

**CITY OF LAKE SAINT LOUIS
GREEN ENVIRONMENTAL ADVISORY COMMITTEE
REGULAR MEETING
DECEMBER 16, 2011**

The meeting was called to order at 9:00 a.m. in the Lake Saint Louis Civic Center Board Conference Room.

IN ATTENDANCE:

Chairman Ed Young, Vice Chairman Scott Ellis, Ann Finklang, Dana Delibovi, Keith Stone, and Alderman John Pellerito. Also present: Steve Schertel, Director of Community Development; Derek Koestel, Director of Public Works; Maria King, Project Manager; and Brenda Cueller, acting as recording secretary.

CALL TO ORDER:

Chairman Young called the meeting to order.

APPROVAL OF AGENDA:

Chairman Young stated a correction on item 1. under "Agenda Items" was needed as follows: "...minutes and ~~November~~ **December** agenda."

MOTION TO APPROVE THE AGENDA:

Committeewoman Delibovi made a motion to approve the amended December 16, 2011 Green Environmental Advisory Committee regular meeting agenda. The motion was seconded by Vice Chairman Ellis and the motion carries.

THE AMENDED AGENDA FOR THE DECEMBER 16, 2011 GREEN ENVIRONMENTAL ADVISORY COMMITTEE REGULAR MEETING AGENDA IS HEREBY APPROVED, AS NOTED ABOVE.

MINUTES: October 28, 2011

Chairman Young made the following corrections:

- Page 1 under "Approval of Agenda:" third paragraph, first line should read as follows: "THE AGENDA FOR THE ~~SEPTEMBER 30~~ **OCTOBER 28**, 2011..."
- Page 4 paragraph under "Next Meeting:" first line should read "The next meeting is Friday, ~~November 18th~~ **December 16th**, 2011..."
- Page 4 last paragraph heading should read: "AGENDA ITEMS FOR ~~NOVEMBER 18TH~~ **DECEMBER 16TH** 2011."

MOTION TO APPROVE THE MINUTES:

CITY OF LAKE SAINT LOUIS
GREEN ENVIRONMENTAL ADVISORY COMMITTEE
REGULAR MEETING
DECEMBER 16, 2011
(JOURNAL & MINUTES)

Committeewoman Finklang made a motion to approve the amended October 28, 2011 Green Environmental Advisory Committee regular meeting minutes. The motion was seconded by Vice Chairman Ellis and the motion carries.

MOTION TO APPROVE THE AMENDED OCTOBER 28, 2011 GREEN ENVIRONMENTAL ADVISORY COMMITTEE REGULAR MEETING MINUTES IS HEREBY APPROVED, AS NOTED ABOVE.

GENERAL DISCUSSIONS:

1. UPDATE ON THE SOLID WASTE MANAGEMENT DISTRICT GRANT

Vice Chairman Ellis noted there were 10 dumpsters at Founders Park parking lot and Christian Disposal will place their decals on them. Once the decals have been placed, Christian Disposal will pick them up and start using them in their commercial recycling activities. Vice Chairman Ellis said this was two (2) of the five (5) items being purchased with the grant.

Vice Chairman Ellis said the third item is recycling information stickers that will go on the correct residential recycling bins that are in use. He said the ordering information is on Eric Serman's, Assistant City Administrator, desk. Vice Chairman Ellis said once the stickers have been received, Chairman Young will lead the effort on getting them placed on the 4,500 recycling bins around the City.

Vice Chairman Ellis said the fourth item is to revise the residential recycling brochure which will be done in January. Vice Chairman Ellis said Chairman Young and he worked with Christian Disposal on the first edition. He said they needed to work on the second edition and asked the Committee to look over the brochure and give them their comments so that they could work with Christian Disposal on an updated brochure. Vice Chairman Ellis said the grant provides funding for printing and mailing of the 4,500 copies of the second edition.

Vice Chairman Ellis said the fifth item is a commercial recycling brochure with Christian Disposal Service.

The Committee discussed where the dumpsters would be located.

2. UPDATE STORM WATER ORDINANCES

Derek Koestel, Director of Public Works, said Maria King will give a presentation to explain the City's recently adopted storm water ordinances and how they affect water quality.

Maria King, Project Manager, gave a presentation on "Best Management Practices, Stormwater Facilities Management. Phase II – National Pollutant Discharge Elimination System (NPDES)". (Attached is a copy of the presentation.)

Mr. Koestel followed-up on items Maria touched on:

- Low impact development is talked a lot about these days. The Code provides for it primarily through the Planned Development ordinances, but does not use any particular incentives. Mr. Koestel said the City is pretty accommodating in the Development Code and explained why there are no incentives given.
- Mr. Koestel explained the water quality at different locations within the City.
- The City is not in favor of the sand filter and explained the City's reasoning.

The Committee briefly discussed existing basins and existing water runoff problems.

