Town of Vernon
Connecticut

Stormwater Management Plan

2011 Annual Report

March 26, 2012

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Executive Summary

This document presents 2011 Annual Report required by the Stormwater Management Plan (SWMP) for the Town of Vernon. The SWMP was developed to meet the requirements of the Connecticut Department of Environmental Protection's (CT DEP) General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s). The DEP developed this general permit for the State of Connecticut to comply with the United States Environmental Protection Agency's (EPA) National Pollution Discharge Elimination System's (NPDES) Phase II regulations.

Receiving Waters

The following is a list of the identified receiving water bodies within the Town of Vernon to which identified outfalls discharge.

Shenipsit Lake	Paper Mill Pond	Hockanum River	Ogden Brook
Eckert's Pond	Tankerhoosen River	Talcottville Pond	Dobsonville Pond
Tankerhoosen Lake	Valley Falls Pond	Railroad Brook	Walkers Reservoir West
Gages Brook	Risley Reservoir	Clark's Brook	Walkers Reservoir East
Upper Bolton Lake	Middle Bolton Lake	Lower Bolton Lake	

Stormwater Management Plan

The central focus of the DEP General Permit for the Discharge of Stormwater from MS4s is the Stormwater Management Plan (SWMP). In order for the town to meet the regulations, it has developed an SWMP. Each permittee designs its own SWMP with the goal of reducing the discharge of pollutants from the MS4 to the maximum extent practicable to protect water quality.
To meet the "maximum extent practicable" standard, the Town must develop and implement Best Management Practices (BMPs) for the following six minimum control measures:

- **Public Education and Outreach**
- **Public Participation/Involvement**
- **Illicit Discharge Detection and Elimination**
- **Construction Site Stormwater Runoff Control**
- **Post-Construction Stormwater Runoff Control**
- **Good Housekeeping**

Control Measure 1: Public Education & Outreach

The Town will "implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff". Educating the public about the importance of stormwater management can help lead to greater support for and compliance with the Stormwater Management Plan.

1-1 Develop Educational Brochure for public mailing – The Town has developed a brochure that explains nonpoint source pollution, the municipal stormwater management system, and solutions to the pollution (See the attached). Other potential future topics include a description of the hydrologic cycle, the impacts of increased development, pollutants from developed areas (including lawns) and the impacts to local water bodies from stormwater pollution. The Town will review the content. The brochure will be included in the local publication "Rockville Reminder", made available in the library, town hall, and other public places and be posted on the Town website.

Responsible Department: Engineering
Measurable Goal: Brochure will be distributed / published annually.
Status to Date: Brochure has been created (see attached) and is being distributed.

1-2 Create a stormwater information hotline – Information related to stormwater management will be collected and posted on the Town of Vernon website. The town is in the process of collecting and categorizing the information.

Responsible Department: Engineering
Measurable Goal: Information will always be available.
Status to Date: The town is in the process of collecting and categorizing the information.

1-3 Provide semi-annual educational programs for the Planning & Zoning and Inland Wetland Commissions – Both commissions are encouraged to attend seminars regarding stormwater runoff.

Responsible Department: Engineering
Measurable Goal: Both commissions are encouraged to attend seminars regarding stormwater runoff.
Status to Date: Information is being presented to the members of the Planning & Zoning and Inland Wetland Commission about upcoming seminars as they are offered.

1-4 Train volunteer educators – We are now soliciting volunteers from the school system. Once volunteers are identified, they shall receive training once a year. Each year the training shall be in a different aspect of stormwater management.

Responsible Department: Engineering
Measurable Goal: Information will always be available.
Status to Date: The town is in the process of looking for volunteers and collecting and categorizing the information.

1-5 Develop public school curricula – The volunteer educators are in the process of developing lesson plans for grades K-5, 6-8, and 9-12. The Town of Vernon has obtained a working model that shows what happens during a rain event. It shows the rain cycle and how stormwater effects erosion and how drainage systems work. We are planning to set up this model at a different local school each year.

Responsible Department: Engineering / Public Works
Measurable Goal: Set up the model on a regular basis and explain how it works.
Status to Date: The town set up the model and explained the effects of stormwater to students at Skinner Road Grammar School in the past. We were not been able to schedule a time or place in 2011.

1-6 Develop Town Stormwater Website – We are now collecting information as well as many links to stormwater related websites, including the Connecticut Departments of Transportation and Environmental Protection, which contain information on stormwater management. Discussion will be included of stormwater management issues. Website updates will be performed annually and this plan will be posted on the web, as well as the annual reports to the DEP.

Responsible Department: Engineering
Measurable Goal: Create Stormwater page for the Town website.
Status to Date: The town has collected much information and links to related websites. We are compiling the information and are planning to be ready to put it online during 2012.

1-7 Develop and mail educational brochure for restaurants - The Town has developed a brochure that explains nonpoint source pollution related to restaurants, and solutions to the pollution.

Responsible Department: Engineering
Measurable Goal: Brochure will be distributed and/or published annually.
Status to Date: Brochure has been created (see attached) and is in the process of being distributed.

1-8 Develop and mail educational brochure for automotive uses – The Town has developed a brochure that explains nonpoint source pollution related to the automotive industry, and solutions to the pollution.

Responsible Department: Engineering
Measurable Goal: Brochure will be distributed and/or published annually.
Status to Date: Brochure has been created (see attached) and is in the process of being distributed.

Control Measure 2: Public Participation & Involvement

To satisfy the requirements of this measure, the Town has developed a plan for a public participation and involvement program that includes the public in learning about proper stormwater management.

2-1 Develop public involvement/participation program – Over 80 businesses now participate in the Hockanum River Business Partner Program, which encourages local business owners to adopt some simple housekeeping practices designed to reduce pollutants from entering the Hockanum River.

Responsible Department: Engineering
Measurable Goal: Encourage businesses to participate in the program.
Status to Date: Over 80 businesses now participate in the program.

2-2 Comply with state and local public notice and FOI requirements – Once completed, the town will make available for public review and comment a draft copy of the Stormwater Management Plan for a minimum period of thirty (30) days. Draft copies will be available at the Town Hall and through the Town website.

Responsible Department: Engineering
Measurable Goal: Create and make available the Stormwater Management Plan.
Status to Date: Plan is being drafted and should be complete in 2012.

2-3 Create citizen stormwater public participation panel – The Town of Vernon is in the process of soliciting volunteers for this panel. We have had little response, but will publicize more during the next year.

Responsible Department: Engineering
Measurable Goal: Create a panel to meet on a regular basis to discuss relevant topics.
Status to Date: Soliciting volunteers.

2-4 Train volunteers to locate outfalls/illicit discharges - The Town of Vernon is in the process of soliciting volunteers for this panel. We have had little response, but will publicize more during the next year.

Responsible Department: Engineering
Measurable Goal: Create a panel to meet on a regular basis to discuss relevant topics.
Status to Date: Soliciting volunteers.

2-5 Develop drain stenciling program and train volunteers – Local Boy Scouts, members of the Conservation Commission and/or Town employees have been applying decals to catch basins each year. Brochures (see attached) were also given to residents of the streets where the stenciling occurred.

Responsible Department: Public Works
Measurable Goal: The goal is 100 per year.
Status to Date: This year, a member of the Public Works Department and volunteers have stenciled catch basins and distributed brochures.

2-6 Develop clean-up program and train volunteers – For the past few years, a local man has volunteered, not only to help clear and maintain many trails in town but also to coordinate a Hockanum River clean-up on an annual basis.

Responsible Department: Engineering
Measurable Goal: Annual clean-up program.
Status to Date: The clean up program has been in place for the last few years.

2-7 Develop and train neighborhood watch groups - The Town of Vernon is in the process of soliciting volunteers for these groups. We have had little response, but will publicize more during the next year.

Responsible Department: Engineering
Measurable Goal: Create and train groups to meet on a regular basis to discuss relevant topics.
Status to Date: Soliciting volunteers.

Control Measure 3: Illicit Discharge and Elimination

To satisfy the requirements of this control measure, the Town will map outfalls, create a program to detect and eliminate illicit discharges, and sample and test six outfalls to see if they meet the acceptable requirements.

