



The Protection of Highly Valued Water Resources Impacted by Groundwater-Surface Water Interconnections Through Maximized Recycled Water Reuse

11 August 2015



Project Location



Surfrider Beach

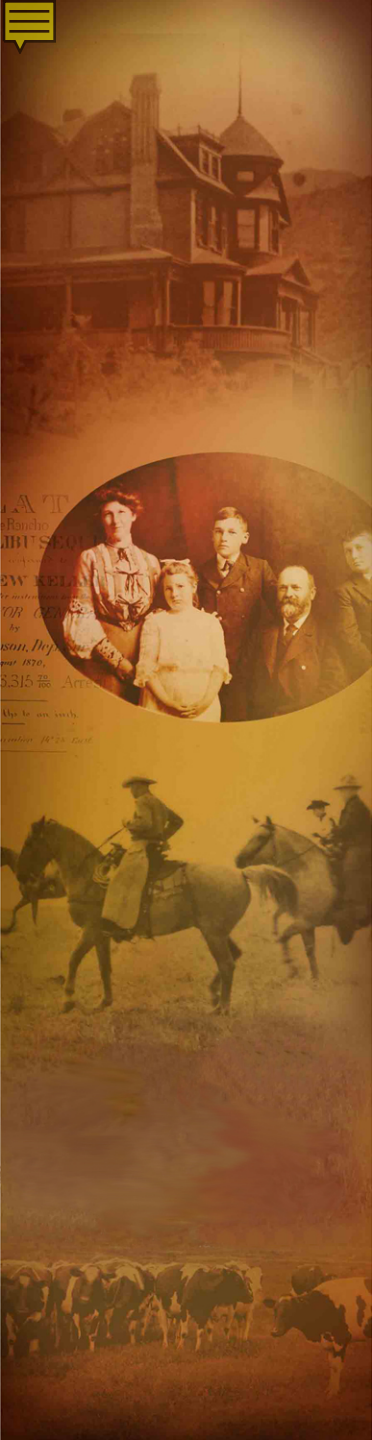


Malibu Lagoon



RWQCB Requirements Force Project Development

- 2009 – LA RWQCB prohibits septic tank systems and discharges in Malibu Civic Center Area
- 2010 – SWRCB establishes schedule for compliance
- 2011 – City of Malibu and LA RWQCB sign MOU defining Prohibition Zone, and schedule for compliance
- 2014 – MOU updated to reflect current project schedule
- March 2015 LA RWQCB approves WDR/WRR for project



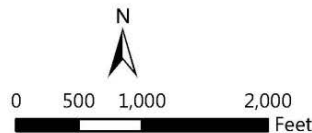
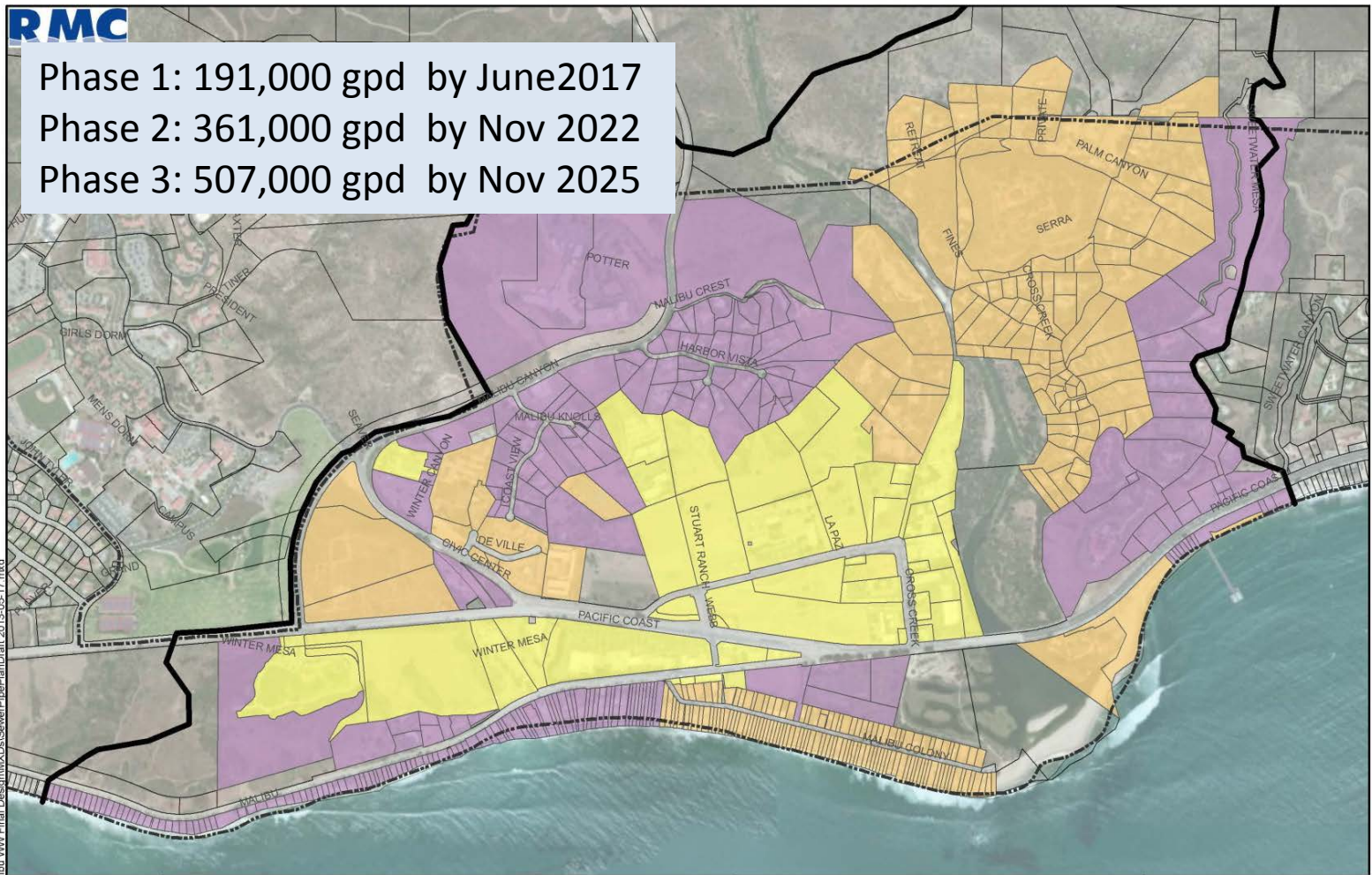


What are Goals of the CCWTF Project?