Committeewoman Delibovi said she believes an article that focuses on stormwater needs to be placed in Newstime and a brochure devoted to stormwater.

A copy of the City's stormwater ordinances was passed out to the Committee and the committee members were asked to read over the material so that a discussion can be held at the next GEAC meeting.

3. COMMUNICATION UPDATE

Chairwoman Delibovi said she has an article on energy audit that is ready to go into the paper.

The Committee discussed topics for articles to be written resulting in educating the residents. The Committee agreed that a follow-up article should be written after an event.

Chairwoman Delibovi said the next article will be about the bio-retention project.

4. GREEN BUSINESS UPDATE

Alderman Pellerito said local businesses can be asked how they are going green and a follow-up article can be written.

5. OTHER OLD BUSINESS

Chairman Young said the Electronic Recycling event has been held and plans for next years event have been started.

6. OTHER NEW BUSINESS (SOLAR COLLECTORS VISIT)

Chairman Young said a fieldtrip was taken to see a solar power farm. He said the parts are not that expensive but the cost is in the labor. Chairman Young explained the type of breaks given when utilizing solar power. He said any electricity that is not used from the solar panels is a credit at the retail rate, noting that the equipment is metered.

Alderman Pellerito provided information on the Regional Plan for Sustainable Development. They have been looking for partner communities. Lake Saint Louis, Wentzville, and O'Fallon have been nominated for free help. The final selection will be in January and Alderman Pellerito will keep the committee informed of the status.

7. DISCUSSION OF "TO DO" LIST, LONG-TERM ACTION PLAN, AND ANY NEW INITIATIVES FOR THE COMMITTEE

The Committee discussed areas to address such as information that has been provided by Alderman Pellerito and Derek Koestel, energy audit, and bike paths.

To Do List:

- Improve Committee website
- Implement recommendations for City Hall operation and staff activities to reduce energy use and carbon emissions.
- Expand this energy analysis for other Lake Saint Louis buildings and households.
- Inform and educate the community through the website and articles in Newstime and The Happenings.
- Help to conserve green space, trees, and bike paths in the community.
- Consider storm water management plan and other water quality issues.
- Inform residents regarding utilization of pesticides and fertilizers on their lawn.
- Assist City staff in application for energy efficiency and other sustainability grants.
- Learn about City ordinances and building codes that promote energy efficiency and "green" living.

CITY OF LAKE SAINT LOUIS
GREEN ENVIRONMENTAL ADVISORY COMMITTEE
REGULAR MEETING
DECEMBER 16, 2011
(JOURNAL & MINUTES)

- Amend ordinance regarding landscaping plans to encourage use of native plants.
- Promote more participation in recycling in City.
- Promote greater use by the City and individuals of compact fluorescent lights (CFL).
- Establish a safe disposal location for CFL's.
- Investigate reuse of yard wastes collected in the City.
- Place home kwh measuring devices in local libraries.

LONG-TERM ACTION PLAN:

- Provide "green" recommendations to the Board of Aldermen and City Staff, including energy conservation, recycling program, green space preservation, transportation choices, and enhanced water quality practices.
- Establish long-term practices for education of citizens for green/sustainable living.

NEXT MEETING:

The next meeting is Friday, January 27, 2012, at 9:00 a.m. in the Lake Saint Louis Civic Center Board Conference Room.

AGENDA ITEMS FOR JANUARY 27, 2012:

1. Approval of December minutes and January agenda.
2. Update on the Solid Waste Management District grant.
3. Update storm water ordinances
4. Communication update
5. Green business update
6. Other old business
7. Other new business. 2012 Electronics Recycling Event
8. Discussion of "To Do" list, long-term action plan, and any new initiatives for the committee.

ADJOURNMENT:

The meeting adjourned at approximately 9:55 a.m.

CITY OF LAKE SAINT LOUIS
GREEN ENVIRONMENTAL ADVISORY COMMITTEE
REGULAR MEETING
DECEMBER 16, 2011
(JOURNAL & MINUTES)

APPROVED

Brenda Cueller
Serving as recording secretary



Best Management Practices

Stormwater Facilities Management

PHASE II – NATIONAL POLLUTANT DISCHARGE
Elimination System (NPDES)

April 1, 2010

Phase II Program Overview



- Program Requirements
 - Reduce the discharge of pollutants to the “maximum extent practicable” (MEP)
 - Protect water quality
 - Satisfy the appropriate water quality requirements of the Clean Water Act
- “Maximum Extent Practicable”?
 - Implementation of the MEP requires the development of “Best Management Practices” (BMPs)
 - 6 Minimum Control Measures (MCMs)

