



ABSTRACT & POWERPOINT PRESENTATION

***Indirect Reuse with Multiple Benefits –
The El Monte Valley Mining, Reclamation,
and Groundwater Recharge Project***

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La Mesa, California

Managed Aquifer Recharge Symposium
January 25-26, 2011
Irvine, California

Symposium Organizers:

- National Water Research Institute
- Orange County Water District
- Water Research Foundation

www.nwri-usa.org/rechargesymposium2011.htm

INDIRECT REUSE WITH MULTIPLE BENEFITS – THE EL MONTE VALLEY, MINING, RECLAMATION, AND GROUNDWATER RECHARGE PROJECT

**Tim Smith, P.E., Helix Water District
Jim Rasmus, P.E., BCEE, Black & Veatch**

Abstract: The El Monte Valley Mining, Reclamation, and Groundwater Recharge Project (Project) marks one of the first projects in California to explore utilizing highly purified recycled water to recharge a groundwater basin to provide better managed groundwater levels for habitat restoration, and ultimately utilize the water to augment the local water supply. The Helix Water District (HWD) is exploring the use of highly treated, purified water to: recharge the existing El Monte Valley Groundwater Basin (Basin); better manage the groundwater levels to support habitat restoration; and extract groundwater to enhance their supply portfolio. The Project has numerous benefits to the local community including: providing a valuable sand and aggregate resource; creating a recreational area; restoring riparian habitat; improving the water quality in the Basin; and expanding the regional water portfolio within Southern California by providing a new water supply.

Highly purified recycled water for the Project will be produced at the Santee Water Recycling Facility. This water will be pumped and transported to either recharge basins or injection wells located on the land owned by Helix Water District in El Monte Valley. This water will be blended with raw water pursuant to the requirements of the California Department of Public Health (CDPH). The groundwater level will be managed so that its elevation is near the bottom of the re-contoured, rehabilitated river channel providing a source of water to the re-vegetated area. Groundwater extracted through a series of extraction wells will be blended with raw imported or local waters and treated at the R.M. Levy Water Treatment Plant.

The primary goal of the project is to better manage (through augmentation and extraction) the Basin in a manner that is more consistent with the natural state of this part of the watershed prior to construction of the El Capitan Dam in 1935. It is anticipated that approximately 5,000 acre-feet per year of new water will be developed in the Basin. In addition to water, options are available to provide up to 12,000,000 tons of high quality sand and aggregate as a part of the project. When completed, the Project will provide a restored riverbed, habitat and recreational areas.

California Department of Public Health criteria dictate treatment, injection, and extraction requirements. Key criteria relevant to ground water include minimum underground residence time(s); minimum separation distances between the application and extraction of water; and requirements for allowable blending ratios of recharge water. These criteria are particularly critical in a basin of this size.

Other key factors in the determining the layout and phasing of the project include: environmental factors, pipeline routing, flow rates and timing of deliveries of purified water, sand/aggregate mining, adjacent wells, and the San Diego River (which must convey 30,000 cubic feet per second through the Project).

The presentation will describe key efforts conducted to-date including: pilot test facilities and calibration; and modeling of full-scale recharge scenarios; environmental documentation, public outreach and education, and preliminary design efforts. A preferred project will also be presented.



