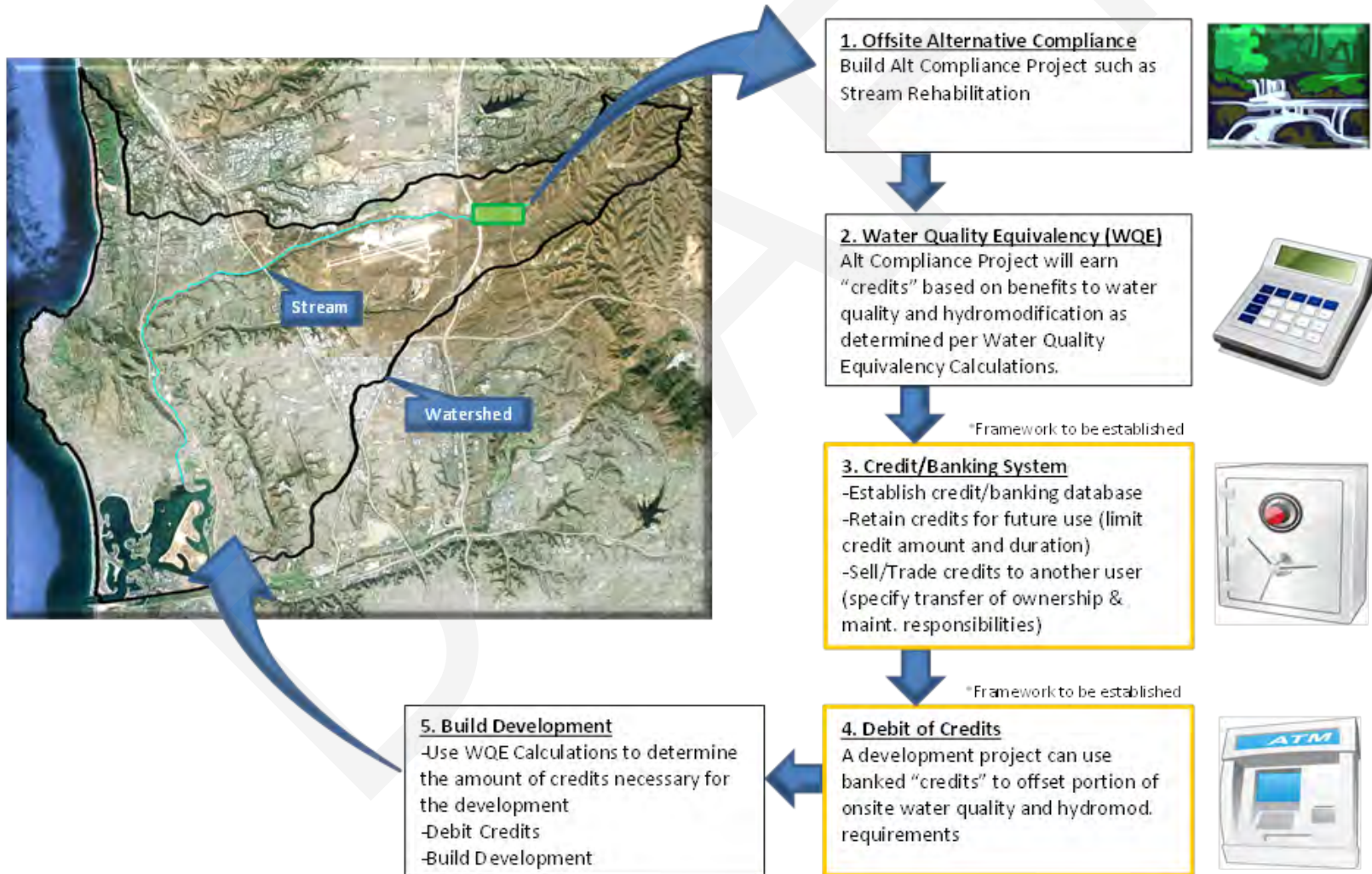


WATER QUALITY EQUIVALENCY FMA OVERVIEW

June 18th, 2015

General Items: Alternative Compliance Program



General Items:

Potential Program Components

Potential Pathways for Project Approval and Construction		Projected Phases
Applicant Implemented ACPs	Applicant <u>purchases or constructs</u> Alternative Compliance Project (ACP)	Phase 1
Independently Implemented ACPs	A party other than the applicant <u>owns or constructs</u> the ACP	
<ul style="list-style-type: none"> • Credit System 	Applicant <u>purchases ACP credits</u> in-lieu of fully complying on-site	Phase 2
<ul style="list-style-type: none"> • In-Lieu Fee Structure 	Applicant <u>funds or partially funds ACP</u> in-lieu of fully complying on-site (no purchase or exchange of credits)	Phase 3

