Background on the Orange County Great Park

- Largest-scale Metropolitan Park of the 21\textsuperscript{st} Century
- 1,200 acres on former MCAS El Toro, in Irvine.

Guiding Principles from 2007 Great Park Master Plan:

- Be forward thinking in innovative design
- Implement programs for environmental sustainability
- Lead the charge on environmental stewardship
Former Site of MCAS El Toro
Original 2007 Great Park Master Plan modified through public park design review in 2011
Park Development Challenges

- Cost to irrigate planned non-native landscaping
- Cost to construct canyon, lake, and other water features
- RWQCB municipal storm water permit requirements for new development
  - low impact development (LID) features to capture, treat, and release (eventually reuse) design storm volume.
Solution – Prepare Water Management Plan for Build-out of Park

Begin with a Water Balance Model and Graphic to:

- Locate water storage features throughout Park to maximize storage of on-site runoff
- Examine diversion of off-site storm water flows to on-site storage water features
- Model volume requirements for storage versus historical rainfall data; dry and wet years
- Identify maximum water needs throughout Park and adjust landscaping plant palettes
Water Balance Model

**Input**
- Precipitation (Directly into BMPs)
- Onsite Runoff (71-acre Watershed)
- Offsite Runoff (40-acre Watershed)
- Offsite Runoff (195-acre Watershed)
- Excess Inflow (> 85th % Volume)

**NLS #1 & #1A**
- D = 10.0 ft (55 ac-ft)
- Overall Volume of Runoff Captured by BMPs
- Recovery (4%)*
- Evaporation
- Irrigation Demand Met From Site
  (IF NLS #2 Volumes is NOT enough to satisfy Irrigation Demand AND NLS #1 Volume is enough to satisfy Irrigation Demand)

**NLS #2 & #3**
- D = 10.0 ft (205 ac-ft)
- Overall Volume of Runoff Captured by BMPs
- Recovery (4%)*
- Runoff lost by BMPs
- Evaporation
- Irrigation Demand Met From Site
  (IF NLS #2 Volume is enough to satisfy Irrigation Demand)

**Output**
- Precipitation (Directly into BMPs)
- Onsite Runoff (700-acre Watershed)
- Offsite Runoff (113-acre Watershed – Not Included)

**Offsite Diversion**
- Marshburn: 3,700-acres
- If NLS #1 + NLS #2 Storage is > 90% full, no MB capture/diversion
- If NLS #1 + NLS #2 Storage is ≤ 90% full, MB capture/diversion

**Potential Offsite Runoff**
- Agua Chinon: 1,840-acres
- If NLS #2 Storage is > 90% full, no AC capture/diversion
- If NLS #2 Storage is ≤ 90% full, AC capture/diversion

*On the order of half of runoff volume captured by BMPs is assumed to be recovered.*
WMP Graphic for Feasibility Analysis
WMP Recommendation

Build approx. 260 acre-feet of raw water storage at full build-out, plus BMP/other treatment facilities and low water demand plant palette would:

- Produce approx. 60% of Park’s irrigation demand during typical rainy season and approx. 40% on an average annual basis. Big life-cycle cost savings!
- Meet existing and future storm water permit requirements and protect downstream receiving water quality
- Be expandable/scalable for future phases of Park build-out
- Provide potential LID mitigation credits for adjacent development (potential revenue source)
- Results in a sustainable park design!
First Phase Implementation of WMP

Storm Water Reuse Pond System at the Great Park’s 30-acre South Lawn Soccer Complex
WESTERN SECTOR PARK DEVELOPMENT PLAN as per Approved PDR

- SOUTH LAWN (complete)
- NORTH LAWN (complete)
- SPECIAL EVENT SITE (complete)
- COMMUNITY ICE FACILITY (Future)
- ‘O’ CLUB (Underway)
- FARM & FOOD LAB (complete)
- PALM COURT (complete)
- HANGAR 244 (complete)
- VISITORS CENTER
- PAVILION
- BALLOON PARK (complete)
- OPS/RESTROOM BUILDING
- COMMUNITY GARDEN

PARK DESIGN REVIEW APPROVED
South Lawn and Ponds under construction
March 2013
Pond Treatment System
Construction of Pond 4 (reflecting pond)
Initial Filling of Pond 5
(reflecting pond)
Completed Ponds 4 and 5 – Sept 2013 with viewing deck and walkable timeline
Construction of Pond 1– Summer 2013
Pond 1 construction completed Sept 2013
Pond 1 prior to 2/23/14 -2/24/14 rain event
Pond 1 after 2/24/14 storm
South Lawn Pond System – Notable Facts

- Could provide approx. 55% of irrigation demand for South Lawn
- Meets storm water permit requirements; helps protect water quality of downstream receiving waters
- Designed to be expandable. New areas can flow to South Lawn ponds; decrease LID costs for future Park build out
- Provides LID compliance opportunity for adjacent development
- Low electrical consumption (200,278 Kwh/yr); could be powered by 10,000 sf of solar panels
- Aligns with Park’s sustainability goals
- Design qualifies for LEED certification
Recent Recognition

- Project recognized by state water quality officials as a “Major breakthrough in cost effective storm water capture and reuse design.”

- 2013 Project of the Year award - American Public Works Association (APWA) Southern California Chapter

- 2013 Top Storm Water Project - Storm Water Solutions Magazine

- 2014 Award of Excellence - American Council of Engineering Companies – Orange County Chapter (ACEC-OC)
Acknowledgement of the Project Team

Orange County Great Park Corporation/City of Irvine
Mike Ellzey, Assistant City Manager/CEO Great Park Corporation

URS Corporation – Program Engineering

WRNS Studio - Architecture

Sherwood Design Engineers – Civil Engineering

Bellinger Foster Steinmetz – Landscape Architecture

MCK – Construction Management

USS Cal Builders – General Contractor
Update: FivePoint Communities 688-Acre Plan
Questions?