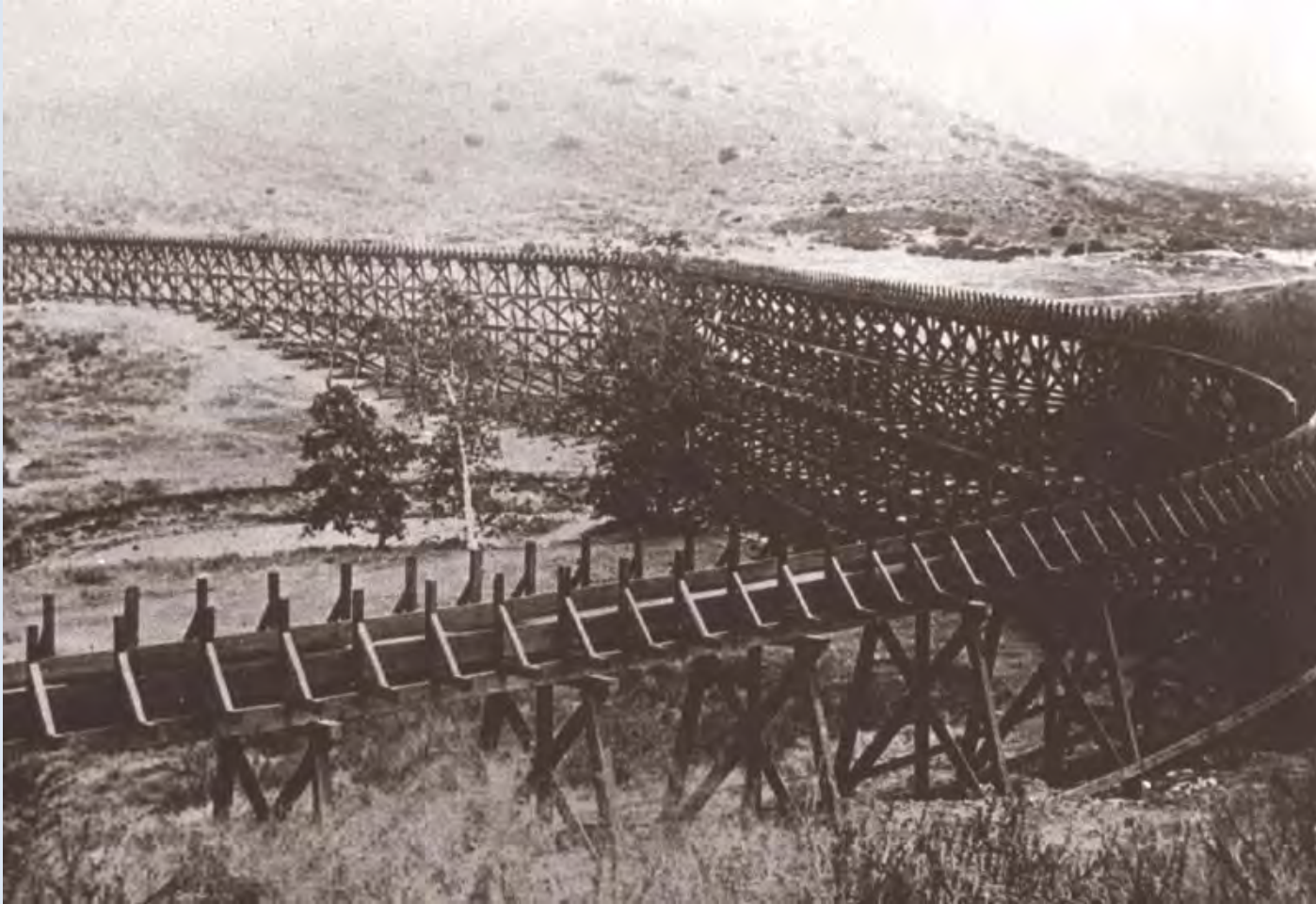
El Monte Valley Project

Indirect Reuse with Multiple Benefits – The El Monte Valley Mining, Reclamation, and Groundwater Recharge Project

Managed Aquifer Recharge Symposium
January 25, 2011



Providing High-Quality Water Since 1885



Helix Water District

Helix Water District supplies water to 262,000 people within the Eastern Region of San Diego County

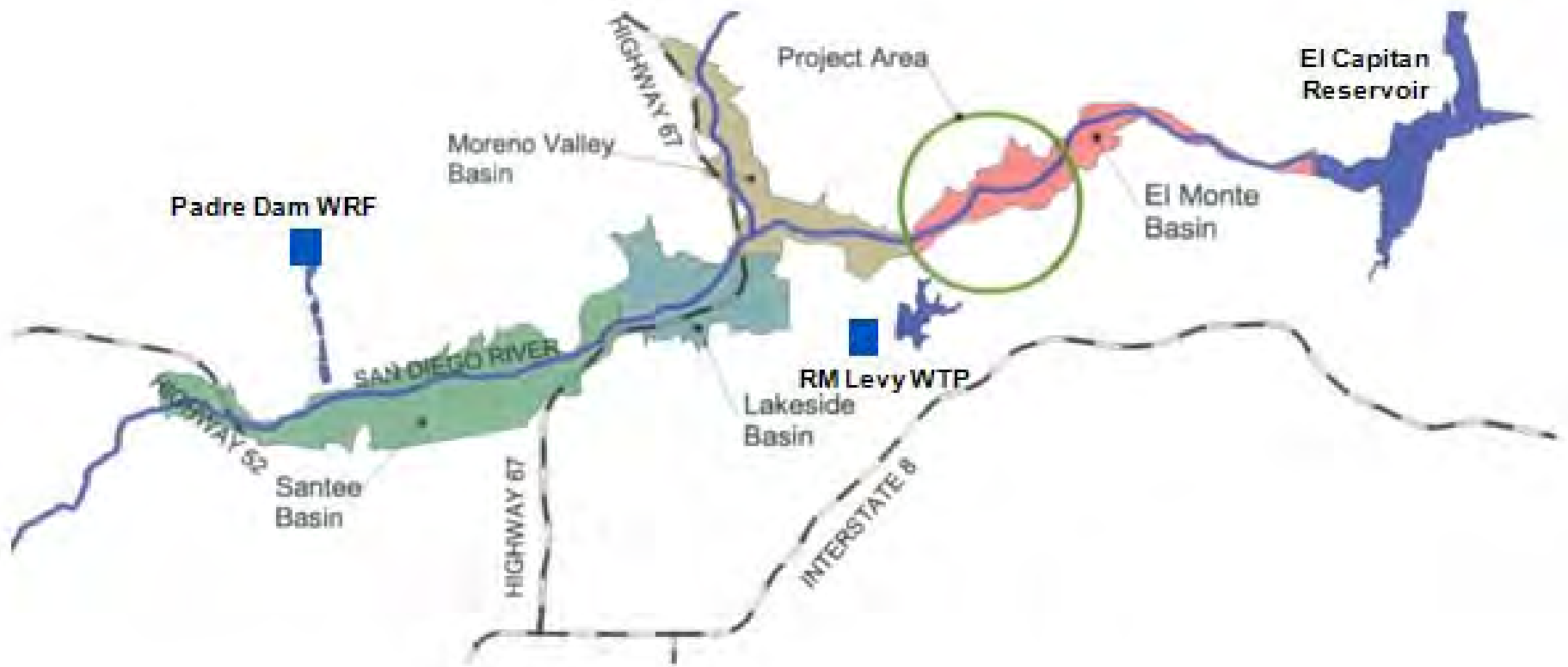
- La Mesa
- Spring Valley
- El Cajon
- Lemon Grove
- Santee
- Lakeside
- San Diego County



