Rainbow Creek Nutrient TMDL Public Workshop #4

Presented by

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San Diego Regional Water Quality Control Board

November 17, 2004

Overview of Rainbow Creek Nutrient TMDLs

- TMDL Report (Alan Monji)
- Implementation Plan (Ben Tobler)
- Questions for the Regional Board

Workshop is being recorded

Rainbow Creek Nutrient TMDLs – Presentation Overview

- **Project Update**
- **Site History**
- **Problem Statement**
- **Numeric Targets**
- **Source Assessment**
- **Linkage Analysis**
- **Allocations**
- **TMDL Calculations**

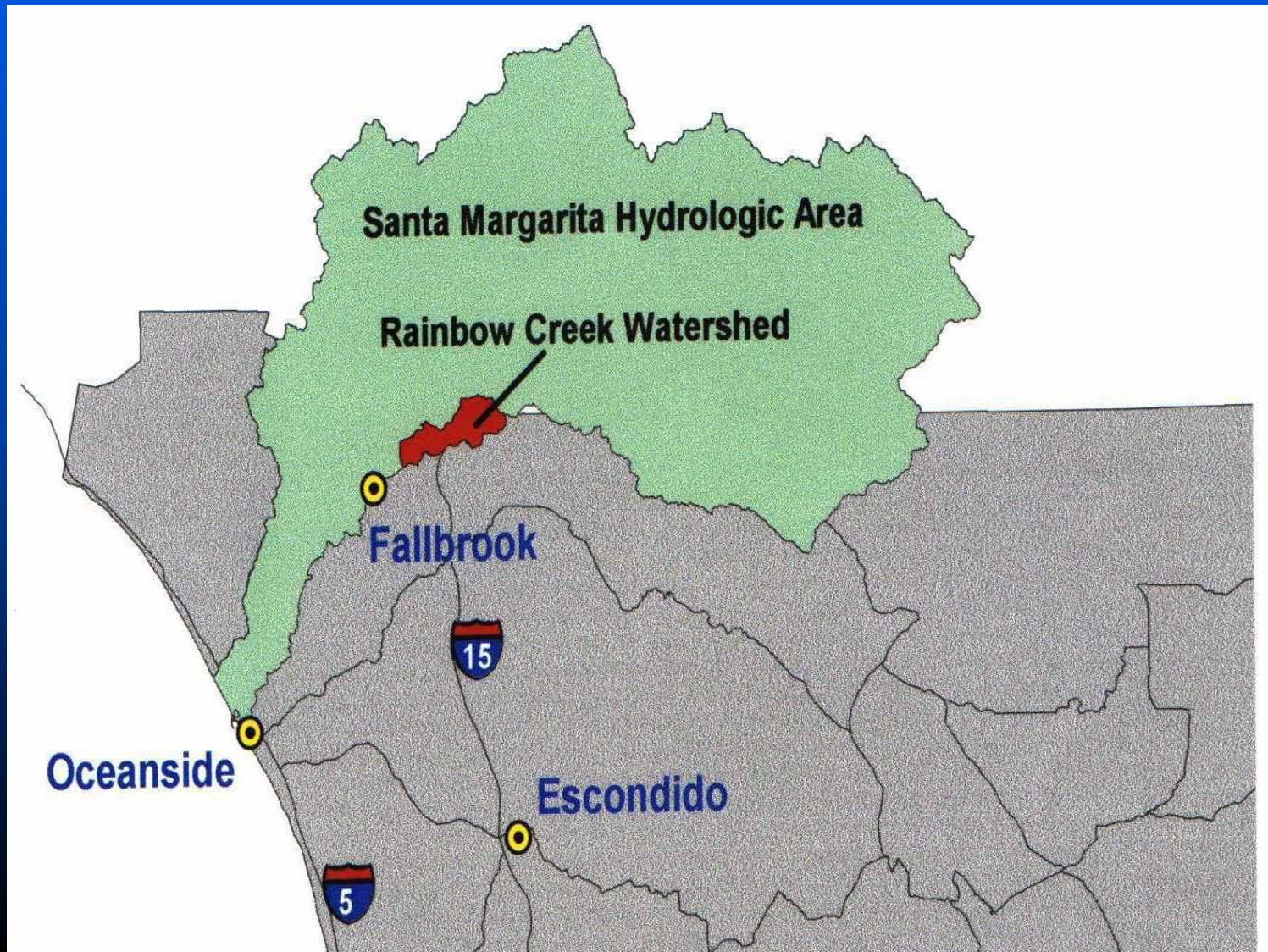
Rainbow Creek TMDL – Update

- **Revised TMDL Report (Since May 2002)**
  - Background Nutrient Calculations
  - Economics Section (Ch 12)
  - Response to Comments (Ch 11, App M and N)
  - Caltrans (Ch 4 and 6)
  - Legal Authority, Implementation Action Plan and Implementation Monitoring (Ch 8, 9, 10)

Rainbow Creek TMDL – Update

- **Scientific Peer Review #2** (July 2004)
  - Comments and Response to Comments
  - App N
- **Release Revised Draft TMDL to the Public** (Version Oct 15, 2004)
- **Public Workshop #4 - Today**
- **Board Hearings** (Dec 2004 and Feb 2005)

Rainbow Creek Watershed



Rainbow Creek TMDL – Brief History

- **Historical Nitrogen concentrations in the creek**
  - Prior to1980s 0.99 mg nitrate as N/L
  - 1986: Average conc 48.7 mg nitrate as N/L
    - » Agricultural Practices increase
- **Santa Margarita River**
  - Drinking water supply Camp Pendleton
  - Eutrophic conditions expected in river and lagoon

Rainbow Creek TMDL – Brief History

- **303 (d) list of Impaired Waterbodies**
  - 1996 - Eutrophic Conditions
  - 2002 – Total Nitrogen and Total Phosphorus (Nutrients)
  - USEPA approved update
- **Clean Water Act**
  - Priority Rankings
  - Establish TMDLs for impaired waterbodies