Phase II Program Overview



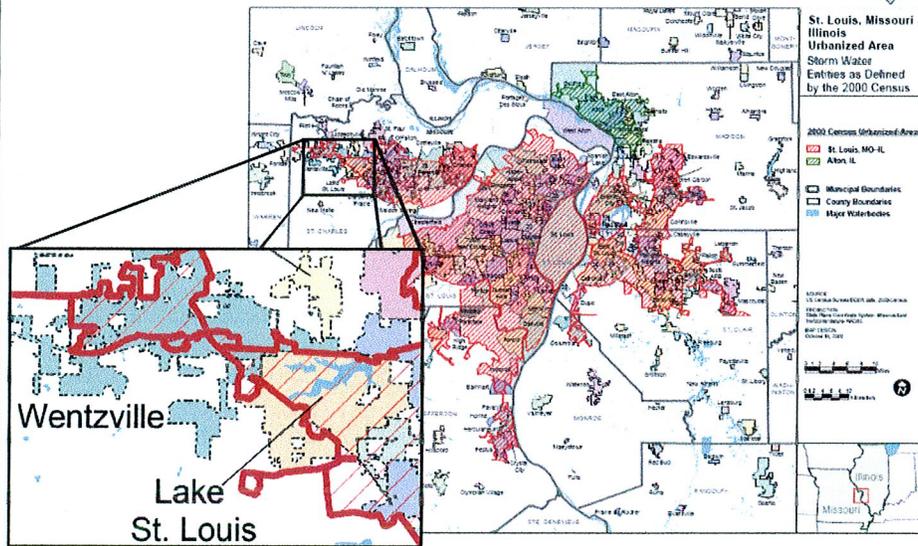
- Who is affected?
- What is a *regulated small MS4*?
 - MS4 = Municipal Separate Storm Sewer System
 - A *small MS4*
 - Any MS4 not covered by the Phase I storm water program.
 - Populations of 100,000 or fewer
 - A *regulated small MS4*
 - All operators of small MS4s located within the boundaries of a Bureau of the Census-defined “Urbanized Area” (UA).

April 1, 2010

BMP's

3

St. Louis “Urbanized Area”



April 1, 2010

BMP's

4

Six Minimum Control Measures (MCM's)



- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Removal
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention and General Housekeeping
In Municipal Operations

Post-Construction Runoff Control (MCM #5)



- Substantial Impacts of Post-Construction Runoff
 - Increase in the type and quantity of pollutants in stormwater runoff
 - Increasing the quantity of water delivered to the waterbody during storms

MCM #5



■ Lake Saint Louis BMP Annual Activities

- Inspect existing basins and ponds for functionality (one-third per year per ward)
- Monitor complaints, track and log existing problems relative to storm water management
- Perform follow-up inspections of 10% of sites completed in the previous year
- Discuss low impact development zoning requirement for all future development in the city with the Mayor and Board of Aldermen



Develop standards for development BMPs (structural and non-structural) to improve water quality



Facilitate city officials to establish regulations for use of BMPs



Previous Discussion

What's the dilemma with stormwater?



- Runoff is primarily from downspouts and streets.
- Stormwater is:
 - Polluted with metals (copper, lead, and zinc), phosphorus, organic nitrogen, and nitrates
 - Hot
 - Fast
 - Sediment laden



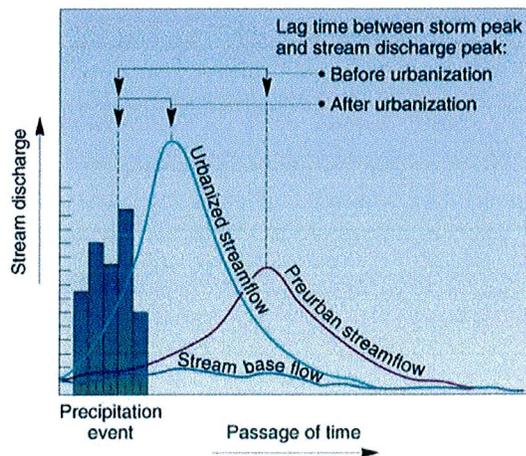
Photo – East Tributary, just west of Henke Road

April 1, 2010

BMP's

9

What's wrong with stormwater runoff the way it is currently?



Before and After urbanization hydrograph

Source: Christopherson, R. W. (1997). *Geosystems: An introduction to physical geography*. Saddle River, NJ: Prentice Hall.

April 1, 2010

BMP's

10

■ What is LID?

