Burnsville Rainwater Garden (RWG) Efficacy Monitoring and Cost Evaluation

West Metro Water Alliance

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Project background and objectives

- Burnsville Retrofit (previous) Study—paired watershed study of RWG implementation
  - Estimated volume reduction ~90%
- Follow-up effectiveness monitoring
- Document maintenance
- Life-cycle cost-benefits compared for BMPs
- Recommendations for optimizing performance

Burnsville retrofit study area characteristics

Treatment area—5.3 acres, 25 homes

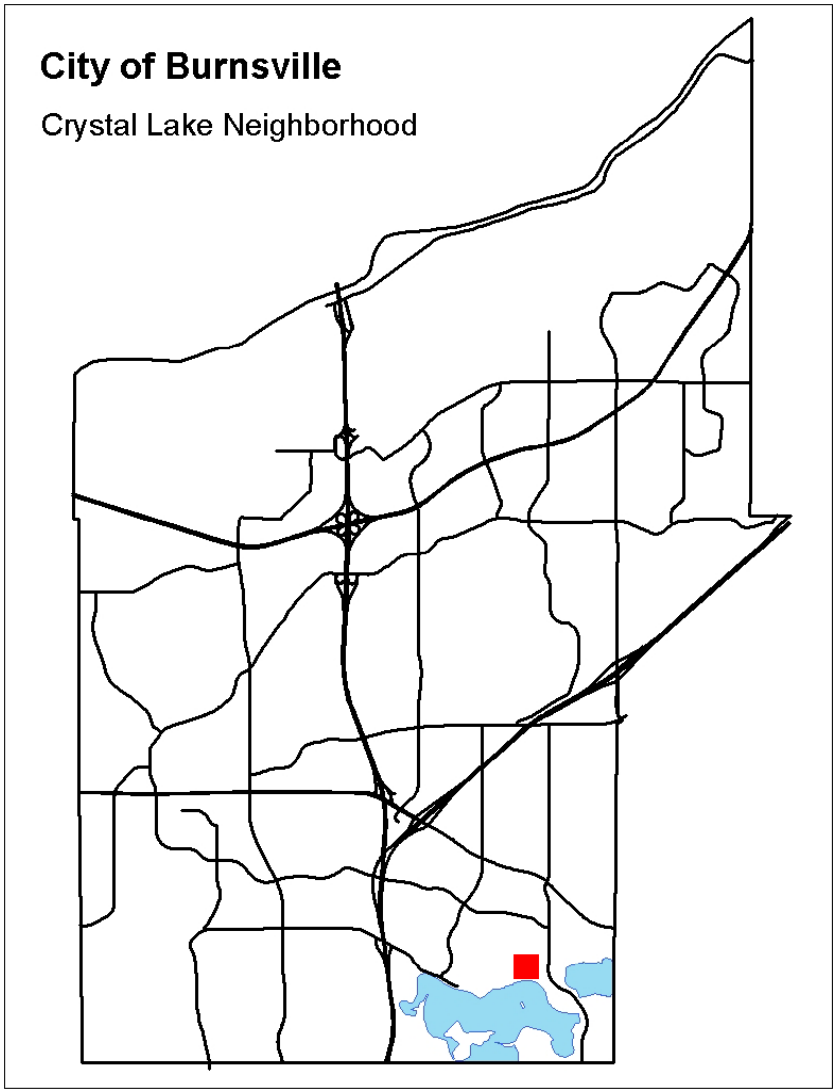
- High homeowner participation—17 RWGs

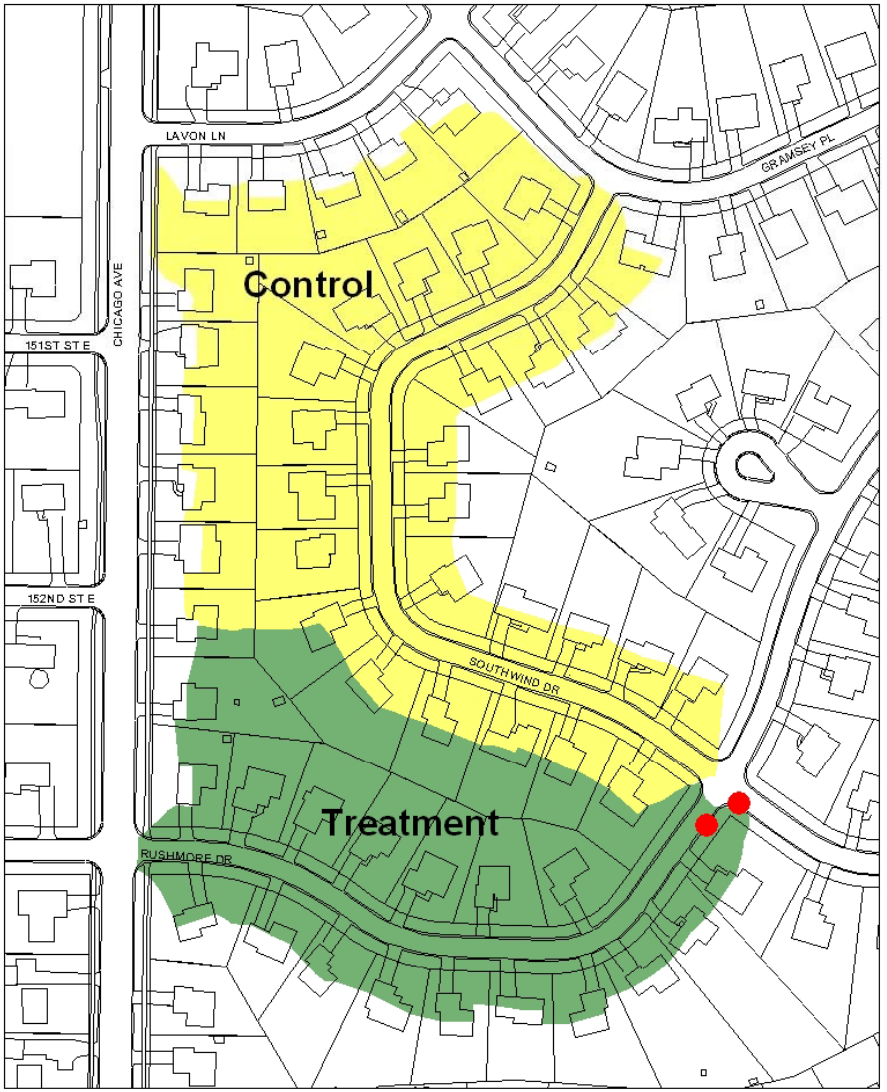
Control watershed—7.5 acres, 36 lots

Both watersheds

- Sandy soils
- Gradual slopes
- Few trees, existing landscaping
- 15’ from back of curb to ROW