3-1 Map outfalls greater than 15" in urbanized areas – The Town of Vernon has worked with the Tolland County Agricultural Center, who have located all the outfalls along the Hockanum River and plotted them on a map (see Appendix A).

Responsible Department: Engineering
Measurable Goal: Create and maintain a map of stormwater outfalls greater than 15"
Status to Date: All outfalls along the Hockanum River have been plotted on a town map.

3-2 Map outfalls greater than 15" town-wide - The Town of Vernon has worked with the Tolland County Agricultural Center, who have located all the outfalls along the Hockanum River and plotted them on a map (see Appendix A).

Responsible Department: Engineering
Measurable Goal: Create and maintain a map of stormwater outfalls greater than 15"
Status to Date: All outfalls along the Hockanum River have been plotted on a town map.

3-3 Map outfalls greater than 12"in urbanized areas - The Town of Vernon has worked with the Tolland County Agricultural Center, who have located all the outfalls along the Hockanum River and plotted them on a map (see Appendix A).

Responsible Department: Engineering
Measurable Goal: Create and maintain a map of stormwater outfalls greater than 12"
Status to Date: All outfalls along the Hockanum River have been plotted on a town map.

3-4 Develop program to detect and eliminate illicit discharges – The Town will develop a program to address the elimination of illicit discharges. This program may include follow up visits and action based on unacceptable stormwater testing and public complaints.

Responsible Department: Engineering
Measurable Goal: Develop a program to address the elimination of illicit discharges.
Status to Date: Currently developing the program.

3-5 Develop illicit discharge ordinance – The Illicit discharge ordinance is in the process of being prepared. The ordinance will be presented to the Town Council for their adoption into the Code of Ordinances.

Responsible Department: Engineering
Measurable Goal: Create an Illicit discharge ordinance.
Status to Date: Currently preparing the ordinance.

3-6 Develop town-wide stormwater system map – The Town of Vernon is using the recently purchased GPS unit to map stormwater outfalls. The results are being plotted onto a town-wide map. Once the outfalls are mapped, we will start mapping the drainage structures and systems.

Responsible Department: Engineering
Measurable Goal: Create and maintain a map of town-wide stormwater system.
Status to Date: Currently obtaining outfall information and plotting the results on a town map.

3-7 Develop program for recycling household hazardous wastes - The Town of Vernon has a program for recycling household hazardous waste. This program is part of the Capitol Region East Operation Committee and serves several area towns. Household hazardous waste was collected on seven separate dates in 2011; April 2, April 16, May 7, September 10, September 24 and October 1 and October 15.

Responsible Department: Public Works
Measurable Goal: Continue plan for recycling household hazardous wastes.
Status to Date: Seven separate dates were made available in 2011 for the public to recycle their household hazardous wastes (see attached flyer).

3-8 Provide water testing at six outfall locations annually – Water testing at the six outfall locations has been completed and test results are attached.

Responsible Department: Public Works
Measurable Goal: Sample and test six outfalls annually.
Status to Date: These samples were taken on 10/19/2011 and the results of the testing are attached.

Control Measure 4: Construction Site Runoff Control

The Town will develop, implement and enforce a program, or modify an existing program to reduce pollutants in stormwater runoff from a construction site. To comply with this measure, the Town of Vernon only needs to continue enforcing the Planning and Zoning and Inland Wetlands Regulations.

4-1 Review land use regulations to meet requirements of MS4 permit and E&S Guidelines – The existing regulations are under review. As the Town develops a new stormwater regulations and ordinance, the existing regulations may be modified.

Responsible Department: Engineering
Measurable Goal: Review requirements and regulations.
Status to Date: Currently preparing the new stormwater regulations and ordinance.

4-2 Review and develop enforceable compliance regulations – The Town is in the process of preparing a stormwater management plan and an ordinance, which will enforce the plan.

Responsible Department: Engineering
Measurable Goal: Create stormwater management plan and an ordinance
Status to Date: Currently preparing the plan and ordinance.

4-3 Review and develop performance/maintenance bonding – The Town presently requires an erosion and sedimentation control bonding for all projects brought before the Planning and Zoning and the Inland Wetland Commissions.

Responsible Department: Engineering
Measurable Goal: Review and develop performance/maintenance bonding
Status to Date: Bonding procedure is currently in place.

4-4 Develop procedures for site inspections/enforcement – The Town of Vernon Wetlands Enforcement Officer, or his designee, inspects all construction sites a minimum of once a week. He inspects more often if necessary.

Responsible Department: Engineering
Measurable Goal: Inspect construction sites for compliance.
Status to Date: Wetlands Enforcement Officer inspects all construction a minimum of once a week.

4-5 Review and develop standards from State Stormwater Manual - The Town is in the process of preparing a stormwater management plan and an ordinance, which will enforce the plan.

Responsible Department: Engineering
Measurable Goal: Create stormwater management plan and an ordinance
Status to Date: Currently preparing the plan and ordinance.

Control Measure 5: Post Construction Runoff Control

The Town will develop, implement and enforce a program to address stormwater runoff from new development projects that discharge into the municipal stormwater system or directly into waters of the State. To comply with this measure, the Town of Vernon only needs to continue enforcing the Planning and Zoning and Inland Wetlands Regulations.

5-1 Review land use regulations to meet requirements of MS4 permit and E&S Guidelines – The Town of Vernon will review the planning and zoning, and Inland Wetland regulations and ensure they meet the 2004 CT DEP Storm Water Quality Manual Guidelines.

Responsible Department: Engineering
Measurable Goal: Review Land use regulations
Status to Date: Regulations are currently under review.

5-2 Develop post-construction ordinance or regulation - The Town is in the process of preparing a stormwater management regulations and an ordinance, which will enforce the plan. Post-construction will be addressed in a section of these regulations.

Responsible Department: Engineering
Measurable Goal: Create stormwater management regulations and an ordinance
Status to Date: Currently preparing the regulations and ordinance.

5-3 Develop and implement post-construction BMP strategy – The Town is in the process of preparing a stormwater management regulations and an ordinance, which will enforce the plan. Post-construction will be addressed in a section of these regulations.

Responsible Department: Engineering
Measurable Goal: Create stormwater management regulations and an ordinance
Status to Date: Currently preparing the regulations and ordinance.

5-4 Develop a program to ensure long-term operation and maintenance of BMPs - The Town is in the process of preparing a stormwater management regulations and an ordinance, which will enforce the plan. Post-construction will be addressed in a section of these regulations.

Responsible Department: Engineering
Measurable Goal: Create stormwater management regulations and an ordinance
Status to Date: Currently preparing the regulations and ordinance.

5-5 Develop a program to encourage decrease impervious surfaces – Part of the new stormwater regulations will be a fee schedule that will reduce the cost of a permit if certain methods of reducing impervious surfaces are implemented.

Responsible Department: Engineering
Measurable Goal: Create a program to encourage decrease of impervious surfaces.
Status to Date: Currently preparing the regulations and ordinance.

5-6 Develop a program to encourage infiltration practices – During the review process for planning and inland wetland applications, The Town staff currently looks to see if infiltration is a good alternative for stormwater management.

Responsible Department: Engineering
Measurable Goal: Develop a program to encourage infiltration practices.
Status to Date: Currently being done during review process for new applications.

5-7 Develop a program to encourage riparian buffering – Riparian buffers will be the focus on future brochures to be distributed to the public. The Town is compiling information to use for that brochure.

Responsible Department: Engineering
Measurable Goal: Develop a program to encourage riparian buffering.
Status to Date: The Town is currently collecting and compiling the information.

Control Measure 6: Good Housekeeping

6-1 Develop a training program for municipal employees – A training program for municipal employees is implemented and being updated with continued training.

Responsible Department: Public Works
Measurable Goal: Develop a training program for municipal employees.
Status to Date: The Town is currently following a training program.

6-2 Sweep streets at least once a year as soon as possible after snowmelt – All roads were swept between April 6 and June 27, 2011. A total of 450 cubic yards of material was removed from the roadways.

Responsible Department: Public Works
Measurable Goal: Sweep all roads at least once a year
Status to Date: The Town completed sweeping all roads by June 27, 2011.

6-3 Evaluate urbanized areas for possible sweeping more than once a year – The Rockville section of Vernon is continually being evaluated and swept as necessary.