Project Location



Groundwater Basin

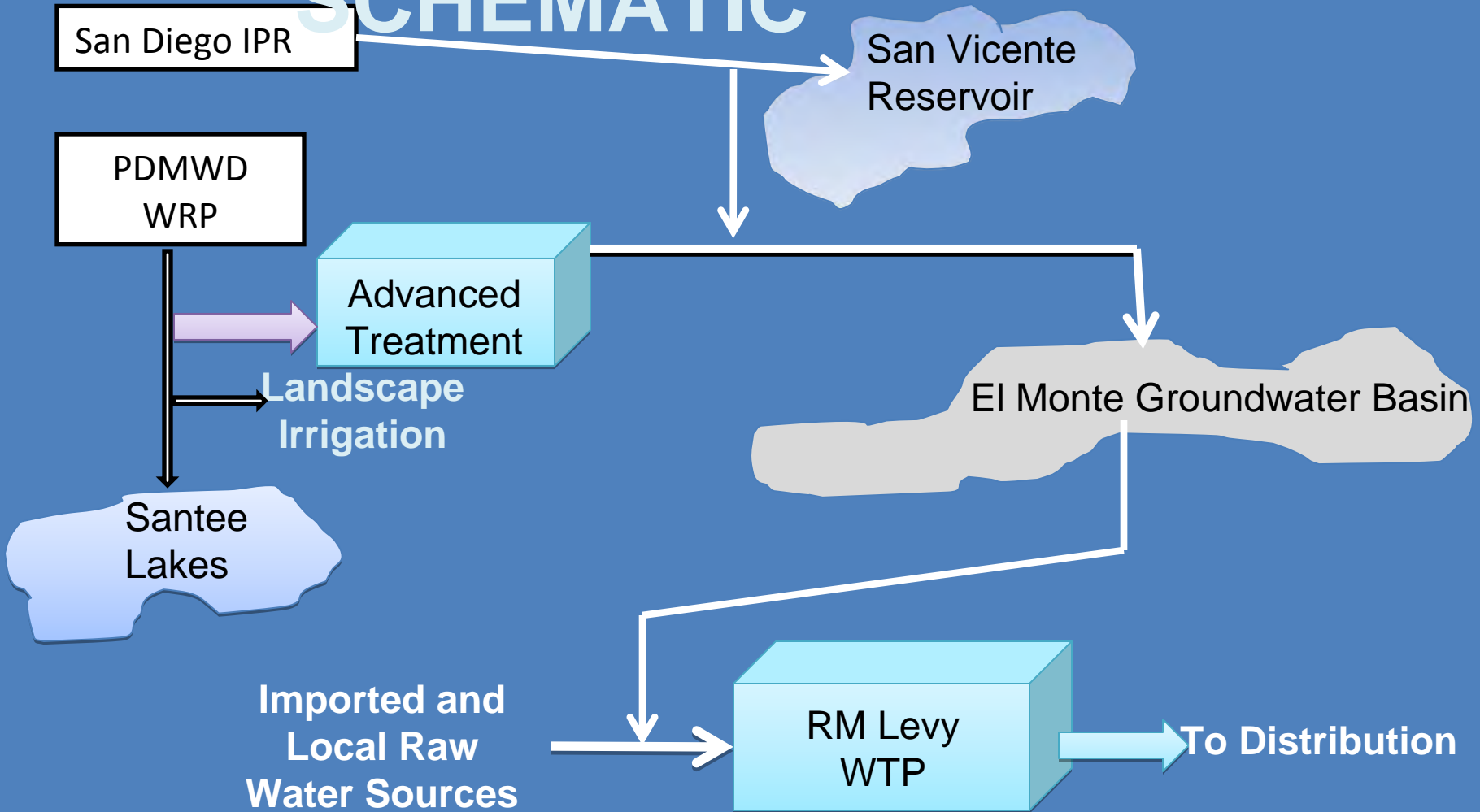




El Monte Valley Project

- 
- Groundwater Recharge
 - Riverbed Reclamation/Restoration
 - Mining

PROJECT SCHEMATIC



Water Supply

- 90 Percent of San Diego County's Water Supply is imported
- Water shortage
- Statewide judicial rulings
- Environmental concerns
- Rising costs
- Seismic activity