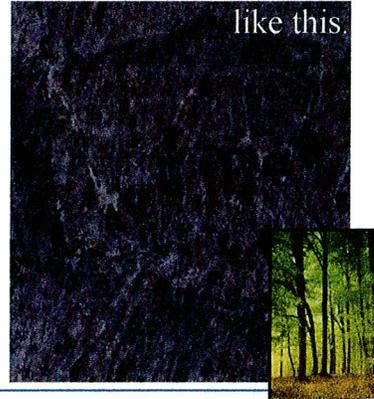
- The low impact development approach to developing land and managing stormwater is to **imitate the natural hydrology (or movement of water) of the site.**



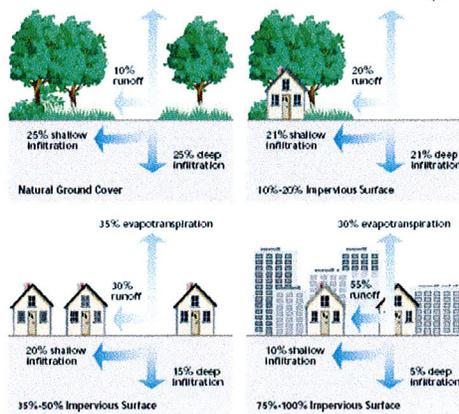
Tries to make this....



...function hydrologically like this.



Runoff Potential



Illustrations courtesy of *Stream Corridor Restoration: Principles, Processes, and Practices*, by the Federal Interagency Stream Corridor Restoration Working Group, 10/98

LID Site Planning and Design Concepts



- Preserve Open Space and Minimize Land Disturbance
- Protect and Incorporate Natural Systems (i.e. wetlands, stream/wildlife corridors, mature forests)
- Reexamine the Use and Sizing of Traditional Site Infrastructure (lots, streets, curbs, gutters, sidewalks) and Customize Site Design to Each Site
- Utilize Neo-Traditional Street and Lot Layouts and Designs
- Decentralize and Micromanage Storm Water at its Source Using LID Storm Water Management Practices

April 1, 2010

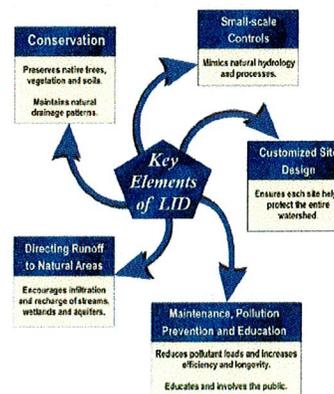
BMP's

13

LID Benefits



- Environmental Benefits
 - Reduced wetland impacts & associated impact fees
 - Reduced downstream erosion
 - Improved groundwater recharge
- Cost Benefits
 - Reduced infrastructure maintenance costs
- Other Benefits
 - Improved site aesthetics
 - Enhanced public awareness

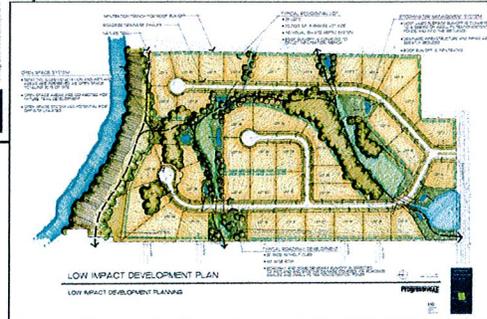


April 1, 2010

BMP's

14

Conventional Subdivision Layout vs. Low Impact Development Layout



Graphics from *Low Impact Development – Concepts and Considerations*
By Tony Groves, M.S., Water Resources Director, Progressive AE
Craig Hundorp, ASLA, LEED®AP, Director of Landscape Architecture, Progressive AE

April 1, 2010

BMP's

15

Conventional Subdivision Layout vs. Low Impact Development Layout



Graphics by AHBL Engineering for the *Low Impact Development Technical Guidance Manual for Puget Sound*, January 2005

April 1, 2010

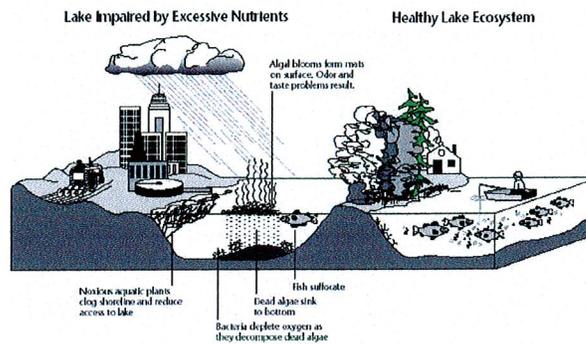
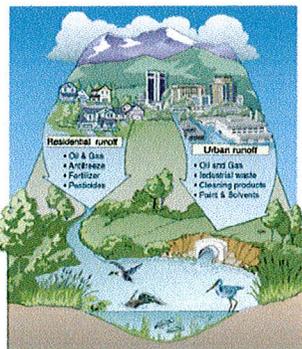
BMP's

16



Best Management Practices

How does Water Quality affect our Lakes?



