY PROTECTION	N/A
VENTILATION	N/A
PROTECTIVE GLOVES	To prevent skin contact
EYE PROTECTION	Goggles
OTHER PROTECTIVE EQUIPMENT	Eye wash fountains should be easily accessible.
HANDLING AND STORAGE	Keep container closed, keep container from freezing, and keep out of reach of children.

Section IX - Special Precautions

N/A

Foot Notes

This information is furnished without warranty, or license of any kind, except that it is accurate to the best of Norlab's knowledge or obtained from sources believe by Norlab Inc to be accurate. Norlab Inc does not assume any legal responsibility for use or reliance upon same. Customers are encouraged to conduct their own tests.



**LIQUID
POWDER™**

TRACING DYE

Red

GENERAL USES

- Sewer Maintenance
- Septic System Analysis
- Pollution Studies
- Examine Water Movement
- Trace Water, Sewage or Septic Lines
- Flow Time Study
- As Tracers in a Multitude of Systems

NORLAB INC.

P.O. BOX 380

AMHERST, OHIO 44001 USA

U.S.A. and CANADA: 1-800-247-5454

INTERNATIONAL: 1-440-282-5454

www.norlabdyes.com



**LIQUID
POWDER™**

TRACING DYE

**Yellow
Green**

GENERAL USES

- Sewer Maintenance
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**City of Farmington Hills Illicit Connection Source Identification
Final Project Summary Report
January, 2011**

**APPENDIX E
HEALTH DIVISION
SEPTIC SYETEM RECORDS**

LOT# 1
Subdivision M. Co.
Sidwell# 23 36-753-001

OAKLAND COUNTY HEALTH DIVISION

1200 N. Telegraph Rd., Pontac 48341 (248) 858-1312
27725 Greenfield Rd., Southfield 48076 (248) 424-7191
1010 E. West Maple Road, Walled Lake 48390 (248) 926-3305

APPLICATION 946199 X Yes V

PART A: NOTIFICATION OF WATER SUPPLY INFORMATION
 PART B: PERMIT TO INSTALL OR REPAIR A SEWAGE DISPOSAL SYSTEM

(Township, Village, City) FARMINGTON HILLS No. 28035 Street SHANNESSE
New Home NO No. of Bedrooms 3 Repair of System Yes
Non-Residential Building Type _____ No. of Persons _____
Owner HERSHEY FAMILY (AED) Address SAME City _____ Zip _____
Applicant HERSHEY CARD Address _____ City _____ Zip _____
Signed: [Signature] Date 7/6/10 Telephone No. 248-475-9744
Call 248-960-1887

WELL INFORMATION

Will the property be serviced by a water well on-site? Yes No Casing Size _____ inches
Well Use: New Replacement Residential Public
SPECIAL CONDITIONS/DEVIATIONS: _____

SOIL INFORMATION

Make at least two borings into the soil about twenty-five (25) feet apart to at least a depth of seven and one-half feet in the area of the planned drain field. Soil borings for dry well installation must be at least twelve (12) feet deep.
(To be completed by Health Division)

Hole #1	Hole #2	Hole #3	Hole #4
1 1/2 Ft. Topsoil _____	1 1/2 Ft. Topsoil _____	_____ In. Topsoil _____	_____ In. Topsoil _____
1 1/2 Ft. <u>Loamy Sand</u>	1 1/2 Ft. <u>Loamy Sand</u>	_____ Ft. _____	_____ Ft. _____
_____ Ft. _____	_____ Ft. _____	_____ Ft. _____	_____ Ft. _____
_____ Ft. _____	_____ Ft. _____	_____ Ft. _____	_____ Ft. _____
Grnd. Water at <u>6</u> Ft.	Grnd. Water at <u>6</u> Ft.	Grnd. Water at _____ Ft.	Grnd. Water at _____ Ft.

BORING LOCATIONS MUST BE INDICATED ON ACCOMPANYING PLOT PLAN
REPORTED SOIL CONDITIONS CONFIRMED? YES NO Environmentalist MR Date 7/6/10

ON-SITE SEWAGE DISPOSAL SYSTEM PERMIT

Two compartment tank recommended 1000 Gals; Lineal feet Drain Tile 250; Trench width 36 In; Spacing C. to C. 8 Ft.;
OR Drainage Bed consisting of _____ Sq. Ft., OR _____ Drywells of _____ Gals. each with _____ Ft. of stone

totaling _____ Sq. Ft. of Absorption Area. Stipulations are listed below. The location and system design are indicated on attached scaled drawing which is part of this permit.

1. Locate drain field: Over Per Holes
2. PREVALING SMALL SIZED LOT, OR POOR SOIL QUALITY WILL LIMIT THE SERVICE OF THIS INSTALLATION. THIS REPAIR PERMIT IS ISSUED WITH NO ASSURANCES FOR A NORMAL USE PERIOD.
3. CALL FOR A CUTDOWN INSPECTION PRIOR TO BACKFILLING YES Date of Mid-Inspection _____ by _____
4. Backfill with Clean, Coarse Sand to Grade of Tile Field _____
5. Special Conditions/Comments: Maintain 50' from any well. Hold System as high as existing plumbing will allow. Prohibit tea or oil in existing tank. Maintain 10' from all lot lines and easements. Comply with Article III Guidelines.
6. Adequate replacement space available? Yes, over existing field Yes, another area (show on plot plan) No
7. Noncompliance Red Tag issued: Date: _____ Reason: _____ by: _____

If Denied, Indicate Reasons: _____
PERMIT: Approved Denied Hold Environmentalist MR Date: 7/6/10

ACT 53 - P.A. 1974 Requires the applicant to notify the public utilities prior to excavation.
THIS PERMIT IS VOID TWO (2) YEARS FROM DATE OF ISSUE
A:\EHS-3\EHS-14-2.FRM (3/01)

IMPACT
DATE OF ISSUE 7/6/10
PERMIT NO 00025674
POST ON JOB

FINAL INSPECTION

INDICATE WHEN APPLICABLE THE FOLLOWING

- (a) Received engineer's signed affidavit regarding inspection and approval ()
- (b) Surveyor's level used to check inches of fall in tile lines (List fall on sketch or plan) ()

(A) SEPTIC TANK

- (1) Septic tank size 750 gals. (2) Outlet "T" or "L" checked (3) Tank level
- (4) Tank/cover free of cracks (5) Outlet sealed 365° (6) Isolation distances:
- (a) Well N/A (b) Foundation 10' Remarks: Existing 750 Gallon

(B) TILE FIELD

- (1) Header level (2) Header installed on compact sand (3) Number of drain lines 8
- (4) Drain line length 25 ft. (5) Footer 59 ft. (6) Total lineal 259 ft.
- (7) Trench width 36 in. (8) 2" stone over and 6" under tile (9) Stone clean
- (10) Stone installed at least 4 ft. above water table (11) Grade of tile lines not greater than 3"/100 ft.
- (12) Cutdowns to required depth N/A Remarks: N/A

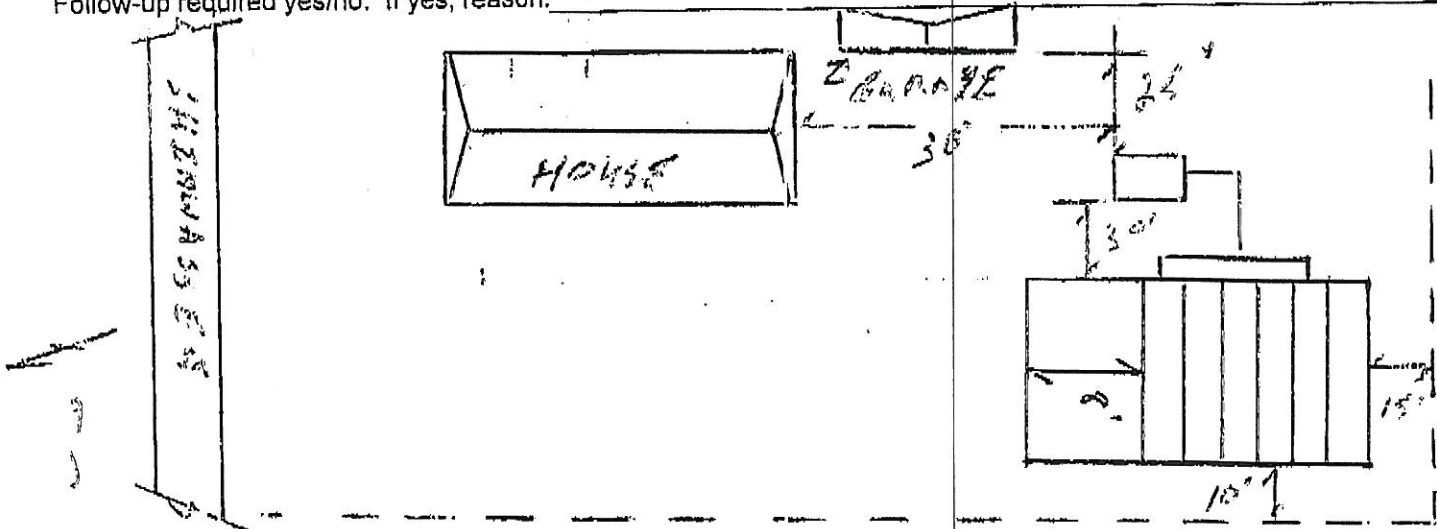
(C) DRAINAGE BED

- (1) Dimensions _____ ft. X _____ ft. (2) Total _____ sq. ft. (3) Header level _____
- (4) tile lines 5' on center 2-3 ft. from edge of bed _____ (5) 2" stone over & 6" under tile _____
- (6) Stone clean _____ (7) Cutdown depth approved _____ (8) 2 ft. sand over shelf for cutdown installations _____
- (9) Proper sand fill _____ (10) Stone installed 4 ft. above water table _____
- Remarks: _____

(D) DRYWELLS

- (1) To calculate the effective absorption area of one rectangular dry well, measure the two sides and the two ends of the excavated area and multiply the sum of these four sides by the water depth of the well + 6 inches.
- Side _____ ft., end _____ ft., depth _____ ft. Absorption area _____ sq.ft.
- No. of wells _____ Total absorption area _____ sq. ft. (2) 6" stone under _____
- (3) Drainage slots open _____ (4) Stone 4 ft. above water table _____
- Remarks: _____

Sketch plan of installation showing house, street, North, water well by X, any lake, stream and A, B, C, D above.
 Indicate isolation distances where applicable. Well installed: Yes or No _____
 Follow-up required yes/no. If yes, reason: _____



Approved Disapproved _____
 Installer Home Owner

Permit # 25674 Date: 7-10-01
 Environmentalist T. S. ...

