

## Developing Credits and Incentives for Innovative Stormwater Management

Collaborative Learning Group Meeting  
July 17, 2012, 9:00 am-1:00 pm  
Erie County Administration Building, Sandusky, OH

### Meeting Summary

**Group Members Present:** Dan Bogoevski (Ohio EPA), Jane Cullen (City of Sandusky), Eric Dodrill (Perkins Township), Alex Etchill (John Hancock & Associates), Ken Fortney (Erie County), Lynette Hablitzel (NW OEPA Office), Clyde Hadden (CT Consultants), John Hancock (John Hancock & Associates), Frank Lopez (Old Woman Creek NERR), Matt Scharver (CRWP), Rachel Webb (NEORS), Cheryl Wolfe-Cragin (Old Woman Creek NERR), Betsy Yingling (NEORS).

**Project Team Members Present:** Amy Brennan (CRWP), Jay Dorsey (ODNR), Crystal Dymond (Erie SWCD), Heather Elmer (Old Woman Creek NERR / ODNR), Ona Ferguson (Consensus Building Institute), Breann Hohman (Erie SWCD/OWCNERR).

**Observers and Staff:** Linda Cornell (BGSU – Firelands), Chris Feurt (Wells NERR), Olivia Staman (OWC NERR Intern), John Rufo (Erie SWCD).

### **Next Steps:**

- All – Contact Amy to inform development of model stormwater codes and other tools. Technical assistance for code review may be available from CRWP or the project team.
- All – The project team will notify the group of opportunities to engage with and provide feedback on BMP designs and installation of monitoring equipment.
- All – provide feedback to Jay on the “Making Stormwater BMPs Monitoring Capable” factsheet
- All – Send Heather the contact info of anyone who should receive project updates.
- Next meeting: October 18, 9am-1pm, location to be determined.

### **Site Visit: Perkins Township Administration Building Construction Site**

Eric Dodrill and Crystal Dymond provided a project overview. Breann Hohman talked about key features and land use in the Pipe Creek watershed. Alex Etchill oriented everyone to the site and designs for pervious concrete and a grass swale basin. Proposed BMPs include pervious concrete and a swale with perforated tile. An extra catch basin is being installed to accommodate monitoring equipment. Jay Dorsey demonstrated the soil infiltration test method that informed the BMP design. No pre-wetting is required. Readings should be stopped once a stable infiltration rate is measured over several consecutive intervals – for example, three consecutive unchanged readings at one hour intervals for lakebed or glacial till subsoils are probably necessary. The test should be performed at the depth anticipated for the bottom of the BMP.

The group walked the site and reviewed plans for the pervious concrete and swale. For the pervious concrete, Alex noted that it was necessary to keep the outlet of the BMP shallow to avoid tailwater effects in the catch basin. The design calls for a 6” sump, minimum 15” aggregate depth, and 6” underdrains. Jay Dorsey said that the BMP was designed per the standards in *Rain Water and Land Development* manual, taking into account infiltration test results. The pervious concrete will capture and infiltrate the 3/4” event. There is a 5:1 drainage area to infiltrative surface ratio for this BMP. One

of the group members raised concerns that this exceeds the recommended ratio of 3:1. Another person asked why there is no sump on either side of the building. Alex said this is due to cost and the need to keep the sump level. In regard to the swale there was some disagreement regarding how the BMP should be classified. Dan Bogoevski of Ohio EPA noted that the design is not an enhanced water quality swale per Ohio's construction general permit and indicated he would classify it as a dry extended detention basin with amendments to promote infiltration. Matt Scharver suggested soil ripping to promote infiltration. Jay said that there is conflicting data on whether soil ripping is effective because it tends to close up without amendments. The BMP will be planted with a fescue/rye turfgrass. Someone asked if there is a low flow channel that can meander and Jay indicated the swale has been designed to accommodate sheet flow for small events.