Traditional Detention Design



April 1, 2010

BMP's

19

BMP Types



- Wet Pond
- Wetlands
- Infiltration Basins and Dry Swales
- Surface Sand Filters
- Bioretention and Organic Filters

April 1, 2010

BMP's

20

Wet Ponds



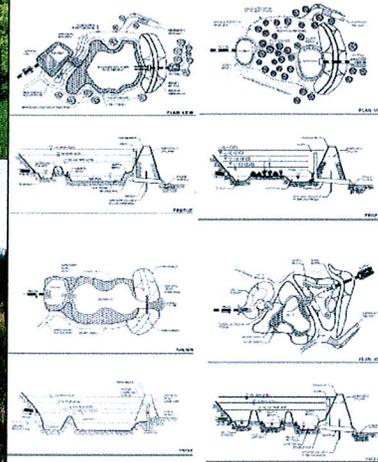
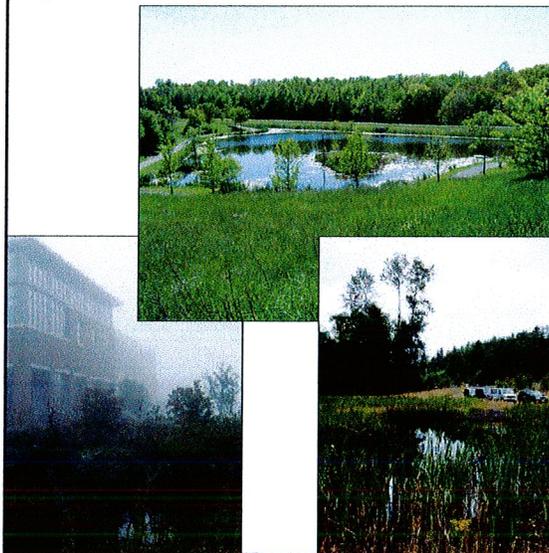
- Provides sedimentation, which removes:
 - Metals
 - Nutrients
 - Sediment
 - Organics
- Types of wet ponds
 - Extended Detention Ponds
 - Multiple Pond Systems
 - Pocket Ponds

April 1, 2010

BMP's

21

Wet Ponds



April 1, 2010

BMP's

22

Wetlands



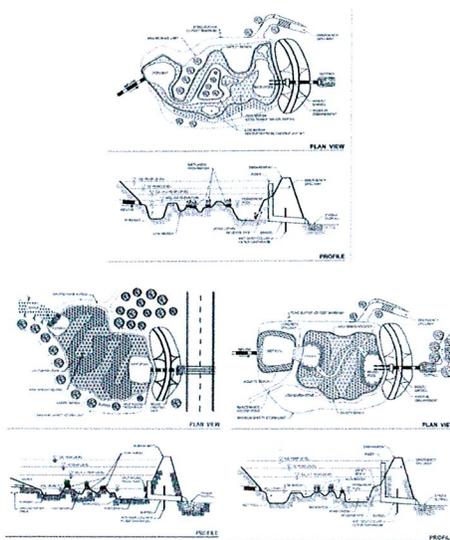
- Use for stormwater treatment stems from earlier attempts for wastewater treatment and flood control.
- Stormwater must be directed to an “Engineered Wetland”.
 - Damage can occur to a natural wetland’s hydrology and functionality.
- Sufficient supply of water important to ensure proper functioning wetland.
- Water surface elevations vary considerably.
 - Suitable plantings are important.

April 1, 2010

BMP's

23

Extended Detention/Shallow Wetland



Photos by:
Seuss
(<http://www.flickr.com/photos/90124154@N00/4449003159>
<http://www.flickr.com/photos/90124154@N00/2803476132>)

April 1, 2010

BMP's

24

Infiltration Basins and Dry Swales



■ Infiltration Basins

- Runoff allowed to infiltrate into the ground
- Pollutants are removed as water flows through the soil

■ Dry Swales

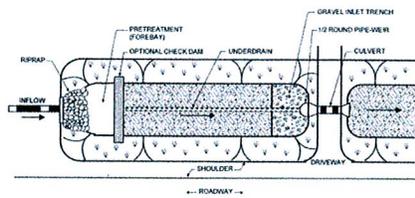
- Open vegetated channels
- Designed to filter and slow stormwater
- Usually used along roadsides

April 1, 2010

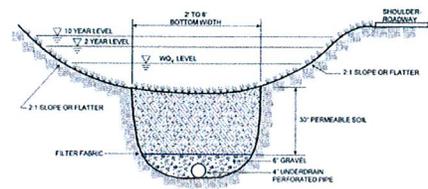
BMP's

25

Dry Swale



PLAN VIEW



SECTION



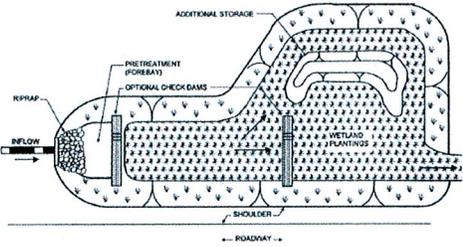
Photos by:
Top: Greg Raisman
Bottom: Lauren Jolly Roberts