- Meet the environmental requirements of RWQCB Prohibition
 - Protect water quality in Lagoon and beaches
 - Protect groundwater quality in Malibu Valley Groundwater Basin
 - Protect public health
 - Meet deadlines of RWQCB
- Provide a solution that is acceptable to community and NGOs
 - Protect public health
 - Maximize water reuse
 - No ocean outfall

CCWTF Project Phasing

Phase 1: 191,000 gpd by June 2017
Phase 2: 361,000 gpd by Nov 2022
Phase 3: 507,000 gpd by Nov 2025

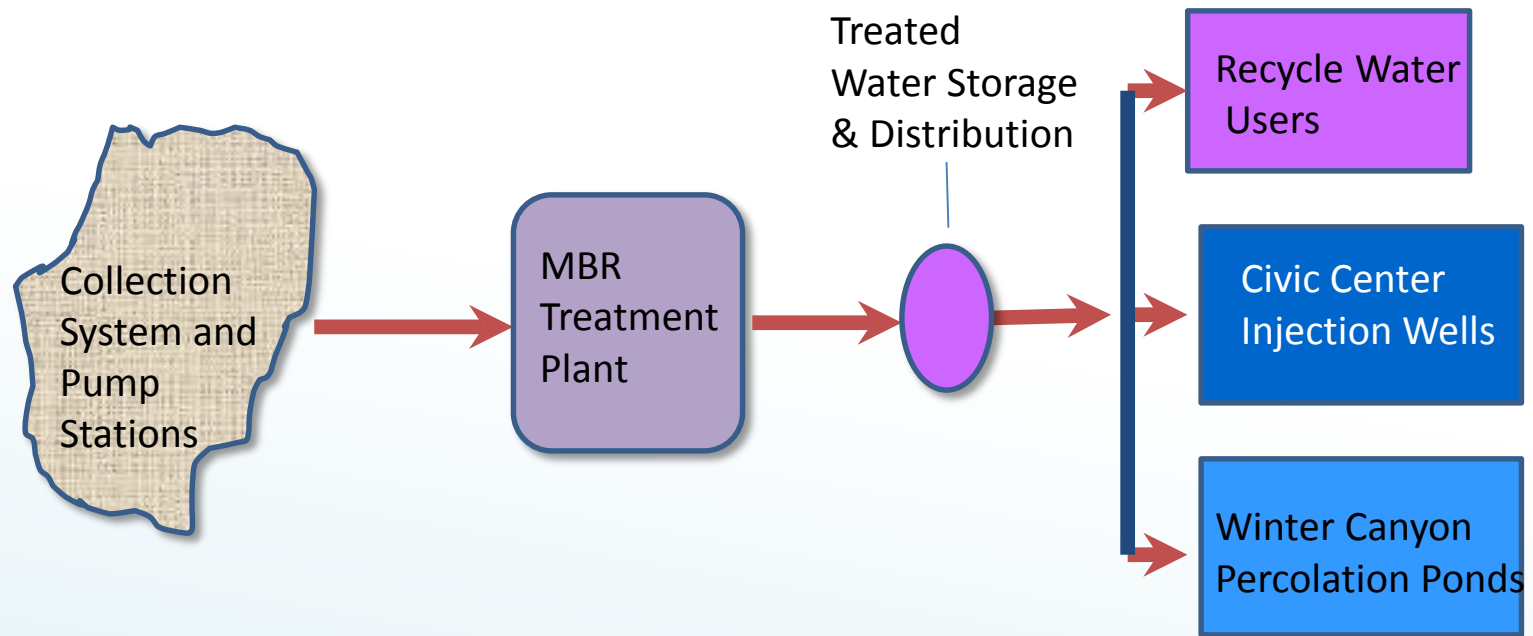


Prohibition Boundary	RWQCB Phase
Malibu City Boundary	Phase 1
	Phase 2
	Phase 3

**City of Malibu
Prohibition Area**

1/6/2014

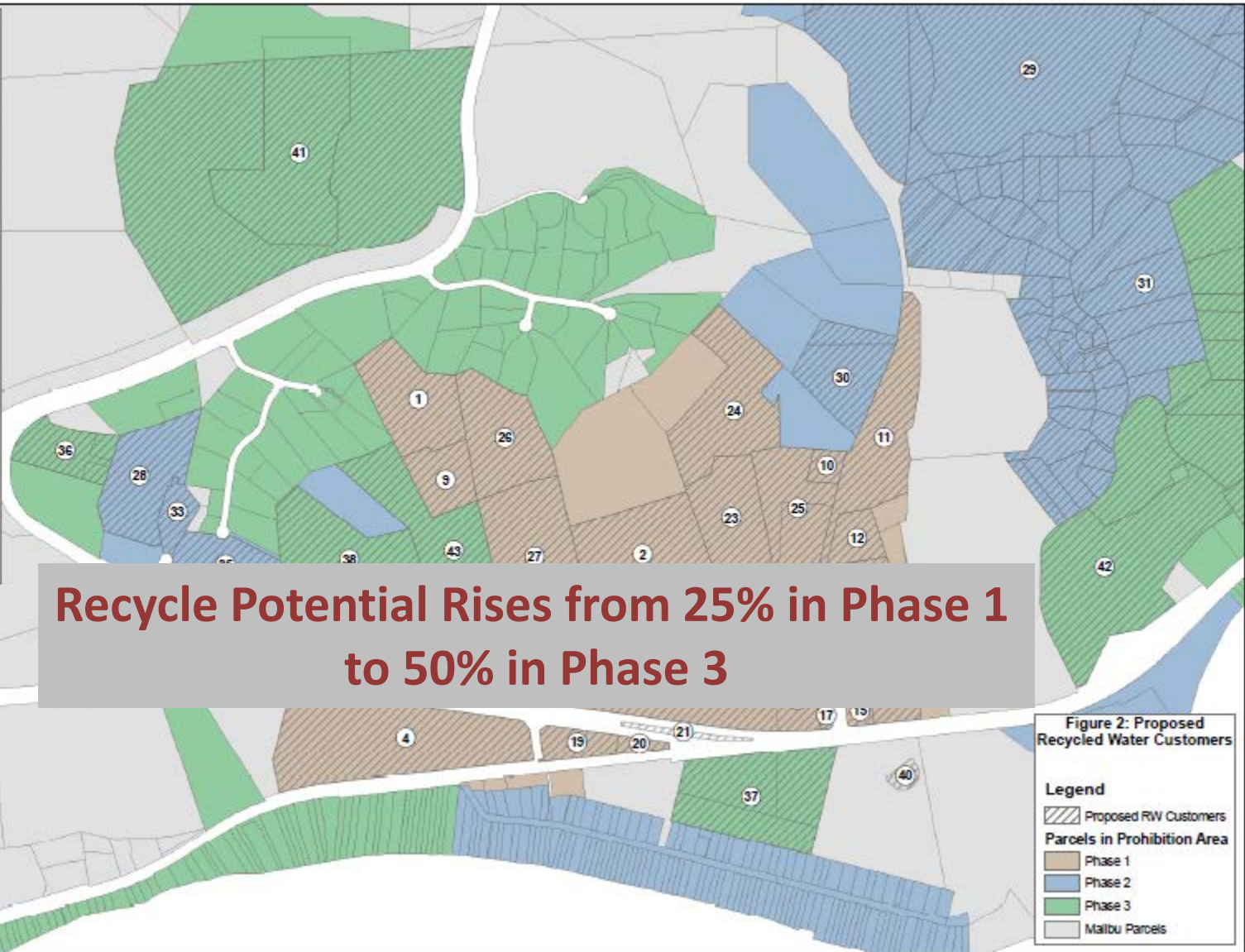
General Project Components



Water Recycling is First Priority Use of Effluent

Reuse Potential Assessed for Every Parcel

Customer No.	RW Tier	Development Name
1	A	Malibu City Hall
2	A	County Offices
3	A	Malibu Country Mart
4	A	Malibu Country Mart
5	A	Professional Arts Building
6	A	J&P Limited
7	A	Drug Store
8	A	Malibu Legacy Park
9	A	Mineral Properties
10	A	GRS Bldg.
11	A	Stone/Masonry Yard
12	A	Newcom Yard
13	A	SoCal Edison
14	A	Malibu Creek Plaza
15	A	Shell Station
16	A	Malibu Lumber Yard
17	A	Prudential Realty
18	A	Malibu Colony Plaza
19	A	Post Office
20	A	Former Gas Station
21	A	PCH Landscaping
22	A	Cross Creek Road Landscaping
23	B	La Paz Ranch - Parcel A
24	B	La Paz Ranch - Parcel B
25	B	Proposed Whole Foods
26	B	Vicent - Upper Yamaguchi
27	B	Vicent - lot
28	B	Wilster Elementary School
29	B	Serra Retreat
30	B	Sycamore Farms Polo Fields
31	B	Serra Area Homes
32	B	Malibu Canyon Village HOA
33	B	Vida Pacific HOA
34	B	Melton DeVille HOA
35	B	Towsons
36	C	Our Lady of Malibu Church/School
37	C	Pewencho Golf Course
38	C	Allied Nursery
39	C	Malibu Bluffs Park
40	C	Overlook
41	C	Hughes Research Lab
42	C	Serra Area Homes
43	C	Vicent - Lower Yamaguchi
44	C	Vicent - Island



Recycle Potential Rises from 25% in Phase 1 to 50% in Phase 3



CCWTF Project through Phase 3





Project Maximizes Reuse Potential

- High quality effluent
 - Groundwater injection requires:
 - MBR treatment
 - Chlorine residual to prevent biofouling
 - Protection of groundwater requires denitrification (< 8 mg/l)
- Recycled water distribution system parallels wastewater collection system
 - All properties will have access to Title 22 water
- Recycled water mains in same trench as sewers
 - DDW approval minimizes cost of dual system