Responsible Department: Public Works
Measurable Goal: Sweep roads in urbanized areas more than once if needed.
Status to Date: The Rockville area was swept several times as needed.

6-4 Develop a program to evaluate and clean stormwater structures at least once a year – Public Works Department currently has a program of cleaning and evaluating catch basins. This year, 317 catch basins were cleaned and evaluated. A total of 107 tons of sediment were removed from these catch basins.

Responsible Department: Public Works
Measurable Goal: Clean and evaluate stormwater structures.
Status to Date: 317 basins were cleaned removing 107 tons of sediment.

6-5 Develop a program to evaluate and prioritize system for upgrade and/or repair – The Town of Vernon is now in the process of reconstructing several roads. This reconstruction includes new drainage systems.

Responsible Department: Public Works
Measurable Goal: Develop a program to upgrade the stormwater system.
Status to Date: New road construction resulted in new drainage systems for those roads.

Monitoring

S-1 Sample six outfalls once a year – The six outfalls have been tested. See the attached results.

Responsible Department: Public Works
Measurable Goal: Sample six outfalls annually.
Status to Date: All samples were taken on 10/19/2011.

TOWN OF VERNON

375 HARTFORD TURNPIKE, VERNON, CT 06066-4864
Tel: (860) 870-3500
Fax: (860) 870-3505

DEPARTMENT OF PUBLIC WORKS

TO: David Gooch, Civil Engineer, Town of Vernon Engineering

FROM: Jeff Schambach, Road Foreman

DATE: March 23, 2012

SUBJECT: STORM WATER II 2011 ANNUAL REPORT

This is the information that Public Works is responsible for implementing or annually attending to according to the Best Management Practice List and required on the 2011 Annual Report.

We are still marking catch basins under BMP ID 2-5. This is being done either by our own employees as time and manpower permits or with the help of volunteers. In addition brochures are distributed to the residents of the corresponding streets.

The Town of Vernon has a program for recycling household hazardous waste. This program is part of the Capitol Region East Operation Committee and serves several area towns. Household hazardous waste was collected on seven separate dates; April 2, April 16, May 7, September 10, September 24, October 15, and October 1- Outreach in Somers.

Water testing at the six outfall locations per BMP ID 3-8 was completed October 19, 2011. Funding and budget restraints continue to be an issue to comply with the requirements.

A training program for municipal employees per BMP ID 6-1 was previously implemented and is currently being reviewed and will be updated and training will be provided.

The yearly street sweeping program began April 6, 2011 and was completed July 27, 2011. A total of 450 cubic yards of road sediment was picked up. This is a reduction of 200 cubic yards from reporting year 2010. This reduction has been a continued effort to reduce the amount of sediment. The public works department is currently using different anti icing products and has eliminated the use of sand being used for winter operations except for emergency use or severe ice conditions. Per BMP 6-2.

The Rockville Downtown and surrounding areas are evaluated and swept several times a year per BMP ID 6-3.

The Town of Vernon Public Works Department has a current program to clean and evaluate stormwater structures per BMP ID 6-4. For the year 2011, approximately 317 catch basins were cleaned, removing approximately 107 tons of sediment. With the anti icing products being used during winter operations and no sand being used a reduction in sediment collection is being noticed. As part of the cleaning process each structure is evaluated and documented for its condition for repair or upgrade per BMP ID 6-5.

S-1 Water testing at the six outfall locations was completed once during 2011. Stormwater Monitoring Report Forms attached.

C: Terry McCarthy, Town Engineer
Robert Kleinhans, Director of Public Works

\jschambach\stormwaterII\dgoochannualrpt11

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: Vernon

Mailing Address: 375 Hartford Turnpike, CT 06066-4864

Contact Person: Robert J. Kleinhans Title: Director, Public Works Phone: (860) 870-3500

Permit Registration #GSM 000087

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample R-1 N41..83343°, W72.49098° (NAD 83)

Please circle the appropriate area description: Industrial, Commercial, or Residential

Receiving Water (name, basin): Hockanum River (A), Local Basin

Time of Start of Discharge: 0850

Date/Time Collected: 10/19/11 1000 Water Temperature: 57° F

Person Collecting Sample: Jeff Schambach

Storm Magnitude (inches): 1.17" Storm Duration (hours): ~ 2 hours

Date of Previous Storm Event: 10/14/11

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	Hanna Checker	6.41 Units	FIELD
Rain pH	Hanna Checker	5.70 Units	FIELD
Hardness	2340B	20 mg/L	CET
Conductivity	EPA 120.1	96 µmhos/cm	CET
Oil & Grease	EPA 1664A	ND<5.0 mg/L	CET
COD	EPA 410.4	91 mg/L	CET
Turbidity	SM 2130B	12 NTU	CET
TSS	EPA 160.2	19 mg/L	CET
TP	EPA 365.2	0.13 mg/L	CET
Ammonia	EPA 350.3	ND<0.10 mg/L	CET
TKN	EPA 351.2	ND<1.0 mg/L	CET
NO_3+NO_2	EPA 300.0	0.43 mg/L	CET
E. coli	EPA 9221-D	>2419.6 COLONIES	CET

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: Robert J. Kleinhans

Signature: [signature] Date: 11/30/2011

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: Vernon

Mailing Address: 375 Hartford Turnpike, CT 06066-4864

Contact Person: Robert J. Kleinhans Title: Director, Public Works Phone: (860) 870-3500

Permit Registration #GSM 000087

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample R-2 N41.82045°, W72.46053° (NAD 83)

Please circle the appropriate area description: Industrial, Commercial, or Residential

Receiving Water (name, basin): Tankerhoosen River (A), Local Basin

Time of Start of Discharge: 0850

Date/Time Collected: 10/19/11 @ 1100 Water Temperature: 57° F

Person Collecting Sample: Jeff Schambach

Storm Magnitude (inches): 1.17" Storm Duration (hours): ~ 2 hours

Date of Previous Storm Event: 10/14/11

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	Hanna Checker	6.20 Units	FIELD
Rain pH	Hanna Checker	5.70 Units	FIELD
Hardness	2340B	13 mg/L	CET
Conductivity	EPA 120.1	82 µmhos/cm	CET
Oil & Grease	EPA 1664A	ND<5.0 mg/L	CET
COD	EPA 410.4	35 mg/L	CET
Turbidity	SM 2130B	9.0 NTU	CET
TSS	EPA 160.2	14 mg/L	CET
TP	EPA 365.2	ND<0.10 mg/L	CET
Ammonia	EPA 350.3	ND<0.10 mg/L	CET
TKN	EPA 351.2	ND<1.0 mg/L	CET
NO_3+NO_2	EPA 300.0	0.65 mg/L	CET
E. coli	EPA 9221-D	478.6 COLONIES	CET

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: Robert J. Kleinhans

Signature: [signature] Date: 11/30/2011

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: Vernon

Mailing Address: 375 Hartford Turnpike, CT 06066-4864

Contact Person: Robert J. Kleinhans Title: Director, Public Works Phone: (860) 870-3500

Permit Registration #GSM 000087

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample I-1 N41.86593°, W72.46278° (NAD 83)

Please circle the appropriate area description: Industrial, Commercial, or Residential

Receiving Water (name, basin): Hockanum River (C/B), Local Basin

Time of Start of Discharge: 0850

Date/Time Collected: 10/19/11 @ 1030 Water Temperature: 57° F

Person Collecting Sample: Jeff Schambach

Storm Magnitude (inches): 1.17" Storm Duration (hours): ~ 2 hours

Date of Previous Storm Event: 10/14/11

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	Hanna Checker	6.71 Units	FIELD
Rain pH	Hanna Checker	5.70 Units	FIELD
Hardness	2340B	98 mg/L	CET
Conductivity	EPA 120.1	480 µmhos/cm	CET
Oil & Grease	EPA 1664A	ND<5.0 mg/L	CET
COD	EPA 410.4	59 mg/L	CET
Turbidity	SM 2130B	19 NTU	CET
TSS	EPA 160.2	24 mg/L	CET
TP	EPA 365.2	ND<0.10 mg/L	CET
Ammonia	EPA 350.3	ND<0.10 mg/L	CET
TKN	EPA 351.2	ND<1.0 mg/L	CET
NO_3+NO_2	EPA 300.0	2.5 mg/L	CET
E. coli	EPA 9221-D	2419.6 COLONIES	CET