General Items: Alternative Compliance Timeline

Permit
Deliverables

FY 2014-15

FY 2015-16

FY 2016-17

WQE Permit
Update
(2/11/2015) Today



- JRMP Update
- WQIP Submittal
- BMPDM Submittal
6/30/2015



BMPDM
Effective Date
12/24/2015



Applicant Implemented ACPs (Phase 1)

Water Quality Equivalency Standards (Sept 2015)

Credit System (Phase 2)

Background / Scoping

Regional Standards

In Lieu (Phase 3)

Jurisdictional Program Tools and Approaches (All Phases)

CEQA (TBD)

Critical Tasks

General Items: Anticipated Schedule

Meeting	Date	Notes
Today	June 18th, 2015	
WQE Public Draft #4	July 14th, 2015	
Public Workshop	July 28 th , 2015	
Comments Due	August 14 th , 2015	<i>Close of first 30 day comment period.</i>
RWQCB WQE Submittal 1	Sept 15th, 2015	
Comments Due	October 16 th , 2015	<i>Close of second 30 day comment period.</i>
Final RWQCB Submittal	Nov 16th, 2015	
Final Approval	Nov 30 th , 2015	<i>End of 2 week RWQCB review.</i>

General Items:

Overview of Document Structure

Section 1: Introduction

Background, Concepts, Document Use, Limitations

Section 2: WQE for Stormwater Pollutant Control

Overview, PDP Calcs, ACP Calcs (WQE Factors), Determination of Benefit

Section 3: WQE for Hydromodification Flow Control

Overview, Currency, Location Requirements, Design, Calculation of Results

Section 4: WQE Examples by Project Type

Structural BMPs: Retrofit, Regional, Groundwater Recharge and Water Supply Augmentation

Natural Management Systems: Land Restoration, Land Preservation, Stream or Riparian Area Rehabilitation

Appendices

A: Worksheets

B: Pollutant Control Reference Information

C: Hydromodification Flow Control Reference Information

D: Relevant WQE Mapping

E: Response to Comments

General Items: Status of Alternative Compliance

ACP Category		Stormwater Pollutant Control Credit				Hydromod Flow Control Credits
		Retention	<u>Biofiltration</u>	Flow-Thru	Volume Reduction	
Structural Best Management Practices	Retrofit BMP	Available	Available	Limited Availability	Available	Available
	Regional BMP	Available	Available	Limited Availability	Available	Available
	Groundwater Recharge & Water Supply Augmentation BMP	Available	Available	Limited Availability	Available	Available
Natural System Management Practices	Land Restoration NSMP	n/a	n/a	n/a	Limited Availability	Limited Availability
	Land Preservation NSMP	n/a	n/a	n/a	Limited Availability	Limited Availability
	Stream Rehabilitation NSMP	n/a	n/a	n/a	Limited Availability	Limited Availability

