



City of San Diego
PUBLIC UTILITIES
Water & Wastewater

THE CITY OF SAN DIEGO
PUBLIC UTILITIES
DEPARTMENT

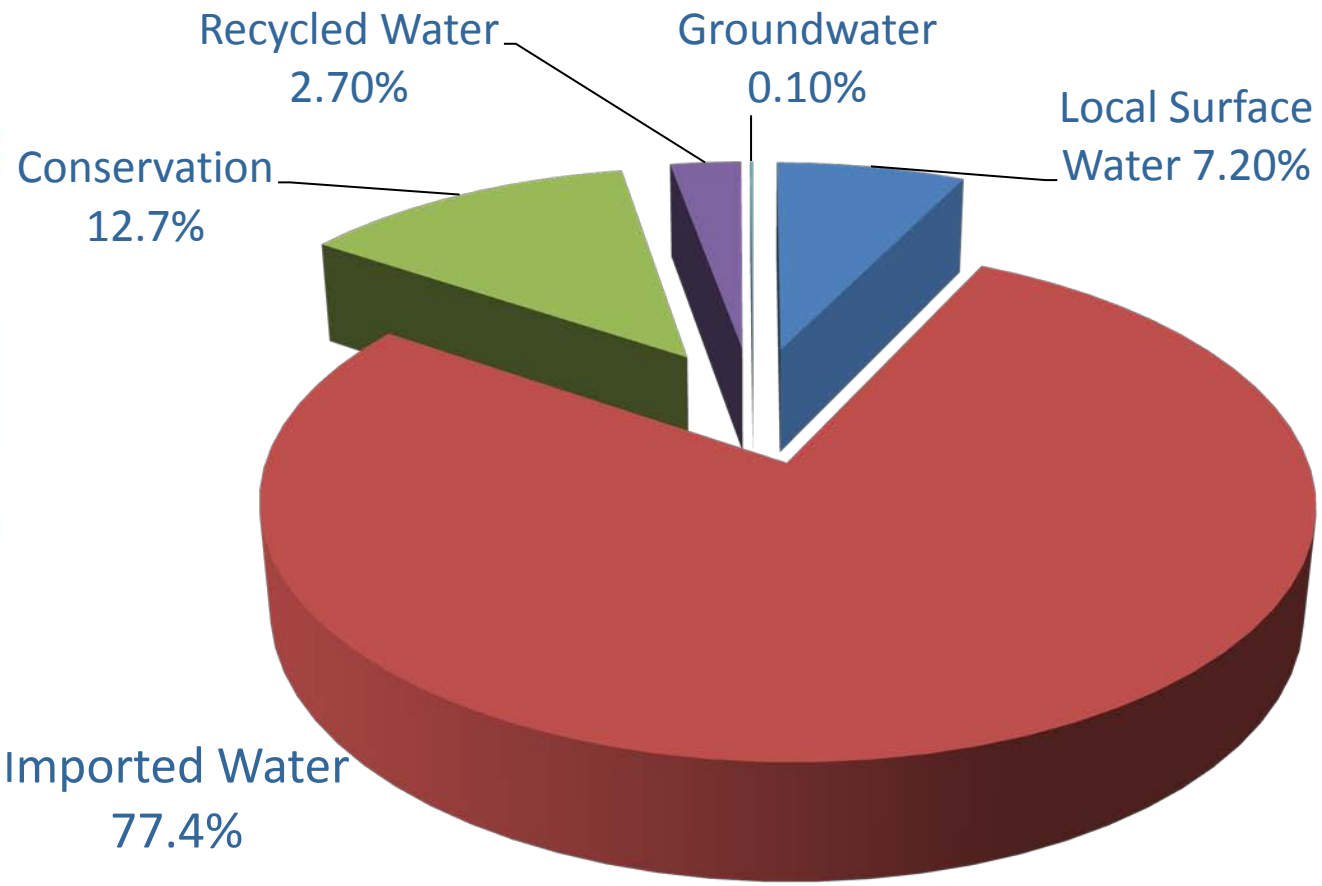
Presentation to Water Policy Implementation Task Force

Recycled Water Program Update

July 25, 2012

Jennifer Casamassima, Program Manager
Public Utilities Department
Long-Range Planning & Water Resources Division

Water Supply: FY 2011
Seven Year Historical Average



Recycled Water Definitions

- State of California Water Code 13050(n)- reclaimed [recycled] water is defined as “water which, as a result of treatment of waste, is suitable for direct beneficial use…”
- Disinfected Tertiary Recycled Water – “filtered and subsequently disinfected wastewater” that meets Title 22, California Code of Regulations.
- City’s Waste Discharge & Water Recycling Requirement for the Production and Purveyance of Recycled Water permits (Regional Water Quality Control Board Orders 97-003 and 2000-203) are specific to tertiary treated recycled water (non-potable).

2010 Recycled Water Master Plan Update

- Compliance with Water Reclamation Ordinance
  - adopted 1989, 64.0806 SDMC
- Completed in conjunction with Recycled Water Study and includes:
  - Current Recycled Water System
  - Planned expansion projects through 2015
  - Market assessment of potential new customers, retail & wholesale
  - Conceptual facility and distribution system expansion alternatives
  - Cost estimates for conceptual projects

