Item 5Bi.
BCWMC 6-18-15

resourceful. naturally.
engineering and environmental consultants

BARR

Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Company
Subject: Item 5Bi – Choose Concept(s) to Implement for Northwood Lake Improvement Project (NL-1); Receive Presentation on Results of Envision Process
BCWMC June 18, 2015 Meeting Agenda
Date: June 10, 2015
Project: 23/27-0051 2015

5Bi Choose Concept(s) to Implement for Northwood Lake Improvement Project (NL-1); Receive Presentation on Results of Envision Process

Background

At its May 21, 2015 meeting, the Commission authorized the Commission Administrator to work with the Commission Engineer to complete the Envision™ analysis of the Northwood Lake Improvement Project options. This memo provides background information about the Envision™ rating system and the results of its application to the project.

Envision™ rating system

The Envision™ rating system is a project assessment and guidance tool for sustainable infrastructure design developed by the Harvard Graduate School of Design, the American Society of Civil Engineers, the American Public Works Association and the American Council of Engineering Companies. It is an objective framework of criteria and performance achievements that help users identify ways that sustainable approaches can be used to plan, design, construct, and operate infrastructure projects. Envision™ provides an opportunity for infrastructure owners and designers to be recognized for using a life cycle approach, working with communities, and using a restorative approach to infrastructure projects. Envision™ is also a useful tool in comparing project options that have different intangible benefits that can be hard to quantify through traditional means. An Envision™ fact sheet as well as a list of the credits that comprise the rating system are attached to this memo.

Use of Envision™ to evaluate project options

Commission staff recently used Envision™ to evaluate the differences between the Northwood Lake Improvement Project's Concept A (Reuse System) and Concept B (Pond) options. Both options were

scored using the Envision™ rating system. In addition, a screening-level life cycle analysis (LCA) of each option was performed using GaBi™ software. Life cycle analysis (LCA) is the systematic approach of looking at a product's complete life cycle, from raw materials to final disposal of the product. It offers a "cradle to grave" look at a product or process, considering environmental aspects and potential impacts such as greenhouse gas emissions, and energy and water consumption, often expressed as "footprints." LCAs are one important consideration in the Envision™ rating system, offering decision makers another way to consider the differences between project options.

Both project options were "scored" using a comprehensive Envision™ guidance manual that includes the assignment of possible credits. Out of 60 credits, the two project options scored the same points in 48 credit areas. The two project options scored differently across 12 specific credits; these differences are highlighted in Table 1.

These differences resulted in a higher overall score for the water reuse option over the pond option, as shown in Figure 1.

Attachments:

- Envision™ Facts
- Credit List

Table 1. Points earned per Envision category for each option

Envision Category	Envision Credit	Pond Option Points Earned	Reuse Option Points Earned
Quality of Life	QL 1.1 Improve Community Quality of Life	2	5
	QL 2.1 Enhance Public Health and Safety	0	2
	QL 3.1 Preserve Historic and Cultural Resources	0	1
	QL 3.2 Preserve Views and Local Character	1	6
	QL 3.3 Enhance Public Space	0	1
Leadership	LD 2.2 Improve Infrastructure Integration	1	7
	LD 3.2 Address Conflicting Regulations and Policies	0	2
Resource Allocation	RA 3.1 Protect Fresh Water Availability	0	9
	RA 3.2 Reduce Potable Water Use Consumption	0	9
	RA 3.3 Monitor Water Systems	0	3
Natural World	NW 1.7 Preserve Greenfields	0	3
	NW 1.8 Manage Stormwater	4	9