Overview of TMDL Process

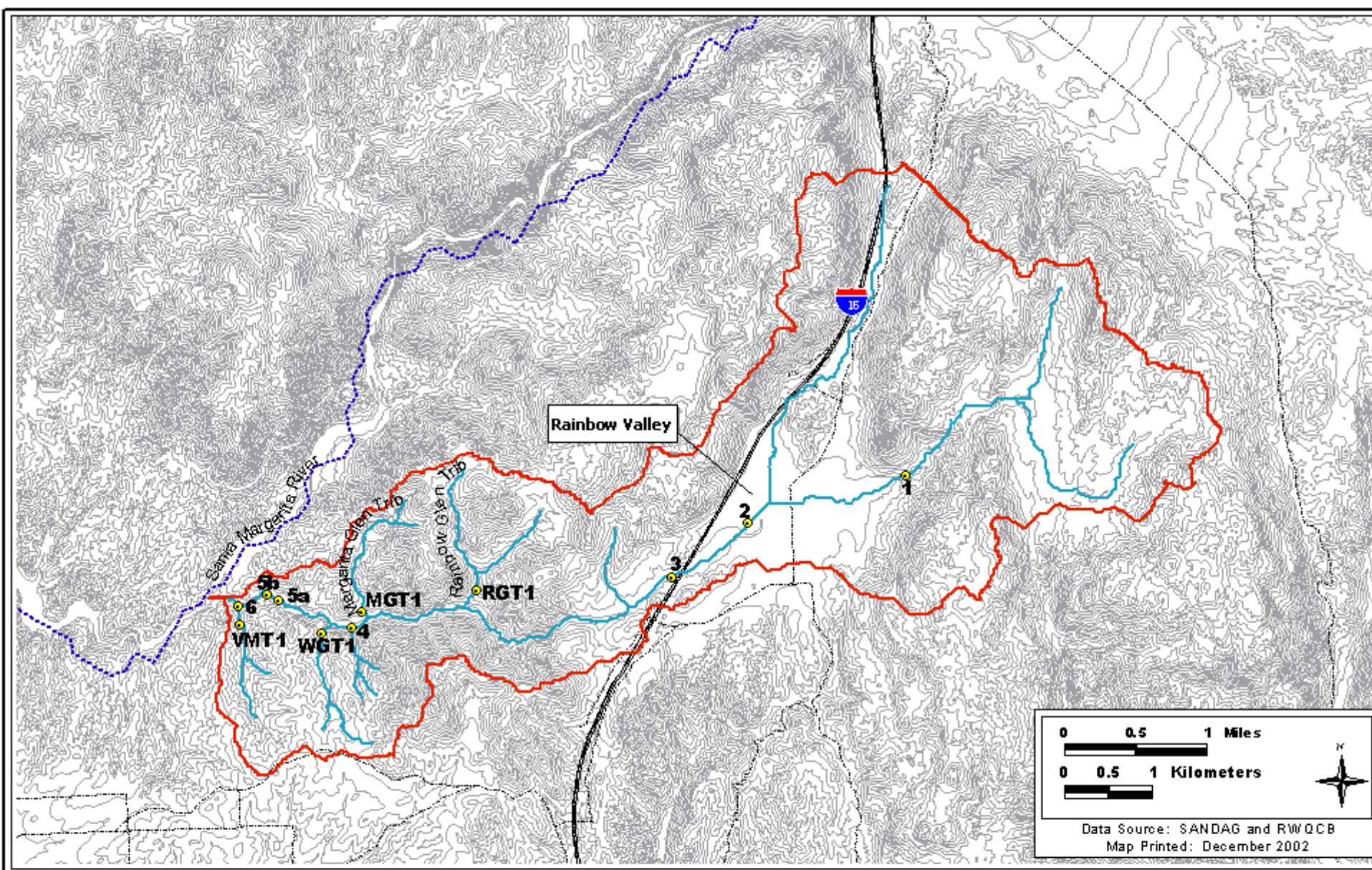
- **Problem Statement**
- **Numeric Targets**
- **Source Assessment**
- **Linkage Analysis**
- **Allocations**
- **TMDL Calculations**
  - **TMDL = Sum LA + Sum WLA + MOS**

Problem Statement

- **Elevated TN, TP , and NO_3 Above the WQO**
- **Beneficial Uses Affected**
  - MUN, REC1, REC2, WARM, COLD, & WILD
- **Occurrence of Excessive Algal Growth**

Numeric Targets

- Biostimulatory Substances Objective
  - TN = 1.0 mg/L
  - TP = 0.1 mg/L
- Nitrate in Municipal Supply
  - NO_3-N = 10 mg/L