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: Robert J. Kleinhans

Signature: [signature] Date: 11/30/2011

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: Vernon

Mailing Address: 375 Hartford Turnpike, CT 06066-4864

Contact Person: Robert J. Kleinhans Title: Director, Public Works Phone: (860) 870-3500

Permit Registration #GSM 000087

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample I-2 N41.83445°, W72.45312° (NAD 83)

Please circle the appropriate area description: Industrial, Commercial, or Residential

Receiving Water (name, basin): Tankerhoosen River (A), Local Basin

Time of Start of Discharge: 0850

Date/Time Collected: 10/19/11 @ 1048 Water Temperature: 56° F

Person Collecting Sample: Jeff Schambach

Storm Magnitude (inches): 1.17" Storm Duration (hours): ~ 2 hours

Date of Previous Storm Event: 10/14/11

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	Hanna Checker	6.77 Units	FIELD
Rain pH	Hanna Checker	5.70 Units	FIELD
Hardness	2340B	5.6 mg/L	CET
Conductivity	EPA 120.1	21 µmhos/cm	CET
Oil & Grease	EPA 1664A	ND<5.0 mg/L	CET
COD	EPA 410.4	30 mg/L	CET
Turbidity	SM 2130B	3.9 NTU	CET
TSS	EPA 160.2	ND<5.0 mg/L	CET
TP	EPA 365.2	ND<0.10 mg/L	CET
Ammonia	EPA 350.3	ND<0.10 mg/L	CET
TKN	EPA 351.2	ND<1.0 mg/L	CET
NO_3+NO_2	EPA 300.0	0.11 mg/L	CET
E. coli	EPA 9221-D	517.2 COLONIES	CET

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: Robert J. Kleinhans

Signature: _____ Date: 11/30/2011

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: Vernon

Mailing Address: 375 Hartford Turnpike, CT 06066-4864

Contact Person: Robert J. Kleinhans Title: Director, Public Works Phone: (860) 870-3500

Permit Registration #GSM 000087

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample C-1 N41.82893°, W72.49788° (NAD 83)

Please circle the appropriate area description: Industrial, Commercial, or Residential

Receiving Water (name, basin): Tankerhoosen River (A), Local Basin

Time of Start of Discharge: 0850

Date/Time Collected: 10/19/11 @ 0945 Water Temperature: 58° F

Person Collecting Sample: Jeff Schambach

Storm Magnitude (inches): 1.17" Storm Duration (hours): ~ 2 hours

Date of Previous Storm Event: 10/14/11

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	Hanna Checker	7.14 Units	FIELD
Rain pH	Hanna Checker	5.70 Units	FIELD
Hardness	2340B	28 mg/L	CET
Conductivity	EPA 120.1	140 µmhos/cm	CET
Oil & Grease	EPA 1664A	ND<5.0 mg/L	CET
COD	EPA 410.4	83 mg/L	CET
Turbidity	SM 2130B	29 NTU	CET
TSS	EPA 160.2	36 mg/L	CET
TP	EPA 365.2	ND<0.10 mg/L	CET
Ammonia	EPA 350.3	ND<0.10 mg/L	CET
TKN	EPA 351.2	1.2 mg/L	CET
NO_3+NO_2	EPA 300.0	0.47 mg/L	CET
E. coli	EPA 9221-D	547.5 COLONIES	CET

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: Robert J. Kleinhans

Signature: [signature] Date: 11/30/2011

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: Vernon

Mailing Address: 375 Hartford Turnpike, CT 06066-4864

Contact Person: Robert J. Kleinhans Title: Director, Public Works Phone: (860) 870-3500

Permit Registration #GSM 000087

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample C-2 N41.8664°, W72.4744° (NAD 83)

Please circle the appropriate area description: Industrial, Commercial, or Residential

Receiving Water (name, basin): Hockanum River (C/B), Local Basin

Time of Start of Discharge: 0850

Date/Time Collected: 10/19/11 @ 1020 Water Temperature: 54° F

Person Collecting Sample: Jeff Schambach

Storm Magnitude (inches): 1.17" Storm Duration (hours): ~ 2 hours

Date of Previous Storm Event: 10/14/11

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	Hanna Checker	6.41 Units	FIELD
Rain pH	Hanna Checker	5.70 Units	FIELD
Hardness	2340B	47 mg/L	CET
Conductivity	EPA 120.1	200 µmhos/cm	CET
Oil & Grease	EPA 1664A	ND<5.0 mg/L	CET
COD	EPA 410.4	43 mg/L	CET
Turbidity	SM 2130B	12 NTU	CET
TSS	EPA 160.2	20 mg/L	CET
TP	EPA 365.2	ND<0.10 mg/L	CET
Ammonia	EPA 350.3	ND<0.10 mg/L	CET
TKN	EPA 351.2	ND<1.0 mg/L	CET
NO_3+NO_2	EPA 300.0	1.1 mg/L	CET
E. coli	EPA 9221-D	272.3 COLONIES	CET

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: Robert J. Kleinhans

Signature: [signature] Date: 11/30/2011

APPENDIX A

HOCKANUM RIVER OUTLETS REPORT

Summary Report
NCCD NPS Management Project 08-04b
Task 1.c Conceptual Stormwater Retrofit Design Narrative

As outlined in the Scope of Work in the North Central Conservation District NPS Management contract 08-04b, outfalls in the town of Vernon were evaluated and prioritized for repair, retrofit or upgrade in accordance with the MS4 General Permit's Minimum Control Measure Item 6, which requires development and implementation of a program to evaluate conveyances, structures, and outfalls for repair and retrofit. Discharges were categorized into low, moderate, and high priority based on several factors including: the expected pollutant load, the condition of the infrastructure, sedimentation and/or erosion, fish passage, the relative value of the receiving wetland or waterbody as a resource, and the extent of its degradation. In total, district staff identified six moderate priority discharges and five high priority discharges.

A number of the outfalls, especially those in the vicinity of Tri-City Plaza, receive drainage from both private and public drainage systems. In some cases, more extensive mapping of the collection area is required to determine the precise location of all contributing catch basins. In addition, four of the high priority discharges are not shown on the stormwater system maps provided by the Vernon Engineering Department. The outfalls were identified by staff during trackdown surveys along the main stem of the river and are located on private property. Collaboration with business owners will be necessary to pursue retrofitting projects.

For two of the high priority discharges (VR041, and VR051), the District recommends additional characterization of the pollutant load with water quality testing. There are several reasons for this, including: the size of the outlet pipe and high level of imperviousness of the associated drainage basin make it likely that the discharge carries a significant pollutant load, the surrounding landscape may allow for advanced treatment methods (treatment wetlands, ponds etc.) to be used, the cost of advanced treatment methods requires that the benefits of such a system are warranted based on the extent of pollution.

Moderate Priority

Outfalls rated as a moderate priority had one or two issues with erosion, sedimentation, trash, or failing infrastructure. These outfalls were clustered around one of two areas: Paper Mill Pond and an area along the main stem of the Hockanum River in Rockville, adjacent to River Street. Individual outfalls may not have exhibited conditions to warrant a retrofit, however the combined impact of several discharges to the receiving water warranted the moderate priority rating.

Paper Mill Pond

Paper Mill Pond is a body of water west of Shenipsit Lake, the headwaters of the Hockanum River. The pond is just over 9 acres and has eight stormwater discharges that

empty into it. Three of these discharges, VR002, VR004, and VR005, were identified as moderate priorities due to sedimentation. All three outfalls discharge a significant amount of road sediment, creating large deltas that extend 10 to 15 feet into the pond. In addition, VR004 and 005 have infrastructure issues: the pipe at VR004 is degraded and buried, and VR005 is submerged below the level of the pond and stormwater is unable to discharge properly. VR001, one of the high priority outfalls, also discharges into Paper Mill Pond and also has a large sediment delta.

Collectively, all of the discharges into Paper Mill Pond represent a significant sediment load. The accumulated sediment degrades the habitat value of the pond, and reduces recreational and aesthetic value. In addition, during large storm events, the sediment deposits may be re-suspended and transported downstream. Recommended remediation measures include sediment removal, outfall protection, and sediment control measures. In addition, in the Watershed Report, load reductions are provided for replacing the existing catch basins with deep sumps and installing a hydrodynamic separator.