April 1, 2010

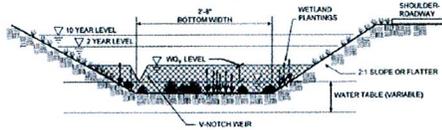
BMP's

26

Wet Swale



PLAN VIEW



PROFILE



Photo by: Thomas Le Ngo

April 1, 2010

BMP's

27

Surface Sand Filters



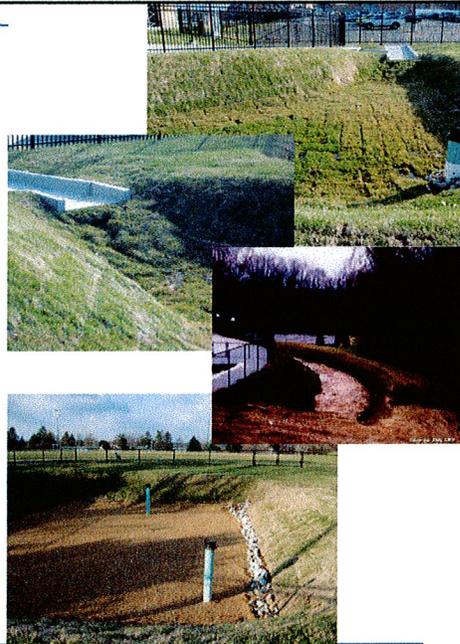
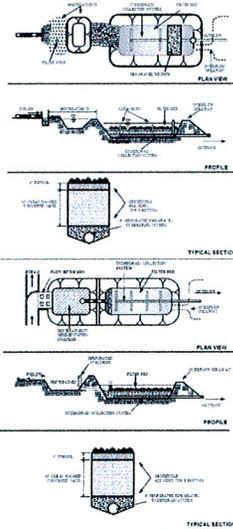
- Permeable medium, usually sand or small gravel
- Very adaptable
- Planting soil must not contain clays

April 1, 2010

BMP's

28

Sand Filters



April 1, 2010

BMP's

29

Bioretention and Organic Filters



- Designed to absorb runoff from impervious surfaces such as roofs or parking lots
- Adaptable to any site layout, i.e.:
 - Residential landscapes to Big Box retail
- Rigorous engineering required to meet stormwater standards
- Bioretention area ranges from 3.5' to 6' below ground and contains an underdrain.

April 1, 2010

BMP's

30

Bioretention

PLAN VIEW

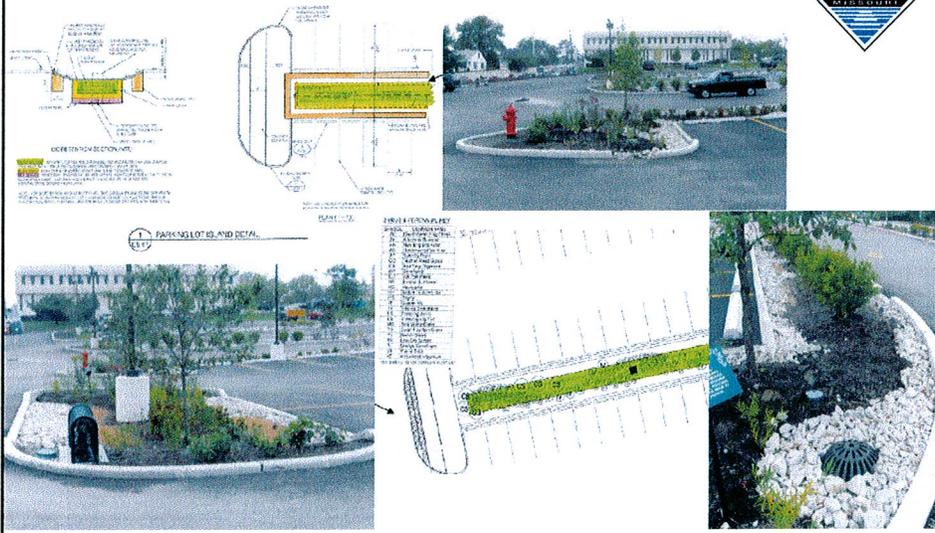
TYPICAL SECTION

April 1, 2010 BMP's 31

Bioretention Pre-Treatment

- 20' Grass Filter Strip (if space allows) or
- Sand Layer (if space is tight)
 - Use clean concrete sand
 - Construct with "greased" plywood forms
- Purpose
 - "Knock down" more concentrated pollutants first (oils, metals, etc.)
 - Lengthen life of filter bed