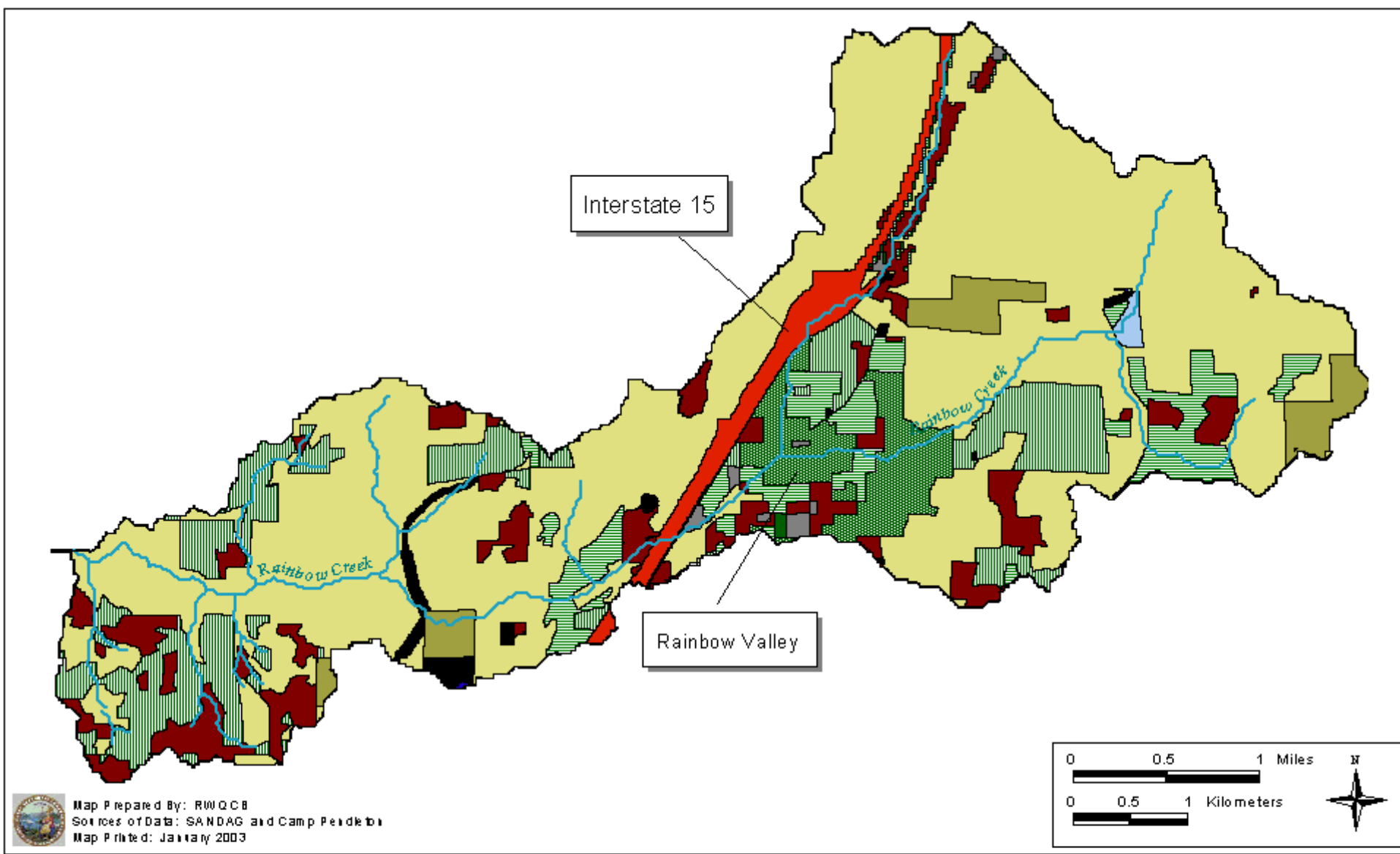
Water Sampling Sites

1	Jubilee Way	6	Stagecoach
2	Hines Nursery	RGT1	Rainbow Glen
3	Oak Crest	MGT1	Margarita Glen
4	Willow Glen-4	WGT1	Willow Glen

Legend

- Rainbow Creek
- Tributaries of Rainbow Creek
- Santa Margarita River
- Interstate 15
- Major Roads
- Rainbow Creek Watershed Boundary

Figure A-3: Rainbow Creek sampling sites with topography and water courses



Land Use and Acreage (percentage of total)

339 (4.8%)	Commercial Nurseries	223 (3.2%)	Preserves	214 (3.0%)	Freeway Corridor
436 (6.1%)	Agricultural Fields	4,342 (61.3%)	Vacant Not Graded	20 (0.3%)	Prison
781 (11.0%)	Orchards	618 (8.7%)	Residential Areas	34 (0.5%)	Urban Areas
5 (<0.1%)	Park	73 (1.0%)	Communication/Utilities	2 (<0.1%)	Water

Figure A-2: Rainbow Creek Watershed 2000 Land Use

Background Nutrient Levels

- **City of San Diego Data (background/reference):**
  - **TN Mean = 0.47 mg/L,** (SE = 0.09, n = 12)
  - **TP Mean = 0.07 mg/L,** (SE = 0.01, n = 12)
  - Chpt 4, App D and E
- **Biostimulatory Substances WQO**
  - **TN = 1.0 mg/l**
  - **TP = 0.1 mg/l**