Overview of WQE

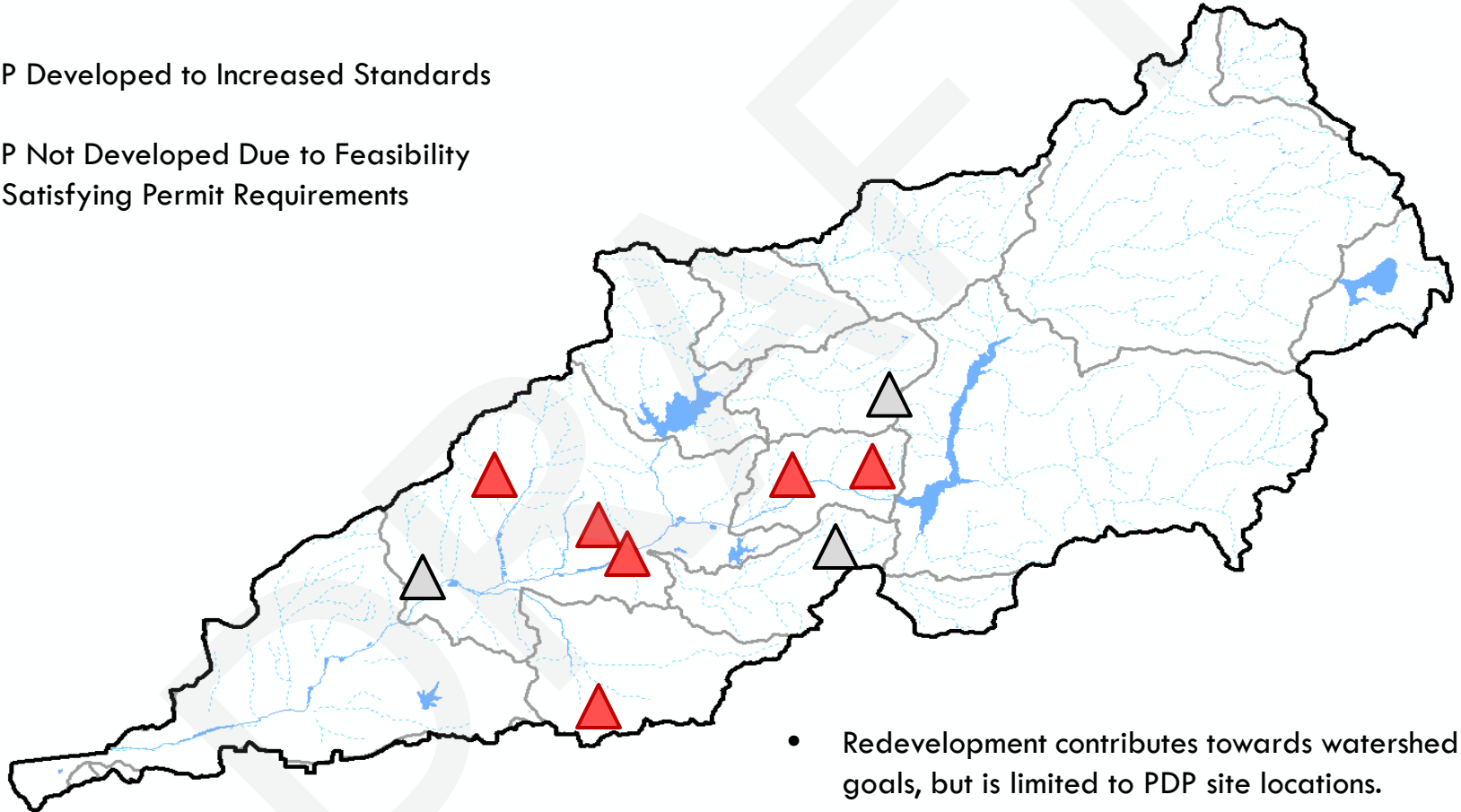
- Overview
- Pollutant Control
 - Currency, Formula, Application
- Hydromodification Management
 - Currency, Application