LOT# 9

Approved
OAKLAND COUNTY HEALTH DIVISION
1200 N. Telegraph Rd., Pontiac, 48053
27725 Greenfield Rd., Southfield, 48076

12-2-88
11-11-88

Subdivision J.M. Cox Estates

11/14/88 4:31PM DUDD#6401 ***

Sidwell# 23-36-253-022

CHECK \$30.00

APPLICATION
FOR PERMIT TO INSTALL OR REPAIR
A SEWER DISPOSAL SYSTEM

(Township, Village, City) Farmington Hills No. 28128 Independence Independence

New Home Existing No. of Bedrooms 4 Repair of System Repair

Non-Residential Building Type _____ No. of Persons _____

Owner Jeanette Lewis Address 28128 Independence City Farmington Hills Zip 48024

Applicant M & M Septic Tank, Inc Address 32726 Northwestern City Farmington Hills Zip 48018

SIGNED: *[Signature]* Date 11-9-88 Telephone No. 313 626-2150

SUBSOILS DATA: Make at least two borings into the soil about twenty-five (25) feet apart to at least a depth of seven and one-half feet in the area of the planned drain field. Soil borings for dry well installation must be at least twelve (12) feet deep.

Hole #1	Hole #2	Hole #3	Hole #4
<u>15</u> In. Topsoil	_____ In. Topsoil	_____ In. Topsoil	_____ In. Topsoil
<u>3</u> Ft. of <u>Salt Crust</u>	_____ Ft. of _____	_____ Ft. of _____	_____ Ft. of _____
<u>2</u> Ft. of <u>Wetland</u>	_____ Ft. of _____	_____ Ft. of _____	_____ Ft. of _____
_____ Ft. of _____	_____ Ft. of _____	_____ Ft. of _____	_____ Ft. of _____
Grnd. Water at _____ Ft.	Grnd. Water at _____ Ft.	Grnd. Water at _____ Ft.	Grnd. Water at _____ Ft.

BORING LOCATIONS MUST BE INDICATED ON ACCOMPANYING PLOT PLAN REPORTED SOIL CONDITIONS
CONFIRMED? YES NO Environmentalist G. A. Park Date 12-2-88

Two-Compartment Tank Recommended PERMIT

Size of Septic Tank 1000 Gal Gals; Lineal feet Drain Tile 305; Trench width 36 In.;

Spacing C. to C. 8 Ft.; OR Drainage Bed consisting of _____ Sq. Ft. or _____ Drywells
of _____ Gals. each with _____ Ft. of stone totaling _____ Sq. Ft. of Absorption Area _____

Stipulations are listed below. The location and system design are indicated on attached scaled drawing which is part of this permit.

1. Locate drain field: At back lot 2. Cut all trenches _____ Ft. to _____
Cut Drainage Bed 50% / 100% _____ Ft. to _____

3. CALL FOR A CUTDOWN INSPECTION PRIOR TO BACKFILLING _____
Date of Mid-Inspection _____ by _____

4. Backfill with Clean, Coarse Sand to Grade of Tile Field _____

5. Other Describe: Remove saturated soil. Backfill with clean washed stone. Install the system 15-20 inches above grade level. USE WASHED STONE.

If Denied, Indicate Reasons: _____

PERMIT: Approved Denied Hold Environmentalist G. A. Park Date 12-5-88

ACT 53 - P.A. 1974 Requires the applicant to notify the public utilities prior to excavation.

HIS PERMIT IS VOID TWO (2) YEARS FROM DATE OF ISSUE

POST ON JOB

DATE OF ISSUE 12-5-88 PERMIT NO. 10002643

FINAL INSPECTION of Sewage System Shown on Reverse Side

INDICATE WHEN APPLICABLE THE FOLLOWING

- (a) Received engineer's signed affidavit regarding inspection and approval
- (b) Surveyor's level used to check inches of fall in tile lines (list fall on sketch or plan)

(A) SEPTIC TANK

- (1) Septic Tank Size 1000 gals. (2) Outlet "T" or "L" checked L (3) Interior free from excessive dirt ---
 - (4) Sound Cover EXIS (5) Outlet sealed 360° --- (6) Tank free from cracks, etc. ---
- Remarks: EXISTING TANK

(B) TILE FIELD

- (1) Header level --- (2) Distribution box level, footings below frost --- (3) Number of tile lines 4
- (4) Length 71 ft. (5) Trench width 36 in. (6) Footer 21 ft. (7) Total lineal 302 ft. (8) 2", 6A stone over ---
- (9) Proper joint covering --- (10) Tile spacing 1/4" to 1/2" --- (11) 6", 6A stone under ---
- (12) Fall of tile lines not more than 3"/100 ft. --- (13) Does installation essentially comply with scaled plan? ---
- (14) If not explain in remarks: ---

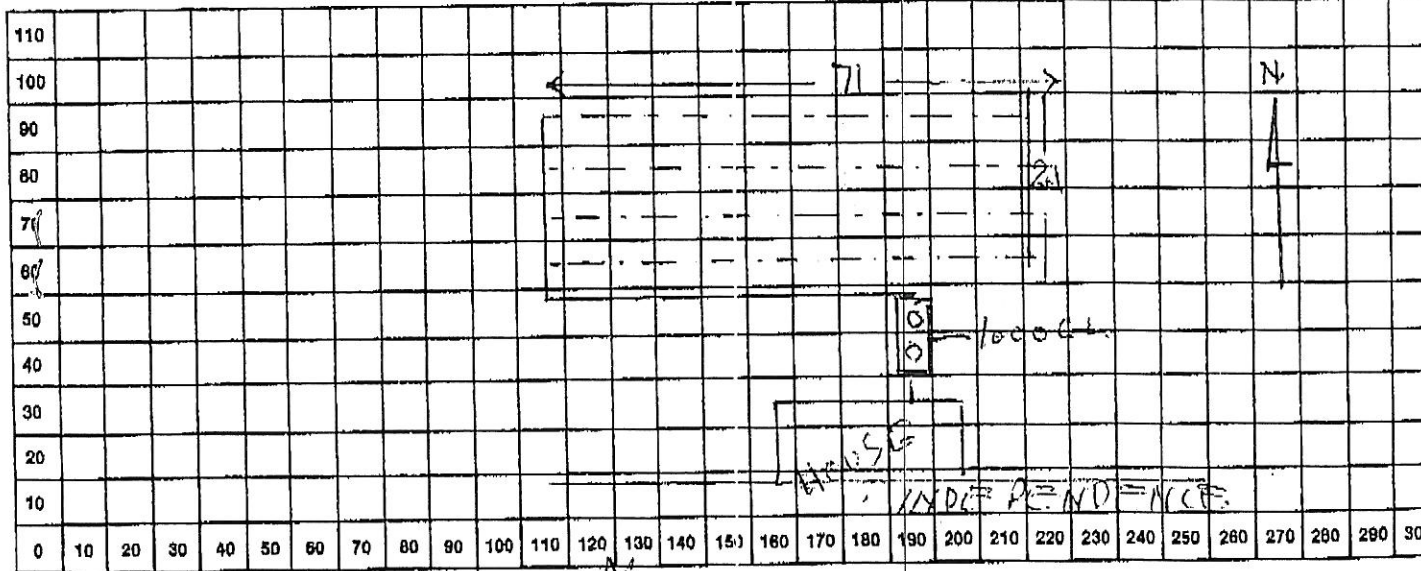
(C) DRAINAGE BED

- (1) Size _____ ft. x _____ ft. (2) Total _____ sq. ft. (3) Distribution box level, footings below frost _____
- (4) Header level _____ (5) Number of tile lines _____ (6) Length of tile lines _____ ft.
- (7) Footer _____ ft. (8) Total _____ ft. (9) 2" 6-A stone over _____ 10 1/4" to 1/2" spacing _____
- (11) Proper joint covering _____ (12) 6", 6-A stone under tile _____ (13) At least 2 ft. sand, of total area (2) under stone _____
- (14) Does installation comply with plan accompanying permit? _____
- (15) If not, explain in remarks: _____

(D) DRY WELLS(S)

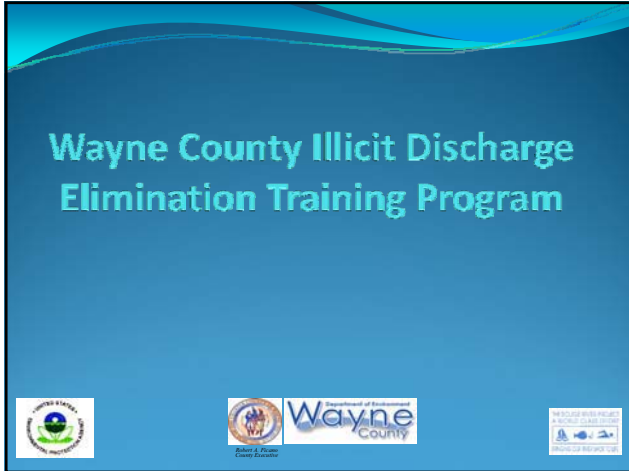
- (1) To calculate the effective absorption area of one rectangular dry well, measure the two sides and the two ends of the excavated area and multiply the sum of these four sides by the water depth of the well + 6 inches. Side _____ ft., end _____ ft., depth _____ ft. Absorption area _____ sq. ft. No. of wells _____ Total absorption area _____ sq. ft.
- (1) For circular dry well, use formula: $A = \pi dh$ ($\pi = 3.14$), d = Diameter of excavated area _____ ft., h = water depth + 6 inches _____ ft. absorption area _____ sq. ft. no. of wells _____ Total absorption area _____ sq. ft.
- (2) 6-A stone, sides _____ in, ends _____ in. (3) Drainage openings, sides _____, ends _____

Sketch plan of installation showing house, North, water wall by X, any lake or stream and A, B, C, D above.
 Indicate isolation distances where applicable. Scale 1/4" = 10'. (House not to scale).