Reference Streams In San Diego County

- Wilson Creek
- Pine Valley Creek
- Kitchen Creek
- San Vincente Reservoir
- Cottonwood Creek
- Conejos Creek
- Boulder Creek
- San Diego River
- Cedar Creek
- Bloomdale Creek
- Santa Ysabel Creek

Other Nutrient Criteria

- **USEPA Recommended Nutrient Criteria:**
  - **TN = 0.5 mg/L and TP = 0.03 mg/L**
  - **Potential Reference Conditions**
- **Other Nutrient Studies**

Dodds 1998:

- **TN = 0.9 mg/L and TP = 0.04 mg/L**

Dodds & Welch 2000:

- **TN= <3 mg/L and TP = <0.4 mg/L**

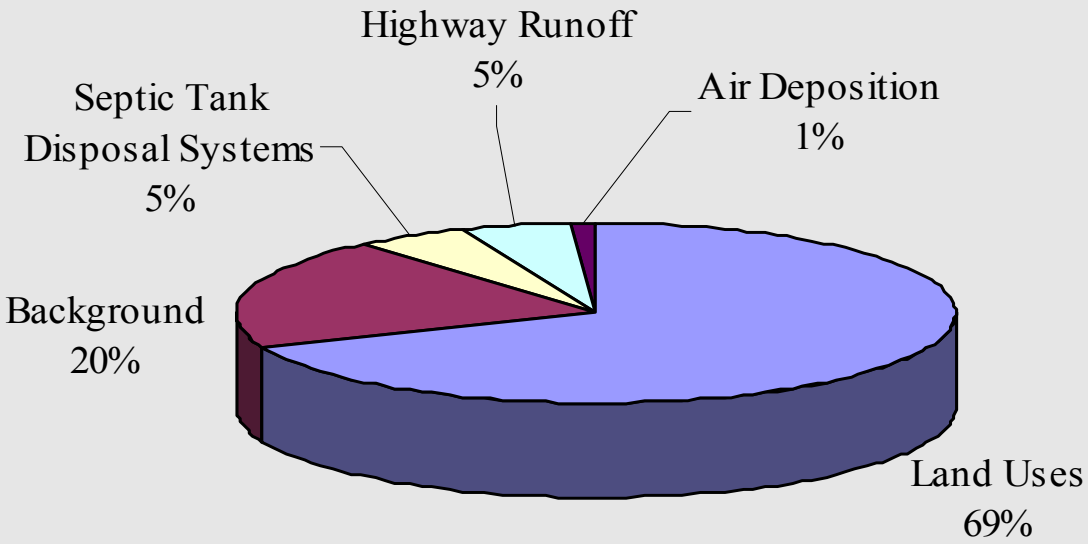
USEPA Regional Technical Advisory Group (RTAG)

- **Regional Nutrient Criteria for Central and Southern Calif.**
- **Adoption of New Nutrient Criteria**
  - **TMDL recalculated**
  - **Draft Basin Plan Amendment, Att. A**
- http://www.epa.gov/ost/standards/nutrient.html