Paired watershed study



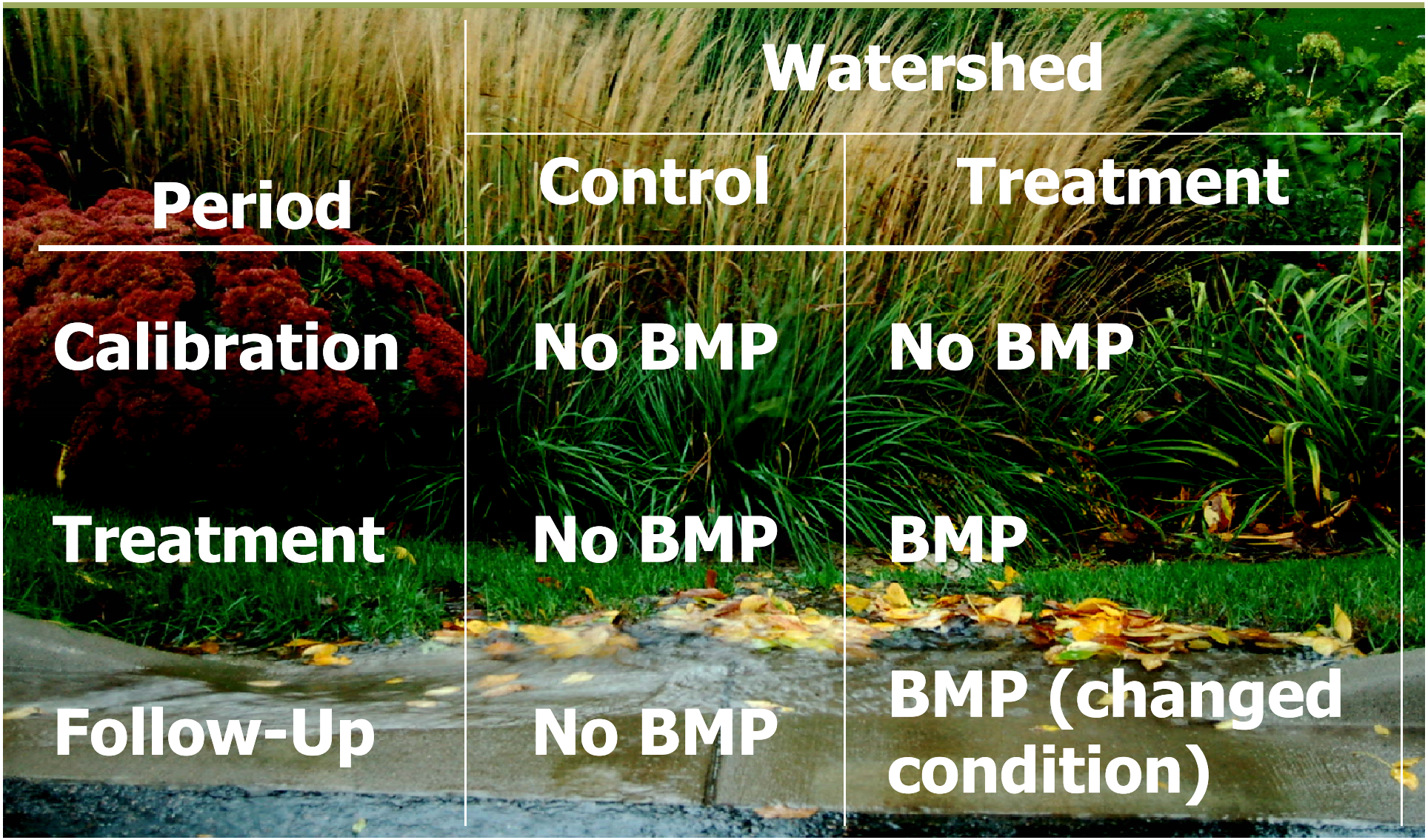


Rainwater garden layout

Before and After

Before and After

Paired watershed schedule of BMP implementation



Period	Watershed	
	Control	Treatment
Calibration	No BMP	No BMP
Treatment	No BMP	BMP
Follow-Up	No BMP	BMP (changed condition)

