

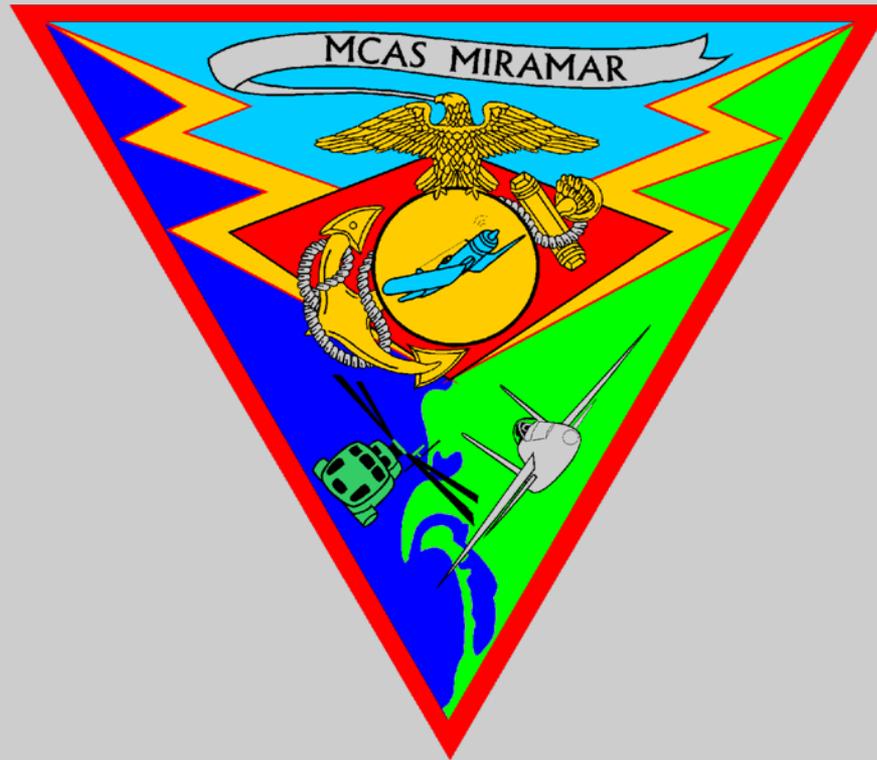
Charting a Course to Energy Independence