Treatment Plant Will Be Covered and Fully Landscaped



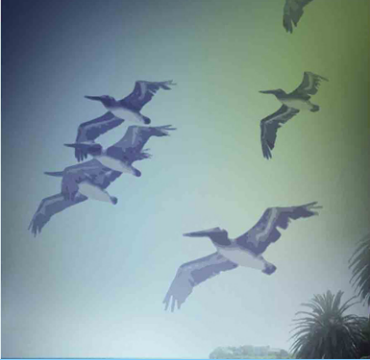
Existing Site Conditions





Site Perspective – 5 yrs post-construction

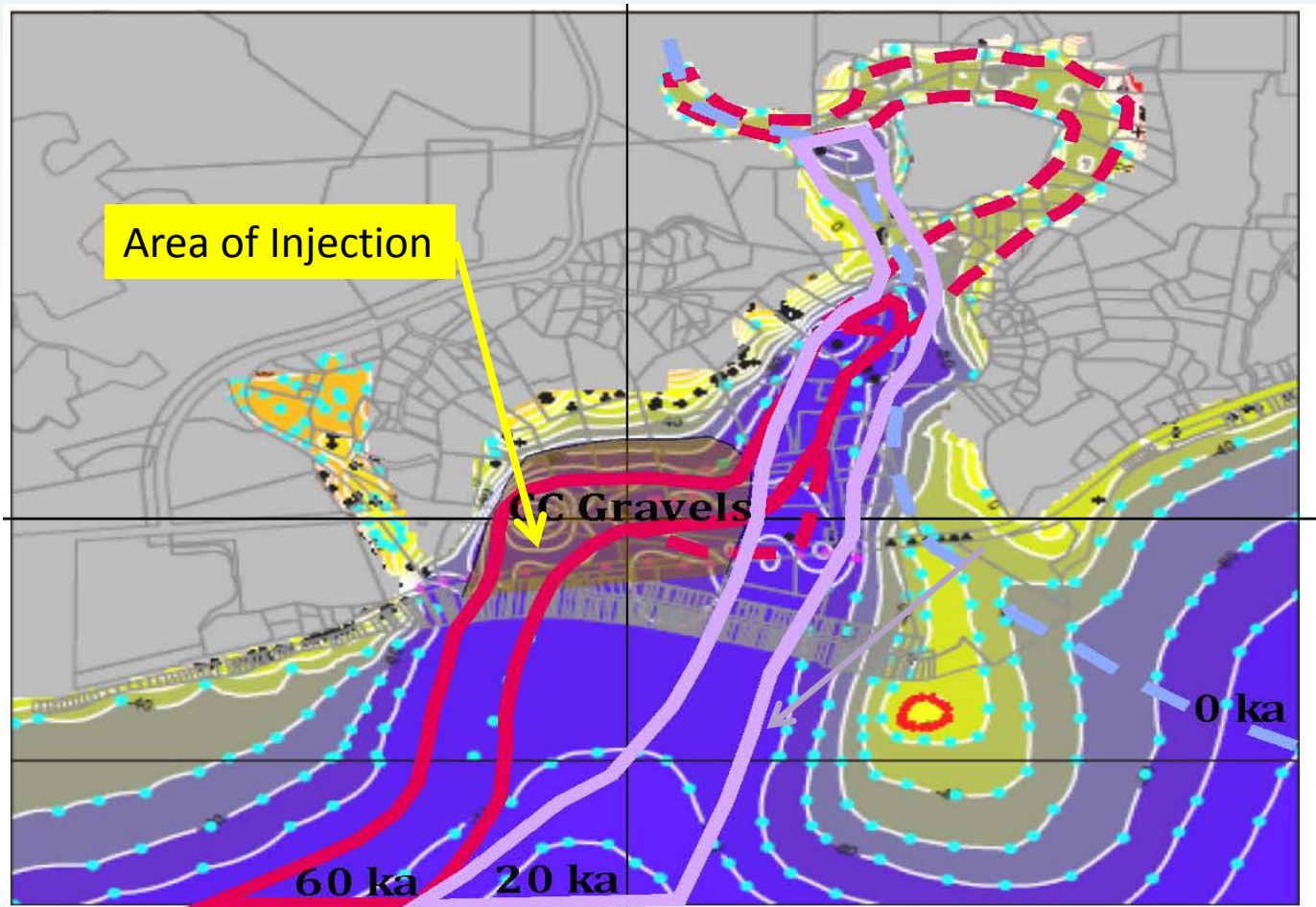




Site Perspective After Landscaping Matures



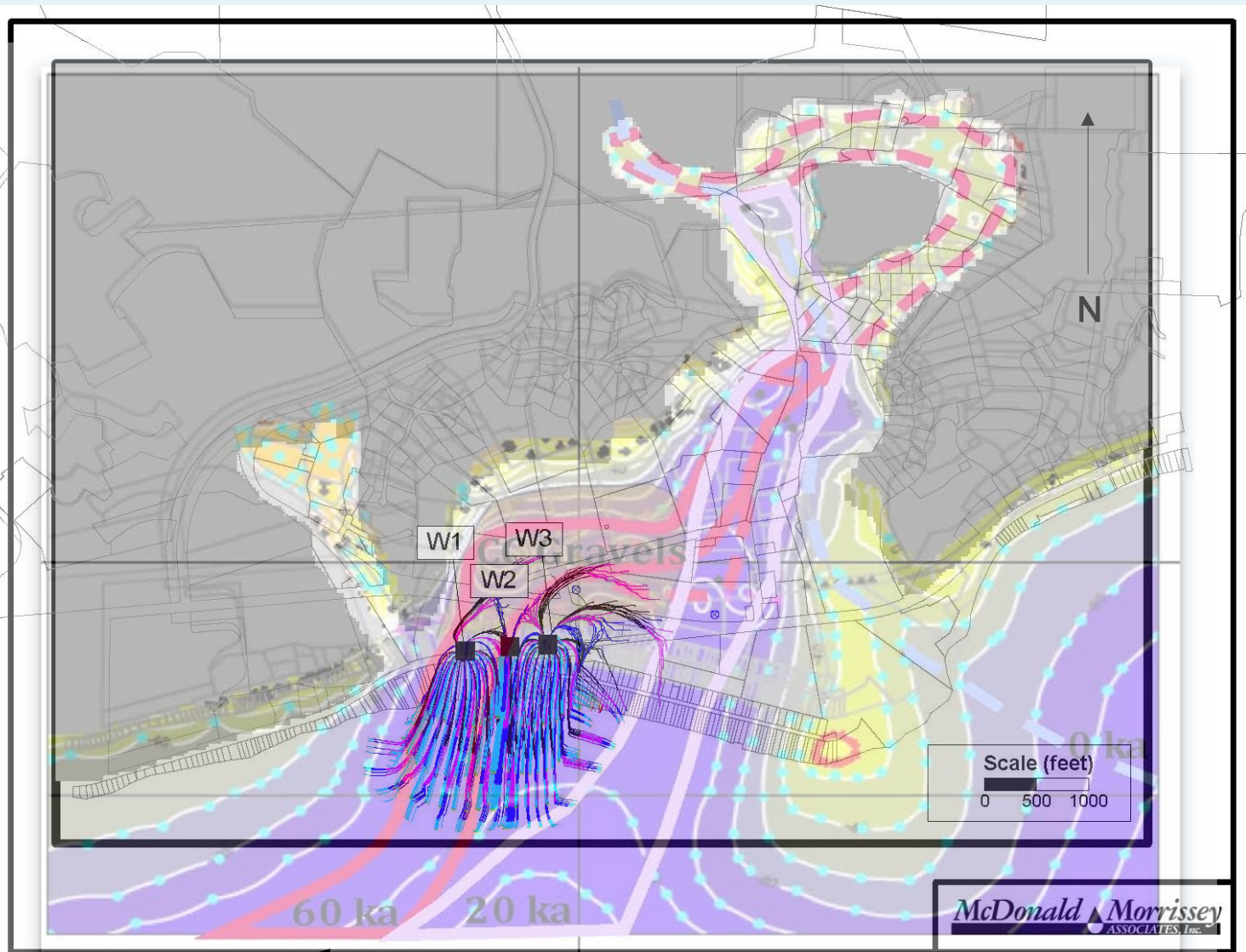
Water Injection will be in Buried Stream Bed