### Welcome, Introductions and Meeting Overview

Amy Brennan welcomed meeting participants. Heather Elmer reviewed the agenda asked people what they thought of the site visit. Several people said they appreciated the opportunity to be on a site, see a demonstration infiltration test, and understand the details of one of the projects. Some noted that it is helpful to witness site constraints like elevation. Others liked hearing about challenges and resolutions encountered during site design. The group wants to engage with each project at multiple stages from preliminary through final design, construction, and monitoring. All meeting presentations and handouts can be found at: <http://www.nerrs.noaa.gov/NSCIndex.aspx?ID=690>

Topics people indicated they want to know about the projects or at site visits:

- How site owners and project are building maintenance capacity.
- Maintenance cost estimates and the watershed context.
- Ohio EPA should be present and both EPA and the group should have input early in the process so their feedback can be incorporated into final design.
- Log maintenance activities and correlate with monitoring data long term. Amy noted that the contractor will complete an inspection sheet during site visits including maintenance
- Summarize challenges during design, construction, and maintenance for each site and how they were addressed, so sites can be compared and lessons learned.

### Design Assistance Update

Amy Brennan provided an overview of design assistance RFP results through which the project will fund, ensure monitorability of, and track the development of several stormwater BMPs at five sites. Four of five proposals received were awarded and all took a 10% funding decrease which allows the project to support four designs instead of three. Three are awaiting Ohio EPA (SWIF) announcements.

Submitted By	BMP Type	Project Location	Watershed	Soils	Status
Stephen Hovancsek & Associates, Inc	Pervious Pavers and Bioretention	Orange Village Service Facility	Chagrin River	C	Funded, pending SWIF
CT Consultants	Pervious Pavers and Bioretention	Willoughby Hills Community Ctr	Chagrin River	C/D	Funded, pending SWIF
Erie SWCD	Porous Asphalt	Old Woman Creek NERR	Old Woman Creek	D	Funded
Chagrin Valley Engineering	Pervious Pavers	Pepper Pike City Hall Retrofit	Chagrin River	C/D	Funded, pending SWIF
Holden Arboretum	Bioretention and possible WQ Swale	Holden Arboretum	Chagrin River	C/D	Technical assistance

**Orange Village Service Facility:** The village purchased an old church that will be renovated into the service department. Proposed design includes pervious pavers and a series of bioretention cells that would infiltrate roof drainage from existing buildings. The project team has identified potential problems regarding how stormwater features may be connected and will discuss with engineers.

**Willoughby Hills Community Center (Lake County):** Pervious pavers proposed in handicap parking areas are being considered in part because of safety benefits of reduced icing. In addition, a bioretention basin would capture parking lot runoff.

**Old Woman Creek NERR Visitor Center:** Erie Soil and Water Conservation District proposed a parking lot retrofit to replace pervious grasspave with porous asphalt. A full parking lot renovation is also being considered which could involve bioretention in parking lot medians or adjacent areas. A NOAA climate station/weather station immediately adjacent to the lot will allow for quantification of evapotranspiration and rainfall. Old Woman Creek NERR is funding construction.

**Pepper Pike City Hall (Cuyahoga County):** Pervious pavers in existing parking lot and a 'snowmelt swale' which will serve as pretreatment for a turfgrass bioretention. Only the pavers will be monitored.

**Holden Arboretum:** This project will receive technical assistance to develop BMPs that will treat drainage from a maintenance building parking lot. Another concern is drainage from an access road and parking area that flows into a series of catch basins which converge and outlet to a headwater stream and are causing erosion. There are also opportunities to enhance infiltration at the visitor center parking area with bioretention, pervious pavers, or soil amendments to a roadside swale. Mulch and other material storage connected to a dual designated exceptional warm water habitat/cold water habitat stream should be moved. Arboretum soil scientists could research soil development.

Heather asked the group for feedback on how they want to engage with projects (e.g. via webinars to review draft designs, working site visits, and informal advisory groups). Key suggestions, which the Project Team will seek to use as guidance, included:

- Provide webinars and/or virtual tours that can be archived online, even if not highly produced.
- Ohio EPA would like to review draft designs and do site visits with project engineers.
- Take an "all of the above" approach to maximizing opportunities for CLG.
- Provide regular status reports on design, construction, maintenance, and monitoring.
- Post a review set of plans online with calculations and graphs. Let group members review and provide feedback to project engineer through a comment log by a cut-off date.

Someone asked how group input was handled for the Perkins Township project. Amy noted that other than discussions at the April meeting the full group was not able to participate due to timing constraints. There will be more opportunities for CLG members to coordinate with projects receiving design funds.