Providence, RI
August 9-12, 2009



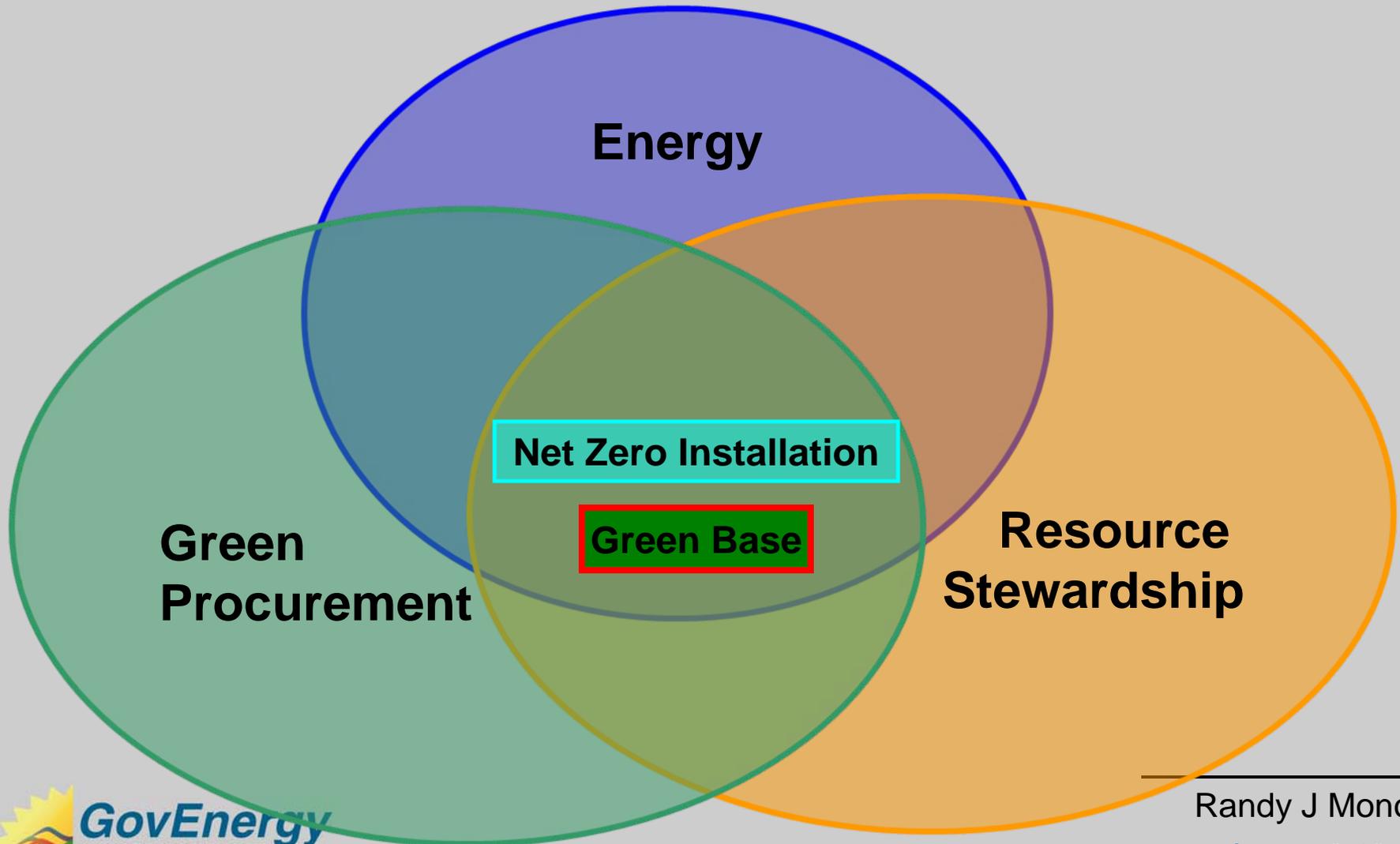


Miramar's Green and Net Zero Plan



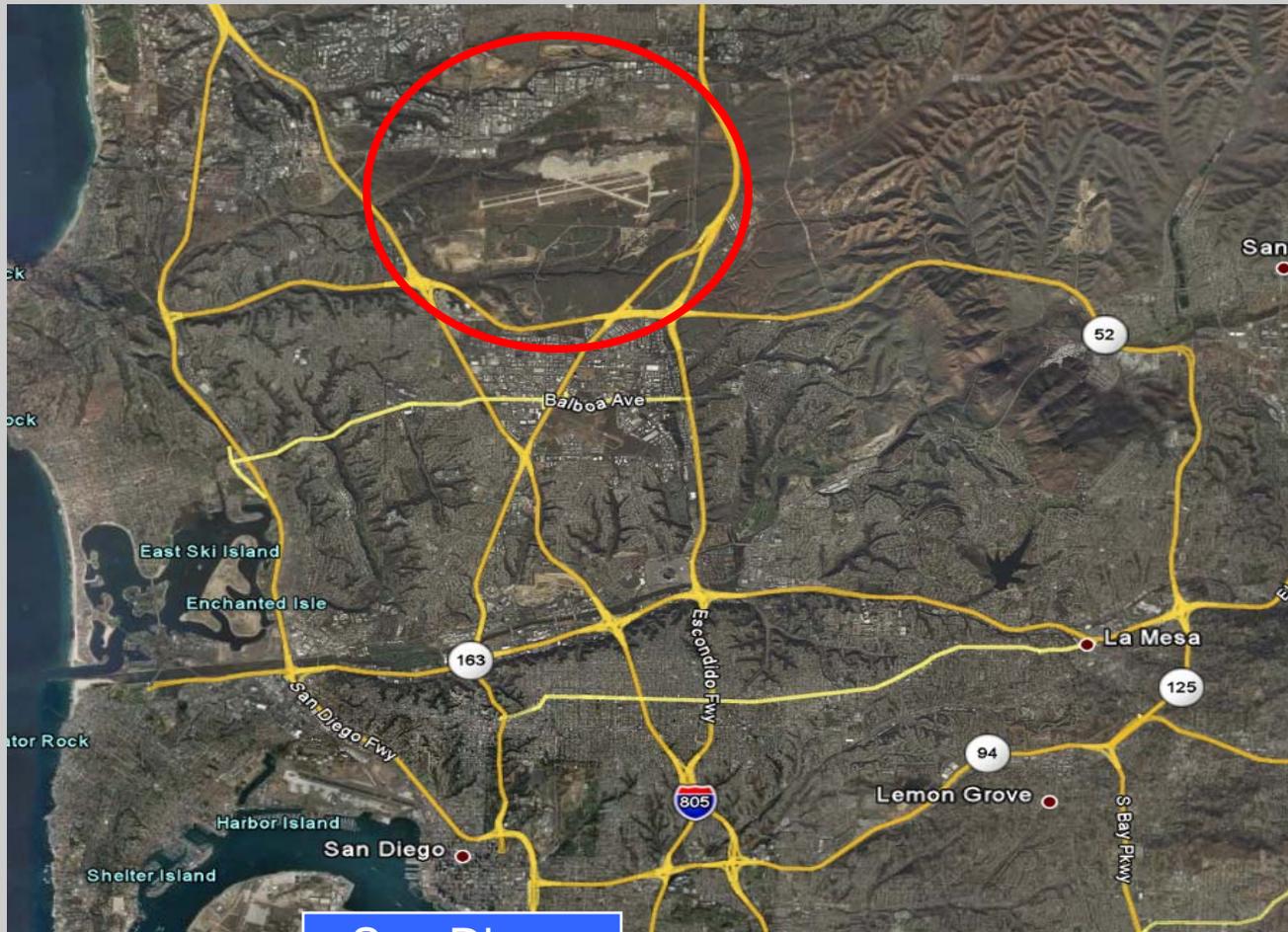


Miramar's Plan





Marine Corps Air Station Miramar



San Diego