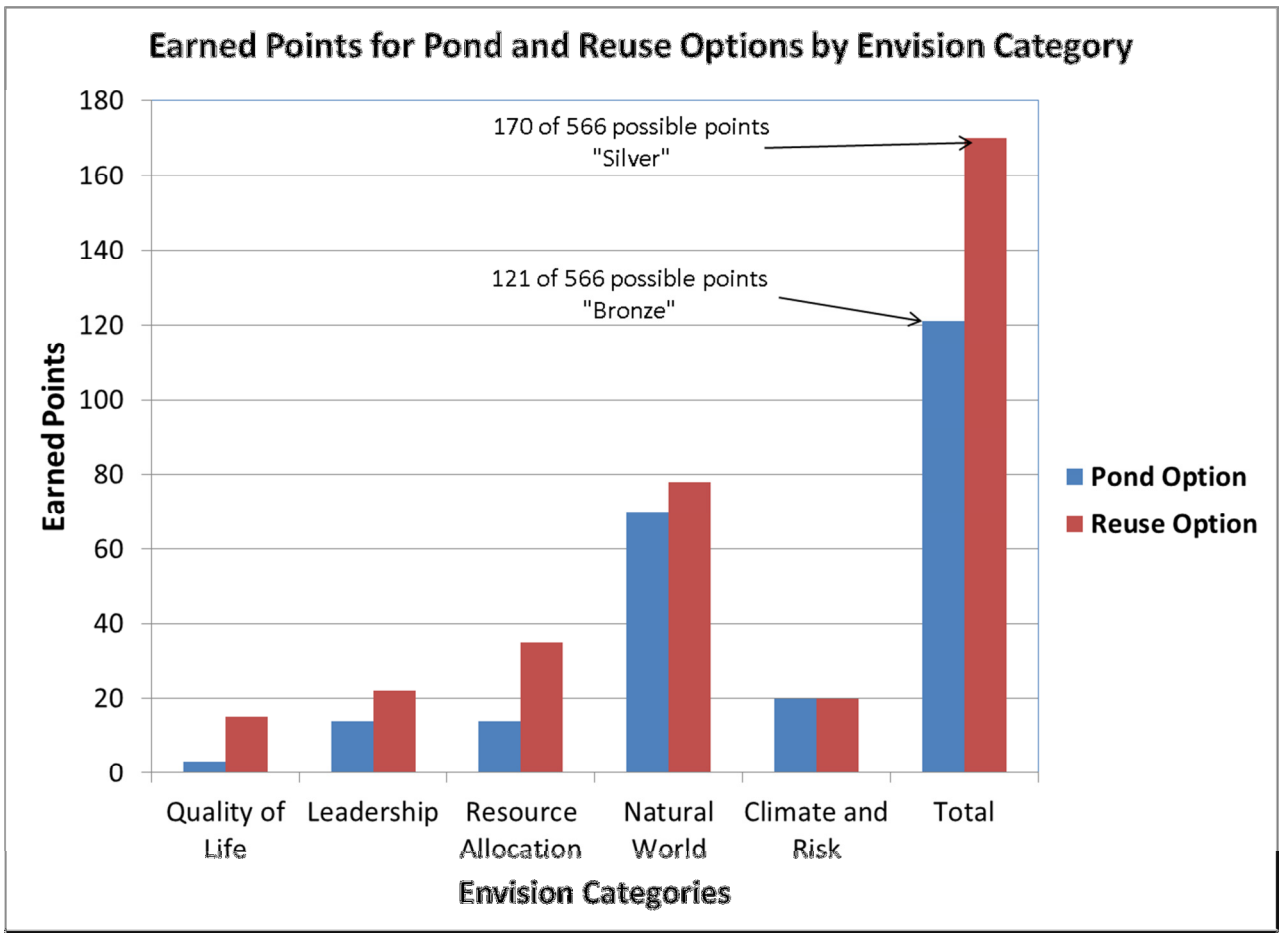

Figure 1. Chart showing earned points for each option

ENVISION™ FACTS

OUR ENVISION™ GOAL

To help owners, communities, constructors, designers, and others to create cost-effective, more resource-efficient and adaptable long-term infrastructure investments.

PURPOSE OF ENVISION™

To foster a dramatic and necessary improvement in the performance and resiliency of our physical infrastructure across the full spectrum of sustainability. Envision provides the framework and incentives needed to initiate this systemic change. As a planning and design guidance tool, Envision™ provides industry-wide sustainability metrics for all infrastructure types.