Installer M E M Approved (Environmentalist or Other) G. A. Smith Date 1.9.59

APPENDIX F



DEVELOPED AND PRESENTED BY:

- Wayne County Department of Public Services – Water Quality Management Division
 - Dean Tuomari, Watershed Coordinator
734-326-4483, dtuomari@co.wayne.mi.us
 - Susan Thompson, Environmental Specialist
734-326-5515, sthompson@co.wayne.mi.us
- Environmental Consulting & Technology, Inc.
 - Annette DeMaria, P.E. Staff Engineer
586-465-2583, ademaria@ectinc.com

Program Outline

- Introduction
- Basic Investigations
- On-Site Sewage Disposal System Strategies
- Advanced Investigations
- Prevention Considerations
- Case Studies
- Tabletop Exercise

WHAT IS IDEP?

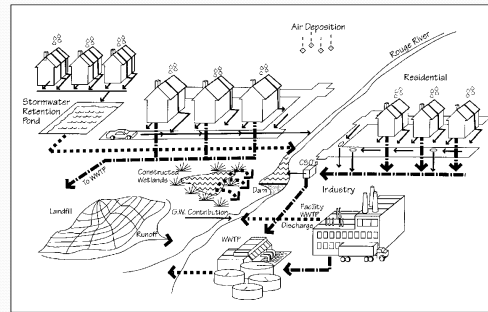
- I**llicit – wrong, illegal, it stinks!
- D**ischarge – someone swims in it!
- E**limination – let’s get rid of it!
- P**lan &/or **P**rogram &/or **P**roject – solutions!

WHY DEVELOP AN ILLICIT CONNECTION/DISCHARGE PROGRAM?

- Preventing pollution to receiving stream
- MDEQ stormwater permit requirement
- EPA Phase II stormwater permit requirement

40, 78

WHAT ARE WE TRYING TO VERIFY?



WHAT IS AN ILLICIT CONNECTION?

- When a pipe intended for a sanitary sewer ends up in a storm drain



WHAT IS AN ILLICIT DISCHARGE?

- Failing septic field
 - When sanitary sewage escapes an on-site sewage disposal system and migrates to a water course
- Spilling or dumping
 - Mishandling materials in a manner which allows those materials to migrate to a water course
- Illicit Connection
 - Creates an illicit discharge



WHAT ARE WE REALLY LOOKING FOR? (WHEN ALL ELSE FAILS, TRY COMMON SENSE)

- If it isn't raining, the storm drain should be dry
- Groundwater is crystal clear
- Streaks of lush green grass during a drought should suggest that something is amiss
- If it looks/smells polluted, it probably is



WHAT CAN THE FIELD STAFF DO TO CLEAN UP OUR ENVIRONMENT?

- Be an alert observer
- Report suspicious discharges

Remember - even small discharges are large pollutant sources if they pollute day after day after day...



226

WHAT CAN THE PUBLIC DO TO CLEAN UP OUR ENVIRONMENT?

Storm Drains aren't Garbage Cans--



--Neither is the Floodplain

Program Outline

Introduction

Basic Investigations

On-Site Sewage Disposal System Strategies

Advanced Investigations

Prevention Considerations

Case Studies

Tabletop Exercise

WHAT IS THE PURPOSE OF AN OUTFALL SURVEY?

- Locate outfalls
- Identify areas with potential illicit connections/discharges
- Determine conditions of outfall structures
- Locate potential sample collection points
- Identify failing septic systems along streambanks
- Locate abandoned dumps along streambanks



1

SURVEY TYPES

- Entire watercourse
 - "Stream walking"
- Political jurisdiction
- Pre-screening
 - Using existing stream data
 - Complaint histories



FIELD PLANNING & PREPARATIONS

- Personnel safety
 - Property rights
 - Traffic control
 - Confined space entry
 - Opening of manhole covers
 - Exposed barrels
 - Crew size
- Communication & security
- Personal safety equipment
- Insects & animals
- First aid
- Terrain
- Plants



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FIELD PLANNING & PREPARATIONS

- Pre-survey planning
 - Identify area
 - Prepare data collection method
 - Develop sampling method, if necessary
 - Community notification
 - Examine sewer maps
 - Identify outfall ownership
 - Assemble equipment



OUTFALL SURVEY

Survey Forms

SAMPLE GPS SURVEY SHEET

SITE ID: _____ CREW INITIALS: _____
 DATE: _____
 PHOTOGRAPHER: _____
 PHOTO MODEL #: _____
 LOCATION:
 STREAM: _____
 CITY: _____
 ADDRESS OF PROPERTY: _____
 GPS LATITUDE: _____
 GPS LONGITUDE: _____


OUTFALL CONDUIT DIMENSIONS:
 DRAIN: _____
 SIZE: _____
 YEAR: _____
 MATERIAL: _____
 OUTFALL TYPE (1=boxed, 2=unboxed, 3=culvert): _____
 DIMENSIONS TO OUTFALL STRUCTURE: _____
 OUTFALL CONDITION:
 ACTIVE (1=good, 2=poor): _____
 ESTIMATED FLOW RATE: _____
 SOURCE: _____

OUTFALL CONDITION (CONTINUED)


VISUAL APPEARANCE: _____
 REINFORCEMENT: _____
 DEPOSIT/STORAGE: _____
 STREAM CONSIDERATIONS:
 COLOR: _____
 ODOUR: _____
 VEGETATION: _____
 CHANNEL DIMENSIONS: _____
 TEMPERATURE (°C): _____
 CONDUCTIVITY: _____
 REMARKS: _____

OUTFALL SURVEY

- Field procedure
 - Photographs
 - Measurements
 - Location/GPS
 - Type of outfalls



- Record physical condition of outfall/headwall
- Record stream conditions
- Other observations
- Ownership verification



TYPES OF OUTFALLS






TYPES OF OUTFALLS






Irrigation Pumps-NOT Outfalls

TYPES OF OUTFALLS: FOUNDATION DRAINS

OUTFALL SURVEY: SUSPICIOUS DISCHARGES

- Recognizing the signs
- Potential pollution sources
- Describe on outfall survey form
- Sampling

OUTFALL SURVEY: SUSPICIOUS DISCHARGES

- Stream bank observations
 - Exposed fill
 - Erosion
 - Discharging septic systems
 - Former landfills
 - Dump sites

Former landfill site

OUTFALL SURVEY: DISTINGUISHING VISUAL OBSERVATIONS

- Natural phenomena
- Nutrient discharge
- Sewage discharge
- Non-sewage discharge

This manual was developed by the Wayne County Department of Environment, Watershed Management Division, funded in part by the Rouge River National Wet weather Demonstration Project, United States Environmental Protection Agency (EPA) Grant #XP995743-01 - 09 and #C995743-01. The views expressed by individual authors are their own and do not necessarily reflect those of EPA. Mention of trade names, products, or services does not convey official EPA approval, endorsement or recommendation.

NATURAL PHENOMENA

- False Oil sheen



131, 268


NATURAL PHENOMENA

- Foaming and Tannin



NATURAL PHENOMENA

- Iron bacteria



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NUTRIENT DISCHARGE

- Nutrient enriched discharge from drain tile
- May require follow-up



SEWAGE DISCHARGE

- Gray Water



SEWAGE DISCHARGE

- Sewage Fungus



SEWAGE DISCHARGE

- Blackish discharge



SEWAGE DISCHARGE

- Oil and paper



SEWAGE DISCHARGE

- Sanitary sewer overflow



SEWAGE DISCHARGE

- Failing drainfield



SEWAGE DISCHARGE

- Septic system discharge



NON-SEWAGE DISCHARGE

- Oily discharge



OUTFALL SURVEY: PHYSICAL PARAMETERS

- Odor
 - Industrial sources: can include spoiled organic (rotten egg smell) products, oil, gasoline, specific chemicals, solvents
 - Sewage sources: foul odor
- Color/Turbidity
 - Groundwater is usually clear and colorless
 - Inappropriate discharges are often turbid or discolored water

FALSE NEGATIVES CAN OCCUR

The absence of these parameters does not mean that an illicit discharge is not occurring

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OUTFALL SURVEY: PHYSICAL PARAMETERS

- Floatable Matter
 - Industrial sources: animal fats, food products, oils, solvents, sawdust, foams, packing materials, fuels
 - Sanitary sources: fecal matter, other sanitary wastes
- Deposits and Stains
 - Coatings that remain on the streambank or on the outfall structure after a non-stormwater discharge has ceased.
 - Industrial sources: often dark staining
 - Sanitary sources: black and gray