Overview

Watershed **without** Alternative Compliance

▲ PDP Developed to Increased Standards

△ PDP Not Developed Due to Feasibility of Satisfying Permit Requirements



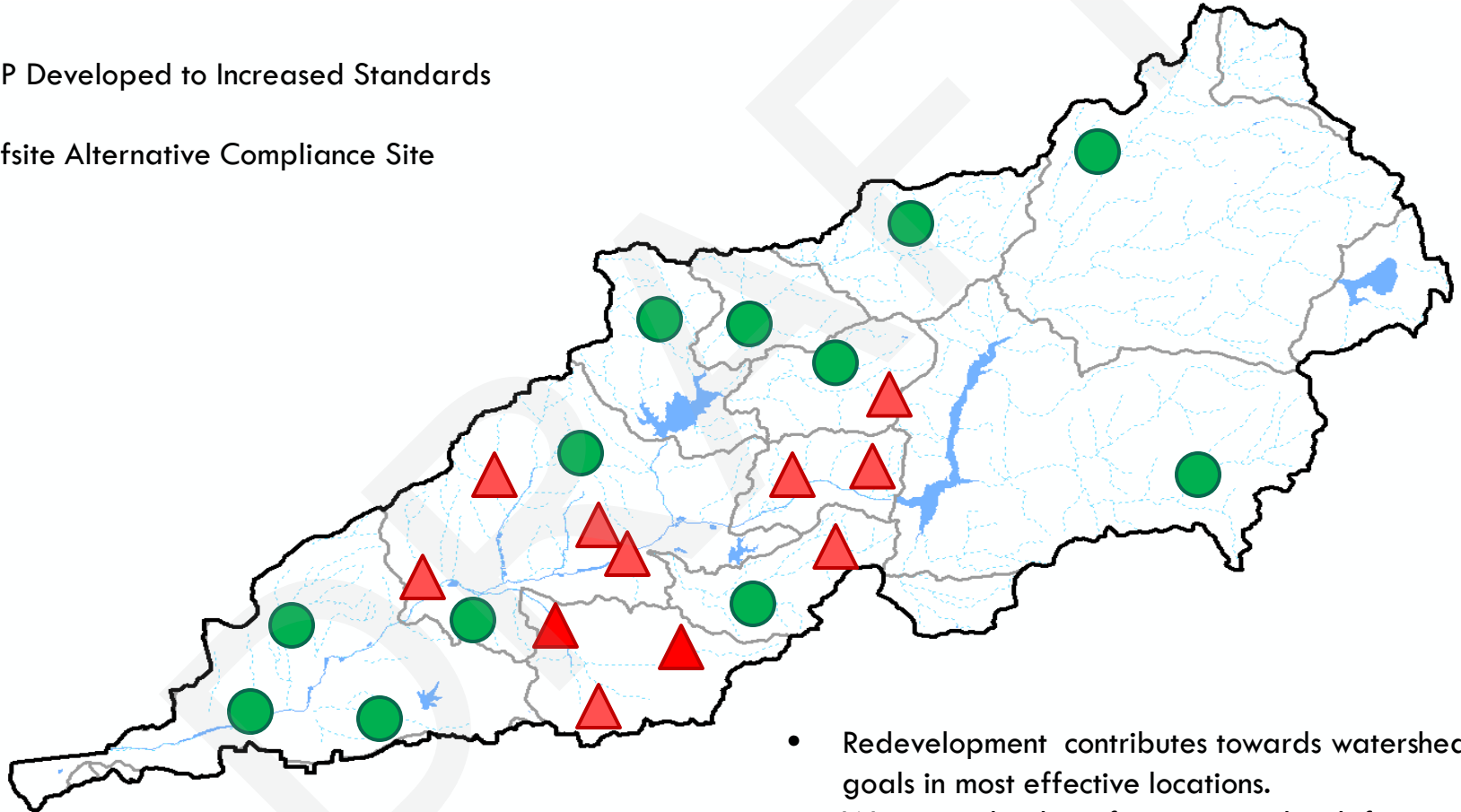
- Redevelopment contributes towards watershed goals, but is limited to PDP site locations.

Overview

Watershed with Alternative Compliance

▲ PDP Developed to Increased Standards

● Offsite Alternative Compliance Site

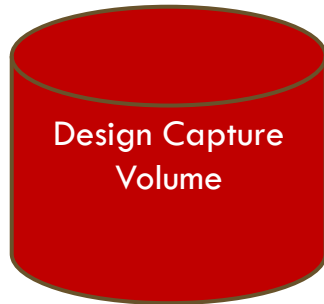


- Redevelopment contributes towards watershed goals in most effective locations.
- Water quality benefits preserved with fewer restrictions on PDPs.
- Water Quality Equivalency needed to relate all projects.

Note: Animation assumes credit system is in place.

Water Quality Equivalency: Pollutant Control Concept

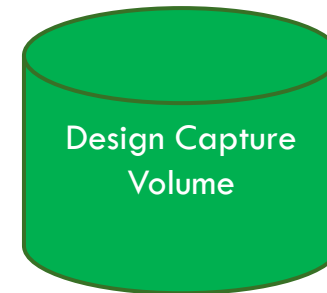
Priority Development Project (PDP)



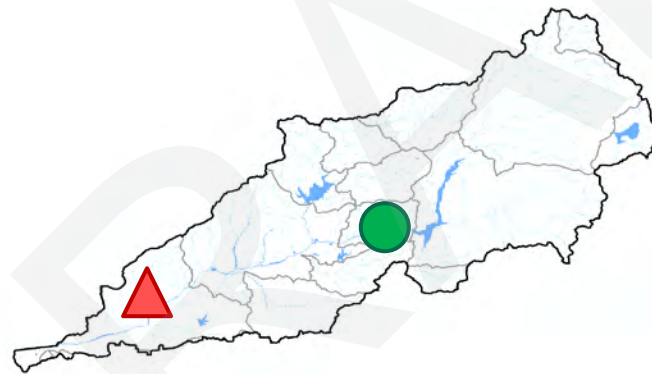
Subtract Volume
Retained/Biofiltered



Alternative Compliance Project (ACP)



Modify to account for variations in:
Tributary Land Uses (L)
Design Capture Volume (V)
BMP Type (B)



*Onsite flow-thru treatment of this volume must be provided prior to utilizing offsite alternative compliance.

Water Quality Equivalency: Pollutant Control Formula

$$V_E = L (\Delta V + V_2 B_2 - V_1 B_1)$$



1. Accounts for variation in **pollutant supply** between projects. (ACP Tributary vs Reference Tributary)
2. Accounts for change in ACP **imperviousness**.
3. Accounts for **proposed ACP BMP pollutant removal**.
4. Accounts for **existing ACP BMP pollutant removal**.