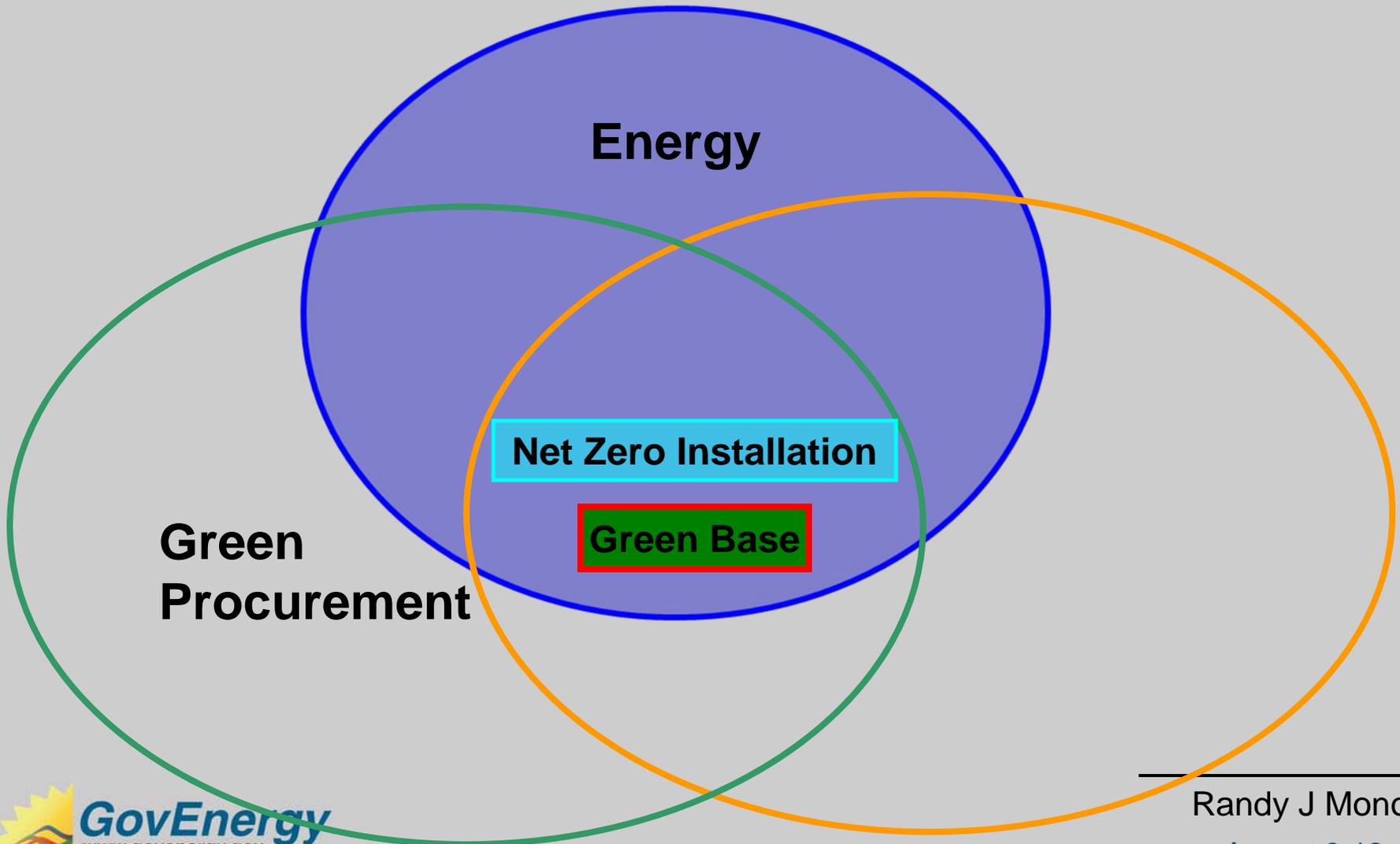


Miramar's Action Plan is to become Green and Net Zero

- Miramar will capitalize on the following resources to execute our strategic plan:
 - ☐ **Power Purchase Agreement (PPA)**
 - ☐ **American Recovery and Reinvestment Act of 2009**
 - a.k.a Stimulus Package
 - ☐ **Energy Conservation Investment Program (ECIP)**
 - ☐ **Energy Investment Program (EIP)**
 - ☐ **Energy Saving Performance Contracting (ESPC)**