FALSE NEGATIVES CAN OCCUR

The absence of these parameters does not mean that an illicit discharge is not occurring

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OUTFALL SURVEY: PHYSICAL PARAMETERS



OUTFALL SURVEY: PHYSICAL PARAMETERS

- Vegetation
 - Inhibited or excessive growth at the outlet based on surrounding conditions
 - Consider weather conditions and time of year
 - Vegetation conditions can show effects after the flow ceases

FALSE NEGATIVES CAN OCCUR

The absence of these parameters does not mean that an illicit discharge is not occurring

270

OUTFALL SURVEY: PHYSICAL PARAMETERS

- Structural Damage
 - Industrial discharges with abnormal pH can cause pitting or spalling of the outfall structure
 - Don't confuse with the results of structure age, hydraulic scour or poor construction

FALSE NEGATIVES CAN OCCUR

The absence of these parameters does not mean that an illicit discharge is not occurring

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OUTFALL SURVEY: CHEMICAL PARAMETERS

- Ammonia (NH₃)
 - Produced by decay of organic nitrogen compounds
 - Use to identify sanitary wastewater & septic tank effluent
 - Can also indicate ammonia based cleaners & fertilizer runoff
 - Visual method, numeric result
 - Low background levels exist from decay of plant and animal matter

269, 270

OUTFALL SURVEY: CHEMICAL PARAMETERS

- Detergents (Anionic Surfactants)
 - Found in household detergents
 - Use to identify sanitary wastewater, but not septic tank effluent
 - Visual method, numeric result
 - Low background levels exist – why?

269, 270

OUTFALL SURVEY: CHEMICAL PARAMETERS

- Conductivity
 - Use as an indicator of dissolved solids
 - Use to identify sanitary wastewater, septic effluent, industrial water and irrigation water
 - Instrumental method, numeric result
 - Tap water very low (225 $\mu\text{S}/\text{cm}$)

OUTFALL SURVEY: CHEMICAL PARAMETERS

- Temperature
 - Use to identify sanitary wastewater, septic effluent and industrial water
 - Useful during cold months
 - Instrumental method, numeric result

EPA FIELD SURVEY PARAMETERS AND ASSOCIATED NON-STORMWATER FLOW SOURCE CATEGORIES

Parameter	Natural Water	Potable Water	Sanitary Wastewater	Septic Tank Effluent	Industrial Water	Wash Water	Rinse Water	Irrigation Water
Fluorides	▲	■	■	■	■	■	■	Not listed
Hardness Change	▲	■	■	■	■	■	■	■
Surfactants	▲	▲	■	■	■	■	■	■
Fluorescence	▲	▲	■	■	■	■	■	■
Potassium	▲	▲	■	■	■	■	■	■
Ammonia	▲	▲	■	■	■	■	■	■
Odor	▲	▲	■	■	■	■	■	■
Color	▲	▲	■	■	■	■	■	■
Clarity	▲	▲	■	■	■	■	■	■
Floatables	▲	▲	■	■	■	■	■	■
Deposit/Stains	▲	▲	■	■	■	■	■	■
Vegetation Change	▲	▲	■	■	■	■	■	■
Structural Damage	▲	▲	■	■	■	■	■	■
Conductivity	▲	▲	■	■	■	■	■	■
Temp. Change	▲	▲	■	■	■	■	■	■
pH	▲	▲	■	■	■	■	■	■

▲ Low concentration
■ High concentration
◆ Variable concentration

Adapted from "Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems - A User's Guide", EPA/600/R-92/238, Jan. 1993, p. 26

REGIONAL EXPERIENCE: FIELD SURVEY PARAMETERS AND ASSOCIATED NON-STORMWATER FLOW SOURCES

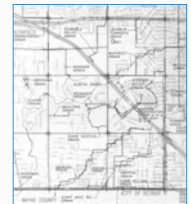
Parameter	Natural Water	Potable Water	Sanitary Wastewater	Septic Tank Effluent	Industrial Water	Wash Water	Rinse Water	Irrigation Water
Surfactants	▲	▲	■	■	■	■	■	■
Ammonia	▲	▲	■	■	■	■	■	■
Odor	▲	▲	■	■	■	■	■	■
Color	▲	▲	■	■	■	■	■	■
Clarity	▲	▲	■	■	■	■	■	■
Floatables	▲	▲	■	■	■	■	■	■
Deposit/Stains	▲	▲	■	■	■	■	■	■
Vegetation Change	▲	▲	■	■	■	■	■	■
Structural Damage	▲	▲	■	■	■	■	■	■
Conductivity	▲	▲	■	■	■	■	■	■
Temp. Change	▲	▲	■	■	■	■	■	■
pH	▲	▲	■	■	■	■	■	■

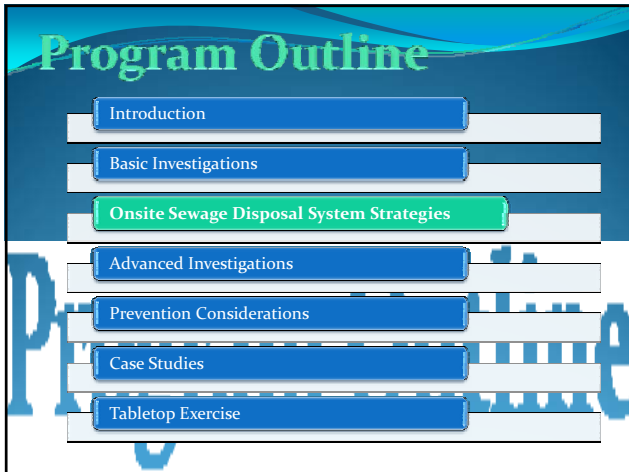
▲ Low concentration
■ High concentration
◆ Variable concentration

Adapted from "Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems - A User's Guide", EPA/600/R-92/238, Jan. 1993, p. 26

POST SURVEY TASKS

- Confirm outfall ownership
 - Re-examine maps
 - Review municipal/county records
- Enter data into database
- Review data for future investigations
- Notify management of possible actions





ON-SITE SEWAGE DISPOSAL SYSTEM (OSDS) STRATEGIES

- Local Ordinances
 - Operation and Maintenance Ordinance
 - City of Southfield
 - “Time of Sale”
 - Wayne, Washtenaw & Macomb Counties
- Stream Walking
 - St. Clair County



OSDS STRATEGIES: LOCAL ORDINANCES “TIME OF SALE”

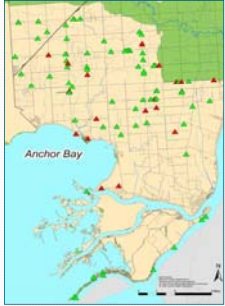
Time of Sale Summary for 2003			
County	Number of Evaluations	Failed Systems	Percent Failed
Wayne	129	34	26%
Washtenaw	952	190	20%
Macomb	741	94	13%
Total	1822	318	17%

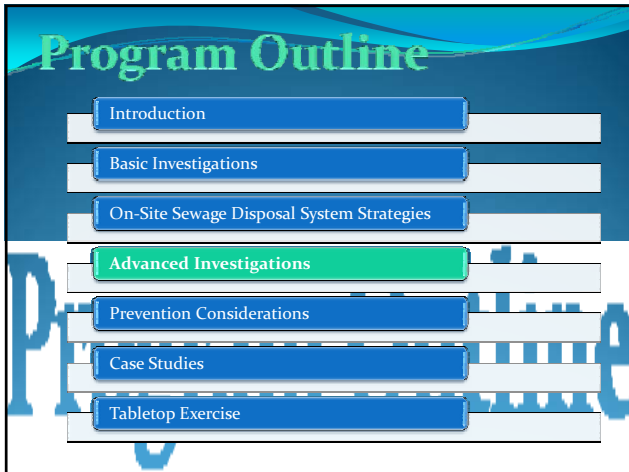
OSDS STRATEGIES: STREAM WALKING

St. Clair County Stream Survey Results

- Area: 90 sq. miles
- Surveyed 3,690 outfalls
- Identified 160 “problems”
- 110 were failing septic systems
- 85% corrected

Prevented over 8 million gallons of untreated sewage per year from entering surface water





ADVANCED INVESTIGATIONS OVERVIEW

- **Bridging from basic to advanced investigations**
- Elements of the advanced investigations
- Eliminating the discharge
- Enforcement

BRIDGING FROM BASIC TO ADVANCED INVESTIGATIONS

- Summarize field information
- Prioritize your sites from the initial survey
 - Compare data in your community or drainage area
 - Determine if “hot spots” exist
- Address “hot spots” first
- Or you may be responding to a complaint
 - Decide what parameters to test for

ADVANCED INVESTIGATIONS OVERVIEW

- Bridging from basic to advanced investigations
- **Elements of the advanced investigations**
- Eliminating the discharge
- Enforcement

ELEMENTS OF ADVANCED INVESTIGATION

- **Keeping your feet dry (office work)**
 - **Planning the investigation**
- **Getting your feet wet (field work)**
 - Finding the problem area
 - Isolating the source
 - Communication
 - Techniques



PLANNING THE INVESTIGATION

- What area does the outfall/storm sewer system drain?
- What is the land use in area?
 - Residential/business/commercial
 - Know the "lay of the land"

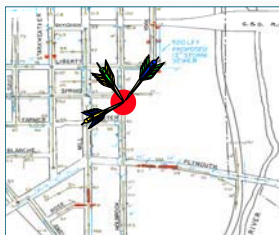


NOTE:

- Is it a CSO area?
- Sewer separation projects
- Hybrid systems
- Other exceptions

PLANNING THE INVESTIGATION

- Reviewing drain plans
- Select sample points
 - Field verify



PLANNING THE INVESTIGATION

- Discuss sampling details (safety, procedures and equipment)
- Notify local agencies



TYPICAL EQUIPMENT

- Clipboard
- Survey forms
- USGS maps
- Waterproof pens
- Compass
- Backpack/equipment bag
- Sledgehammer
- "J" hook
- Crowbar
- Measuring tape
- Flashlight
- Rope
- Mirrors
- Hard hats
- Life vests
- Safety vests
- Steel toe boots
- Latex gloves
- Work gloves
- Waders
- Field radios
- First aid kit
- Sunscreen
- Insect repellent
- Drinking water
- Camera & film



ADDITIONAL EQUIPMENT

- Global Positioning System (GPS)
 - Receiver & data logger
- Chemical Test kits
 - (Ammonia, surfactants, etc.)
- Field meters
 - (Conductivity, pH, etc.)