Malibu Creek
60,000 yrs ago

Malibu Creek
20,000 yrs ago

Phase 3 – No Flow to Lagoon

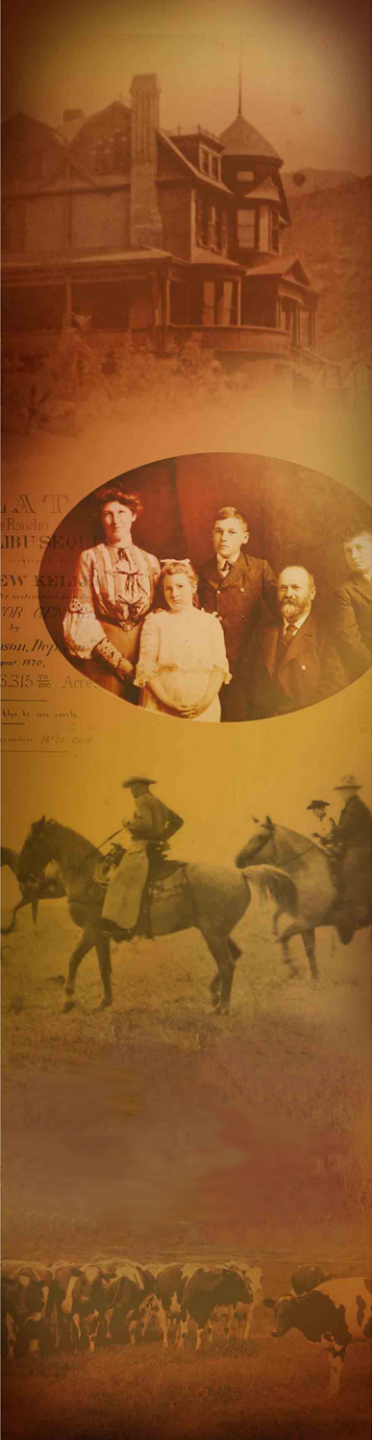


60,000 yr old channel 20,000 yr old channel



Groundwater Model Indicates Lagoon will be Protected

- Calibrated to data from hydraulic testing of aquifer
- Groundwater basin has sufficient injection capacity for all project phases
- Project will not adversely impact groundwater levels
 - Lowered in most areas
 - Raised 2 to 3 inches in selected areas





Project Summary

- Will protect Malibu Lagoon, beaches, and Malibu Valley Groundwater Basin
- Treatment needed for injection provides very high quality water for recycling
- Inability to use ocean outfall resulted in project with high level of recycle potential
 - 25% at project start
 - 50% at build out conditions



And now onto Legacy Park...

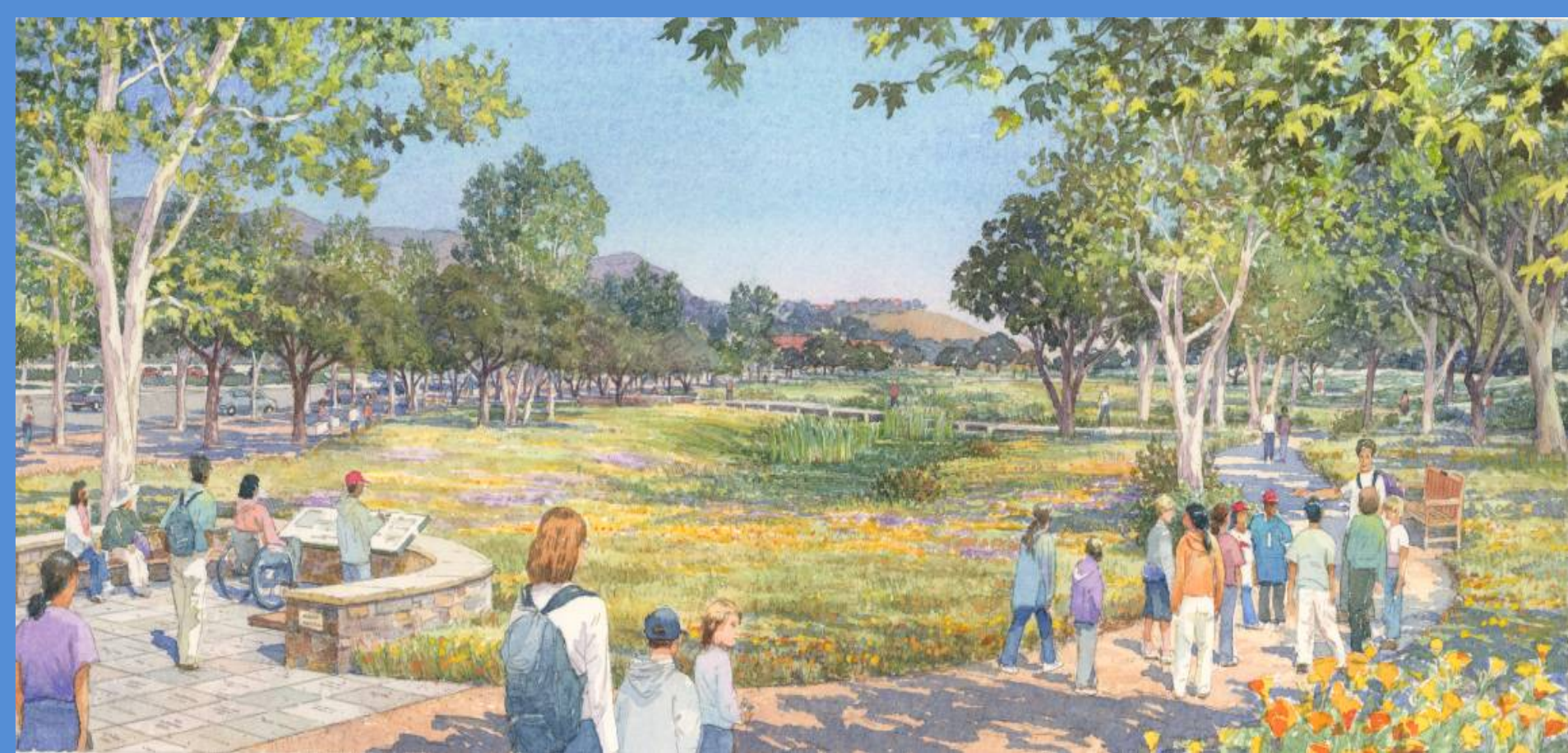
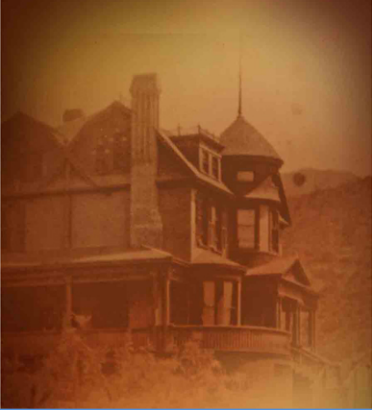
Approach: Manage Runoff from 337 Acres to Meet TMDL, and...