Recycled Water System

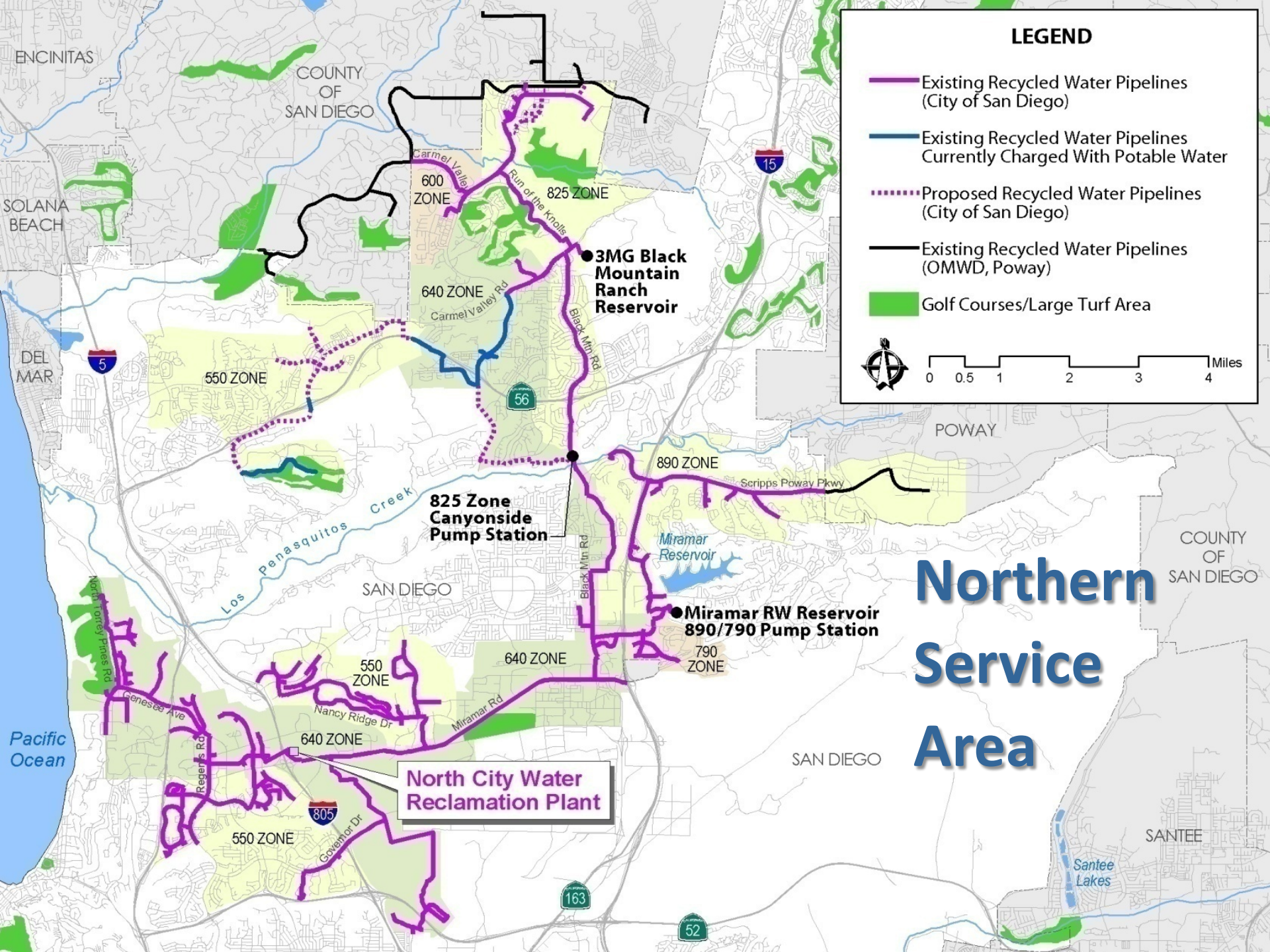
North City Water Reclamation Plant

Opened 1997

Peak design capacity 30 MGD

OLIVENHAIN

Municipal Water District

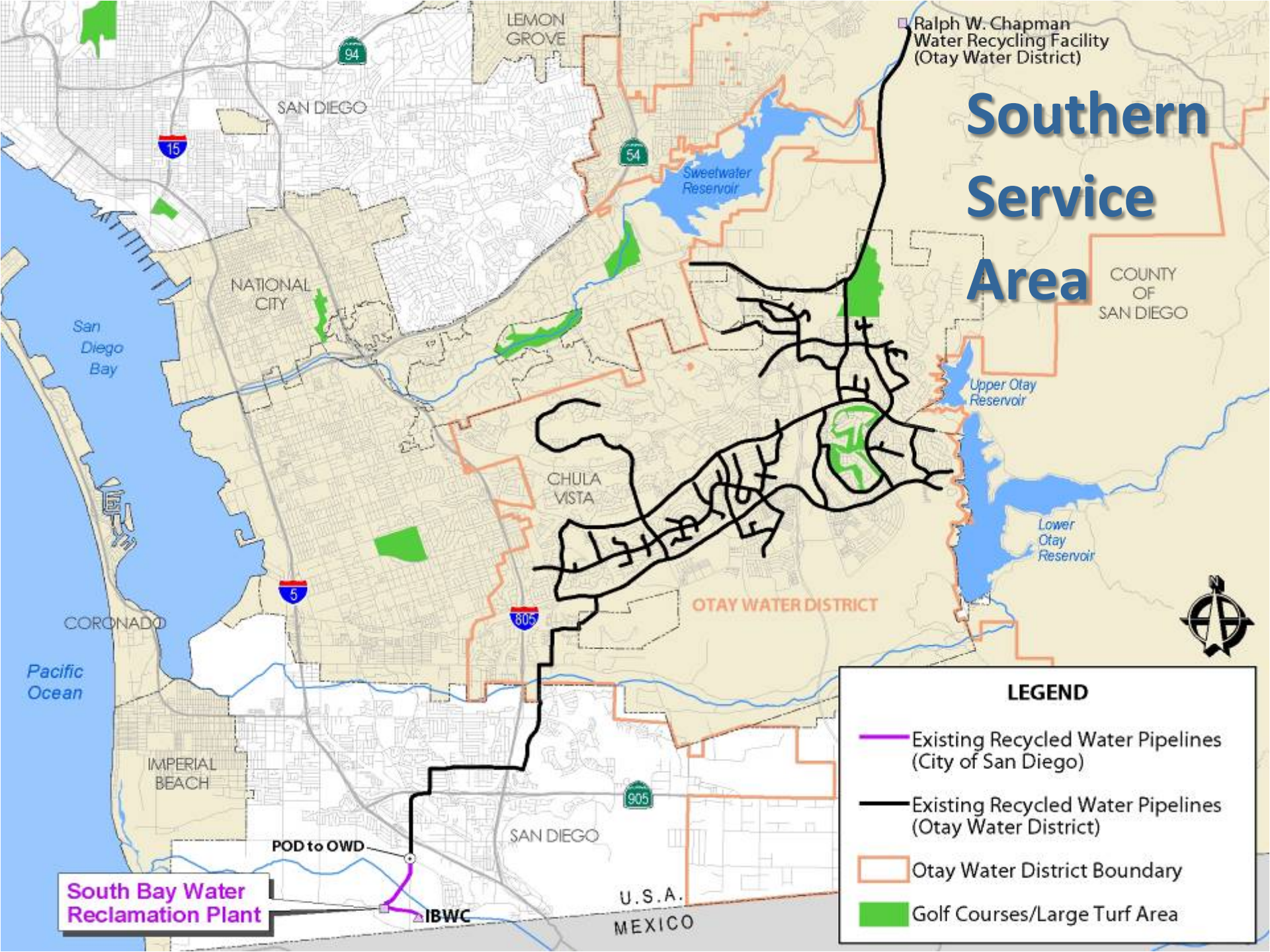

LEGEND
Existing Recycled Water Pipelines (City of San Diego)
Existing Recycled Water Pipelines Currently Charged With Potable Water
Proposed Recycled Water Pipelines (City of San Diego)
Existing Recycled Water Pipelines (OMWD, Poway)
Golf Courses/Large Turf Area
0 0.5 1 2 3 4 Miles
ENCINITAS
COUNTY OF SAN DIEGO
SOLANA BEACH
DEL MAR
POWAY
SAN DIEGO
COUNTY OF SAN DIEGO
SAN DIEGO
SANTEE
Pacific Ocean
600 ZONE
825 ZONE
640 ZONE
550 ZONE
890 ZONE
790 ZONE
Carmel Valley Rd
Run of the Knolls
Black Mtn Rd
Scripps Poway Pkwy
Miramar Reservoir
Los Penasquitos Creek
Nancy Ridge Dr
Miramar Rd
Genesee Ave
North Torrey Pines Rd
Regents Rd
Governor Dr
Santee Lakes
5
15
56
805
163
52
3MG Black Mountain Ranch Reservoir
825 Zone Canyonside Pump Station
Miramar RW Reservoir 890/790 Pump Station
North City Water Reclamation Plant
Northern Service Area