KEEPING YOUR FEET DRY

SUMMARY

- Specify problem area
- Identify parameters to measure
- Collect and review drain maps
- Determine land use
- Select sample points
- Notify appropriate agencies
- Review standard operating procedures
- Develop safety plan
- Gather equipment

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ELEMENTS OF ADVANCED INVESTIGATION

- Keeping your feet dry (office work)
 - Planning the investigation
- **Getting your feet wet (field work)**
 - **Finding the problem area**
 - **Isolating the source**
 - Communication
 - Techniques



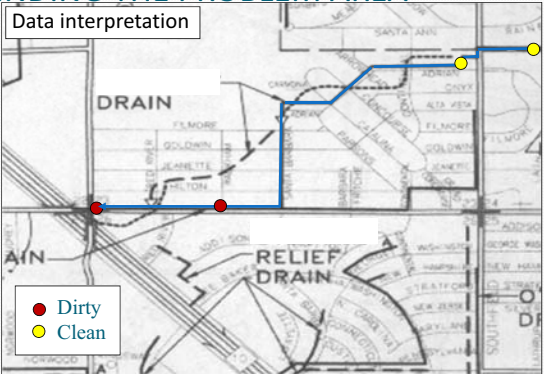
FINDING THE PROBLEM AREA

- Sample at planned locations
- Survey sample site area
 - Adjacent land use
 - Commercial/industrial housekeeping practices
 - Signs of dumping
 - Other irregularities

FINDING THE PROBLEM AREA

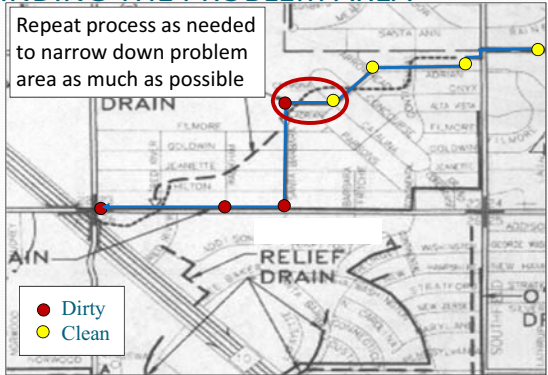
Data interpretation



- Dirty
- Clean

FINDING THE PROBLEM AREA


Repeat process as needed to narrow down problem area as much as possible



- Dirty
- Clean

ISOLATING THE SOURCE

- Communication
 - Notify affected parties of investigation efforts/problem
 - Utilize mailing for public education

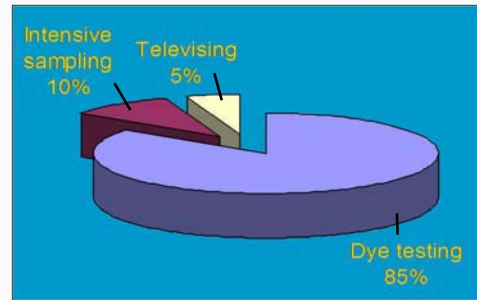


ISOLATING THE SOURCE

- Techniques
 - Intensive sampling
 - Televising the sewer
 - Dye testing
 - Other



WAYNE COUNTY EXPERIENCE



TELEVISING TECHNIQUE

- Televising (T.V.) the sewer
 - To see illicit taps
 - To see condition of the sewer line
 - To create permanent record



TELEVISING TECHNIQUE

NEEDED EQUIPMENT

- Manhole guards
- Cable guard (roller)
- Cable guard (shoe)
- Self propelled camera
- 1200 feet of cable
- Truck with generator, monitor and control room
- Video player
- Connecting poles for guiding shoe into the pipe
- Safety cones
- Electrical tape
- Manhole hook
- Shovel
- Paper towels to keep lens clean
- Sized tires to adapt for pipe diameter changes
- Small diameter lead camera and monitor

TELEVISION TECHNIQUE

BEFORE YOU LEAVE THE SHOP

- Check all engine fluids
- Check generator fluids and couplings
- Check tractor camera for lights, mobility and picture
- Check yellow water tank for adequate supply
- Make sure that you have a hook, shovel, roller and electrical tape on board

TELEVISION TECHNIQUE

WHAT TO LOOK FOR

- Heavily stained pipe
- Grease build-up on pipe walls
- Table scraps
- Toilet paper or paper products
- Soap suds
- Chemicals (if in industrial area)
- Paint
- Waste products



TELEVISION TECHNIQUE

ON SITE

- Plan your run sequence before you set up
- Make sure your helper backs you up to the manhole
- Start the generator
- Connect the cable to the camera and check all functions
- Using electrical tape, secure the connection. This prevents water penetration and premature uncoupling which would result in loss of power to the camera
- Securely grasp the cable and slowly lower the camera down the manhole, making sure not to bang the shell against the walls or steps, or slamming it on the bottom of the channel

TELEVISION TECHNIQUE

ON SITE

- Move the camera into position and listen for your helper's signal
- Assemble the cable protector (shoe) and lower it into position
- Place the roller around the cable and over the manhole
- Tighten up the slack of the cable and reset the rear counter
- Reset the electronic footage
- The helper at this time places the yellow safety barricade around manhole and positions him or herself to observe the cable during its run. This allows the camera operator to notice any nicks or gouges in the cable or tangles in the take up reel.
- After the run is completed disassemble the setup in reverse sequence

PROS/CONS OF TELEVISIONING

- Pros
 - May have equipment in-house
 - Easy to see active taps
 - Record of observations
 - Only way to observe pipe between manholes
 - Less intrusive
- Cons
 - Expensive to hire out work
 - Difficult to characterize inactive taps
 - Interpreting the results is time consuming
 - Won't work on obstructed sewers (root overgrown, etc.)
 - May require confined space entry
 - May be pipe-size limited, depending on type of equipment
 - Won't work in water-filled pipes

DYE TESTING TECHNIQUE

- Storm sewer
 - May show inter-connections between sewer systems
 - Leaks from a sanitary sewer to storm sewer (e.g., sanitary sewer goes through a county drain)
 - MDEQ notification required
- Facility
 - To determine if illicit connections exist



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DYE TESTING FACILITIES

- Equipment
 - Million candle power light
 - Dye
 - Radios
 - Other, as required
- Other issues
 - Confined space
 - Manhole access



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DYE TESTING FACILITIES

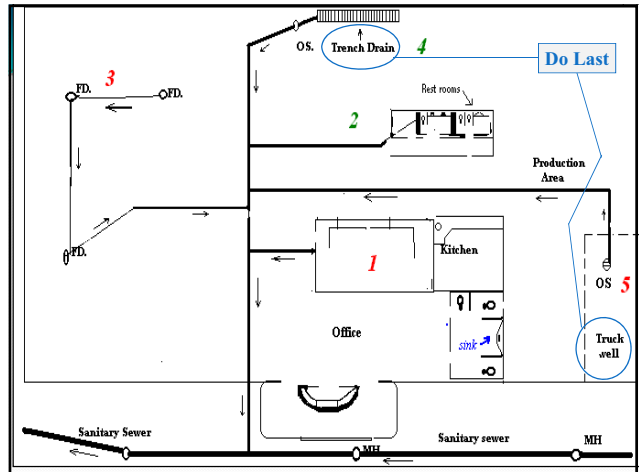
- Site visit
 - Program introduction
 - Visit purpose
 - Small facility
 - Large facility
- Site evaluation
 - Small facility
 - Site visit
 - Housekeeping practices
 - Large facility
 - Site drawings
 - Site visit
 - Housekeeping practices
 - Formulate testing plan



DYE TESTING FACILITIES

- Dropping the dye
 - Liquid
 - Packets
 - Alternate colors
 - Green
 - Fluorescent red





DYE TESTING FACILITIES

- Observation of dye
 - Radio communication
 - Account for all dye




DYE TESTING FACILITIES

- Field records
 - Site utility plan
 - Mark plan
 - Field sketch
 - Field data
 - Fixtures tested, date, time and dye color
 - Photos



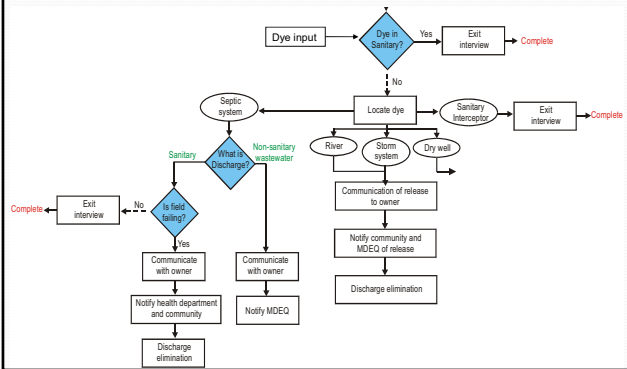

DYE TESTING FACILITIES

- Exit interview
 - Results of dye test
 - Other potential issues
 - Storm water in sanitary sewer
 - Improper housekeeping practices (change SOPs)
- River Friendly Partners Program