River Street

River Street in Rockville has three outfalls within 300 feet of each other that are rated as moderate priorities for retrofit. Two of these, VR019 and VR021, are attached to catch basins that do not contain a sediment-trapping sump, so sand is allowed to run through the basin and directly into the river. This, in addition to River Street's location at the bottom of a large hill, contributes a large amount of runoff and road sediment to the Hockanum River. Erosion is also a problem at these two outfalls and VR017, an outfall 100 feet upstream. All three pipes discharge into the river several feet above its normal water level, causing bank erosion. The river bends as it flows underneath River Street, and this, in conjunction with a log obstruction, causes pooling and settling of a large amount of sediment. This sediment deposit may be re-suspended during large storm events and transported downstream.

The three outfalls are contributing a large amount of both road and bank sediment to this stretch of the Hockanum River. It is recommended that the two outdated outfalls, VR019 and VR021, be updated with modern catch basins with sediment sumps to intercept winter road sand being applied to River Street and the areas up the hill from the river. Additional water quality improvements may be obtained by installing a hydrodynamic separator. In the Watershed Report, load reductions are provided for replacing the existing catch basins with deep sumps and installing a hydrodynamic separator. Additional sediment contributions can be limited by lining the area where all three pipes discharge with rip rap to minimize bank erosion.

High Priority

VR001 – Cemetery Road

The outfall carries water from an intermittent stream through a culvert underneath Cemetery Road. Two catch basins in the road above the culvert take drainage and

discharge through a small (8") pipe, located above a 40"culvert. Both pipes discharge onto a concrete splash pad which is cracked and undercut from soil erosion. The discharge then falls 12-15 feet down an unconsolidated rock and rip rap drop into the eroded bed of the stream. Both the bed and the banks of the stream are severely eroded and have slopes 10-15 feet from the bed to the top-of-slope. The stream extends approximately 200 feet down a gradual slope where it empties into Paper Mill Pond. The bed of the stream is subject to active erosion and there is an observable sediment load within the stream. At the confluence with the pond, there is a sediment delta extending 30 feet into the pond. The delta is partially vegetated, indicating that it has been there for some time.

Due to the extent and nature of erosion, remediation would involve complete reconstruction of the outfall and outlet stream. This would require raising the elevation of the streambed and rip-rapping the entire length of stream. Rip rap may also be used to create a sediment forebay ten to twenty feet past the base of the outfall. However, in-stream erosion appears to be the main source of sedimentation.

VR035 – Countrywood at Vernon Apartments

The outfall takes drainage from several parking lots in the Countrywood at Vernon Apartments complex on Talcottville Road. The pipe (~20") is obscured by sediment. The ditch leading from the pipe to the river has become completely clogged with sediment, the material reaching a depth of up to 2 feet. Water from the pipe does not have enough velocity to scour the ditch. A large amount of the sediment has entered the Hockanum River channel from the ditch, degrading water quality.

Remediation would involve sediment removal and installation of sediment storage B.M.P.'s. Further investigation is necessary to determine where the sediment originates. If the source of the sediment is found to be from winter sand applications in the adjacent parking lots, a hydrodynamic separator may useful in minimizing the amount of sand discharged into the river. Another approach may be to modify the existing stream channel to include a sediment forebay which would trap some, if not all, of the sediment discharged from the pipe. The structure would require regular maintenance to remove trapped sediment. Load reductions are calculated for both measures in the Watershed Report.

This outfall has been deemed a high priority due to the significant pollution load and direct discharge into the river.

VR036 – Behind Staples in Tri-City Plaza

The outfall takes discharge from a large area of impermeable pavement in Vernon Center. Measuring 54", the concrete pipe discharges onto a concrete splash pad and then over an 8" drop and into a rip-rap lined plunge pool. It appears that the area surrounding the discharge was originally constructed as a basin to detain flow. However, there is no longer a berm at the downstream end of the basin, so flows pass without obstruction into

an outlet channel. The area just downstream of the pipe is moderately eroded. There is a large wetland further downstream of the outlet. Sediments and trash are widespread throughout the wetland.

The wetland is formed in part by a large berm (possibly a former road) that separates it from the river. The outlet stream flows through what appears to be an eroded breach in the berm.

Recommended remedial measures would include reconstruction of the plunge pool and rip-rap stabilization of the outlet channel. Since all sediment sources have not been identified, further investigation is required before other corrective action is recommended. Erosion of the outlet channel may account for observed sediments in the wetland, or there may be a significant load in the discharge. Additional discussion regarding recommendations for future action is found in the introduction.

This outfall has been deemed a high priority due to the observable sediment and floatables within the wetland downstream of the outfall, the expected pollutant load of the discharge, and infrastructure instability. It is presumed that this outfall is privately owned as it does not appear on the Vernon Engineering Department's stormwater maps.

VR041 – Behind Tri-City Plaza

The outfall takes discharge from the majority of Tri-City Plaza's parking lots. The pipe is approximately 36" and, upon inspection, was discharging water with no recent rainfall. There is a damaged trash rack over the end of the pipe. Water flows into a shallow plunge pool with large sediment deposits directly opposite the discharge. The banks of the pool are covered with iron bacteria. Standing water in the pool has a bluish-green hue. Algae and/or bacteria cover the rock in pool, indicating nutrient enrichment. . In addition, an oil-like sheen was observed on the surface of the pool, most highly concentrated toward the banks. The pool discharges into a small outlet stream which flows 30 feet before emptying into the Hockanum River.

This outfall has been deemed a high priority due to water quality concerns and degradation of the Hockanum River. It is presumed that this outfall and the piping associated with it are privately owned as it does not appear on the Vernon Engineering Department's stormwater maps. The District recommends additional water quality sampling in order to determine possible future remedial action. The discharge is adjacent to a large (probably man-made) wetland that may be suitable for water quality treatment. Due to the extent of alterations that this would require, the District recommends further investigation.

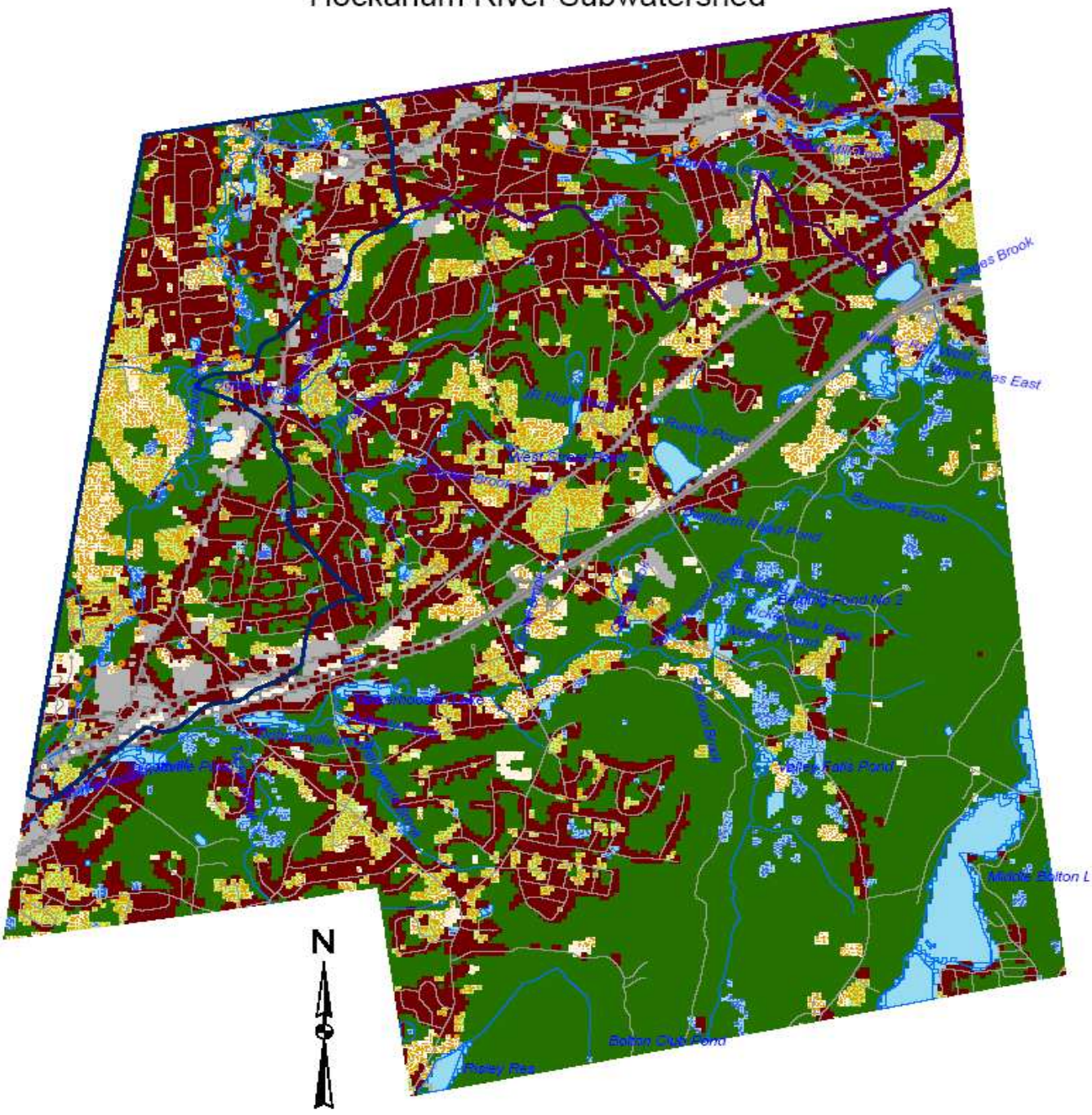
VR052 – Commercial Lot, Talcottville Rd.