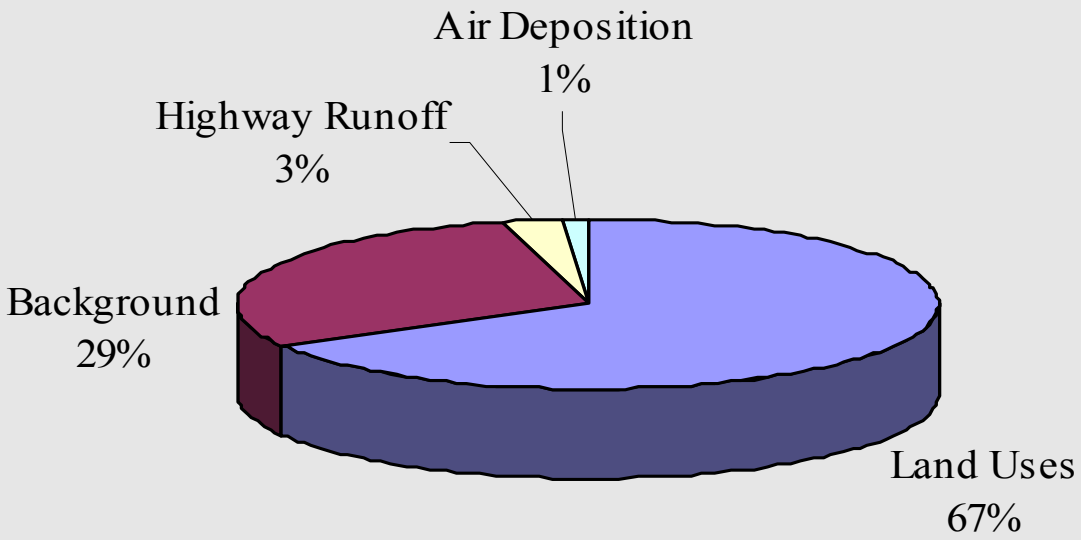
Source Assessment

Source Type	Method of Estimation	Annual TN Load Estimate kg N/yr	Annual TP Load Estimate kg N/yr
Land Uses (surface runoff)	Export Coefficients ∗ Acreage	2,662	262
Caltrans I-15 (storm water runoff)	Runoff Volume ∗ Typical Highway Concentrations	187	12
Background (surface runoff)	Flow ∗ Regional Background Concentration	779	116
Septic Tank Disposal Systems (ground water)	Flow ∗ Baseflow Concentrations	200	N/A
Air Deposition (surface water)	Deposition Rate ∗ area of surface water	40	2
	Total	3,868	392

Annual Total Nitrogen by Source Type



Annual Total Phosphorus by Source Type



TMDL Calculations

- **Low and Moderate-High Flows ∗ Numeric Target = TMDL**
  - TN TMDL = 1,658 kg/yr
  - TP TMDL = 165 kg/yr

- **Very High Flows (≥ 40 cfs) Excluded**
  - Very high magnitude flows
  - Occur less than 2% of the time

Load Allocations

In summary, the TMDL equation is:

$$TMDL = \sum(WLA) + \sum(LA) + Background + MOS$$

	Total Nitrogen	Total Phosphorus
∑ WLA	82 kg N/yr	8 kg P/yr
∑ LA	714 kg N/yr	33 kg P/yr
Background	779 kg N/yr	116 kg P/yr
MOS (5%)	83 kg N/yr	8 kg P/yr
TMDL	1,658 kg N/yr	165 kg P/yr

Total Nitrogen WLA and LA

Source	Current Annual Load Kg N/Yr	Annual Load Kg N/ Yr	% Reduction
Point Sources			
Caltrans Highway Runoff	187	49	74
Unidentified Sources and Future Point Sources		33	
Non Point Sources			
Commercial Nurseries	507	116	77
Agricultural Fields	655	151	77
Orchards	790	182	77
Park	7	3	50
Residential	650	149	77
Urban Areas	53	27	50
Septic Tank Disposal Systems	200	46	77
Air Deposition	40	40	0

Total Phosphorus WLA and LA

Source	Current Annual Load Kg P/Yr	Annual Load Kg P/ Yr	% Reduction
Point Sources			
Caltrans Highway Runoff	12	5	58
Unidentified Sources and Future Point Sources		3	
Non Point Sources			
Commercial Nurseries	27	3	90
Agricultural Fields	35	4	90
Orchards	63	6	90
Park	0.2	0.1	50
Residential	125	12	90
Urban Areas	11	6	50
Air Deposition	2	3	0

Regulatory Framework

- **Point Source Discharges**
  - Caltrans
    - Storm water runoff from I-15
    - MS4 NPDES Storm Water Permit
  - Calif Dept of Forestry and Fire Protection
    - Rainbow Conservation Camp - wastewater treatment plant
    - Waste Discharge Requirements (WDR)
  - County of San Diego
    - Urban runoff
    - MS4 NPDES Storm Water Permit

Nonpoint Source Discharges

- *CA Nonpoint Source Pollution Control Program, 1999*
- *CA Policy for Implementation and Enforcement of the NPS Control Program, 2004*
  - *Third-Party Regulatory Based Approach*
  - *MAA with County of San Diego*