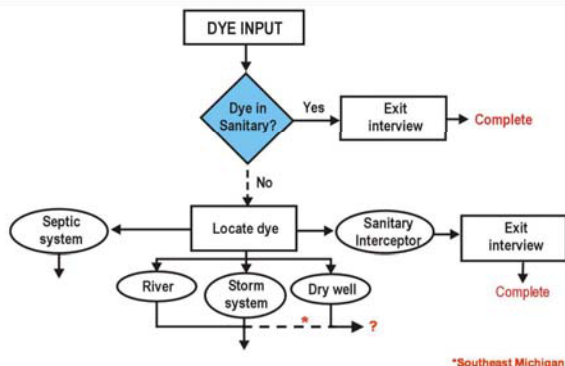


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DYE TESTING FACILITIES

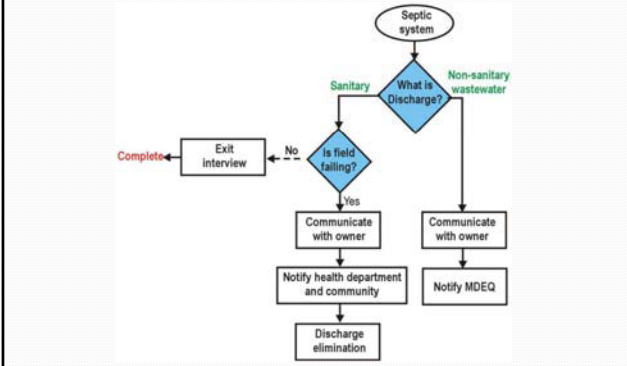


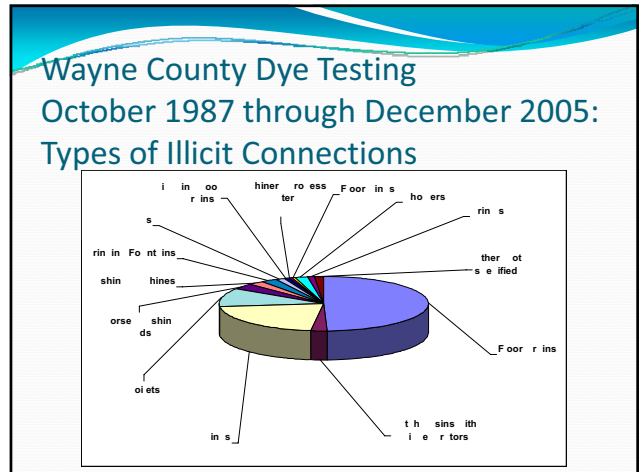
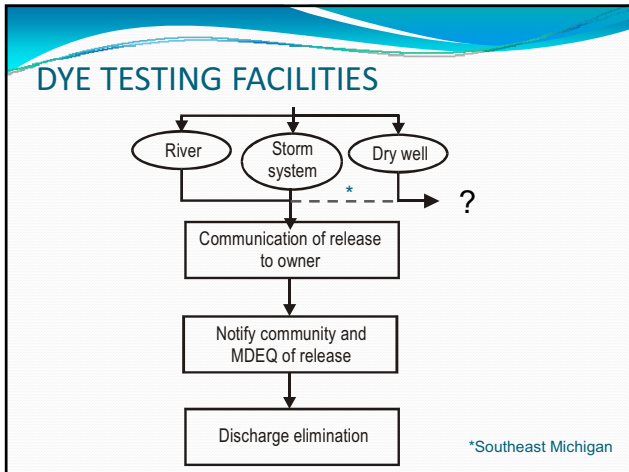
DYE TESTING FACILITIES






*Southeast Michigan

DYE TESTING FACILITIES





- ### PROS/CONS OF DYE TESTING
- Pros
 - Easy to do
 - Materials are inexpensive
 - Results will show specific source
 - Cons
 - Time consuming in low flow
 - Difficult to see dye
 - Need homeowners/business owners cooperation
 - Public reaction to dye in stream
- 

- ### INTENSIVE SAMPLING TECHNIQUE
- To find off-hours or intermittent flows or peak activity
 - Automatic samplers
 - Flow meters
 - Multiple sampling at specific sites
- 
- 
- 242

PROS/CONS OF INTENSIVE SAMPLING

- Pros
 - Good for intermittent flows
 - Fills data gaps
 - Good for off-hour sampling
 - Auto samplers can be left unstaffed
 - Useful in residential areas
 - Effective method to isolate source areas
- Cons
 - Does not point to specific source
 - May create inconclusive data
 - Limited holding times
 - Expensive lab analysis
 - May require confined space entry

OTHER TECHNIQUES

- Smoke testing
- Drain walk
- Use your imagination



ADVANCED INVESTIGATIONS

OVERVIEW

- Bridging from basic to advanced investigations
- Elements of the advanced investigations
- **Eliminating the discharge**
- Enforcement



ELIMINATING THE DISCHARGE

- Identify responsible party (residence, business, etc.)
- Communicate problem to responsible party by informal and formal means
 - Refer/collaborate with local community for enforcement (Cite CWA, PA of 451, BOCA, IPC)
 - Copy other interested parties (MDEQ, Water Quality Board, Health Department, etc.)

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ELIMINATING THE DISCHARGE

- Give responsible party time to address problem
- Follow-up investigation (to see if problem is fixed)
- If problem is fixed, investigation is closed
 - Site visit to confirm corrections
 - Send confirmation letter

ADVANCED INVESTIGATIONS

OVERVIEW

- Bridging from basic to advanced investigations
- Elements of the advanced investigations
- Eliminating the discharge
- **Enforcement**

ENFORCEMENT

What if they don't fix it?

- State and federal regulations
 - Clean Water Act
 - Michigan Act 451, Part 31, Section 324.3109 of 1994
- Local codes and ordinances
 - Failing septic systems (Health Code)
 - Illicit connections (Michigan/International Plumbing Code)
 - Discharges to County Drains (Michigan Drain Code)
 - Dumping (litter ordinances)



Wayne County Findings:

- Majority of cases are resolved voluntarily
- Only 2 cases since 1987 needed referral to the State

Program Outline

Introduction

Basic Investigations

On-Site Sewage Disposal System Strategies

Advanced Investigations


Prevention Considerations

Case Studies

Tabletop Exercise

PREVENTION CONSIDERATIONS

- Designers and plan reviewers are a key to "prevention"
 - Plans and specs
 - First line of IDEP defense
- Site related design issues
 - Know public sewer infrastructure
 - Foundation sump pumps
 - Mobile floor washing machines
- Building related issues: original design, modifications and additions
 - Truck wells, floor drains



Program Outline

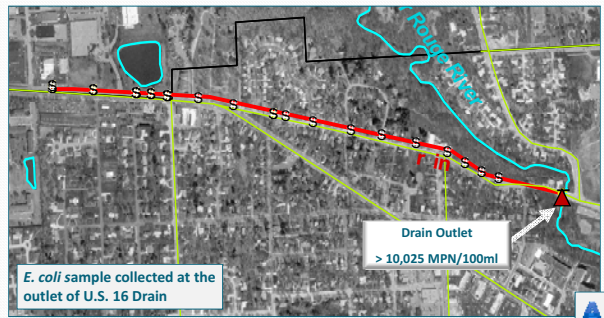
- Introduction
- Basic Investigations
- On-Site Sewage Disposal System Strategies
- Advanced Investigations
- Prevention Considerations
- Case Studies**
- Tabletop Exercise

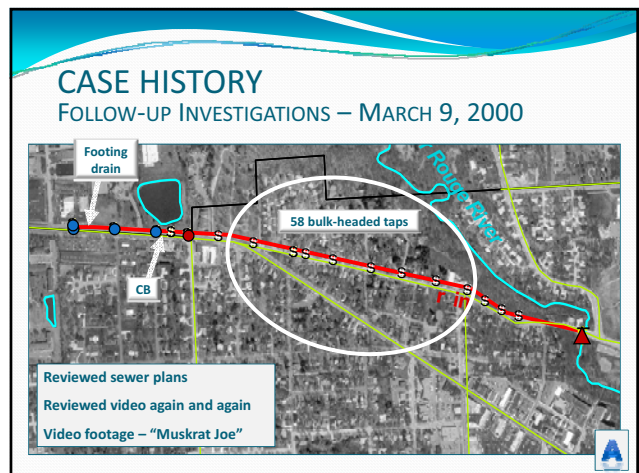
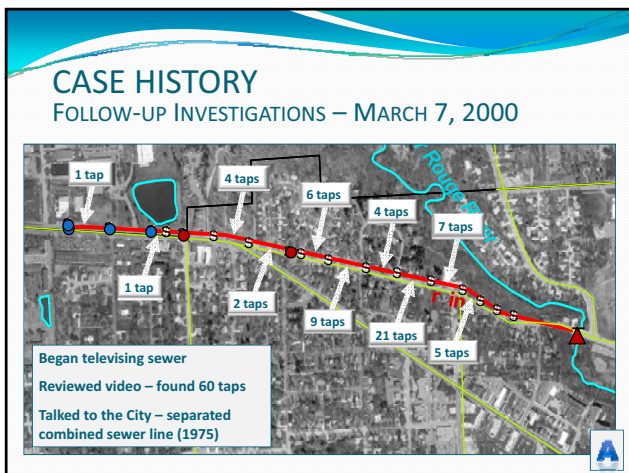
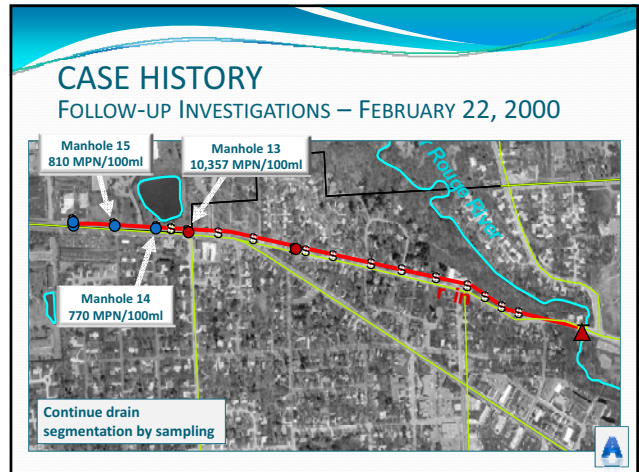
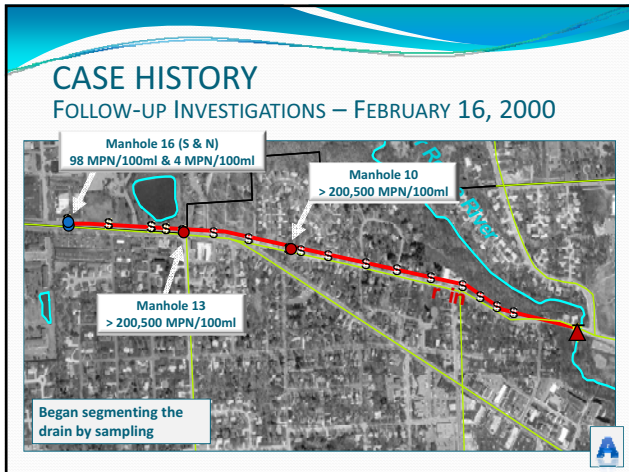
CASE HISTORY – ELIMINATING 15 YEARS OF DISCHARGE ALONG THE UPPER BRANCH