El Monte Valley Project

Environmental Impact Report



El Monte Valley Project

Objectives

- A new sustainable, drought-proof water supply
- Sand aggregate resource for local supply consistent with existing zoning
- Natural habitats along the San Diego River
- Recreational opportunities
- Wastewater discharges to the ocean
- Cost effective



Water Supply Benefits

- Locally-controlled
- Pure, high-quality and safe
- Reliable
- Drought-proof
- Environmentally responsible
- 15% of demand



El Monte Valley Project

Advanced Water Purification Process

Microfiltration (MF)



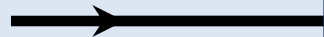
Reverse Osmosis (RO)



Ultraviolet Light (UV) with Hydrogen Peroxide



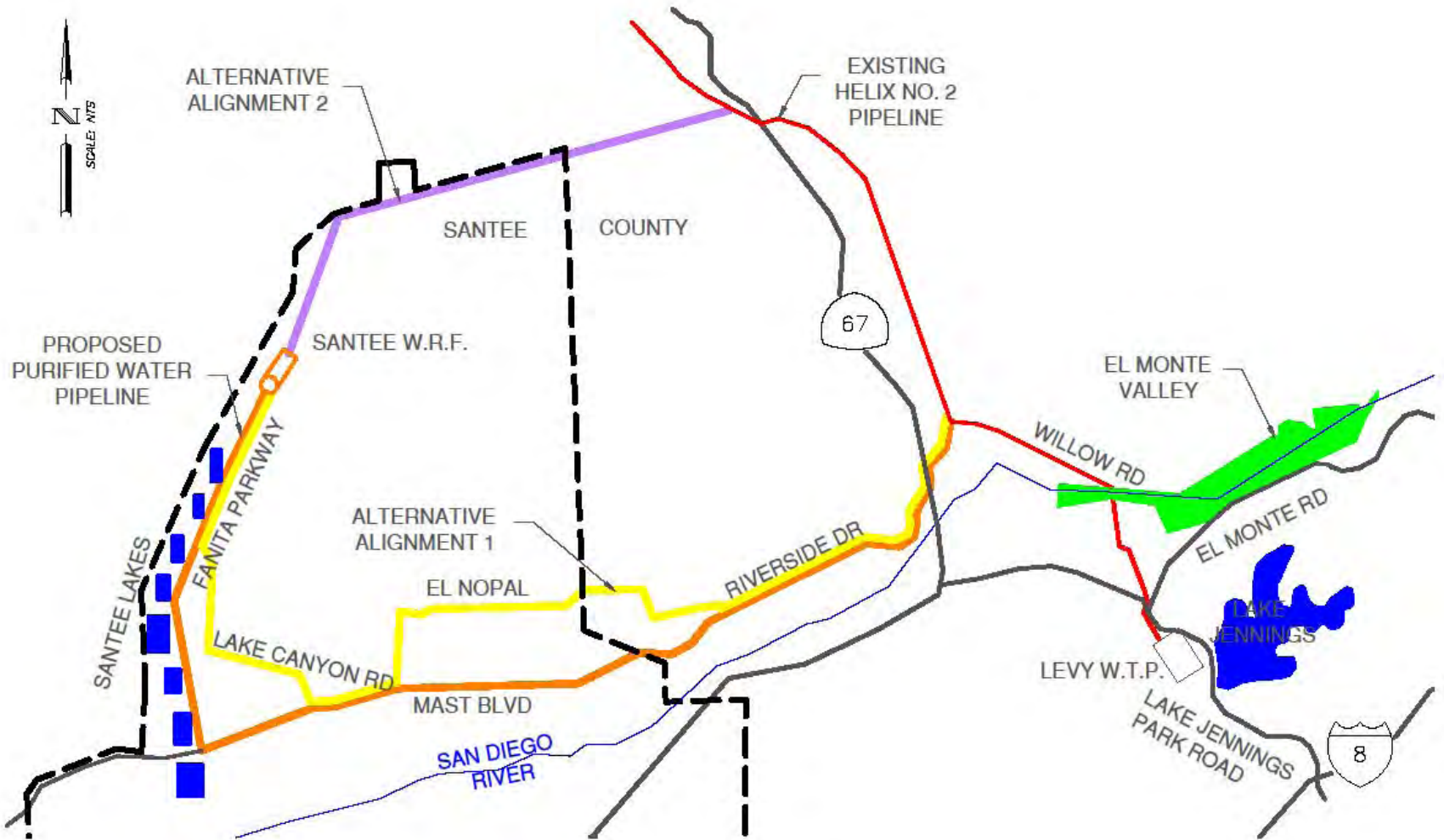
Padre Dam Effluent



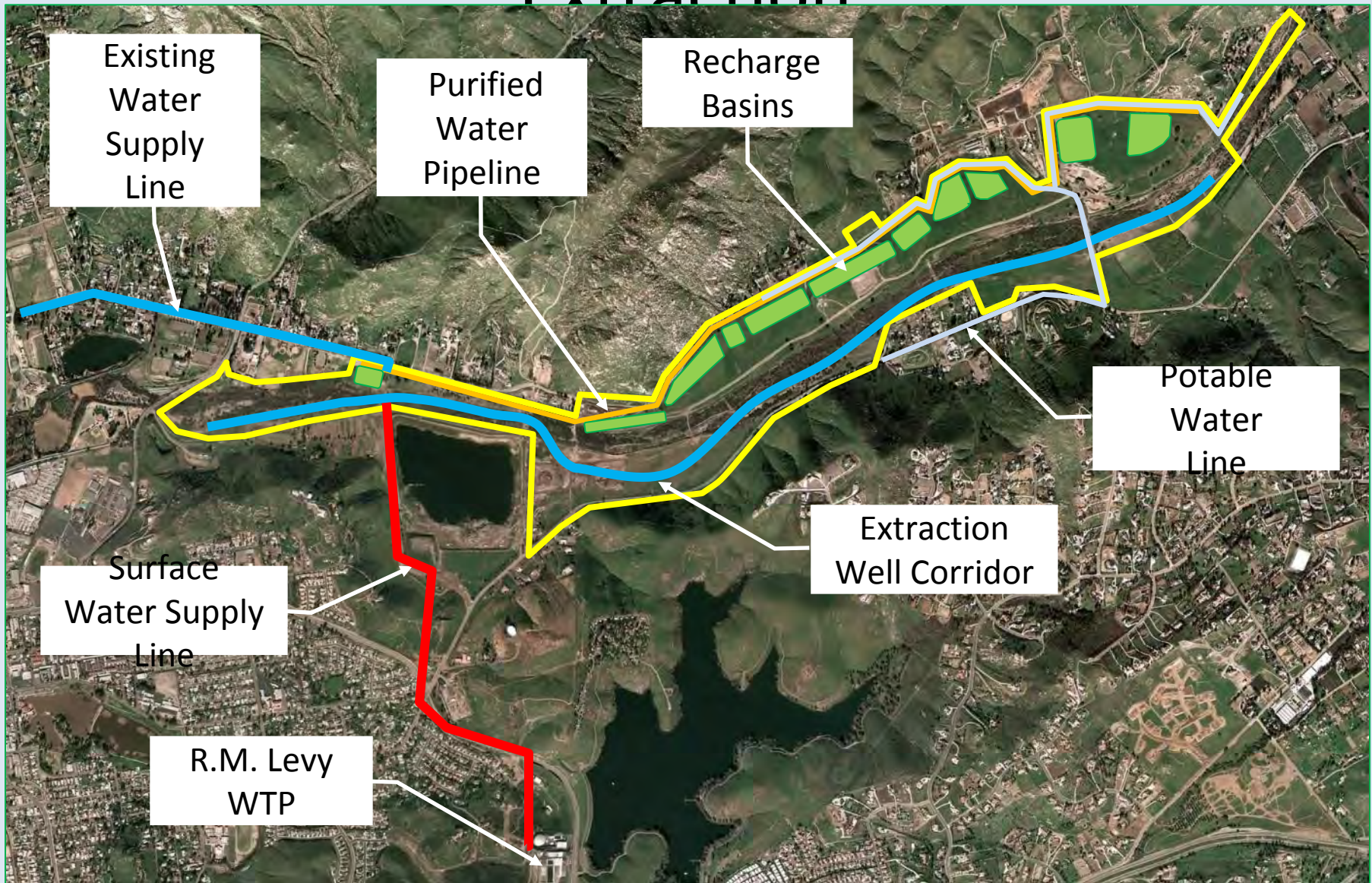
Normally Goes to Ocean