OVERVIEW

- A holistic sustainability rating system for all types and sizes of civil infrastructure
- Guide for making more informed decisions about the sustainability of projects
- Framework of criteria and performance objectives to help project teams identify sustainable approaches during planning, design, construction, and operation
- Optional third-party verification and award for recognizing project achievements

STRUCTURE

Envision™ has 60 sustainability criteria, called credits, arranged in five categories that address major impact areas.

BENEFITS

Infrastructure investments with:

- Long-term viability
- Lower cost
- Few negative impacts on the community
- Potential to save owners money over time
- Credibility of a third-party rating system

WHERE DOES ENVISION APPLY?

- Covers the roads, bridges, pipelines, railways, airports, dams, levees, landfills, water treatment systems, and other civil infrastructure
- Primarily for the U.S. and Canada, Envision™ benefits and criteria could be adapted to other locations
- Used by infrastructure owners, design teams, community groups, environmental organizations, constructors, regulators and policy makers

HOW ENVISION™ WORKS

- Go to www.sustainableinfrastructure.org to download Envision™ at no cost
- Learn to use Envision™ better with the Envision™ Sustainability Professional (ENV SP) training
- Use Envision™ to guide planning, design, and construction projects to reduce environmental footprint and support the larger goal of improved quality of life
- Evaluate and recognize infrastructure projects that use transformational, collaborative approaches to incorporate sustainability throughout a project's life

ENVISION™ BACKGROUND

Envision™ was developed in joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure. The Institute for Sustainable Infrastructure is a not-for-profit education and research organization founded by the American Public Works Association, the American Council of Engineering Companies and the American Society of Civil Engineers.

ENVISION™

ENVISION™ TOOLS

Envision™ Rating System

- An in-depth planning guide and rating system to improve the sustainability aspects of infrastructure projects.
- Includes a guidance manual and online scoring system.
- No cost to download or use for project planning and self-assessment.
- Optional independent, third-party review, called verification, offered by ISI.
- Verification qualifies projects to become eligible for recognition and awards.

Envision™ Checklist

- An educational tool that helps users become familiar with the sustainability aspects of infrastructure project design.
- A self-assessment to quickly compare project alternatives
- Structured as a series of yes/no questions based on the Envision™ rating system criteria.
- No cost to download or use.

ENVISION™ SUSTAINABILITY PROFESSIONALS

ENV SPs are credentialed practitioners trained by the ISI in the use of the Envision™ rating system

- Both online and in-person training is available
- ENV SPs work to guide the project team to achieve higher levels of sustainability and to document project sustainability accomplishments.
- An ENV SP must be involved in a project for it to be eligible for an Envision™ award

VERIFICATION

ISI's independent third-party project verification program is a transparent process to confirm that a project meets Envision™ evaluation criteria.

- Helps rate payers and voters have confidence that the project has good value
- Enables projects to become eligible for Envision™ awards
- Easy to use online process
- After submitting the assessment project verification takes 90 days to complete

CREDIT LEVELS OF ACHIEVEMENT

Envision™ credits define multiple levels of achievement in order to better evaluate performance and encourage incremental project improvement.

1|Improved - Performance that is above conventional

2|Enhanced - Sustainable performance that adheres to Envision™ principles

3|Superior - Sustainable performance that is noteworthy

4|Conserving - Performance that has achieved essentially zero impact

5|Restorative - Performance that restores natural or social systems

Innovation Points

Envision™ provides innovation points for projects that advance sustainable infrastructure practices or show exceptional performance beyond expectations.

ENVISION™ AWARD LEVELS

Recognition Level	Total Applicable Points (%)
Bronze Award	20
Silver Award	30
Gold Award	40
Platinum Award	50

ENVISION™ VERIFICATION COSTS

Project Size ($)	Non-Member Price	ISI Member Price
Up to 2 M	$3,000	$2,400
2-5 M	$8,500	$7,000
5-25 M	$17,000	$14,000
25-100 M	$25,000	$21,000
100-250 M	$33,000	$28,000
Over 250 M	Contact ISI for large or multi-phase projects	

*Registration fee $1000. Verification fee based on project size.