Location	Total Coliform	Fecal Coliform	E. Coli	Enterococcus
Marine Waters (Malibu Ck + Lagoon TMDL) (Santa Monica Bay TMDL)	1000	200	---	35
Fresh Waters (Malibu Ck + Lagoon TMDL)	---	200	126	---



... Create a Community and Environmental Asset





Stormwater Components, Project Operation





Long-term Flow Simulation Used to Size Facilities

- Continuous flow analysis
 - Spanning 57 yrs
 - 762 storms analyzed
- Optimized 'dual' use of detention volume
 - 4 AF to comply with stormwater TMDL
 - 100% of years
 - 4 AF for irrigation storage

Project Meets Stormwater TMDL Requirements

Location	Total Coliform	Fecal Coliform	E. Coli	Enterococcus
Marine Waters (Malibu Ck + Lagoon TMDL) (Santa Monica Bay TMDL)	1000	200	---	35
Fresh Waters (Malibu Ck + Lagoon TMDL)	---	200	126	---
Performance of SWTF	800	---	15	12

Note: All TMDL values, 30-day mean MPN

These values may be exceeded:

3 days during winter dry weather

17 days during winter wet weather

Park Features: Forebay For Sediment Capture



Park Features: 8 AF Detention Pond



Park Features: Six Endangered Habitats



Park Features: Educational Elements



Park Features: Outdoor Classroom



Park Features: 1.5 Miles of Pathways, Lookouts





Project Generated Significant Grants and Donations

- \$ 4M – SWRCB/SMBRC
- \$ 4M - Regional Grants
- \$ 2M – Annenberg Foundation
- \$ 1M – SMBRC/SCC
- \$ 1M – Los Angeles County
- \$ 0.7 M – Private Donors
- \$ 0.5 M – CIWMB



Total Design & Construction Cost: \$16 million

Questions?

Leslie Dumas
RMC Water and Environment
Ldumas@rmcwater.com



Groundwater Model Predicts Injection Capacity

- Calibrated to measured data
- Predicts:
 - Impacts on groundwater elevations
 - Direction and speed of groundwater flow
 - Maximum injection rates

Phase 2 would Allow Removal of these Facilities



Open treatment tanks

Open
treatment
facilities





Project Includes Measures to Protect Neighborhood Quality

- Site will be fully landscaped
- Will remove two existing antiquated plants
- Will be less visible than two existing plants
- Architectural treatment to all buildings
- Full odor scrubbing will be provided
- All equipment within buildings
 - Noisy equipment within sound deadening enclosures, and inside buildings

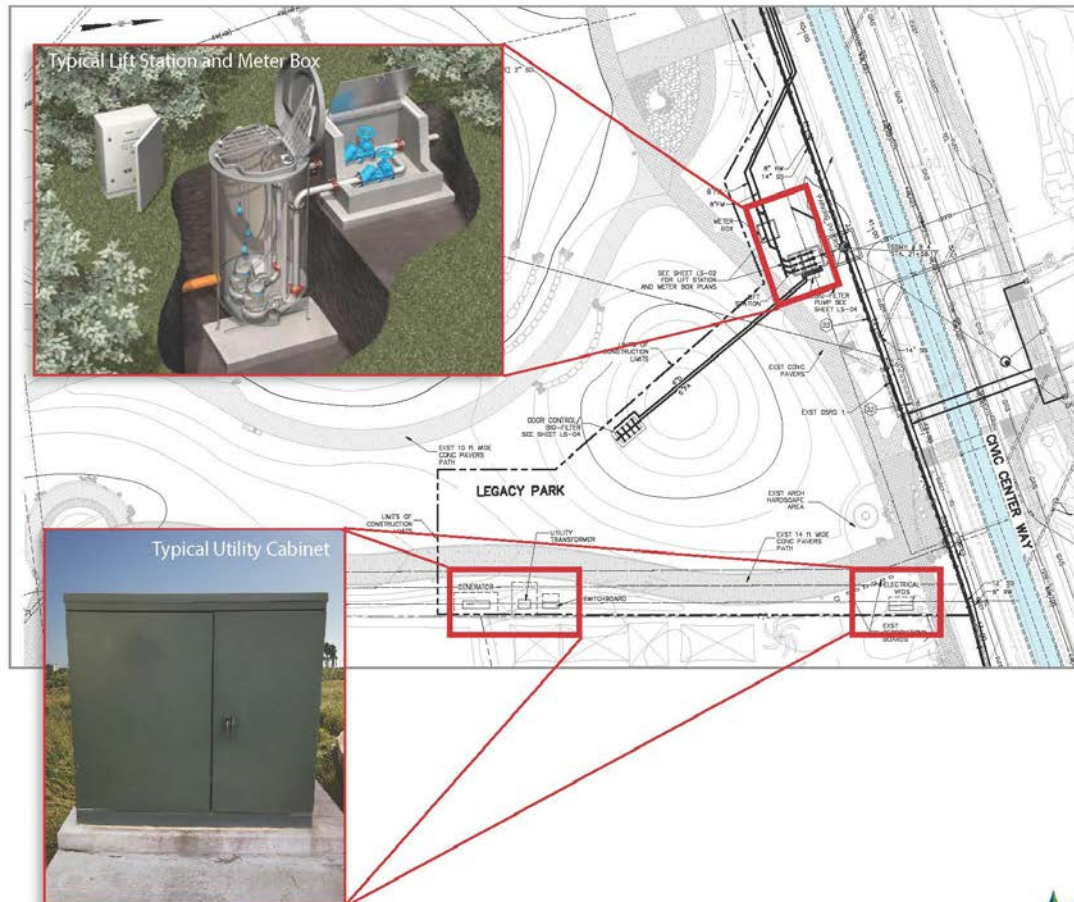


Winter Canyon Percolation Modeling Results

- Can percolate 50,000 gpd in Phase 1
- Can percolate 100,000 gpd in Phase 2
- Provides backup to injection capacity