Recycled Water System

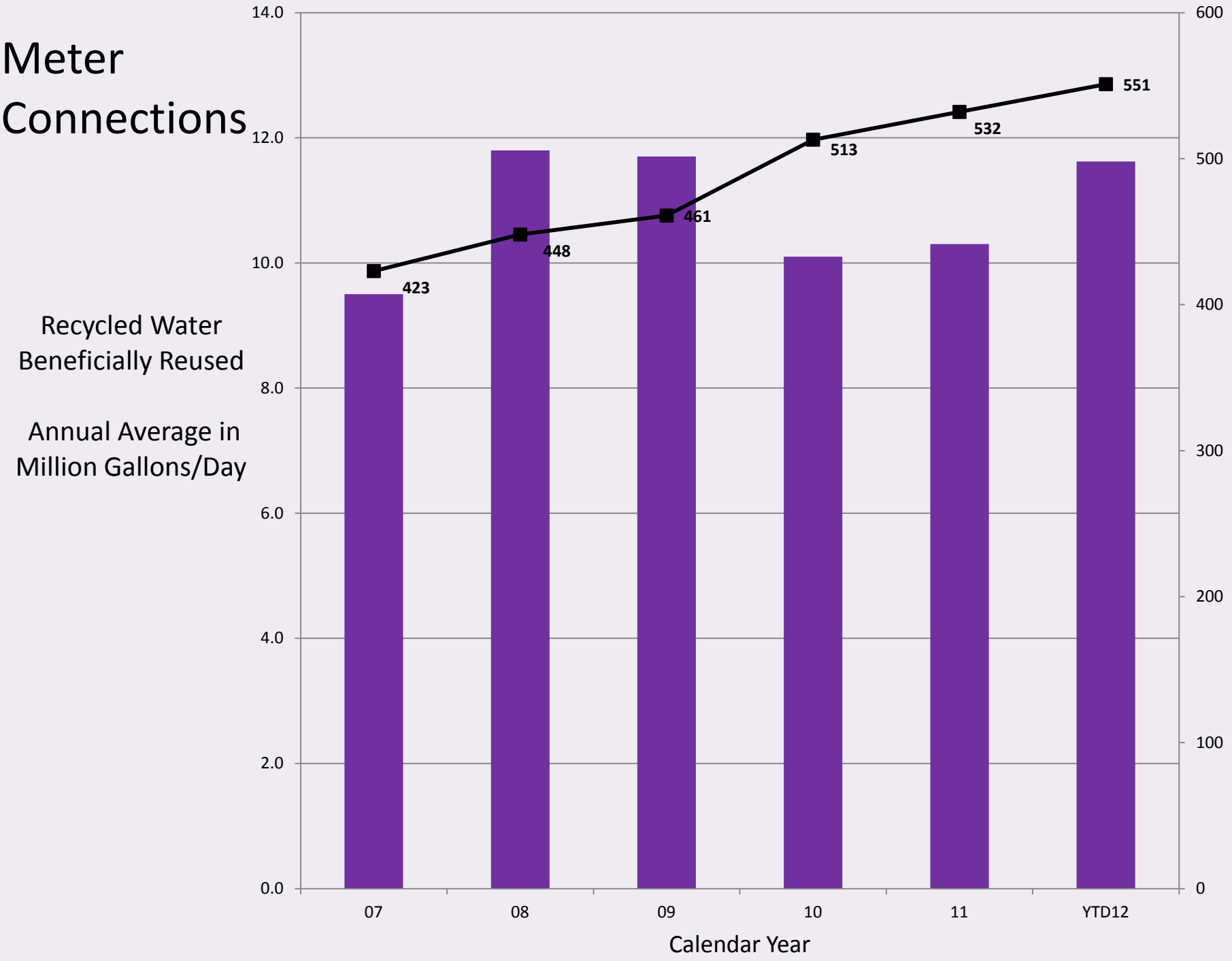
OTAY WATER DISTRICT

South Bay Water Reclamation Plant

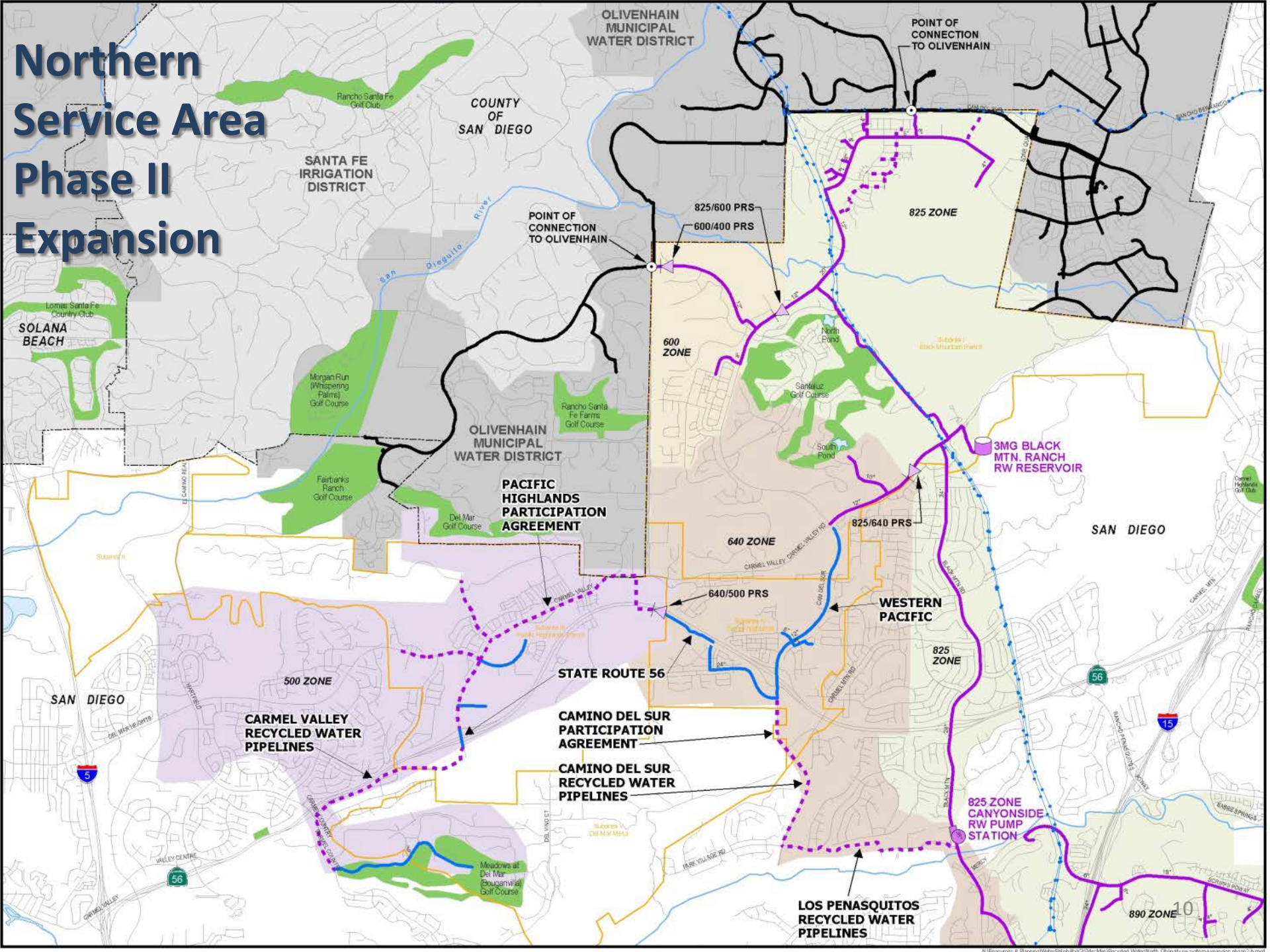
Opened 2002, service to first customer 2006
Peak design capacity 15 MGD (under optimal conditions)
wastewater flows limiting factor