PROJECT PLANNING AND DESIGN

ENVISION SELF-ASSESSMENT

REGISTRATION

ASSESSMENT

VERIFICATION

AUTHENTICATION

ENVISION AWARD

timeline driven by project team

90 day verification process

CREDIT LIST

QUALITY OF LIFE
13 Credits

1 PURPOSE
QL1.1 Improve Community Quality of Life
QL1.2 Stimulate Sustainable Growth & Development
QL1.3 Develop Local Skills & Capabilities

2 WELLBEING
QL2.1 Enhance Public Health & Safety
QL2.2 Minimize Noise and Vibration
QL2.3 Minimize Light Pollution
QL2.4 Improve Community Mobility & Access
QL2.5 Encourage Alternative Modes of Transportation
QL2.6 Improve Accessibility, Safety, & Wayfinding

3 COMMUNITY
QL3.1 Preserve Historic & Cultural Resources
QL3.2 Preserve Views & Local Character
QL3.3 Enhance Public Space

QL0.0 Innovate or Exceed Credit Requirements

LEADERSHIP
10 Credits

1 COLLABORATION
LD1.1 Provide Effective Leadership & Commitment
LD1.2 Establish A Sustainability Management System
LD1.3 Foster Collaboration & Teamwork
LD1.4 Provide for Stakeholder Involvement

2 MANAGEMENT
LD2.1 Pursue By-Product Synergy Opportunities
LD2.2 Improve Infrastructure Integration

3 PLANNING
LD3.1 Plan For Long-Term Monitoring & Maintenance
LD3.2 Address Conflicting Regulations & Policies
LD3.3 Extend Useful Life

LD0.0 Innovate or Exceed Credit Requirements

RESOURCE ALLOCATION
14 Credits

1 MATERIALS
RA1.1 Reduce Net Embodied Energy
RA1.2 Support Sustainable Procurement Practices
RA1.3 Use Recycled Materials
RA1.4 Use Regional Materials
RA1.5 Divert Waste From Landfills
RA1.6 Reduce Excavated Materials Taken Off Site
RA1.7 Provide For Deconstruction & Recycling

2 ENERGY
RA2.1 Reduce Energy Consumption
RA2.2 Use Renewable Energy
RA2.3 Commission & Monitor Energy Systems

3 WATER
RA3.1 Protect Fresh Water Availability
RA3.2 Reduce Potable Water Consumption
RA3.3 Monitor Water Systems

RA0.0 Innovate or Exceed Credit Requirements

NATURAL WORLD
15 Credits

1 SITING
NW1.1 Preserve Prime Habitat
NW1.2 Protect Wetlands & Surface Water
NW1.3 Preserve Prime Farmland
NW1.4 Avoid Adverse Geology
NW1.5 Preserve Floodplain Functions
NW1.6 Avoid Unsuitable Development on Steep Slopes
NW1.7 Preserve Greenfields

2 LAND+WATER
NW2.1 Manage Stormwater
NW2.2 Reduce Pesticide & Fertilizer Impacts
NW2.3 Prevent Surface & Groundwater Contamination

3 BIODIVERSITY
NW3.1 Preserve Species Biodiversity
NW3.2 Control Invasive Species
NW3.3 Restore Disturbed Soils
NW3.4 Maintain Wetland & Surface Water Functions

NW0.0 Innovate or Exceed Credit Requirements

CLIMATE AND RISK
8 Credits

1 EMISSIONS
CR1.1 Reduce Greenhouse Gas Emissions
CR1.2 Reduce Air Pollutant Emissions

2 RESILIENCE
CR2.1 Assess Climate Threat
CR2.2 Avoid Traps & Vulnerabilities
CR2.3 Prepare For Long-Term Adaptability
CR2.4 Prepare For Short-Term Hazards
CR2.5 Manage Heat Island Effects

CR0.0 Innovate or Exceed Credit Requirements