Collection System Pump Station – Legacy Park

Malibu Legacy Park - Typical Pump Station Site Plan



Collection System Pump Station – Bluffs Park

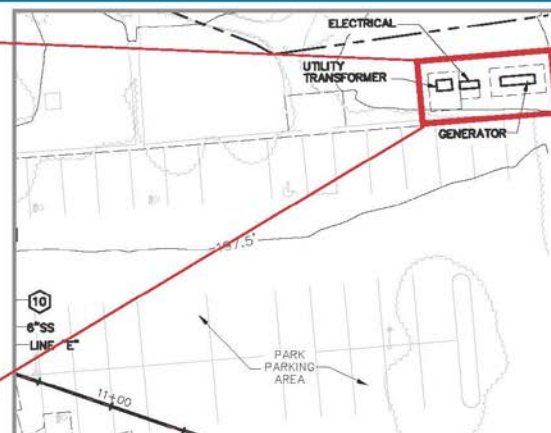


Collection System Pump Station – Bluffs Park

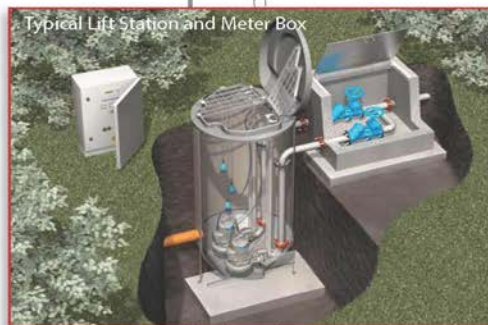
Bluffs Park - Typical Pump Station Site Plan