The outfall is located in the northwest corner of an oversized parking lot. The lot slopes down to the outfall area, transporting large amounts of runoff during storm events. Bordering the northwest side of the lot is a steep slope of twenty to thirty feet. Erosion of

the slope has caused a failure of the parking lot and catch basin. The parking lot pavement has cracked and the underlying fill is unstable. With the curb gone, runoff flows down the slope causing erosion and undercutting the pavement, resulting in further failure. The catch basin is no longer effective and the pipe to the discharge has become disconnected. The area is full of trash, brush, sediment and debris. The slope is actively eroding and will continue to degrade the parking lot with every major rainstorm. Runoff from the parking lot now flow uninterrupted down the slope of the parking, carrying large amounts of sediment. It then intercepts a small stream and enters the Hockanum.

Considering the severity of the failure and the active erosion, the District recommends a complete infrastructure reconstruction for the corner of the parking lot. This outfall has been rated as a high priority due to water quality concerns and active erosion on the parking lot slope. It is presumed that this outfall and the pipes associated with it are privately owned as they do not appear on the Vernon Engineering Department's stormwater maps.

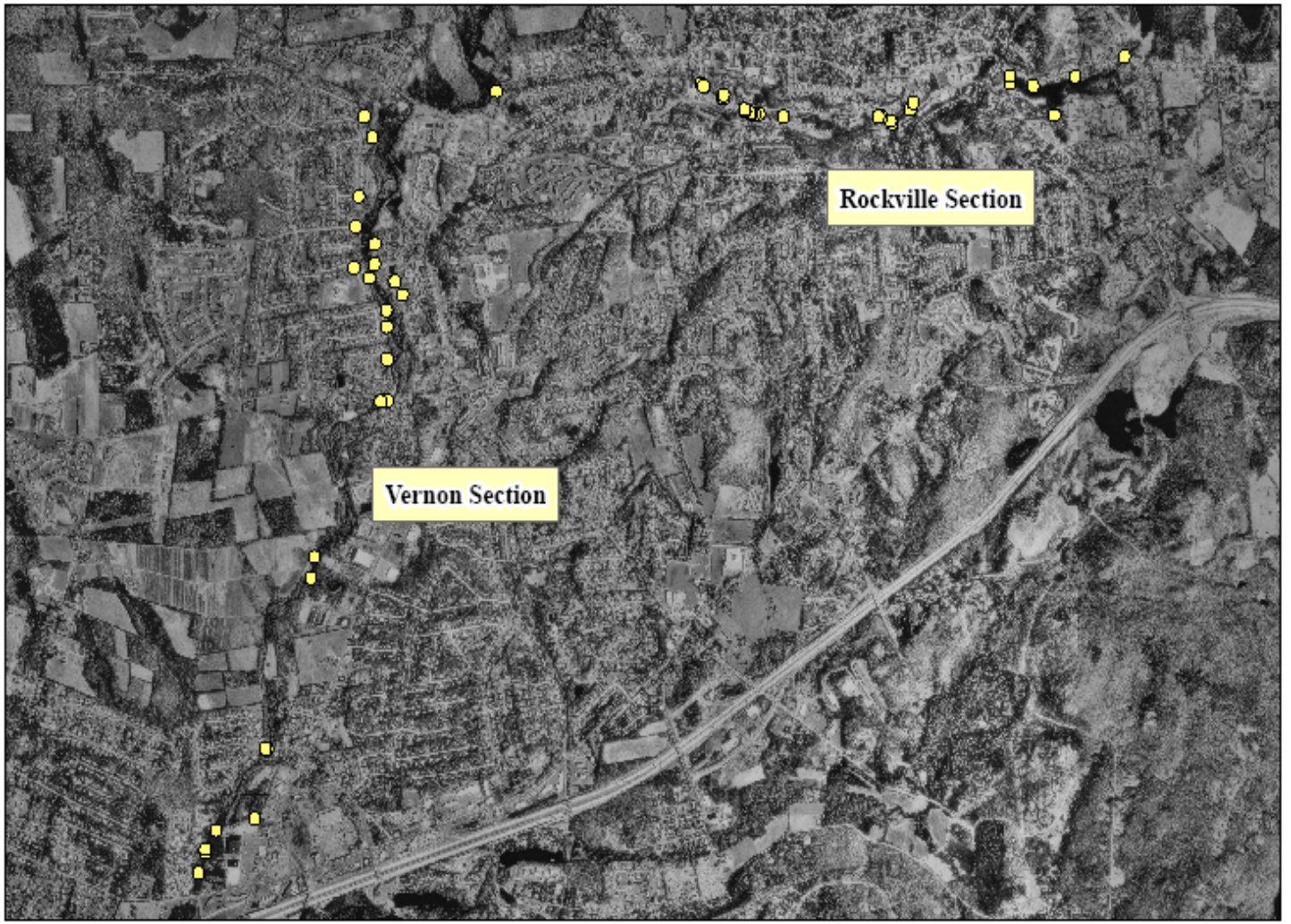
1990 Land Use / Land Cover in Vernon, Connecticut
Hockanum River Subwatershed



Legend

- Stormwater Outfall
- Lower Watershed Basin
- Upper Watershed Basin
- Waterbody
- Wetland
- Forest
- Grass - Turf/Hay/Pasture/Corn
- Soil - Bare/Corn/Grass/Hay
- Barren Land
- Watercourse
- Residential Development
- Road - Major
- Road - Minor
- Surface - Impervious/Roof

Vernon Hockanum River Stormwater Outfall Locations



1/4/2010 North Central Conservation District

OUTLET INFORMATION ALONG THE HOCKANUM RIVER

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR001	Cemetery Ave	41.8649	72.4388	8	PVC	Poor	Splash pad falling apart, large drop off (12'+)	Massive erosion from outfall and attached culvert. Large sediment delta extending well into the pond. Bank slopes of "stream" extremely steep and erodible.	No	Bank stabilization / infrastructure replacement	Moderate	High	High
VR002	Grove St.	41.8666	72.4421	22	PVC	Fair	PVC pipe for 8', then concrete. Outfall integrated into bridge structure. Rip rap functional	Large sediment delta extending into PMP. Presumed road sediment.	Yes	Sump or Hydrodynamic separator	Low	High	Moderate
VR003	Grove St.	41.8669	72.4421	~22	Conc.	Fair	Steep drop after outfall, protected by functional rip rap. Integrated into concrete retaining wall	Large sediment delta extending into PMP. Presumed road sediment. May take runoff from Amerbelle parking lot into two CB's down hill	Yes	Catch basin maintenance	Moderate	High	Low
VR004	East Main St.	41.8664	72.4404	Unknown	Conc.	Poor	Pipe deteriorating, rebar exposed. Blocked by vegetation.	Large sediment delta extending into PMP. Pipe blocked by tree and other vegetation.	Yes	Sump or Hydrodynamic separator	High	High	Moderate
VR005	East Main St.	41.8669	72.4373	~24	Conc.	Unknown	Pipe is submerged ~4" below water level. Only top half of pipe is open for flow. Iron leaching bacteria in outlet stream. Pipe discharging without recent rain.	Sediment delta extending into PMP, which is extremely shallow in this area (~2' deep)	Yes	Sump or Hydrodynamic separator	Moderate	High	Moderate