Recharge Basins in El Monte Valley

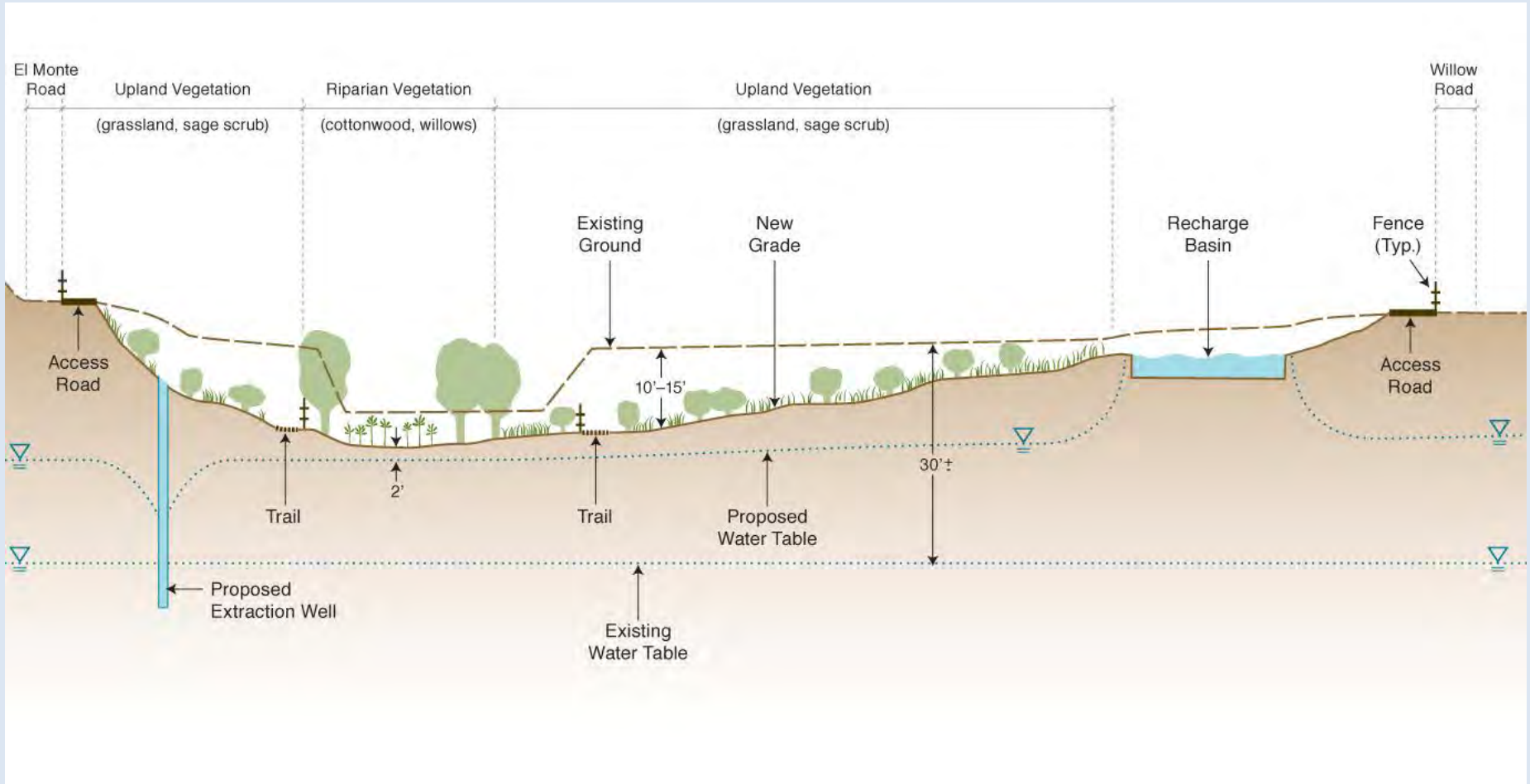
Project Vicinity Map



El Monte Basin Recharge and Extraction



El Monte Basin Cross Section



Basin Characteristics/Modeling

- Alluvium basin
- High quality sand
- Narrow basin and steep walls
- MODflow 3D groundwater modeling



Pilot Study

- Pilot Study conducted in October 2008
- 100-foot diameter by 5-foot deep
- 10 peizometers
- 275 gpm