Southern Service Area
Ralph W. Chapman Water Recycling Facility (Otay Water District)
LEMON GROVE
SAN DIEGO
NATIONAL CITY
CHULA VISTA
COUNTY OF SAN DIEGO
Sweetwater Reservoir
Upper Otay Reservoir
Lower Otay Reservoir
OTAY WATER DISTRICT
San Diego Bay
Pacific Ocean
CORONADO
IMPERIAL BEACH
SAN DIEGO
U.S.A.
MEXICO
POD to OWD
IBWC
South Bay Water Reclamation Plant
LEGEND
Existing Recycled Water Pipelines (City of San Diego)
Existing Recycled Water Pipelines (Otay Water District)
Otay Water District Boundary
Golf Courses/Large Turf Area

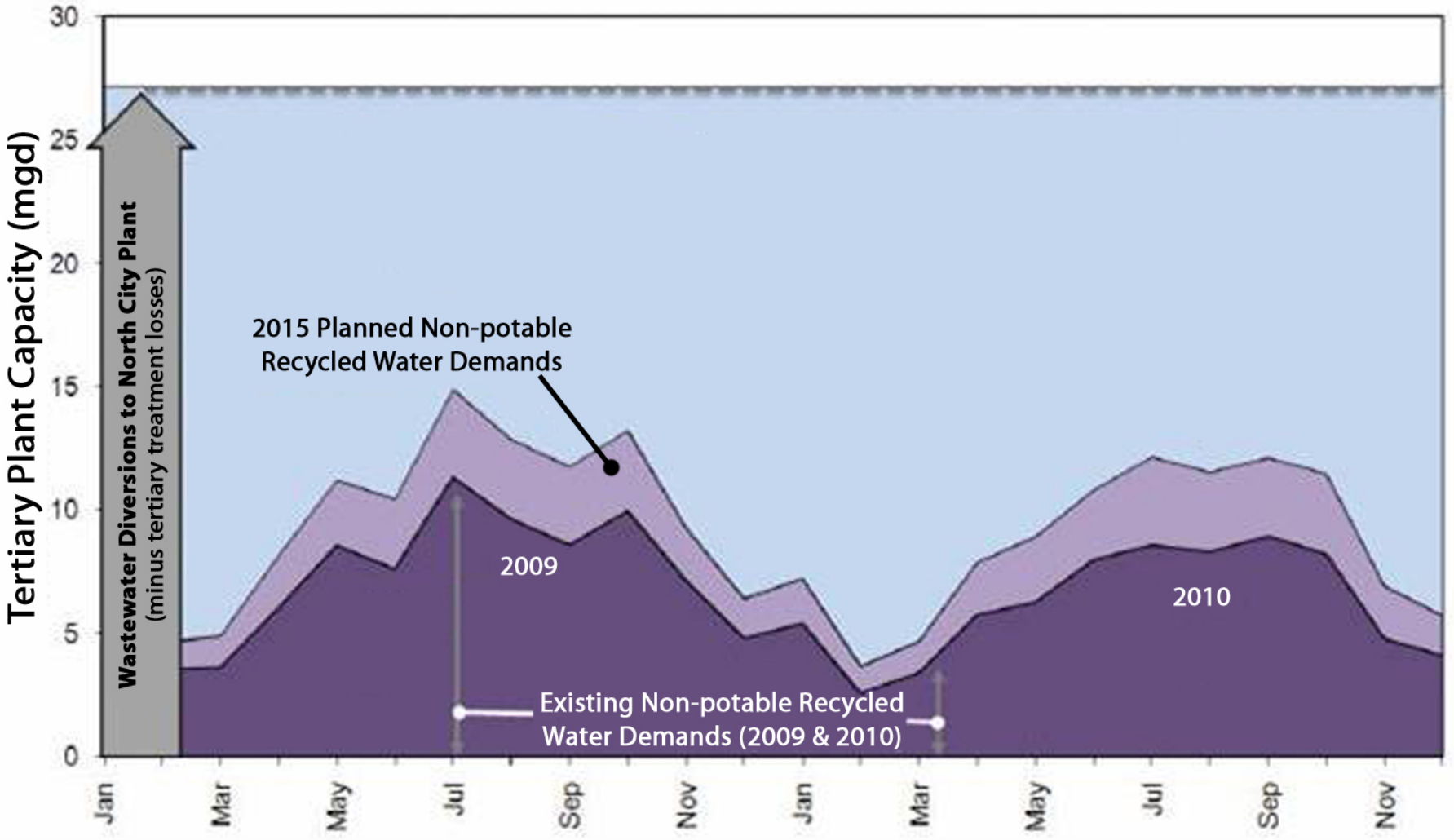
Meter Connections



Northern Service Area Phase II Expansion



North City Plant Seasonal Demand Analysis



Master Plan Summary

- Continue to connect infill customers along the existing distribution pipelines
- Complete Phase II Non-potable Distribution System Expansion
- Future steps should be defined in 2015 Recycled Water Master Plan Update based upon decisions made regarding Indirect Potable Reuse.