Miramar's Plan



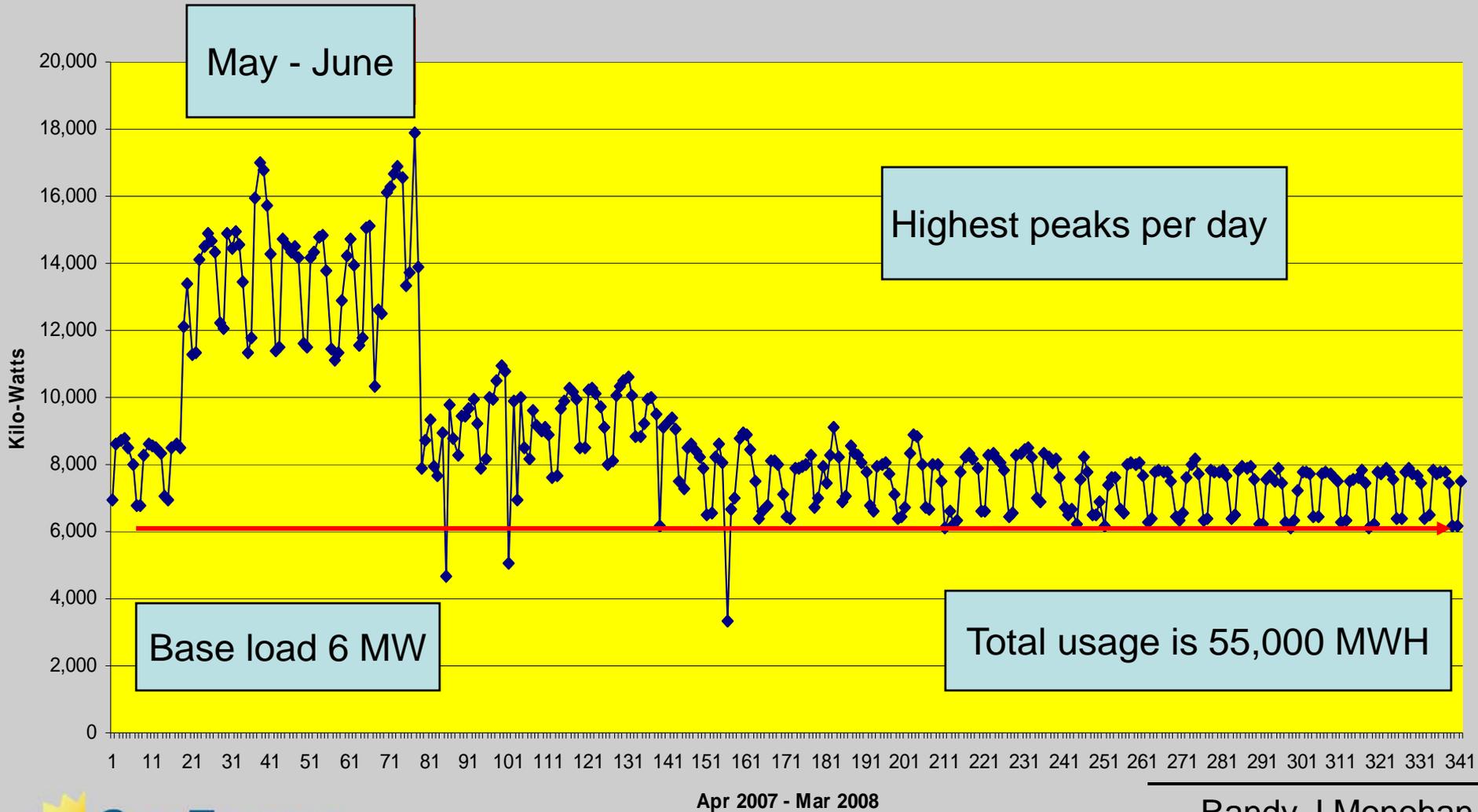


Snap-shot of our energy profile

- **Miramar's baseline Mega-Watt-Hours (MWH)**
 - ☐ 55,127 MWH
- **Base load**
 - ☐ Approximately six (6) Mega-watts (MW) of power
- **Load profile ranges**
 - ☐ 4 MW's on holidays to peaking at 18 MW's
 - ☐ Many times peak power occurs for just a few minutes.