Variables
V_E : Earned Stormwater Pollutant Control Volume of ACP
L : Land Use Factor
ΔV : Change in ACP Design Capture Volume ($V_1 - V_2$)
V₁ : Impacted Condition Design Capture Volume at ACP
V₂ : Mitigated Condition Design Capture Volume at ACP
B₁ : Impacted Condition BMP Efficacy Factor
B₂ : Mitigated Condition BMP Efficacy Factor

Let's explore general application through a few conceptual examples.

Water Quality Equivalency: Pollutant Control Example 1

Impacted ACP Site
40,000 SF
Asphalt

$$L = 1.0 \text{ (assumed)}$$

$$V_1 = 2,000 \text{ ft}^3$$

$$\text{Area} = 40,000 \text{ ft}^2$$

$$\text{Runoff Coefficient} = 1.0$$

$$\text{Rainfall Depth} = 0.6''$$

$$B_1 = 0.0 \text{ (assume no existing BMPs)}$$

Mitigated ACP Site
40,000 SF
Pervious Pavers

$$L = n/a$$

$$V_2 = 200 \text{ ft}^3$$

$$\text{Area} = 40,000 \text{ ft}^2$$

$$\text{Runoff Coefficient} = 0.1$$

$$\text{Rainfall Depth} = 0.6''$$

$$B_2 = 1.0 \text{ (assumed)}$$

$$V_E = L (\Delta V + V_2 B_2 - V_1 B_1)$$

$$V_E = 1.0 (1800 + 200(1.0) - 2000(0))$$

$$V_E = 2,000 \text{ ft}^3$$

Water Quality Equivalency: Pollutant Control Example 2

Impacted ACP Site
40,000 SF
Asphalt

$$L = 1.0 \text{ (assumed)}$$

$$V_1 = 2,000 \text{ ft}^3$$

$$\text{Area} = 40,000 \text{ ft}^2$$

$$\text{Runoff Coefficient} = 1.0$$

$$\text{Rainfall Depth} = 0.6''$$

$$B_1 = 0.0 \text{ (assume no existing BMPs)}$$

Mitigated ACP Site
40,000 SF
Asphalt

$$L = n/a$$

$$V_2 = 2,000 \text{ ft}^3$$

$$\text{Area} = 40,000 \text{ ft}^2$$

$$\text{Runoff Coefficient} = 1.0$$

$$\text{Rainfall Depth} = 0.6''$$

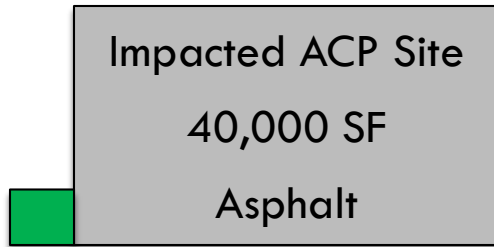
$$B_2 = 1.0 \text{ (assume BMP Factor of 1)}$$

$$V_E = L (\Delta V + V_2 B_2 - V_1 B_1)$$

$$V_E = 1.0 (0 + 2000(1.0) - 2000(0))$$

$$V_E = 2,000 \text{ ft}^3$$

Water Quality Equivalency: Pollutant Control Example 3



$$L = 1.0 \text{ (assumed)}$$

$$V_1 = 2,000 \text{ ft}^3$$

$$\text{Area} = 40,000 \text{ ft}^2$$

$$\text{Runoff Coefficient} = 1.0$$

$$\text{Rainfall Depth} = 0.6''$$

$$B_1 = 0.5 \text{ (assume undersized existing BMP)}$$



$$L = n/a$$

$$V_2 = 200 \text{ ft}^3$$

$$\text{Area} = 40,000 \text{ ft}^2$$

$$\text{Runoff Coefficient} = 0.1$$

$$\text{Rainfall Depth} = 0.6''$$

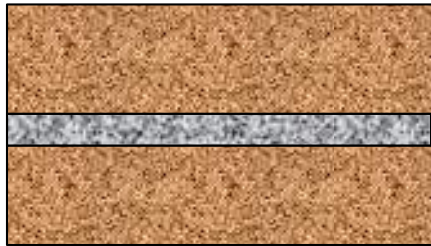
$$B_2 = 1.0 \text{ (assume BMP Factor of 1)}$$