Presentation to the Water Policy Implementation Task Force

City of San Diego's Recycled Water Study

July 25, 2012

Amy Dorman, Senior Civil Engineer
Public Utilities Department
Long-Range Planning & Water Resources Division

Background

- 2010 Point Loma NPDES Permit Renewal Process
  - City entered Cooperative Agreement with local environmental groups (2009)
  - San Diego Coastkeeper and Surfrider Foundation gave their support to the USEPA's decision to grant the modified permit
  - City to fund and conduct the Recycled Water Study
- EPA Approval (June 2010, Permit Effective Aug 1, 2010)
- California Coastal Commission (CCC) consistency determination
  - Conditioned by requiring delivery of Recycled Water Study to CCC within two years (July 31, 2012)
- Current NPDES Permit expires July 31, 2015

Objectives

- Identify opportunities to increase recycling of wastewater for Indirect Potable Reuse (IPR)and Non-Potable Reuse (NPR) for a 2035 planning horizon
- Determine the extent recycling can reduce wastewater flows to the Point Loma Wastewater Treatment Plant
- Determine implementation costs

Stakeholders and Participation

- City of San Diego
- San Diego Coastkeeper
- Surfrider Foundation
- Metro Wastewater Participating Agencies
- Independent Rates Oversight Committee
- San Diego County Water Authority

Stakeholders:

- ✓ Provided input at bi-monthly status update meetings
- ✓ Participated in technical workshops to brainstorm and refine reuse alternatives
- ✓ Reviewed and commented on all technical memoranda and project report

Non-potable Reuse Opportunities

- Potential offload derived from expanding non-potable system into new service areas is small compared to Metro System
- Wide geographic distribution of new potential non-potable customers drives high cost of system expansion
- Total non-potable reuse carried forward in the reuse alternatives: **18 mgd**
  - ✓11 mgd of existing demand
  - ✓7 mgd of new infill demand (customers who can be served from existing infrastructure)

Indirect Potable Reuse Opportunities

Two Forms of IPR Evaluated:

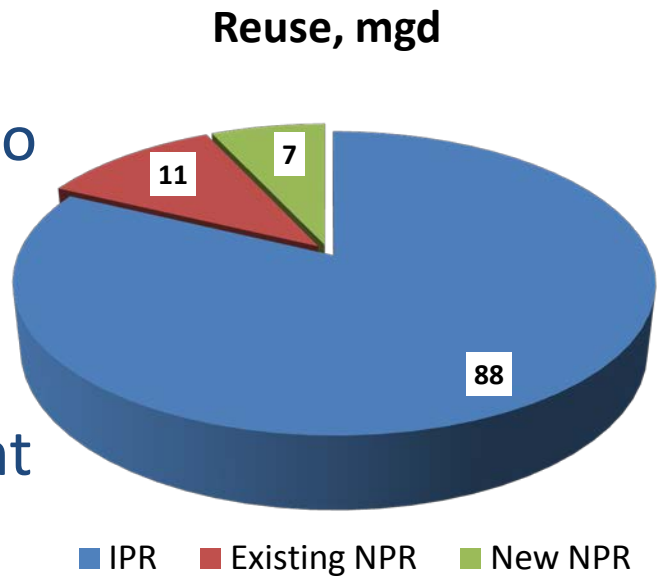
- Groundwater Recharge
- Reservoir Augmentation

Findings:

- Groundwater basin size and data insufficient to determine potential recharge projects. Revisit when more data is available
- Two reservoirs deemed large enough to provide retention times within range required in draft groundwater recharge regulations
  - San Vicente Reservoir
  - Otay Reservoir

Reuse Alternatives

- All divert 135[1] mgd away from Point Loma to new and existing reuse facilities
- All alternatives would lead to 106[2] mgd of reuse
  - 18 mgd non-potable
  - 88 mgd indirect potable
- Results in average daily Point Loma flow of 143 mgd
- Differ only in how treatment capacity is distributed among existing and potential plants



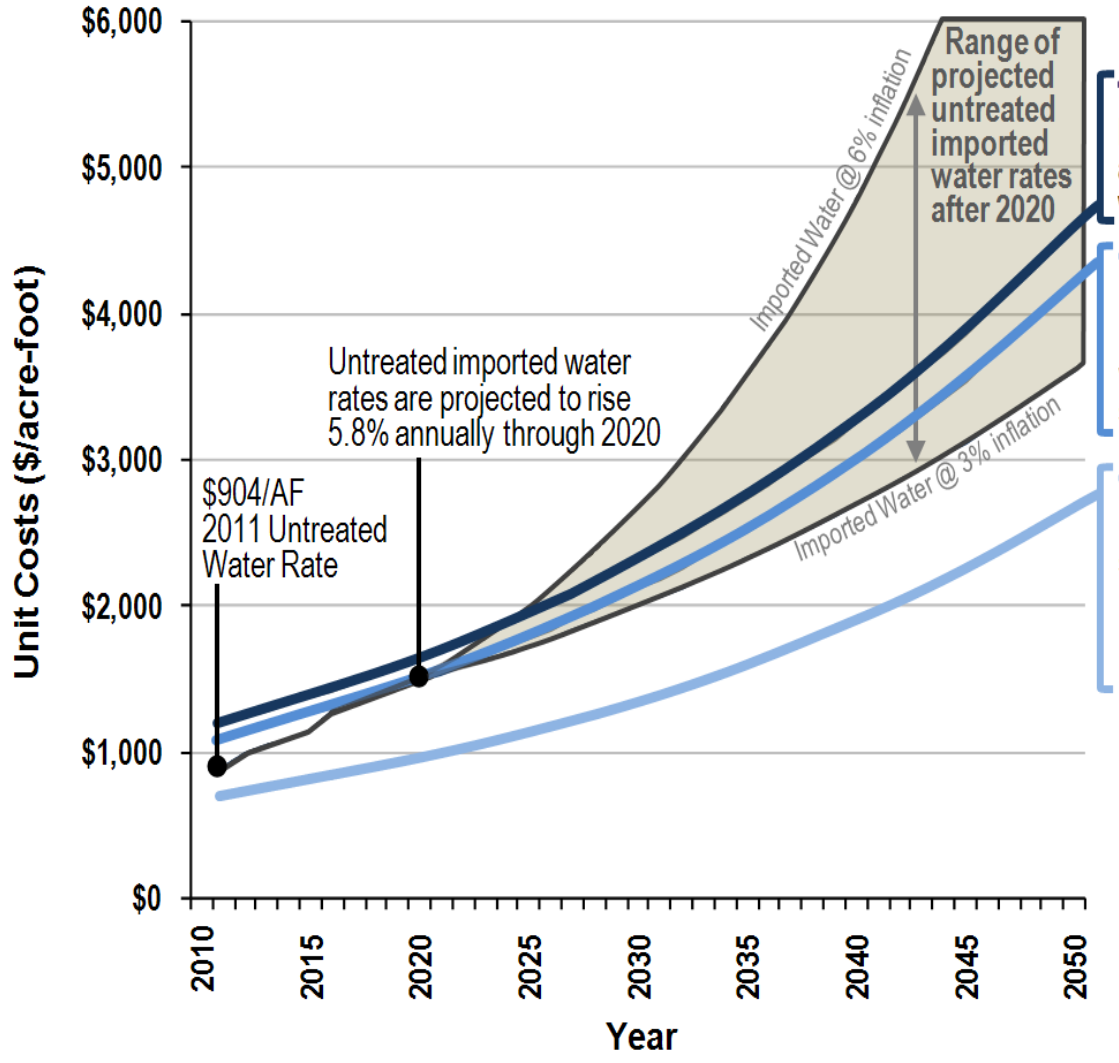
Reuse Costs

- Cost to produce 96,000 acre-feet per year of new reuse
  - $1700 to $1900 per acre-foot
- Includes (in 2011 $) for all new reuse facilities
  - Capital costs: $2.0 - $2.2 billion
  - Annual O&M costs: $100 - $110 million

Potential Savings Derived from Reuse

	$ per ac-ft
Range of Alternative Costs	**$1700 - $1900**
Tier 1 *Savings due to reduced wastewater CIP and O&M costs*	*($600)*
Tier 2 *Savings due to reduced salinity*	*($100)*
Tier 3 *Savings due to avoiding Secondary upgrade at PLWTP and Maintaining it as Chemically Enhanced Primary Treatment Plant*	*($400)*
Total potential savings	*($1100)*
Net cost after all savings	**$600-$800**

Comparing the Cost of Water



TIER 1 REUSE NET COST
Includes savings from reduced capital and O&M costs at downstream wastewater facilities.