Bioretention – Parking Lot Island



April 1, 2010

BMP's

33



St. Charles Boathouse Parking Bioretention

Photos courtesy of Scott Woodbury

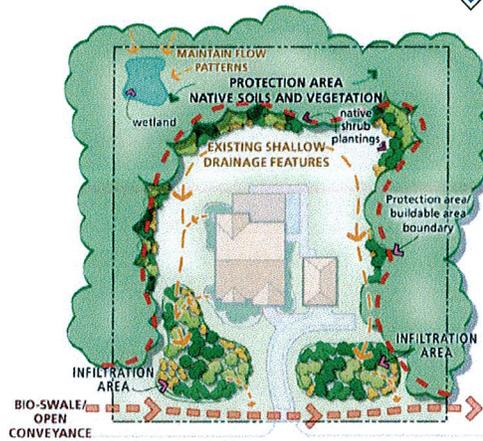
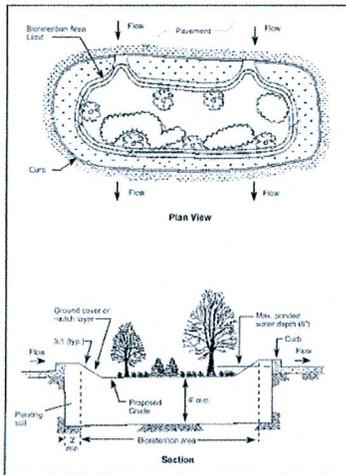


April 1, 2010

BMP's

34

Bioretention for homeowners



Graphic by AHBL Engineering for the Low Impact Development Technical Guidance Manual for Puget Sound, January 2005

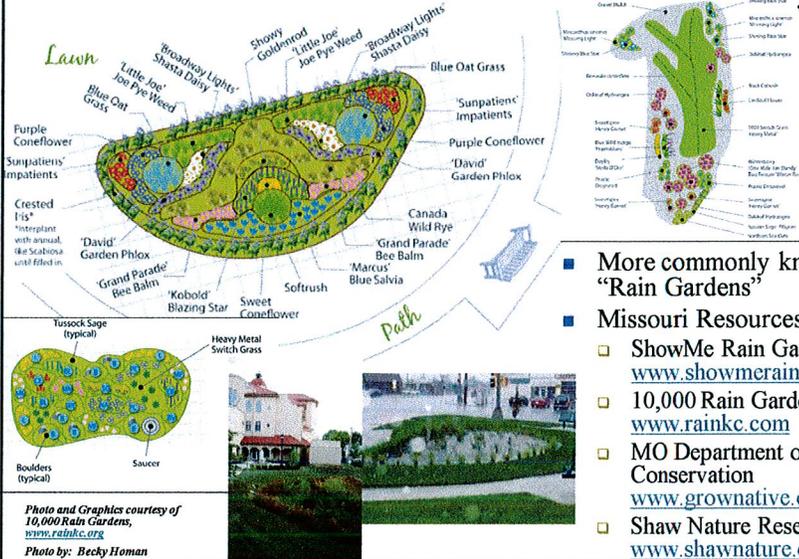
Source: Prince Georges County, 1999

April 1, 2010

BMP's

35

Bioretention...a.k.a. "Rain Gardens"



- More commonly known as "Rain Gardens"
- Missouri Resources:
 - ShowMe Rain Gardens www.showmeraingardens.com
 - 10,000 Rain Gardens www.rainkc.com
 - MO Department of Conservation www.grownative.org
 - Shaw Nature Reserve www.shawnature.org

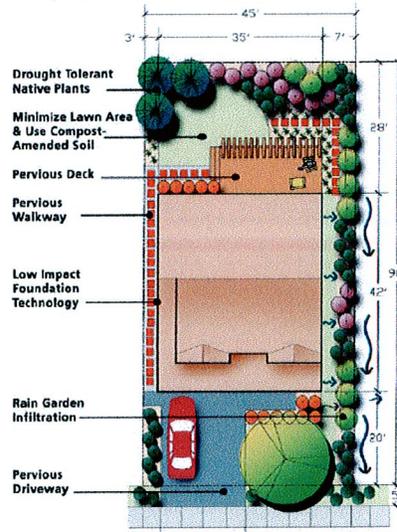
Photo and Graphics courtesy of 10,000 Rain Gardens, www.rainkc.org
Photo by: Becky Homan

April 1, 2010

BMP's

36

LID Lot Layout



*Graphic by AHBL Engineering
for the Low Impact Development
Technical Guidance Manual for
Puget Sound, January 2005*

April 1, 2010

BMP's

37

Pollutant Removal in Bioretention/Infiltration Areas



- Metals
 - >90% removal of Copper, Lead, and Zinc
 - >80 removal of Phosphorus
- Nutrients
- Hydrocarbons and bacteria

April 1, 2010

BMP's

38

Season of Interest



Photos courtesy of MSD

April 1, 2010

BMP's

41

LID Project Photos



April 1, 2010

BMP's

42

St. Louis, MO



Photo Courtesy of Perry Eckhardt, MDC

Citygarden.