$$V_E = L (\Delta V + V_2 B_2 - V_1 B_1)$$

$$V_E = 1.0 (1800 + 200(1.0) - 2000(0.5))$$

$$V_E = 1,000 \text{ ft}^3$$

Water Quality Equivalency: Pollutant Control Example 4



$$L = 1.0 \text{ (assumed)}$$

$$V_1 = 2,000 \text{ ft}^3$$

$$B_1 = 0.0 \text{ (assume no existing BMP)}$$



$$L = n/a$$

$$V_2 = 8,000 \text{ ft}^3$$

$$B_2 = 1.0 \text{ (assume BMP Factor of 1)}$$

$$V_E = L (\Delta V + V_2 B_2 - V_1 B_1)$$

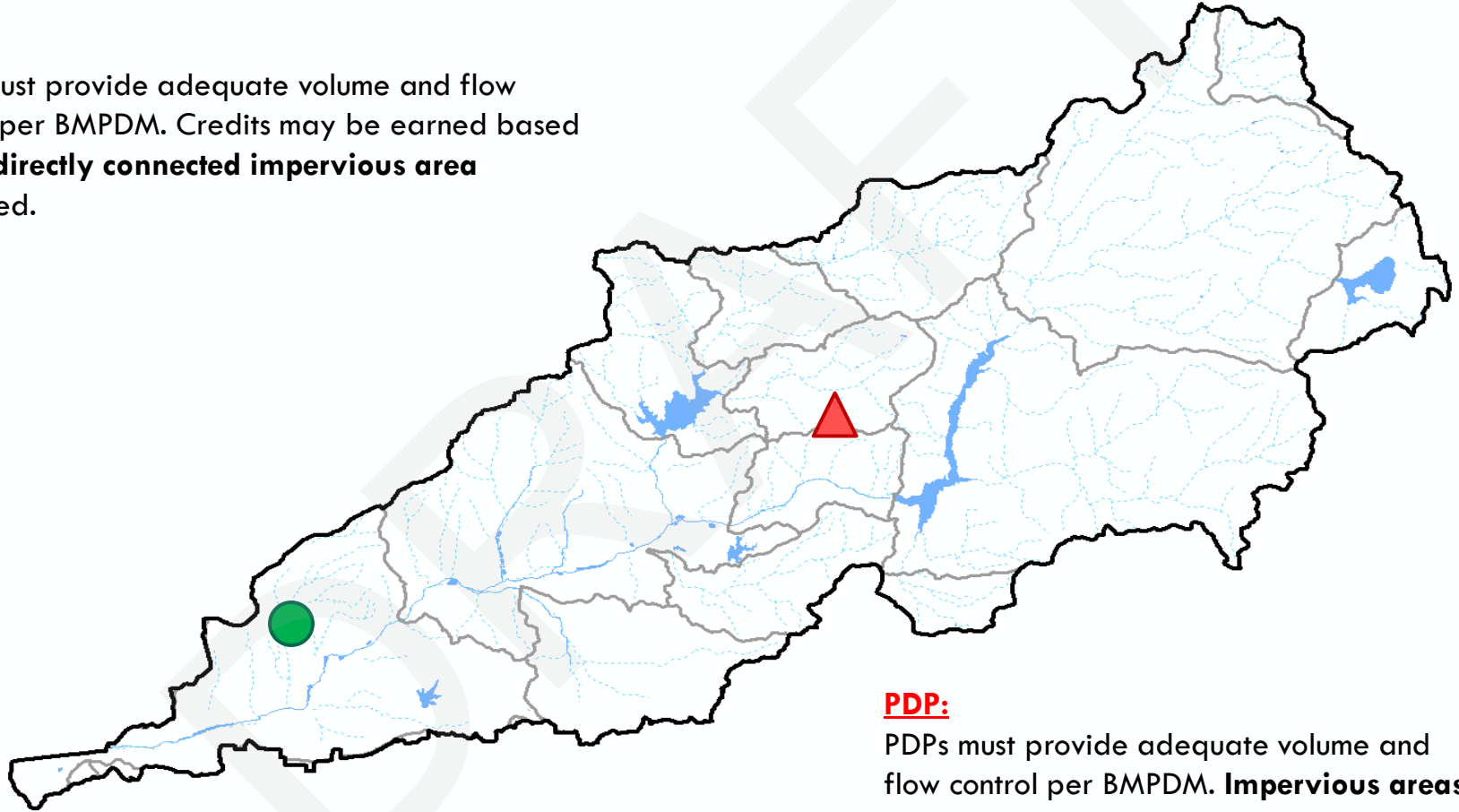
$$V_E = 1.0 (-6000 + 8000(1.0) - 2000(0.0))$$

$$V_E = 2,000 \text{ ft}^3$$

Hydromodification Flow Control Equivalency: Currency

ACP:

ACPs must provide adequate volume and flow control per BMPDM. Credits may be earned based on the **directly connected impervious area** managed.