TIER 2 REUSE NET COST
Includes Tier 1 savings and savings in the municipal water and wastewater systems resulting from significant reductions in water salinity.

TIER 3 REUSE NET COST
Includes Tier 1 and 2 savings, plus savings incurred if the reuse program results in avoiding secondary treatment upgrades at the Point Loma Plant (for remaining flows after reuse).

Recycled Water Study
Prioritized Next Steps

- Finalize the Water Purification Demonstration Project (Dec 2012)
- Conduct Facility Siting Studies (FY13, ~$300k)
- Evaluate cost sharing concepts (FY13, ~$50,000)
- Prepare Financing Plan (FY14, by City Staff)
- Integrate into Point Loma Waiver Process (FY13 and FY14)
- Confirm Otay Reservoir IPR Potential (FY14, ~$200k)

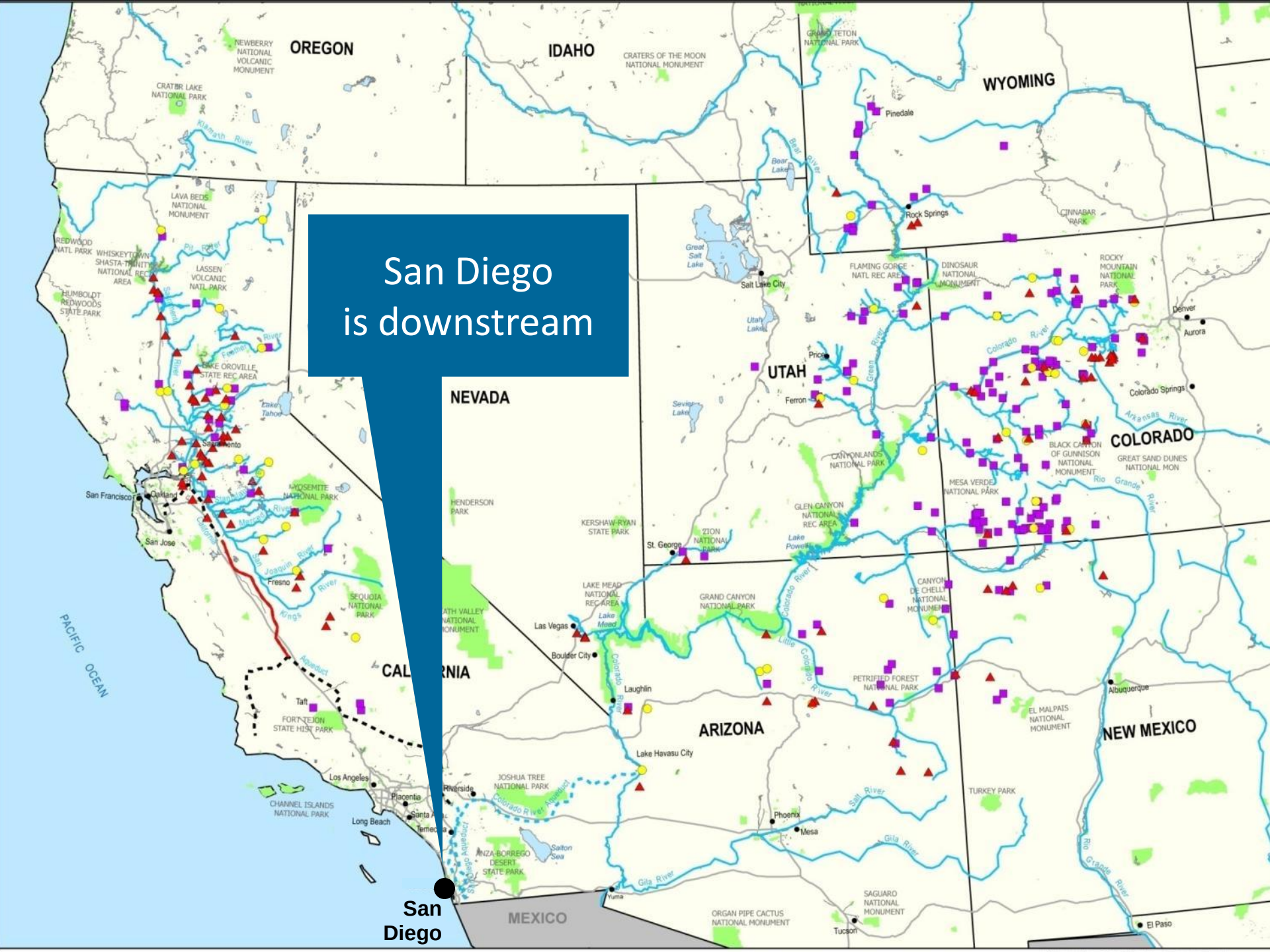
Presentation to the Water Policy Implementation Task Force

Water Purification Demonstration Project

July 25, 2012

Marsi Steirer, Deputy Director
Public Utilities Department
Long-Range Planning & Water Resources Division


California Water Projects
Federal Water Projects
Central Valley Project
Coachella Canal
All American Canal
State Water Projects
Local Water Projects
Mokelumne Aqueduct
Hetch Hetchy Aqueduct
Los Angeles Aqueduct
Colorado River Aqueduct
Bay-Delta
Redding
Sacramento
San Francisco
Fresno
Los Angeles
San Diego
Colorado River


San Diego
is downstream
OREGON
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
MEXICO
PACIFIC OCEAN
San Diego

Water Supply Challenges

- Rising costs of imported water
- Pumping restrictions
- Population growth
- Earthquakes

San Diego's Water Reuse Program

Water Reuse Study

Water Purification Demonstration Project

Full-scale Water Purification Project

Demonstration Project Objective

- Evaluate the feasibility of using advanced treatment technology to produce water that can be sent to San Vicente Reservoir and later distributed as potable water.
- Determine if the Demonstration Project provides evidence of viability for a full-scale IPR/RA project.