- Opened July 1, 2008
- 6 rain gardens throughout
- Green roof on the Café
- <http://www.citygardenstl.org/>

April 1, 2010

BMP's

43

Chesterfield, MO



Pond at Chesterfield City Hall

Photo Courtesy of Perry Eckhardt, MDC



Chesterfield business park bioretention

Photo Courtesy of Perry Eckhardt, MDC

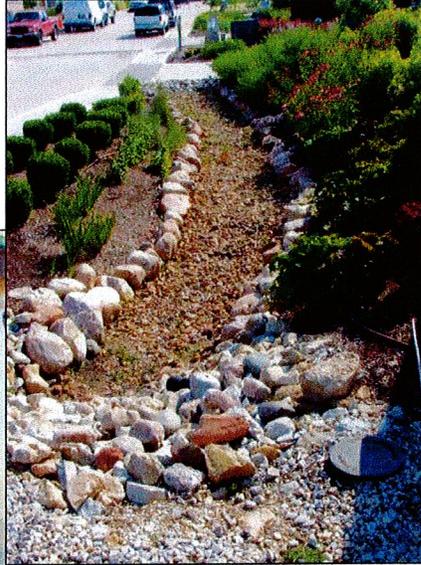
April 1, 2010

BMP's

44

Kirkwood, MO

Sommet at Old Big Bend
Photos Courtesy of Perry Eckhardt, MDC



April 1, 2010

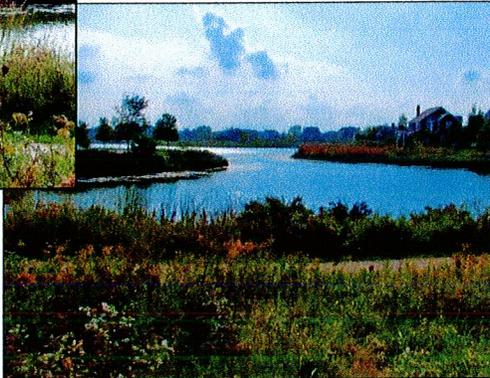
BMP's

45

Prairie Crossing – Grayslake, IL



Lake Leopold
Photos courtesy of Perry Eckhardt, MDC

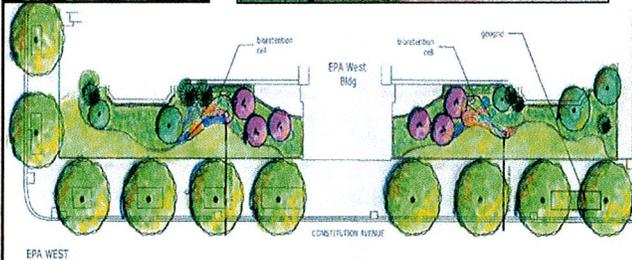
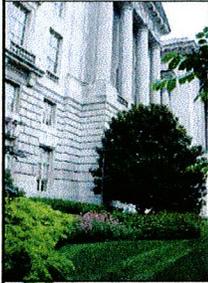


April 1, 2010

BMP's

46

EPA Headquarters – Washington D.C. LID Demonstration Project



47

University of Minnesota – Duluth



Photos by Consumer Horticulture Community
of Practice: eXtension.org



April 1, 2010

48

Summary



- Phase II Program Overview
- The problem with Stormwater
- Low Impact Development
 - Planning and Design Concepts
- Best management Practices
 - Water Quality
 - BMP Types

April 1, 2010

BMP's

49

Engineering Design & Construction Specification Updates - 2010



City of Lake Saint Louis
Public Works Department
April 1, 2010

Objectives



- Unified Manual for Engineering, Plan Preparation, and Construction Rules and Regulations
- Modernize Standards and Methods
- Adopt Commonly used Standards and Methods
- Provide Standard Notes
- Provide Permit Checklist

April 1, 2010

BMP's

51

Engineering Design and Plans Preparation Manual



- Clearly defines expectations
- Unified Source for all standards and specifications
 - Reiterates Code where necessary
 - Made a part of the Code so more detailed requirements are enforceable.
- Adopts Standards and Methods from other local agencies
 - Uses methods engineers are already familiar with
 - Widely available documentation (internet preferred)
 - Automatically updates – rights vest with P&Z introduction

April 1, 2010

BMP's

52

New Provisions



- Access management guidelines have been adopted
- Roadway Geometrics have been revised
- Right-of-way widths have changed
- Street Signs conform to new MUTCD requirements
- Under Drains are required on Public Streets
- Detention standards 2 year and 100 year
- Flows over 4 cfs must be conveyed in pipes or designed channels
- Channels and detention basins must be sodded or stabilized
- Water Quality provisions have been added
- Flowable fill is to be used for back fill when cutting existing streets
- Cutting existing streets is only allowed for access to existing facilities, or where a street is scheduled for replacement or resurfacing, utility crossings are to be bored or pushed

April 1, 2010

BMP's

53