CASE HISTORY

INITIAL OUTFALL SURVEY – AUGUST 18, 1999





CASE HISTORY

FOLLOW-UP INVESTIGATIONS – APRIL 5, 2000

CB had sewage smell

Met with the City – “All taps were verified following sewer separation.” Sanitary for shopping centers and animal hospital known, restaurant not mentioned

Upland investigation

CASE HISTORY

FOLLOW-UP INVESTIGATIONS – APRIL 19, 2000

Dye tested restaurant and other area businesses – restaurant failed.

City gave property owner 15 days to correct the illegal tap.

CASE HISTORY

ELIMINATING THE DISCHARGE – MAY 7, 2000

Manhole 13
Verification Sample
96 MPN/100ml

Property owner disconnected the illegal connection

County verified the correction on May 26th

CASE HISTORY

WHAT DID WE LEARN?

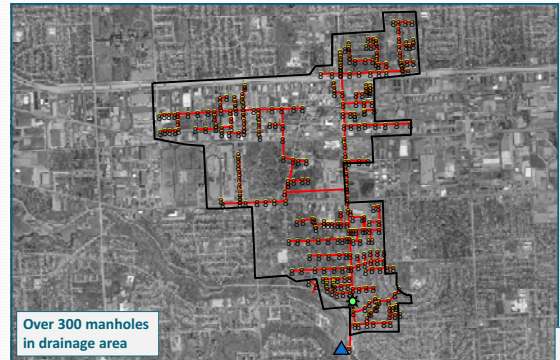
ELIMINATING 15 YEARS OF DISCHARGE TO THE UPPER ROUGE

- 3 months to find and correct
- When reviewing the video
 - Look at water quality, not just the taps
 - Sewer separation may not account for “funky” plumbing
- Talk to the local agencies
 - Ask questions
 - What is being said and more importantly what is not being said?

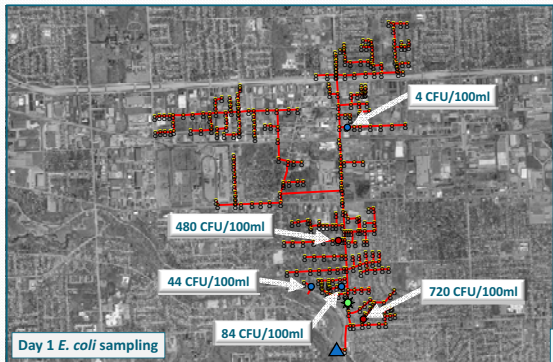
CASE HISTORY – RESTORING RECREATIONAL USE ALONG THE MIDDLE BRANCH



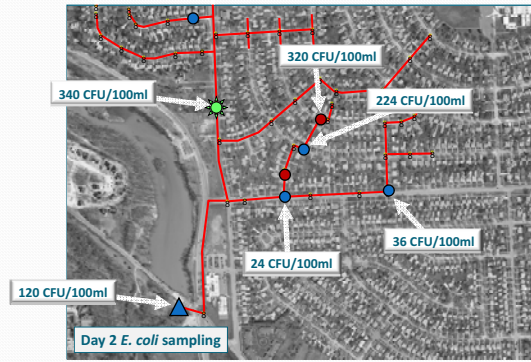
CASE HISTORY – PROBLEM AREA



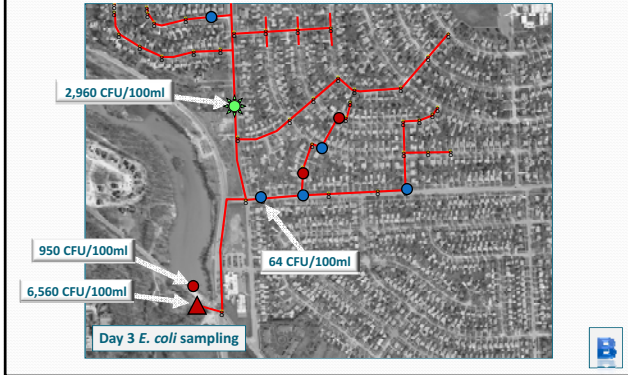
CASE HISTORY – MAY 20, 1997



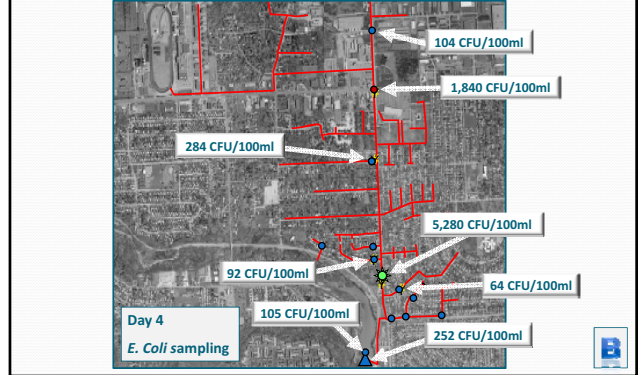
CASE HISTORY – MAY 21, 1997



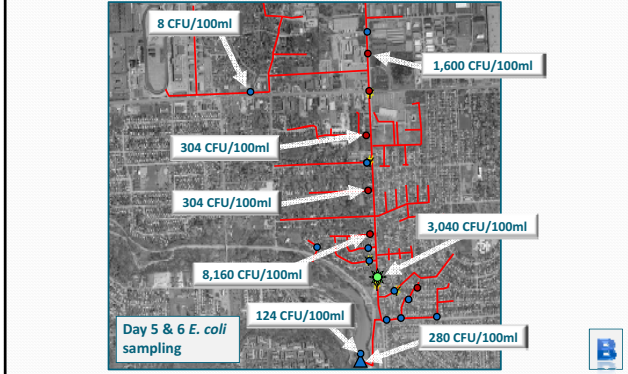
CASE HISTORY – MAY 23, 1997



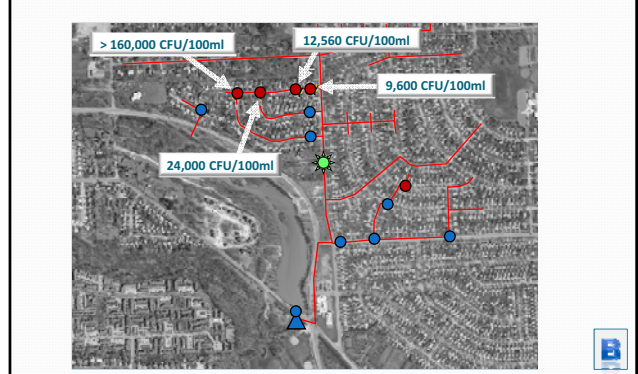
CASE HISTORY – MAY 28, 1997



CASE HISTORY – JUNE 6 & 11, 1997



CASE HISTORY – JUNE 13, 1997



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CASE HISTORY

INITIAL INVESTIGATIONS

- 1997 city planning
 - TV'ed sewer – no taps (completed)
 - Sent letters to residents (not completed)
 - Dye tested homes (not completed)
- 1997 County actions
 - Intermittent monitoring
 - Does problem still exist?
 - Evidence of problem disappeared
 - Continued monitoring



CASE HISTORY

ELIMINATING THE DISCHARGE

- Memorial Day 1998 – problem back!
 - Sent letters out
 - Dye testing
 - Educational material sent to homeowners
- Late 1998 – evidence problem disappeared
- 1999 - Clean
- 2000 - Clean



CASE HISTORY

WHERE DID IT COME FROM?

- Probable cause
 - Recreational vehicle/boat dumping sanitary waste
 - Pet waste



CASE HISTORY

WHAT DID WE LEARN?