Water Purification Demonstration Project

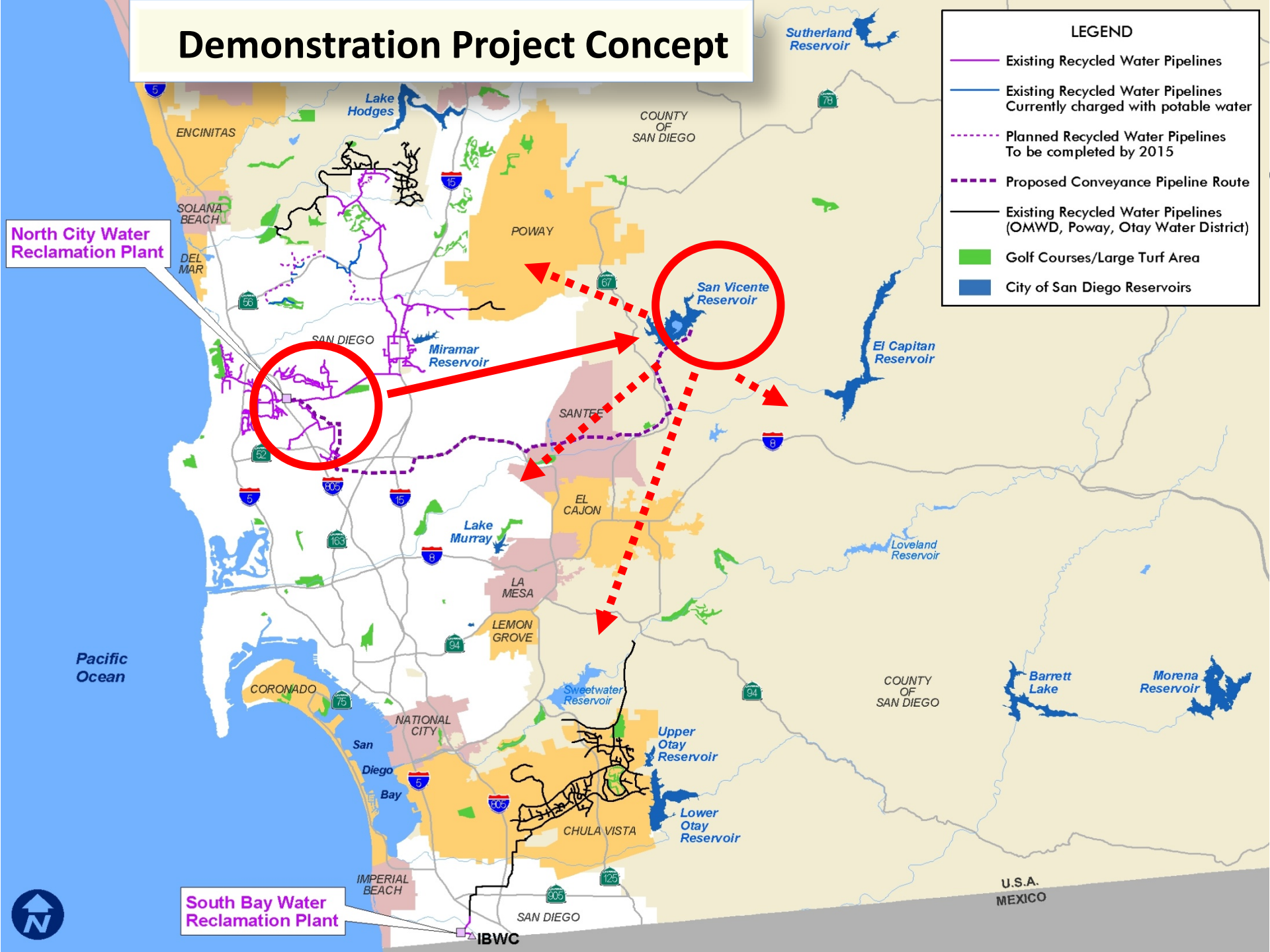
Components

- Operate one MGD facility
- San Vicente Reservoir study
- Define regulatory requirements
- Conduct energy and economic analysis
- Public education and outreach

Outcomes

- Validate treatment process
- Gain regulatory approval
- Evaluate cost
- Public acceptance