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR006	East Main St.	41.8679	72.4337	~15	Conc.	Excellent	Integrated into concrete retaining wall / culvert structure. Outlet has a built-in trash rack with chicken wire inlay. Both racks empty.	Small amount of sediment downstream. Entire area is fenced off and inaccessible.	Yes	N/A	Low	Low	Low
VR007	West Main St.	41.8652	72.4494	~20	Conc.	Fair	Pipe juts out of side of bank, 40' down and 5' above stream. Extender no longer attached and has been fitted with rudimentary cap, most likely purposely discontinued. Rip rap, natural or manmade, protecting outlet.	Runoff cascading down the hill as well as water from pipe may further erode soil from around mouth of pipe.	No	Construct headwall	Low	Low	Low
VR008	West Main St.	41.8656	72.4492	~10	Conc.	Excellent	Pipe protrudes from adjoining parking lot, where gutter pipe is submerged. Most likely roof runoff.	Pipe is precariously supported by retaining wall of culvert. Discharges water from 20' above stream level	Yes		Low	Low	Low
VR009	Brooklyn St.	41.8645	72.4508	~16	Conc.	Excellent	Flared pipe. Long rip-rap swale with built-in detention pool appx. 60 feet down slope.	Detention pool is full of sediment, requires removal and regular maintenance. Otherwise, structure working perfectly	No	Regular maintenance	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR010	Brooklyn St.	41.8646	72.4509	~36	Conc.	Excellent	Integrated into bridge structure. Flowing with no rain in 4-5 days. Discharges 15' directly into Hockanum	No outlet protection	No	Outlet protection	High	High	Low
VR011	West Main St.	41.8649	72.4517	~24	Corrugated Metal	Fair	Plastic pipe flare attached to corrugated pipe. Rip rap swale leading to Hockanum. Appears to be a completed retrofit.	No real problems; rip rap functional, sediment at mouth appears to be bed sediment.	No	N/A	High	High	Low
VR012	West Main St.	41.8649	72.4518		N/A			Tunnel: brick lined, appears to be discharging ground water. Requires revisit. See EXCEL sheet for more information.	No		High	High	Low
VR013	West Main St.	-	-	-	Conc.		Flared pipe end	Barbed wire prevents access. Seen from across river. Requires revisit. See EXCEL for more information	No		High	High	Low
VR014	West Main St.	41.8649	72.4588	16	Conc.	Fair	Flared pipe end, rip rap swale	Outfall is downstream from active construction. Only associated CB is in dirt parking lot surrounded by E&S hay bales. About 2" of sediment line the mouth of the pipe. Rip rap appears functional in catching sediment before Hock.	No	Sediment maintenance; will most likely solve itself after construction ceases	High	High	Low
VR015	West Main St.	41.8650	72.4605	20	Conc.	Fair	Stone headwall, flared end, rip rap swale	No outlet protection. Requires rip rap. Some sediment along swale and at river bank.	No	Outlet protection	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR016	River St.	41.8650	72.4609	12	Terra Cotta	Fair	Pipe made of clay. No other structures. Catch basins appear old and small (undersized?)	Scour pool occurring at discharge, sediment collecting. No outlet protection. Bank is lined with concrete blocks (old bank stabilization measure?)	No	Outlet protection : flared pipe fitting or a circle of rip rap to act as a detention pool.	High	High	Low
VR017	River St.	41.8650	72.4611	15	Conc.	Fair	Headwall, flared end (slightly cracked on left side.) Large 3' dropoff after flare, no outlet protection. Outfall discharges water from the right side of Morrison Street Hill	Needs outlet protection. Sediment visible around catch basin and at discharge point.	No	Outlet protection : energy dissipatin g steps or rip rap under 3' dropoff	High	High	Moderate
VR018	River St.	41.8651	72.4612	18	Terra Cotta	Fair	Clay pipe. No other structures. Catch basins old, small. Many CB's along left side of Morrison St. Hill.	Scour pool behind concrete blocks. Sedimentation probable, although not visibe because pipe discharges directly into stream.	No	Outlet protection : circle of rip rap to act as detention pool	High	High	Low
VR019	West Main St.	41.8659	72.4632	13	Plastic	Fair	Plastic pipe. No CB associated, just a pipe leading to outfall.	Some sedimentation and erosion. No catch basin means sediment discharges directly into stream.	No	Sump or Hydrodyn amic separator, Outlet protection	High	High	Moderate
VR020	Maple St.	41.8660	72.4631	~36	Brick	Poor	Brick structure, possibly a culvert. Most likely mill architechture. Double-barrelled. Falling apart near end. Connects to at least one CB.	Large amounts of sediment along inlet stream. Structure deteriorating.	Yes	Constructi on of detention pool in inlet stream	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR021	River St.	41.8652	72.4616	12	Terra Cotta	Poor	Pipe is cracked and broken. Built into retaining wall of bridge structure. Catch basin is old and undersized.	Large island of sediment directly underneath outfall, unclear whether sediment originates from pipe or stream blockage upstream.	Yes	Sump or Hydrodynamic separator, Outlet protection	Moderate	High	Moderate
VR022	West Main St.	41.8653	72.4616	12	Terra Cotta	Unknown	No catch basin, inlet contains pipe that discharges directly into stream. Outfall is obscured by vegetation.	Large amounts of sediment in front of inlet pipe to outfall.	No		High	High	Low
VR023	River St.	41.8665	72.4646	15	Conc.	Fair	Pipe is part of a bridge structure with retaining wall.		No		High	High	Low
VR024	West St.	41.8665	72.4647	16	Conc.	Fair	Concrete bridge-integrated pipe. 2' drop from pipe to stream level.	No outlet protection	No	N/A	Low	Low	Low
VR025	West St.	41.8666	72.4648	16	Conc.	Fair	Concrete bridge-integrated pipe.	No outlet protection	No	N/A	Low	Low	Low
VR026	Franklin St.	41.8662	72.4798	Unknown	Unknown	Unknown			No		High	High	Low
VR027	Dart Hill Rd.	41.8503	72.4879	22	Conc.	Fair	Concrete headwall / pipe combo.	No outlet protection. Sediment in pipe and delta at outlet. Bank eroded away, exposing tree roots. Needs rip rap.	Yes	Outlet protection necessary. New catch basin may be necessary, or sump may need cleaning and maintenance.	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR028	Dart Hill Rd.	41.8503	72.4884	~30	Corrugated Metal	Poor	Metal pipe degrading and may need replacement. Discharges directly into stream. Paved swale adjacent to OF	No outlet protection. Small amount of erosion.	Yes	Outlet protection necessary (rip rap)	High	High	Low
VR029	Naek Rd.	41.8412	72.4935	~24	Conc.	Fair	Standard concrete pipe in fair condition	Large amounts of sediment at discharge location. Small winding stream catches sediment, but some still reaches stream. Takes drainage from industrial park which is privately owned and sanded.	Yes	Catch basin maintenance, Hydrodynamic separator, line small stream with rip rap	Moderate	High	Low
VR030	Wolcott	41.8593	72.4902	43	Conc.	Fair	Concrete headwall-integrated pipe. Splash pad underneath outfall, but undersized and ineffective. Rip rap scattered	Large amounts of sediment and erosion of the banks of the discharge stream. Needs more outfall protection, discharges a large amount of water.	Yes	Hydrodynamic separator, line small stream with rip rap	High	High	Low
VR031	Neill / Barbara Rd.	41.8549	72.488	12	Conc.	Poor	Pipe has become disjointed, now in two segments.	Difficult to determine sedimentation and trash due as the discharge is in equilibrium with the Hockanum.	No	Pipe maintenance	High	High	Low
VR032	Countrywood at Vernon Apartments	41.8558	72.4867	36	Conc.	Fair	Flared end. Pipe drains into vegetated wetland area about 300-400 feet from the Hockanum.	Area of sediment at mouth of the outfall. Drains majority of adjacent apartment complex's southern parking lots. No major problems.	No	N/A	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR033	Countrywood at Vernon Apartments	41.8565	72.4873	~16	Conc.	Fair	Flared end. Pipe is slightly buried by sediment. Discharge once lined with rip rap which has now also become buried.	Outfall empties into small stream coming from dammed pond. Two swales (one intentional) emptying into pond.	No	Pipe excavation	High	High	Low
VR034	Countrywood at Vernon Apartments	41.8573	72.4888	20	Conc.	Fair	Flared end. Catch basin is covered with debris, impeding water flow.	Heavily sedimentated. Outfall opens to a delta of sediment.	Yes	Pipe excavation, rip rap detention area	High	High	Low
VR035	Countrywood at Vernon Apartments	41.8584	72.4888	~20	Conc.	Fair	Pipe itself in fair condition.	Outfall completely choked with sediment. 40' discharge stream to Hockanum is full of large amounts of road sediment. Water is unable to discharge from the pipe. Sediment 2.5' deep in some places.	Yes	Hydrodynamic Separator, grass-lined swale	High	High	High
VR036	Tri-City Plaza	41.8288	72.4977	54	Conc.	Fair	Pipe is in fair condition. Rip rap detention structure needs to be rebuilt.	Banks of large plunge pool undergoing severe erosion. Sedimentation minimal. Banks appear to be a built-up berm, but are being eroded away.	Yes	Characterize pollutant load, bank stabilization	High	High	High
VR037	Hockanum Boulevard	41.8423	72.4932	25	Conc.	Fair	Flared concrete pipe with 25'+ grass swale leading to Hockanum.	Outfall appears new and to be functioning properly.	No	N/A	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR038	Vernon Village	41.8261	72.5018	15	Conc.	Fair	Outfall is protected by cinderblocks that appear to be maintaining stability of the bank and catching trash / sediment. Bank is lined with concrete slabs.	Outfall is not in good condition but appears to be functioning well. Difficult to determine amount of sediment and trash discharge as it discharges directly into the stream.	No	Pipe maintenance / outfall protection	High	High	Low
VR039	Vernon Village	41.8271	72.5013	~ 5	PVC	Fair	Small pipe protruding from bank. Elevated about three feet above the stream.	Unable to find a concrete pipe where Vernon's Engineering Department indicated there would be one. Assuming this is the pipe, it appears vastly undersized.	No	New pipe installation	High	High	Low
VR040	Vernon Village	41.8272	72.5014	~ 5	PVC	Fair	Small pipe protruding from bank. Elevated about three feet above the stream.	Unable to find a concrete pipe where Vernon's Engineering Department indicated there would be one. Assuming this is the pipe, it appears vastly undersized.	No	New pipe installation	High	High	Low
VR041	Behind Tri-City Plaza	41.8282	72.5005	~36	Conc.	Fair	Large pipe from direction of Tri-City Plaza. Discharging. Banks of plunge pool are eroding. Some sediment.	Large quantities of iron-leaching bacteria. Water is a blue-green color. Bacteria-laden rocks in plunge pool, appear "fuzzy". Oil-like sheen on surface of pool to the left of the OF.	Yes	Characterize pollutant load, bank stabilization	High	High	High
VR042	Sunset Ter.	41.8324	72.4967	11	Conc.	Fair	Pipe discharges directly into stream above stream level, but has rip rap protection.	No significant problems.	No	N/A	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR043	Sunset Ter.	41.8324	72.4969	~15	Corrugated Metal	Fair	Pipe discharges directly into stream above stream level with no outlet protection	No outlet protection.	No	Outlet protection: energy dissipating steps or rip rap	High	High	Low
VR044	Hayes Dr.	41.8566	72.4892	~48	Conc.	Fair	Flared end. Pipe takes drainage from Skinner Road School. No CB on street, continuation of pipe.	Sediment present at mouth of outfall. No CB means road sediment from Hayes Drive discharging directly out pipe with no control measure.	Yes	New CB	High	High	Low
VR045	Hayes Dr.	41.8572	72.4903	24	Conc.	Fair	Headwall-integrated pipe. Pipe takes drainage from Skinner Road School	Banks of small inlet stream (dry) are eroding. Fallen branches are keeping sediment contained, but sediment is visible throughout length of stream.	Yes	New CB / Hydrodynamic separator	High	High	Low
VR046	Gerald Dr.	41.8639	72.4889	~28	Conc.	Fair	Headwall-integrated pipe. Only half of the outfall is visible, the rest is buried in sediment.	Despite being buried, outfall appears to be functioning properly.	Yes	Rip rap for sediment capture/retention	High	High	Low
VR047	Gerald Dr.	41.8649	72.4895	~36	Conc.	Fair	Pipe is in fair condition.	Large pipe empties into "detention pool", not designed as such. Access road alongside inlet stream. Sedimentation evident downstream, large deposits at bends.	Yes	Detention Pool / Ditch modified into functional sediment control structure	High	High	Low
VR048	Neill Rd.	41.8541	72.4879	~28	Conc.	Fair	Partial headwall structure in fair/poor condition	Large amounts of trash (plastic bags, tires), sedimentation. Erosion around the mouth of the outfall.	Yes	Rip rap / other sediment control measure	High	High	Low

