



San Diego Region Stormwater Capture & Use Feasibility Study (SWCFS)

Results of Modeling Approach
Presented to IRWM RAC
February 7, 2018

Presented by County of San Diego and ESA

Agenda

1. Modeling Results Presentation
2. Questions / Comments from TAC
3. Next Steps



Quantification Analysis: Results

- Lower volumes than original estimate in Storm Water Resource Plan (SWRP)
- Applies more screening criteria to the public parcels
 - Developed by TAC & example projects
 - (211 parcels compared to 1,207)
- Refined wastewater treatment alternative, input from facility operators
 - Lower discharge rate by an order of magnitude

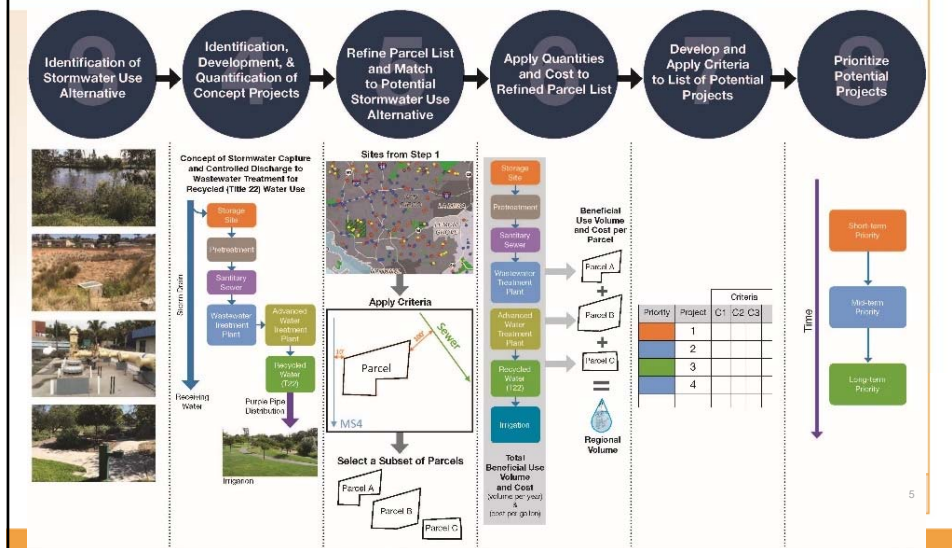


Quantification Analysis: Results






- Wide range of estimated regional volumes
- Range can inform the analysis: Provides basis to assess alternatives for regional & jurisdictional planning
- San Diego has greater number of constraints
 - Greater sensitivity to the screening criteria applied to the parcels
- Results will inform prioritization process



Analysis Approach: Steps 3-6



Stormwater Use Alternatives: Step 3

	Stormwater Use Alternatives
	A Infiltration to groundwater aquifers for potable use
	B Infiltration to groundwater to reestablish natural hydrology
	C Irrigation for parks, golf courses, or recreational areas
	D Small scale on-site use for irrigation and other private use
	E Flow-through for wetland treatment and/or restoration sites
	F Discharge to WWTP for solids management
	G Discharge to WWTP for indirect potable use
	H Discharge to WWTP for recycled water use

Example Projects: Step 4

- 19 Example Projects
- 8 Use Alternatives
- Used to inform calculation of stormwater volumes
- Constraints & opportunities developed by the TAC
 - Assess example projects' "gates" and "keys"



7

Constraints & Opportunities (TAC#2)

Constraints "Gates"

- | | |
|---------------------------------------|--|
| ▪ Site characteristics | ▪ Technology, water type incompatibility |
| ▪ Match production with demand / need | ▪ Regulatory ambiguity |
| ▪ Absence of existing infrastructure | ▪ Capital and O&M costs |
| ▪ Agency agreements | ▪ Funding |
| | ▪ Public/agency support |

8

Refine Parcel List: Step 5

Apply constraints (TAC #2) to develop “feasibility” screening criteria:

- Site characteristics
- Match production with demand/need
- Existing infrastructure
 - Size and location of MS4
 - Size and location of sanitary sewer
 - Capacity of treatment facility

9

Refined Parcel Analysis: Step 5

Use Alternative	Screening Criteria Applied to Public Parcels
Applied to all parcels	<ul style="list-style-type: none"> • > 1 acre • Portion of the site <15% slope
Alternative A (Infiltration to groundwater, potable use)	<ul style="list-style-type: none"> • Major MS4 outfall (>36" diameter) located within parcel • Soil infiltration grade of A, A/D, B, or C • Within a mile of a groundwater basin that is used for potable water supply
Alternative B (Infiltration to groundwater, natural hydrology)	<ul style="list-style-type: none"> • Major MS4 outfall (>36" diameter) located within parcel
Alternative C (Irrigation)	<ul style="list-style-type: none"> • Major MS4 outfall (>36" diameter) located within parcel • Within 1/4 mile of a park, golf course, or recreational area¹⁰