Typical Utility Cabinet



Typical Lift Station and Meter Box



Preliminary Injection Well Design – Malibu Rd

Existing Site Conditions

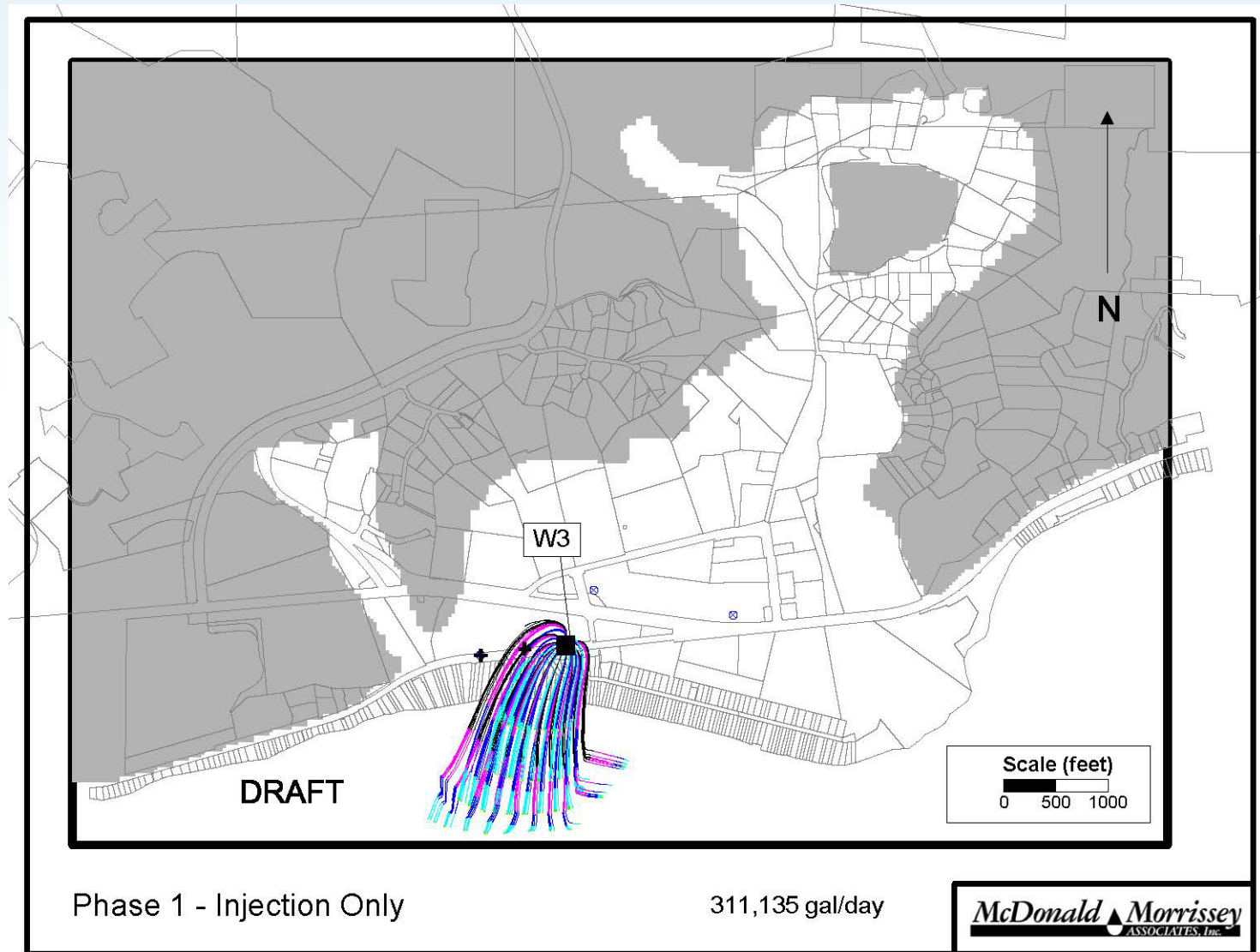


Example Well Enclosure

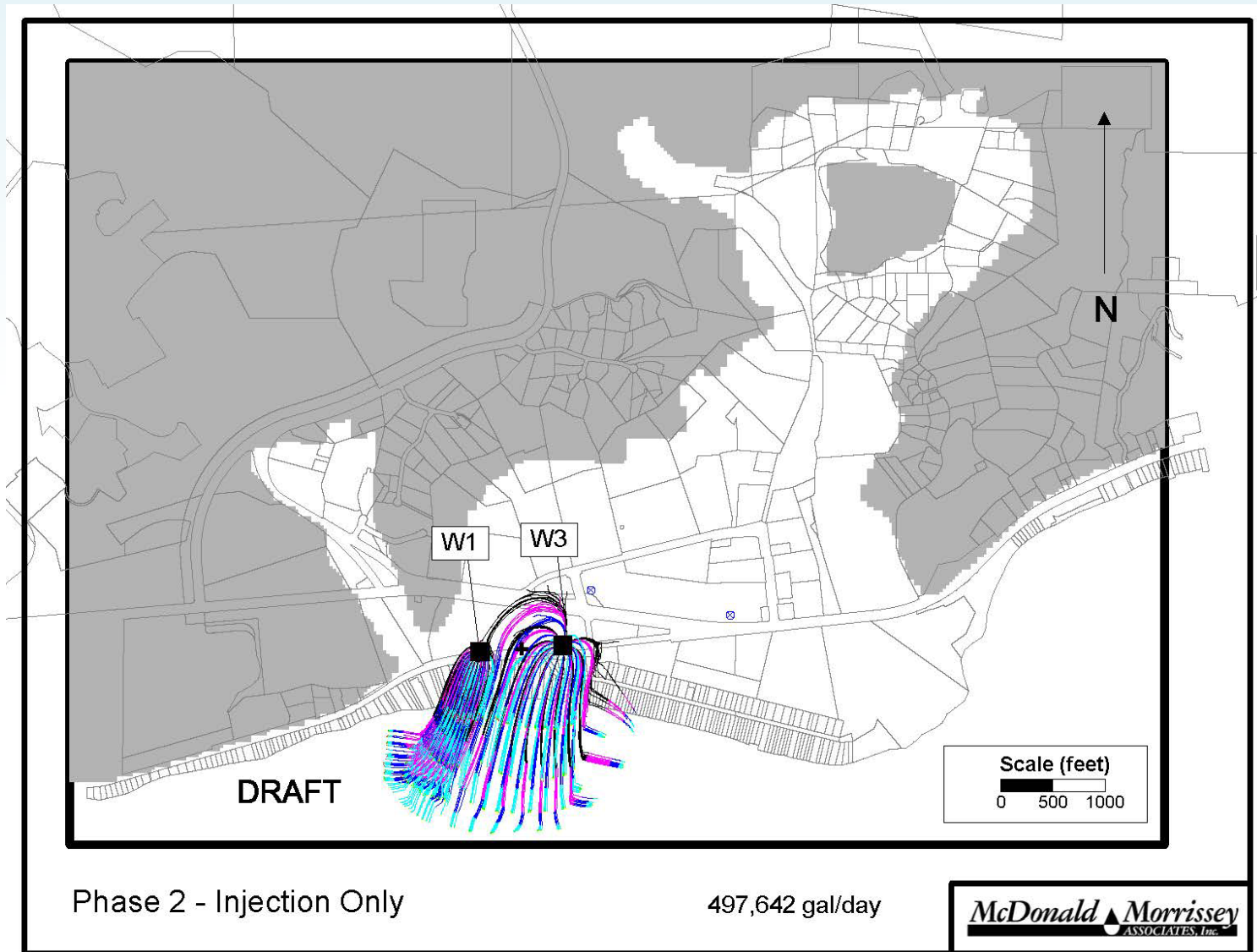