Preliminary Modeling Results

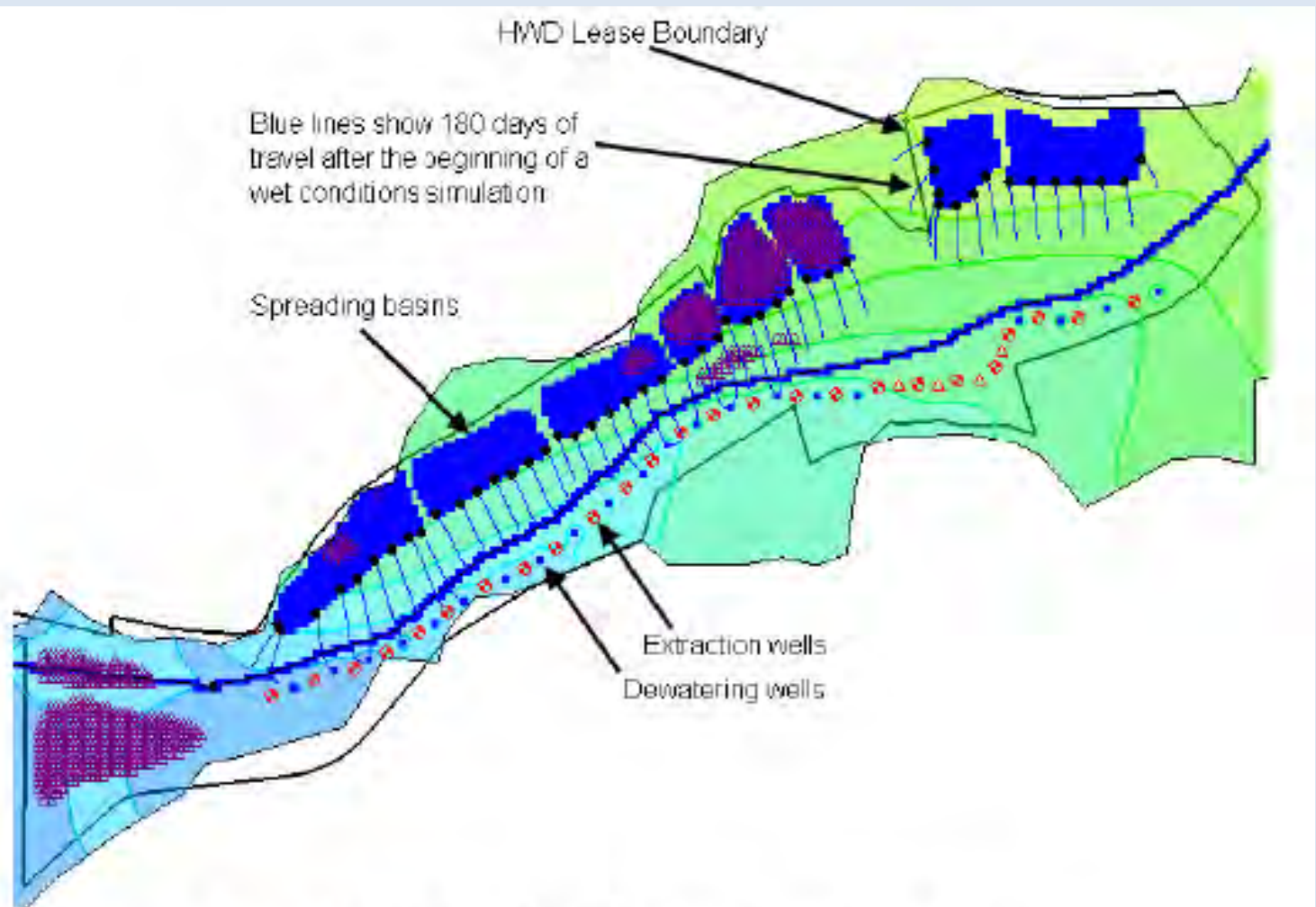


Figure 21. 180-day Travel Distance from Recharge Basins at Beginning of a Wet Conditions Simulation with 50 Wells



Regulatory Parameters

- Groundwater Recharge Reuse DRAFT Regulations – August 5, 2008
- Blending- Recycled Water Contribution: 50%/50% and Phase
- Retention Time: 6 months
- Expert Panel
- Water Quality Monitoring



Water Quality

Water Quality Comparison Table – El Monte Hydrologic Subarea						
Parameter	Units	Imported Raw Water*	OCWD – RWRP**	Basin Plan Objective		Well 101
				Groundwater Quality	Surface Water Quality	
Total Dissolved Solids, TDS	mg/l	650	19	600	1000	690
Chloride, Cl	mg/l	94	3.6	250	400	130
Sulfate, SO ₄	mg/l	257	1.2	250	500	178
Percent Sodium	percent	40	NA	60	60	33
Nitrate as N, NO ₃ -N	mg/l	0.65	<0.1	10	1.0	ND
Total Nitrogen, N	mg/l	NA	1.5	No objective	1.0	NA
Total Phosphorus, P	mg/l	NA	NA	No objective	0.1	0.05
Iron, Fe	mg/l	<0.05	0.007	0.3	0.3	0.14
Manganese, Mn	mg/l	<0.005	<0.001	0.05	0.05	0.3
MBAS	mg/l	NA	<0.02	0.5	0.5	ND
Boron, B	mg/l	0.14	0.25	0.75	1.0	0.06
Turbidity	NTU	0.5	0.34	None	20	1.3
Fluoride, F	mg/l	0.3	<0.1	1.0	No standard	0.35