PDP:

PDPs must provide adequate volume and flow control per BMPDM. **Impervious areas** not managed may be mitigated offsite.

Hydromodification Flow Control Equivalency: Currency

PDP:

PDPs must provide adequate volume and flow control per BMPDM. **Impervious areas** not managed may be mitigated offsite.



ACP:

ACPs must provide adequate volume and flow control per BMPDM. Credits may be earned based on the **directly connected impervious area** managed.



Note: Illustration depicts how credit generation will be determined and does not revise current HMP sizing criteria set forth in the BMPDM.

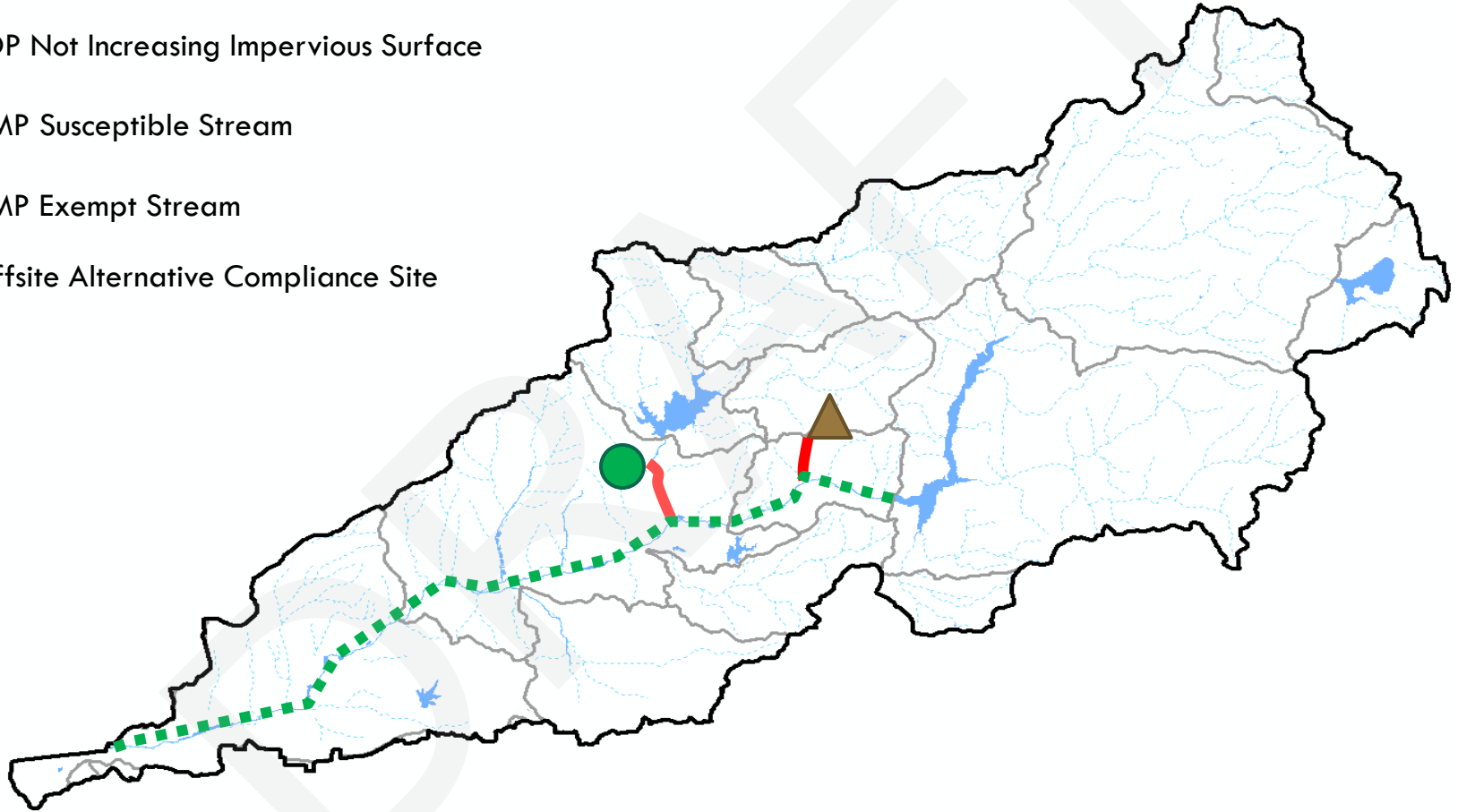
Hydromodification Flow Control Equivalency: Location Limitations Example 1