RESTORING RECREATIONAL USE ALONG THE MIDDLE BRANCH

- Persistence pays
- Observable presence in the area had an affect
- Public education worked

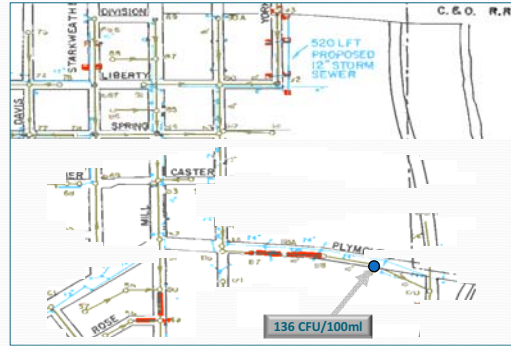


CASE HISTORY – FOLLOW YOUR NOSE

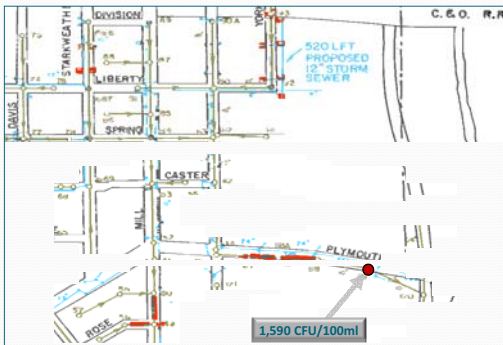
- Foul odor in wood lot near residential property
- Sewage like odor coming from manhole in the street



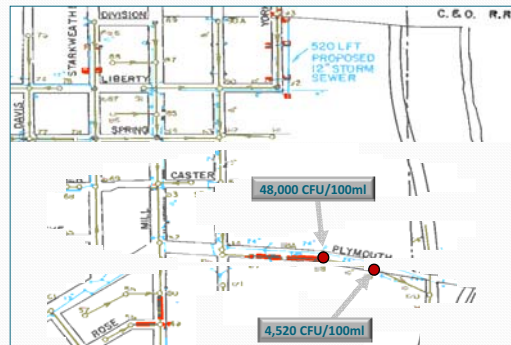
CASE HISTORY – JULY 1997

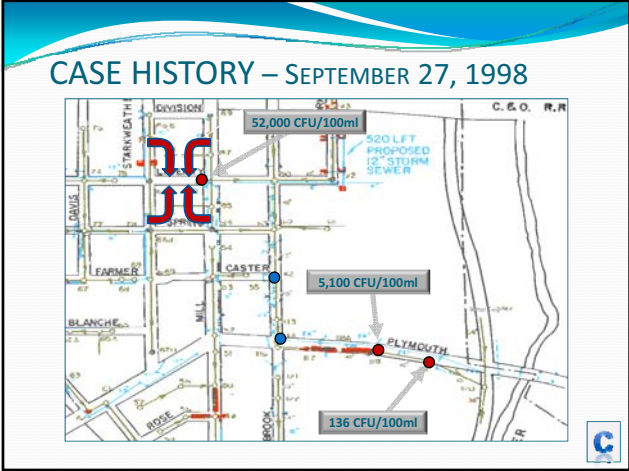
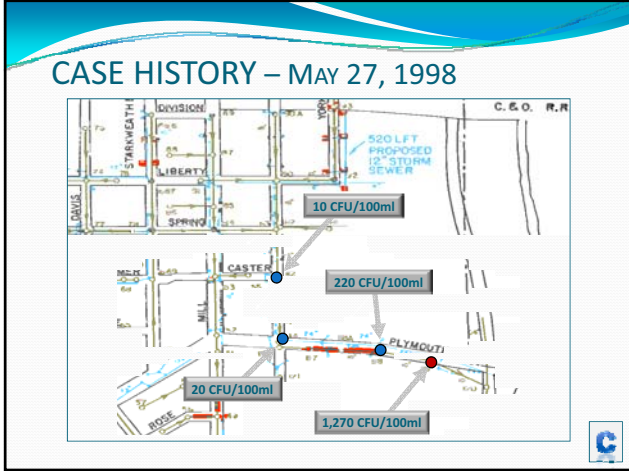


CASE HISTORY – NOVEMBER 1997



CASE HISTORY – MAY 15, 1998





CASE HISTORY

WHAT DID WE LEARN?

FOLLOW YOUR NOSE

- There is usually a basis for a persistent complaint
- Timing is everything
- Sometimes you just get lucky

CASE HISTORY

JUST WHEN YOU THOUGHT IT WAS SAFE

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CASE HISTORY – JUNE 2, 2005

- Strong sewage odor reported from the same manhole in the street
- Investigation leads to the same outfall
 - A plugged sanitary sewer line upstream is found
 - Line unplugged, jetted and the sewage flow stops in the storm sewer
 - How did it get into the storm sewer???



D

CASE HISTORY

ISOLATING THE SOURCE

- A cracked sanitary sewer crossing through the storm sewer is the culprit...
- The sanitary sewer line blockage caused sewage to back up and overflow into the storm sewer



D

CASE HISTORY

ELIMINATING THE DISCHARGE

- Now is it really safe?!?!



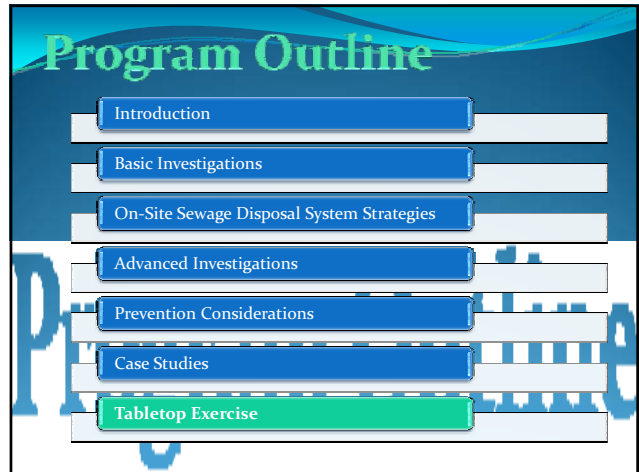
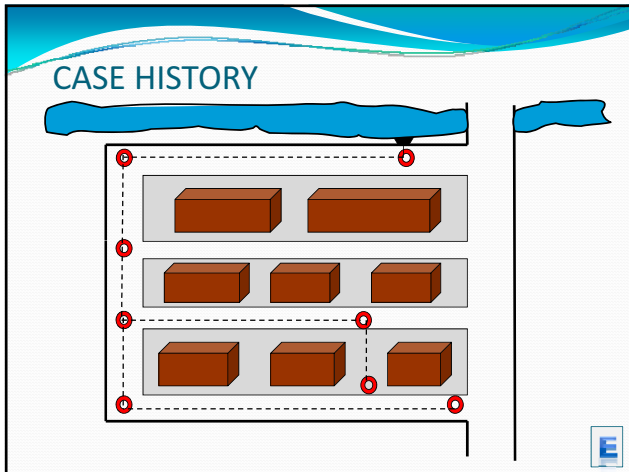
D

CASE HISTORY –

ONE THING LEADS TO ANOTHER

283

E



GROUP PROBLEM SOLVING SESSION

- Divide the class into groups
- Each group must select a leader
- Leaders will present problem methodology and solution to the class
- Rules
 - Each group will have limited resources
 - Each group will have 1 hour to solve the problem
 - Facilitators will be available to answer questions

GROUP PROBLEM SOLVING SESSION

PROBLEM

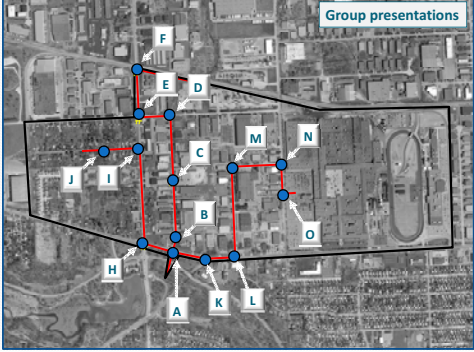
- Milky white discharge
- Happens frequently; not every day
- Sewage-like odor
- Black grease and oil observed
- Suds noticed on riffles 3 feet downstream of outfall
- No suds present upstream of outfall
- On way to site, drove through commercial strips and medium/light industrial area
- Investigation begins in late summer

GROUP PROBLEM SOLVING SESSION

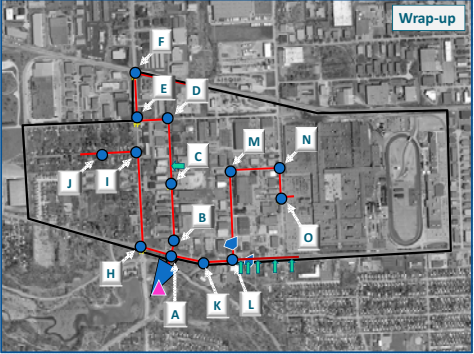
OBJECTIVE

FIND THE SOURCE(S) OF THE ILLICIT DISCHARGE(S)

GROUP PROBLEM SOLVING SESSION



GROUP PROBLEM SOLVING SESSION



GROUP PROBLEM SOLVING

WHAT WE FOUND - BUILDING #20



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USEFUL WEBSITES

- www.wcdoe.org
- www.rougeriver.com
- www.epa.gov
- www.michigan.gov/dnre
- On-site Sewage Disposal Ordinances online:
 - www.macombcountymi.gov/publichealth
 - www.wcdoe.org/watershed/regulations
 - www.ewashtenaw.org/government/departments/environmental_health/wells_septic



It takes a partnership for effective pollution prevention



This training session was developed as part of the Rouge River National Wet Weather Demonstration Project, which is funded, in part, by the United States Environmental Protection Agency grant #XP995743-01 - 09 and #C995743-01