* Currently 100% Colorado River Water

** Orange County Water District – Groundwater Replenishment System, April 2008

Final Water Treatment: Levy WTP

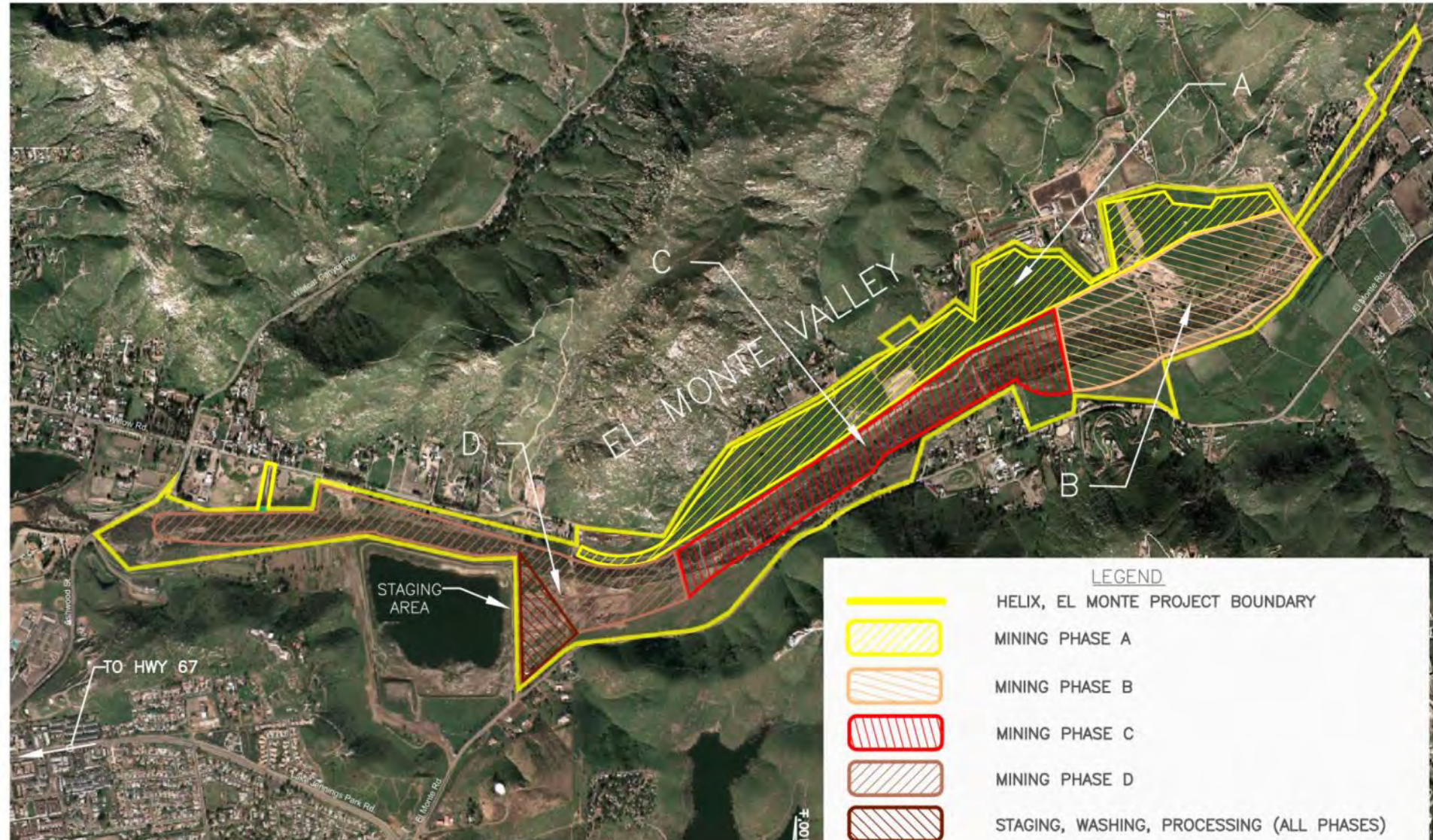


Additional Regional Benefits

- Surface Mining
 - Sand and gravel shortage
 - Riverbed reclamation
 - Project funding
- Riverbed Restoration
 - Native vegetation
 - Wildlife habitat
 - Trails
 - Flood protection



El Monte Valley Project – Mining Areas



Surface Mining Procedures

- Mining will be located in the central area of the site
- Operation times will be limited to 7 a.m. – 5 p.m.
- Traffic will follow a specific route to minimize noise
- Dust management, using groundwater and temporary irrigation



River Restoration Conceptual Plan



Estimated Timeline

Environmental Review and Permits:

- 2010 to 2012

Design:

- 2012 to 2013

Construction of Water Purification Facilities and Pipeline:

- 2013 to 2014

Surface (Sand) Mining:

- 2013 to 2022
 - One year start up
 - Eight years of mining
 - One year of reclamation

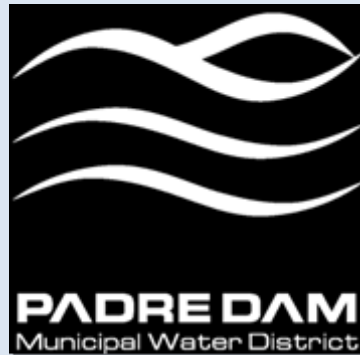


Public Outreach

- Presentations Materials Developed
- Presentations – Cities, Water Agencies, clubs, news media, local residents, equestrian (total 67)
- El Monte Valley Stakeholder Group
- Mailers, bill inserts, website
- Public hearings/comment period
- Helix Water District Board meetings



Project Support



Helix Water District



Contacts

- Learn more at elmontevalley.com
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El Monte Valley Project



Questions?