 PDP Not Increasing Impervious Surface





 HMP Susceptible Stream

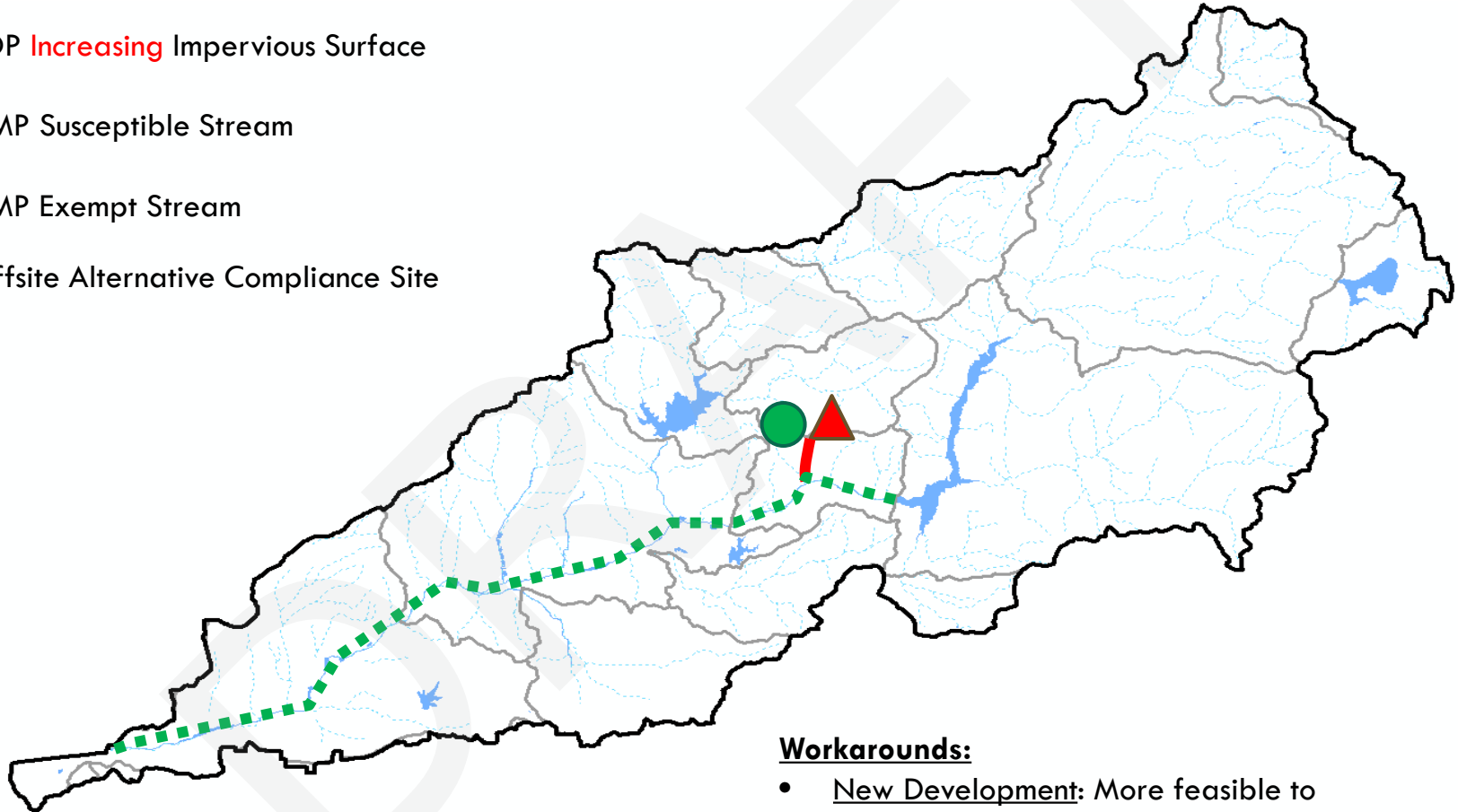
 HMP Exempt Stream

 Offsite Alternative Compliance Site



Hydromodification Flow Control Equivalency: Location Limitations Example 2

-  PDP **Increasing** Impervious Surface
-  HMP Susceptible Stream
-  HMP Exempt Stream
-  Offsite Alternative Compliance Site



Workarounds:

- New Development: More feasible to provide onsite HMP controls
- Redevelopment: Design such that net impervious area does not increase

THANK YOU

WATER QUALITY EQUIVALENCY
FMA OVERVIEW

June 18th, 2015