Monitoring results

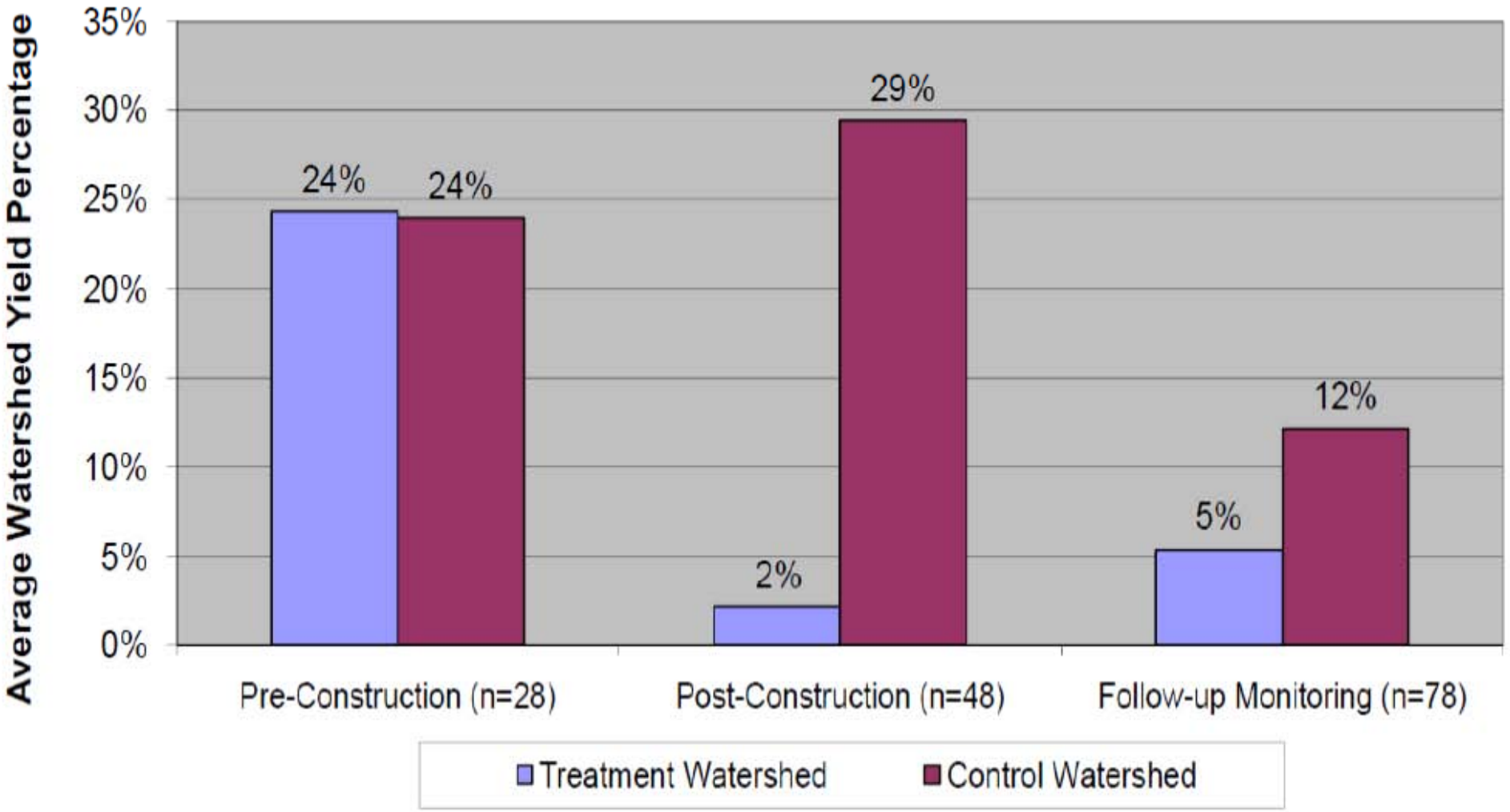
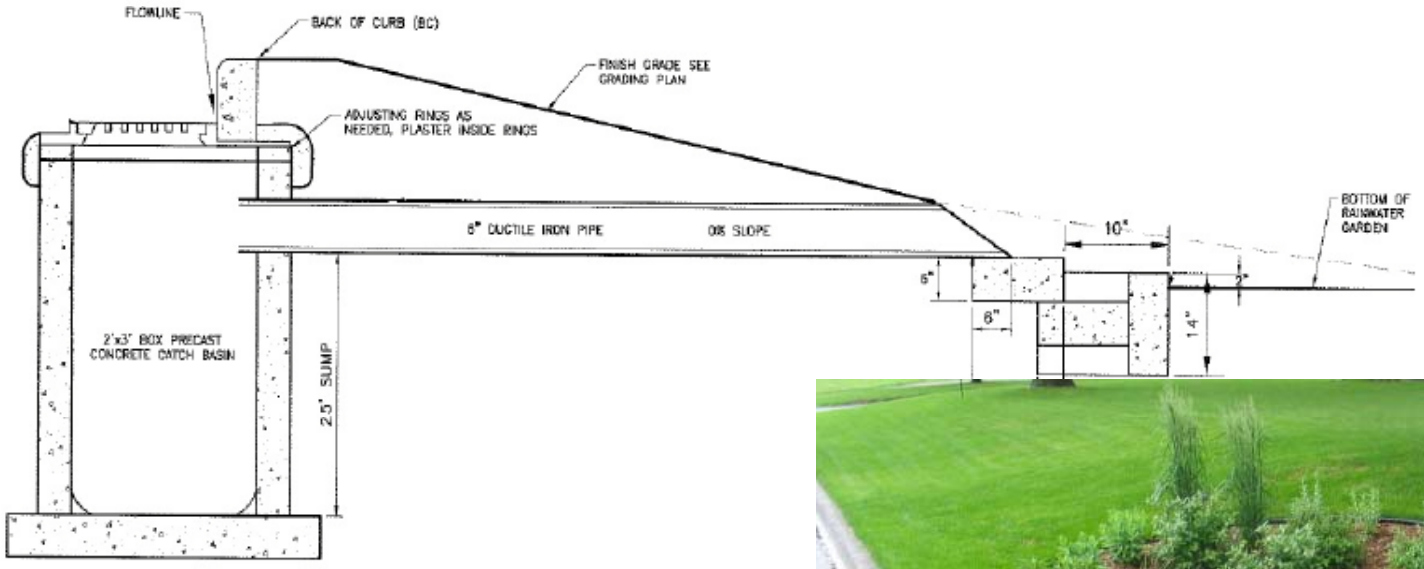


Figure 6 Post-Construction (left) and Follow-Up Monitoring (right) Rainwater Gardens

Figure 7 Examples of Rainwater Gardens Bypassing Flow During Follow-Up Monitoring

Pretreatment configuration for optimum performance

Figure 10 Curb Inlet Schematic for Rainwater Garden Pretreatment



Conclusions and recommendations

- Optimum performance of RWGs reduced runoff volumes by 90%
  - Current treatment level cut in half by grass filter sediment
  - Infiltration capacity has not been compromised
- RWG implementation is
  - 20-30% more cost-effective in new development vs. retrofit
  - More cost-effective (5-15%) in front-yard ROW
- Recommend pretreatment structures to improve
  - Cost and ease of maintenance
  - Long-term efficacy—10-20% more cost-effective
- RWGs w/ pre-treatment are most cost-effective BMP in residential setting for long-term improvements

Thank you! Questions?

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