Refined Parcel Analysis: Step 5

Use Alternative	Screening Criteria Applied to Public Parcels
Alternative E (Restoration and wetland treatment)	<ul style="list-style-type: none"> Major MS4 outfall (>36" diameter) located within parcel Within 200 feet of an estuary or waterway, OR Within 1/4 mile of a park, golf course, or recreational area
Alternative F-H (Diversion to WWTP)	<ul style="list-style-type: none"> Major MS4 outfall (>36" diameter) located within parcel Within 200 feet of sewer lines for a feasible WWTP

Dark Shaded Cells: Sensitivity Analysis performed

Refined Parcel Analysis Results

Stormwater Use Alternative	Site characteristics > 1 acre and portion of site <15 % slope	Site location Demand for use	Site characteristics Poor soil infiltration	Absence of infra-structure No MS4 >=36"	Absence of infra-structure No plant capacity	Site location Infeasible parcels	Total feasible parcels
A – Infiltration to groundwater basin	2,395	-60	-2,244	-51	n/a	-11	29
B – Infiltration for hydrology	2,395	n/a	n/a	-2,276	n/a	-31	88
C – Irrigation	2,395	-1,516	n/a	-786	n/a	-32	61
E – Use for treatment wetland	2,395	-851	n/a	-1,431	n/a	-13	100
F-H – Wastewater treatment	2,395	-1,207	n/a	n/a	-1,063	-2	123

Range of Parcel Analysis Results		
Stormwater Use Alternative	Total Feasible Parcels based on Original Analysis	Total Feasible Parcels based on Sensitivity Analysis
	Low End of Range	High End of Range
A – Infiltration to Groundwater Basin	29	48
A – Injection to Groundwater Basin	9	108
B – Infiltration for Hydrology	88	617
C – Irrigation	61	255
E – Use for Treatment Wetland	100	532
F-H – Wastewater Treatment	123	1,140
Total Uses	410	2,700¹³
Total Parcels	211	977

Quantification Analysis: Step 6

- Develop volumes for each alternative use
- Applied range of parcels from Step 5
 - Low and high parcel count
- Assumptions based on following constraints:
 - Site characteristics
 - Match production with demand/need
 - Absence of existing infrastructure
 - Technology - water type incompatibility
 - Regulatory ambiguity

Quantification Sensitivity

- Tested assumptions on soil infiltration rates (Site characteristics)
 - Alternative A & B, Infiltration – volumes could vary by 55%
- Tested assumptions on time of use after storm (Match production with demand/need)
 - Alternative C, Irrigation – >7 days resulted in little usage
- Tested assumptions on discharge rate (Technology-water type incompatibility)
 - Alternatives F-H, WWTP

15

Quantification Analysis: Step 6

Range of Potential Regional Stormwater Capture & Use

	Total Volume (ac-ft/yr)
Alternative A – to groundwater basin	
Infiltration basins	330 – 430
Injection wells	480 – 5,700
Alternative B – infiltration for hydrology	530 – 3,700
Alternative C – irrigation	260 – 1,100
Alternative D – irrigation for private use	10 – 50
Alternative E – use for treatment wetlands	680 – 3,600
Alternative F-H – wastewater treatment	810 – 7,400
Total: (multiple alts per parcel)	3,100 – 22,000
Total: (Single alt per parcel)	2,200 – 9,400

16

TAC Questions and Comments

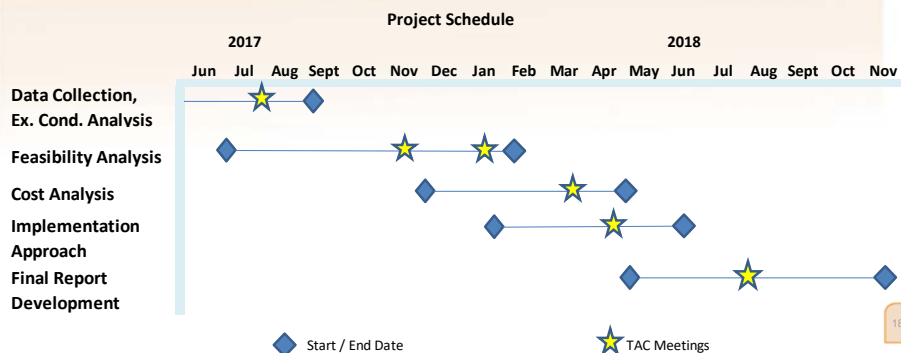
- Best alternative to use on parcels?
- Are parcels equal, how are they 'ranked'?
- How were parcels w/o adjacent MS4 handled?
- Were storage volumes 'capped' based on certain timeframes?
- Compared to regional need, the volume of potential stormwater capture is small.

17

Next Steps

- Comments due: COB February 16, 2018

<http://www.projectcleanwater.org/stormwater-capture-and-use-feasibility-study/>



18

Thank you!



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