Nonpoint Source Discharges

- ***Commercial nurseries***
- ***Agricultural fields***
- ***Orchards***
- ***Parks***
- ***Residential***
- ***Urban***
- ***Septic tank disposal systems***

Implementation Action Plan Objectives

- *Mandate point source waste load reductions in NPDES Permits*
- *Mandate NPS nutrient load reductions from the 7 land use areas*
- *Promote establishment of a MAA between RB and County*

Implementation Action Plan Objectives - Continued

- *Promote establishment of a MOU between RB and other agencies, organizations, and universities*
- *Establish mechanisms to track management measures*

Implementation Schedule

- ***Phased Load Reduction***
  - *20% Reduction Every 4 Years for 12 Years*
  - *14% Reduction in final 4 Years*
  - *16 Years Total Duration*

Implementation Schedule (TN)

Source	Annual Total Nitrogen Load Allocations			
	-20% 2009 kg/yr	-20% 2013 kg/yr	-20% 2017 kg/yr	-14% 2021 kg/yr
Waste Load Allocations				
Caltrans highway runoff	122	49	49	49
Unidentified & future point sources	33	33	33	33
Load Allocations				
Commercial nurseries	396	315	202	116
Agricultural fields	511	405	261	151
Orchards	617	480	315	182
Park	5	3	3	3
Residential areas	507	401	260	149
Urban areas	40	27	27	27
Septic tank disposal systems	200	100	46	46
Air deposition	40	40	40	40
Background	779	779	779	779
MOS (not allocated)	83	83	83	83
Total	**3,333**	**2,715**	**2,098**	**1,658**

Implementation Actions

- Regional Board
- County of San Diego
- Caltrans
- CA Dept. Forestry & Fire Protection

Regional Board Actions

- ***Request SWRCB amend Caltrans permit to incorporate nutrient WLA***
- ***Issue 13225 to County to submit NRMP***
- ***Establish Management Agency Agreement (MAA) with County***
- ***Issue 13225 to County for groundwater investigation***

Regional Board Actions (continued)

- ***CA Dept. of Forestry***
  - ***Issue 13267 for investigation of their discharge***
- ***Establish MOU with other Agencies or Organizations as needed***
  - ***US Dept. of Agriculture***
  - ***Mission Resource Conservation District***
  - ***UC Cooperative Extension***

Regional Board Actions (continued)

- ***Issue WDRs, Waivers, and Discharge Prohibitions***
- ***Take Enforcement Actions***
- ***Review and Revise Existing WDRs***
- ***Recommend High Priority for Grants***
- ***Incorporate WC Section 13291 Regulations in Basin Plan***

County of San Diego Actions

- *Control MS4 Discharges*
- *Submit & Implement Nutrient Reduction Management Plan (§13225)*
- *Submit GW Investigation Workplan and Report (§13225)*
- *Establish MAA with Regional Board*

Caltrans

- ***Meet Waste Load Allocations***
  - *NPDES Permit (Order No. 99-06-DWQ)*
- ***Submit Progress Reports***

CA Dept. Forestry & Fire Protection – Rainbow Conservation Camp

- ***Investigate Percolation Ponds and Report to Regional Board (§13267)***
  - *Evaluate discharges*
  - *Estimate nutrient loads from groundwater originating from septic systems and ponds*

Economic Considerations

Item	First Year Cost[1]	Subsequent Annual Cost[1]
Develop/Revise NRMP	$10,000 - $50,000	$2,000 - $10,000
Surface Water Monitoring Program[2]	$70,600 - $125,000	$70,600 - $125,000
Ground Water and Septic Investigation Program[3]	$54,000 - $102,500	$31,000 - $58,000
Equipment and Outreach[4]	$45,500 - $66,000	$9,000 - $20,000
Total	$180,100 - $343,500	$112,600 - $213,000

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Rainbow Creek Nutrient TMDLs

- *Technical TMDLs*
- *Implementation Plan*
- Questions?