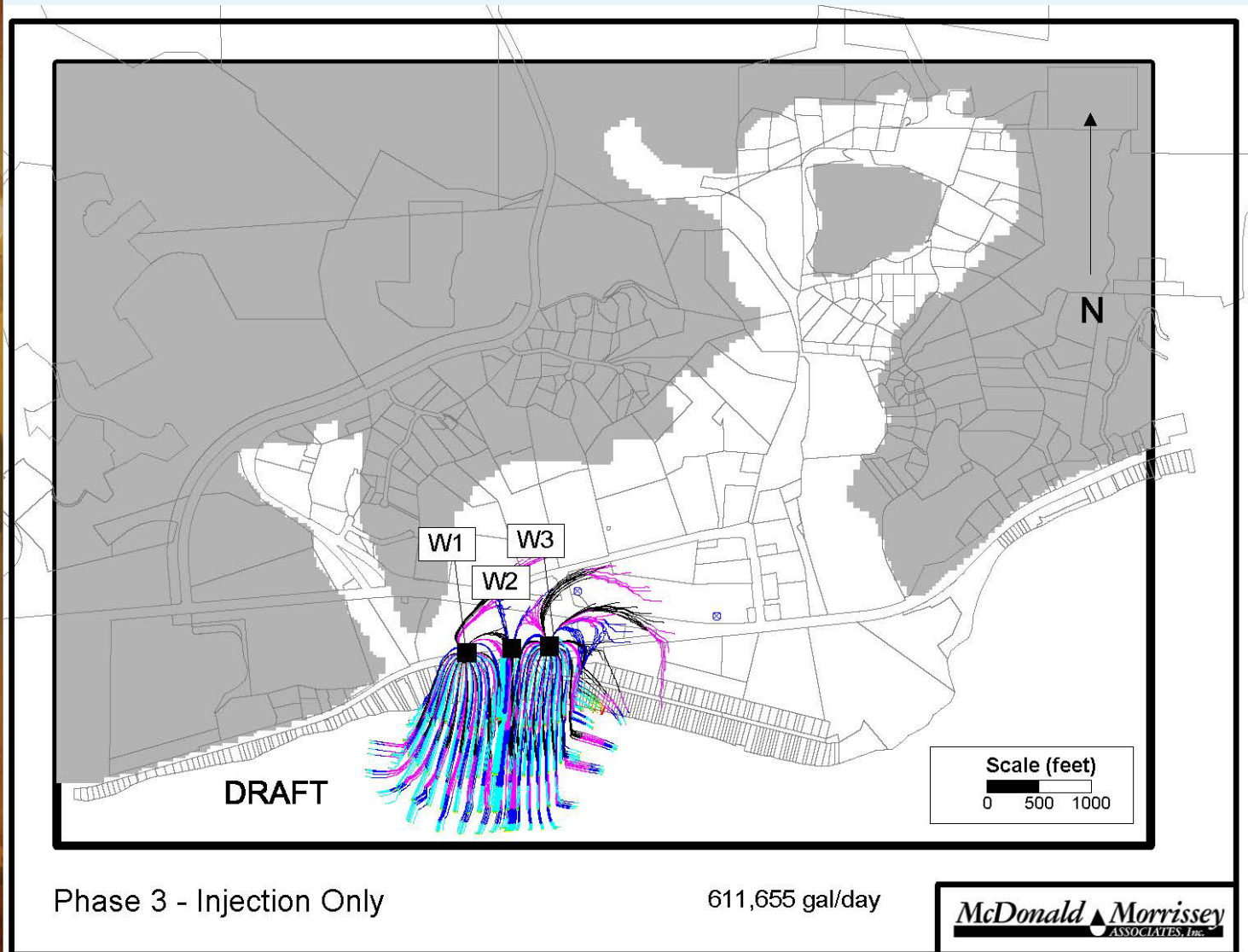
Phase 1 – No Flow to Lagoon



Phase 2 – No Flow to Lagoon



Phase 3 – No Flow to Lagoon



Collection System Pump Station – Legacy Park



Site Layout at Build-Out