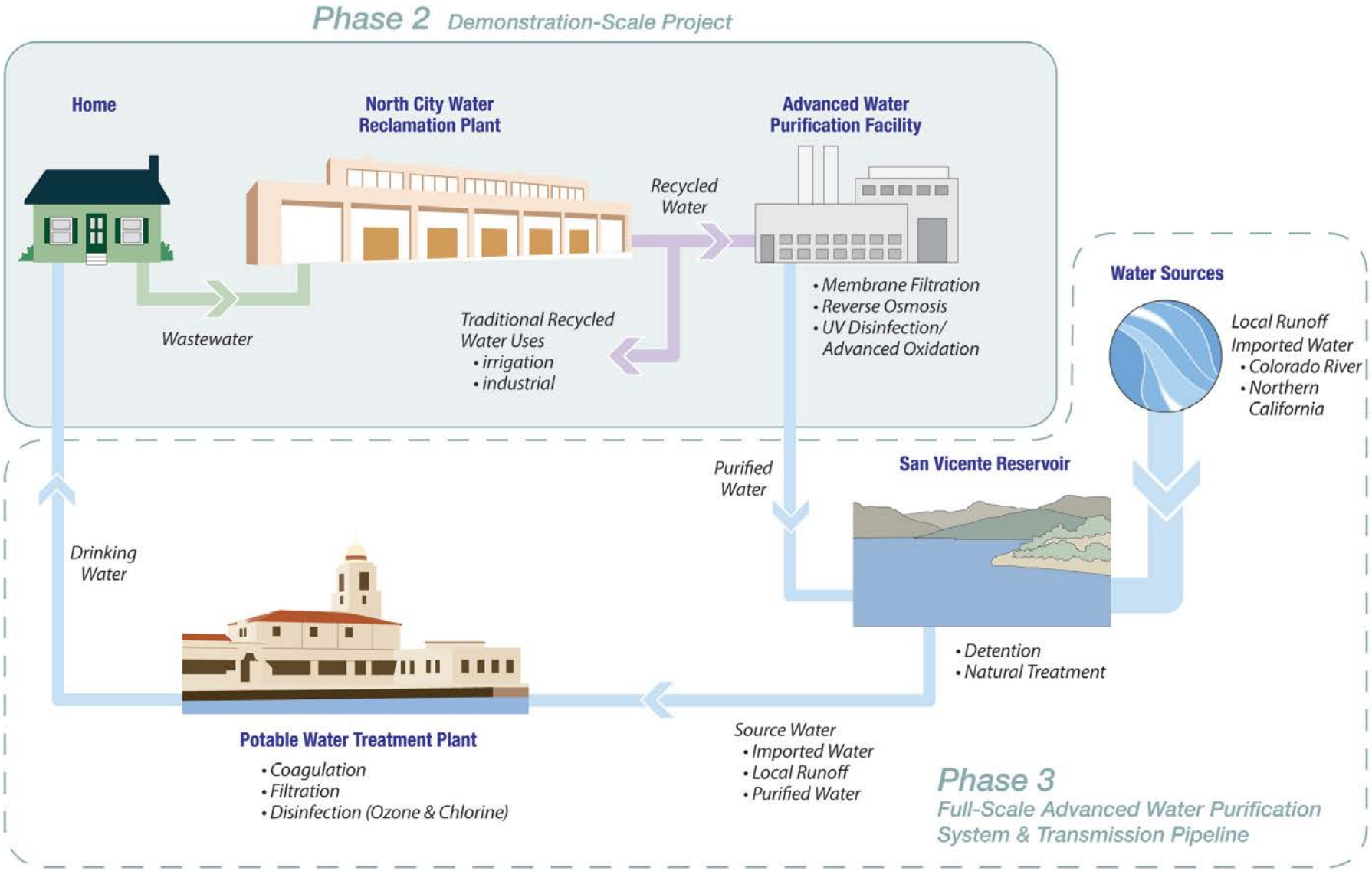
Demonstration Project Concept



City of San Diego's

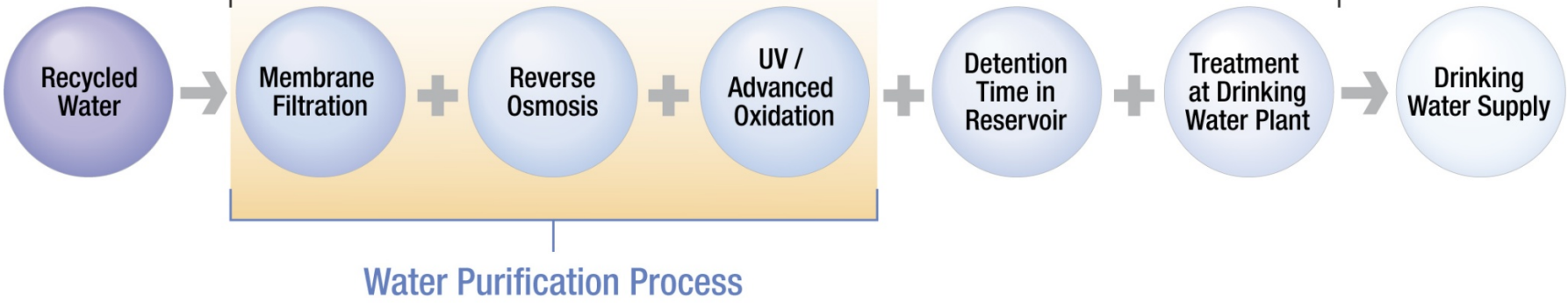
Water Purification Demonstration Project

Purification Process



Water Purification Process

Multi-Barrier Water Purification Steps

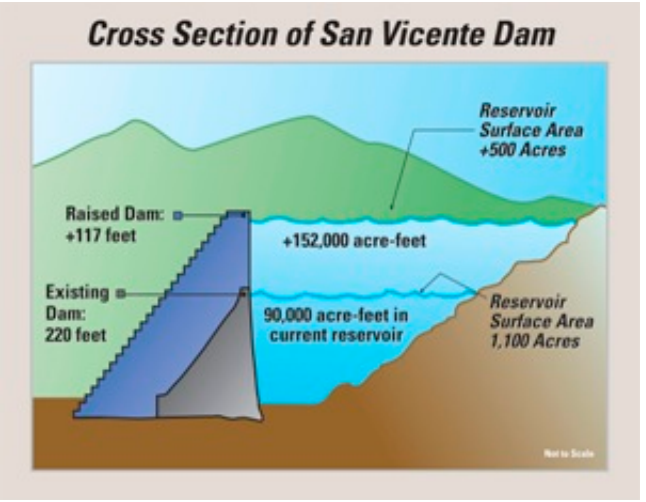


Microfiltration & Ultrafiltration

Reverse Osmosis

Ultraviolet Light / Hydrogen Peroxide

San Vicente Limnology and Reservoir Detention Study



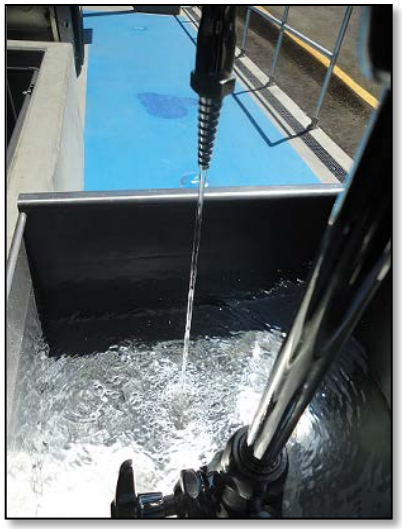
- Dam to be raised 117 feet
- Currently 90,000 acre-feet
- After dam raise 242,000 acre-feet
- Construction duration 2009 – 2013
- Augmentation would improve water quality

Testing & Monitoring Plan Objectives

- Demonstrate proposed treatment technology will produce water quality that meets public health and reservoir augmentation criteria.
- Evaluate nutrient removal performance of the facility treatment train.
- Demonstrate integrity monitoring techniques and performance reliability measures.
- Monitor and collect operational and maintenance requirements of facility equipment.

Water Quality Update

- Tertiary water used as source complies with most drinking water standards.
- Final product water met all drinking water and groundwater replenishment standards.
- Overall, water quality is exceptional, meeting all treatment goals for demonstration project.



Independent Advisory Panel

Panel includes:

- Ph.D's (9)
- Experts in water quality & treatment technology
- Experts in regulatory issues
- Local stakeholders
- O. C. Groundwater Replenishment System management

Public Outreach & Education

- Speakers Bureau
- Community Events
- Facility Tours

Advanced Water Purification Facility Tours



WRC
WATER RELIABILITY COALITION

Planning and Conservation League

ASCE Friends of Infrastructure
American Society of Civil Engineers

BiA

San Diego Audubon Society

BIOCOM

San Diego Regional EDC

Surfrider Foundation
San Diego Chapter

Environmental Health Coalition

BOMA San Diego

San Diego Coastkeeper

The San Diego River Park Foundation

naiop
National Association of Industrial and Office Properties

San Diego County Taxpayers Association

EHL

Empower San Diego

UnionYes
San Diego and Imperial Counties Labor Council

SASC
Sustainability Alliance of Southern California

San Diego Regional Chamber of Commerce

UCAN.org

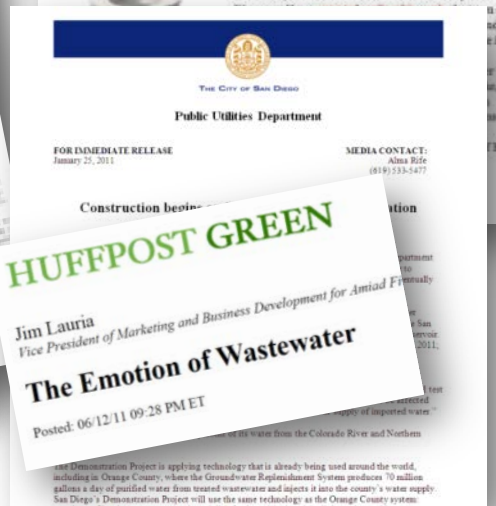
California Environmental Protection Agency
San Diego Regional Water Quality Control Board

Industrial Environmental Association

Coastal Environmental Rights Foundation

Media

- Press releases
- Press conference
- Media consultant
- Fair coverage



Project Benefits

- Local and sustainable supply of drinking water
- Increased use of recycled water
- Decreased dependence on imported water
- Less energy than imported water
- Improved quality of reservoir water
- Positive impact on environment

Questions?

(619) 533-7572
www.purewatersd.org


Water Purification Demonstration Project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