### **Early Discussion of Stormwater Policy Needs**

Participants discussed, one-on-one, their experiences with stormwater management projects in the past, focusing on what worked well, barriers encountered and solutions. Participants then began to think about how scientific results from this project might inform policy or otherwise be used in a practical way to overcome barriers to effective stormwater management. The purpose of this discussion was to get out initial thoughts, which the project will pick up on in the future, though likely not in the next 6 months. Amy provided an overview of the stormwater policy landscape in Ohio, noting

that Ohio EPA's construction general permit is the base requirement. Amy described local stormwater regulations which typically incorporate the water quality volume and require peak discharge quantity control (usually based on critical storm and sometimes the rational method).

Group members noted the following in response:

- Some cities have nothing in their codes and work with engineers on a project by project basis.
- NEORS is has control standards in the combined sewer area of Cleveland, a project can't increase the flow of stormwater to the combined system because can't increase the volume of CSO per the permit requirement. Basically peak flow control, but not reduction per se. If a project increases imperviousness, additional control is required.
- In Ohio EPA NW District communities use models to project what is needed to reduce CSOs.

Amy reviewed stormwater design guidance. She asked the group if they thought the project could influence stormwater standards and guidance either by recognizing the range of what is in use or by providing recommendations to utility credit programs. NEORS is very interested in this and has just adjusted its program so projects can get a onetime 10% discount towards engineering based on percentage of their annual fee. The District has already received several applications for residential credits and is not yet even charging the fee. Several large institutions, redevelopment projects, and homeowners associations have indicated that they intend to file a credit applications so the District is quite confident its credit program will be utilized.

Amy provided an overview of CRWP model codes including stormwater management, erosion and sediment control, and illicit discharge. CRWP is having conversations about downspout disconnection and rain barrels with several communities (and the NEORS is offering a credit for downspout disconnection). Several communities have regulations that prohibit downspout disconnection or require a permit and fee to disconnect downspouts. Some communities are developing rain barrel codes that specify the location, design, and number of barrels. CRWP can share an example rain barrel codes. CRWP also works with communities on higher standards for flood damage reduction, including nonstructural post construction practices such as riparian/wetland setbacks, conservation development districts, and compact development. Regarding community parking codes, CWRP has observed that codes usually require asphalt or concrete (a requirement originally intended to prohibit gravel).

Amy asked the group to think about barriers to effective stormwater management that could be tackled as part of this project. CRWP is reviewing its recommendations to communities regarding appropriate precipitation data. Geauga County recently revised its criteria to NOAA Atlas 14. If codes are hindering effective stormwater management, people should seek to understand the original intent and make changes. The project team may be able to provide assistance on code implementation and enforcement as well as adoption. Erie County is holding a codes workshop on August 1<sup>st</sup>.

Participants brainstormed barriers and gaps in code, permits, and guidance and ideas on how to improve and achieve consistency. The group did not get to a discussion about issues with adoption and implementation and will revisit this topic at a future meeting.

#### Brainstormed list of barriers and gaps in codes, permits and guidance

- Downspout disconnection – City engineers concerned about causing neighborly disputes. Lets learn from cities with downspout disconnection programs (Boston, Minneapolis).

- Off-street parking - Research on off-street parking suggests community study on parking needs. Reduce study burden by completing this on a regional basis for similar communities.
- LID is in codes as an option - Not implemented because adequate credit is not provided or because of economic barriers, or other hurdles. There may need to be either a real incentive or a requirement for LID to get to implementation.
- Need credits and regulations/codes to *work together* for effective stormwater management.
- It is labor intensive to review and rewrite codes, figure out what the barriers are; rewrite them so cohesive. Can this project offer these services, which consultants otherwise do at great cost?
- Confusion about where to start with code review. What data is needed?
- Cost questions - information from this project will probably help.
- Low community awareness of available options for technical assistance through local/county planning commissions (cheaper than consultants). May need to build capacity within these entities, but sometimes it's already there.
- Need communication among county agencies to get codes passed and clarify agency authority.
- Local governments are not driving toward good projects.
- Communities don't want their codes compared in a public forum.
- Lack of flexibility in local codes, e.g. the Columbus drainage manual.
- Sometimes plan reviewers don't understand how a proposed design can meet the water quality volume requirement without using practices listed in manuals.
- Lack of knowledge by local government officials and staff regarding requirements of their stormwater permit, what is in local codes, and their authority.