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR049	Lawler Rd.	41.8525	72.4879	~18	Conc.	Fair	Pipe obscured by sediment	Pipe is at least half full of sediment, impeding discharge flow. Sediment is in bars where land flattens, and in large amounts.	Yes	Pipe cleaning / excavation	High	High	Low
VR050	Gerald Dr.	41.8608	72.4899	~36	Conc.	Fair	Headwall-integrated pipe in fair condition. Culvert entering side of "basin", culvert for draining adjacent above-ground pool directly into stream / Hock	Similar situation as VR047. Pipe discharging into small stream acting as a detention area. Water pooling throughout, may be at equilibrium with Hockanum. Large quantities of sediment filling "basin", erosion of banks.	No	Detention Pool / Ditch modified into functional sediment control structure	High	High	Low
VR051	Gerald Dr.	41.8647	72.4894	~18	Conc.	Fair	Headwall-integrated pipe in fair condition.	Erosion present but minimal, banks of outlet stream eroding. Erosion increases downstream. Stream empties onto floodplain of Hockanum Marsh area.	Yes	Bank stabilization	High	High	Low
VR052	Talcottville Rd.	41.8316	72.4957	N/A	N/A	Poor	Catch basin has become detached from parking lot pavement. Pavement is now massively undercut and crumbling. Water sheets from parking lot into the area and cascades down steep slope, carrying sediment, garbage, and vegetation. Catastrophic failure.	Erosion, garbage, invasive plants. System no longer functioning properly. Sediment being carried down the slope and into small stream that empties into Hockanum	Yes	Complete reconstruction of corner of parking lot. New, larger capacity CB and piping, slope stabilization, trash removal, parking lot reconstruction.	High	High	High

ID #	Nearest Street	GPS N	GPS W	Dia. (in)	Pipe Material	Condition	Infrastructure Comments	Issues / Concerns	Resource Degradation	Retrofit / BMP	Access	Feasibility	Priority
VR053	Talcottville Rd.	41.8310	72.4963	~18	Metal	Fair	Pipe once had a metal energy spreader attached, now detached.	Minimal sedimentation and erosion, outfall appears to be functioning properly.	No	Reattach energy spreader	High	High	Low
VR054	Quail Crossing	41.8470	72.4924	48+	Plastic	Fair	Part of detention basin system. Functioning properly	Functioning properly	No	N/A	High	High	Low
VR055	Hockanum Boulevard	41.8366	72.4973	~28	Conc.	Fair	Part of detention basin system. Functioning properly	Functioning properly	No	N/A	High	High	Low
VR056	Kelly Rd.	41.8246	72.5021	~24	Conc.	Fair	Unknown where the discharged water comes from. Water is at equilibrium but flowing.	Evidence of outlet channel overflowing, some sedimentation	Yes	N/A	High	High	Low