Miramar's One-Year Load Profile





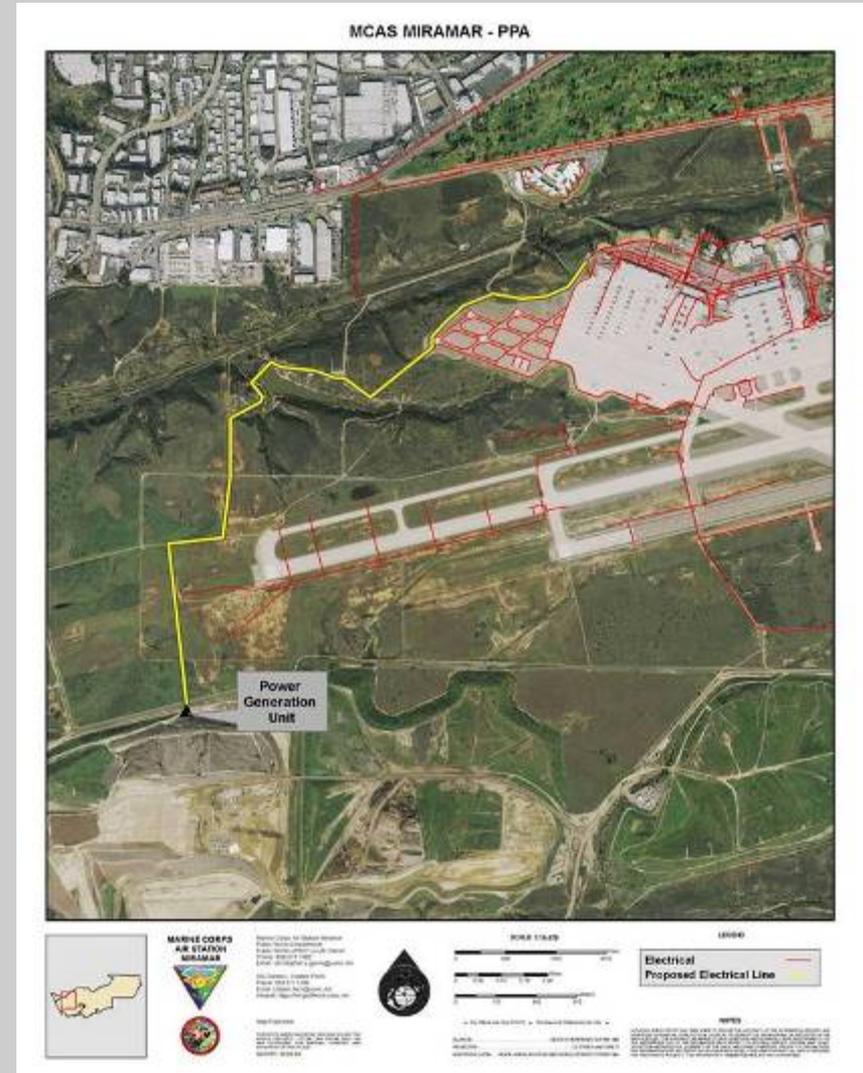
Projects Underway or Planned

1. Landfill power
2. Solar electric
3. Solar thermal
4. Boiler replacement
5. Water Conservation
6. Co-Generation
7. Station-wide backup power
8. Re-commissioning
9. Lighting
10. Smart Grid



Landfill Power

- Final negotiations are underway for PPA to purchase three (3) MW's of landfill power
- This project will provide an estimated 25,000 MWH of renewable power





Solar Electrical Generation Renewable Energy

- >800 KW PV carport structures
- 400 solar powered parking lot lights





Heating and Hot Water Boiler Replacement

Replacing heating boilers



- 50+ Heating and Hot Water Boilers
- Upgraded Motors
- Increased controls (DDC'S)
 - Costing \$7 Million

Replacing DHW tanks and/or using a hybrid approach with commercial grade tankless water heaters or Solar thermal



Randy J Monohan

August 9-12, 2009

Replacing heating and hot water boilers and install solar thermal array's to offset NG



C-Ct T-Ct
D-Ct S-Ct
E-Ct R-Ct
F-Ct Q-Ct

Deneb Ave
Castor Ave

Jupiter Rd

Lodestar Rd

Media Rd

Miramar Ct

PVT Rd

Olympus Rd

Gemma Ave

Miramar Way

Polaris Ave

Mischer Way

Regulus Rd

Miramar Marine Corp Air Station

Altair Ave

Kearny Villa Rd

Panther Rd

Sky-Hawk Rd



Alternative Financing Through ESPC

- **Smart Grid**
 - ☐ Control strategy for several on-site generation units
- **Co-Generation and Station-wide back-up**
 - ☐ 3-6 MW Station-wide Backup Generation
 - ☐ 2MW's of cogeneration
 - ☐ HVAC retrofits
- **Building Retrofits**
 - ☐ Re-commissioning
 - ☐ Building Envelope
- **Water Conservation**
 - ☐ Using recycled water for cooling towers
- **Lighting**