#### Brainstorm of ways to ensure codes are effective

- Incentivize LID "if you harvest/infiltrate the water quality volume, you don't have to treat in extended detention pond." (OEPA)
- Require communities to do code review to a minimum bar. (OEPA)
- Have model codes reviewed by Attorney General's office and advertise that.
- Use references to "latest version" of state manual in local codes so they automatically updated.
- Be sure codes are reviewed by those who will implement/use them.
- Have regionally standard codes.
- Require codes be evaluated every 2-3 years to determine if they are effective and meet local needs.
- Ask zoning board how many variances requested and granted (to indicate need to change code).
- Require projects meet particular standards instead of recommending guidance be considered.
- Carefully design public participation so it doesn't always result in a negative response that may not be representative of the general public participation.
- Need education and cooperation of zoning boards. Withhold building permits until projects meet stormwater requirements. In some cases zoning secretary is the appropriate contact.
- Effective administrative process are key, e.g. Lake County's requires certain people to sign plans.

#### **Monitoring Sites, Modeling, Contractors, and CLG business**

CRWP released a request for qualifications to conduct monitoring work in early May. The project team selected and is currently working out contract details with North Carolina State University. NC State has monitored over 80 stormwater BMPs across the state of North Carolina. The project team felt they were well qualified to perform this work despite the distance. NC State is collaborating with Biohabitats Cleveland and Raleigh offices which will perform on the ground monitoring work and data quality

control. The project team had a lot of discussion about potential contractors and how the project might build monitoring capacity within local organizations. There will be opportunities for small groups of CLG members to be on site for equipment installation. The contractor will participate in two CLG meetings annually, including a tour of sites, discussing equipment selection, installation and design. The goal is to monitor at least two BMPs in 2012. Someone suggested a Perkins Township site visit during BMP construction for other design assistance project engineers.

Jay presented the "Making Stormwater BMPs Monitoring Capable" factsheet which was developed based on discussions at the last CLG meeting. Feedback is welcome: [jay.dorsey@dnr.state.oh.us](mailto:jay.dorsey@dnr.state.oh.us)

### **Infiltration Test Results – Perkins Township and Old Woman Creek NERR**

Jay reviewed results for both sites. For Perkins, the pervious pavement depth under consideration was 24" but there was fill material at that depth so the test was conducted at 24 and 36 inches to test native soils. Three single-ring tests conducted under the proposed pervious concrete practice yielded corrected infiltration rates of .05-.08 in/hour. While this is lower than the recommended infiltration rate of 0.5"/hour commonly used in other states, Ohio soil conditions require that we consider a different range. Based on test results, the pervious concrete design will store and infiltrate 2.4" of rain per unit area in 48 hours. Alex and Jay built a HydroCAD model that projects 99%+ of site runoff will be infiltrated for the 0.85" event. At Old Woman Creek, four tests show infiltration rates of .005 inches/hour; ten times slower than the Perkins Township site. There was compaction at 24" and infiltration practices may not be appropriate. The project team will meet to review BMP options.

### **Modeling**

Gibson Chen, Ph.D. P.E. has collected historic climate data and is in the process of acquiring projected climate change data. He has determined that there is little information regarding how to measure or model evapotranspiration for green infrastructure projects.

### **Communications and Outreach**

- Amy, Jay, and Heather discussed the project with several Ohio Stormwater Conf. participants.
- Amy is providing regular project updates to the CRWP Board of Trustees.
- Heather gave a project overview at the Firelands Coastal Tributaries Watershed meeting.
- Crystal gave a presentation for Northwest Ohio Urban Team of SWCDs .
- CLG members will receive an online feedback survey twice annually, the first this week.
- Heather asked for feedback regarding holding three longer CLG meetings per year. People agreed that one less meeting is fine if there are other opportunities to be involved in project activities.

### **Possible Additional Project**

Ken Fortney provided the group a quick overview of pervious pavement at the BGSU-Firelands McBride Arboretum for monitoring consideration. A rain garden included in the design of this project was not constructed. This site is managed by Erie Metroparks.