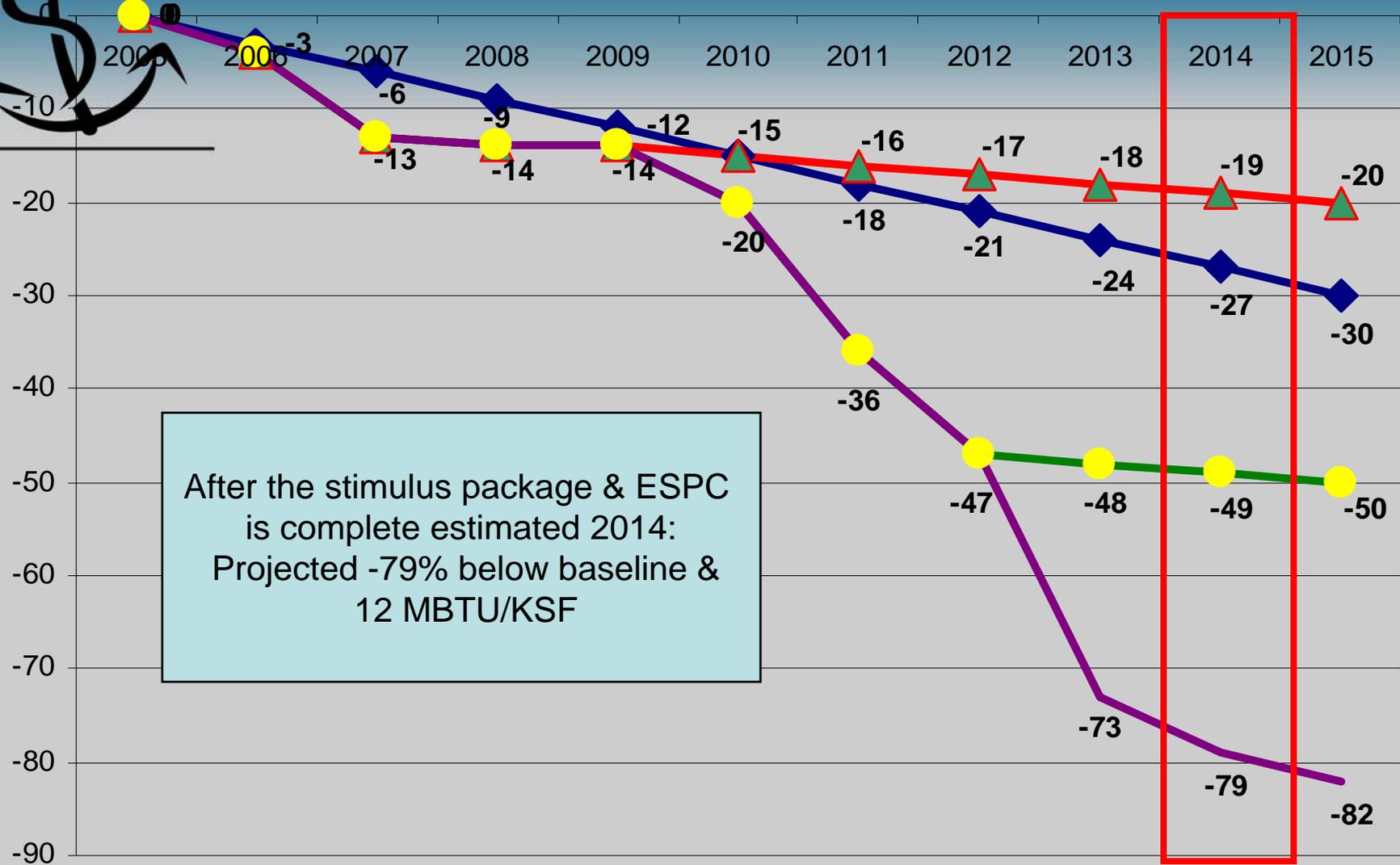
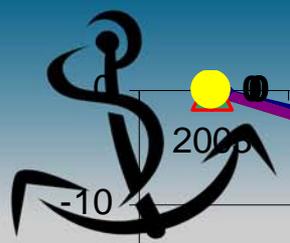
Miramar's Report Card

- **Miramar's 2003 Energy Baseline**
 - ☐ **Baseline calculations,**
 - **MBTU/KSF = 319,749 / 5,612 or**
 - **57 MBTU/KSF**

 - ☐ **Mandated -3% reduction from 2006-2015**

 - ☐ **Current MBTU/KSF -14% (2008)**
 - **49 MBTU/KSF**

 - ☐ **EO 13423 Mandate - 30% (2015)**
 - **40 MBTU/KSF**



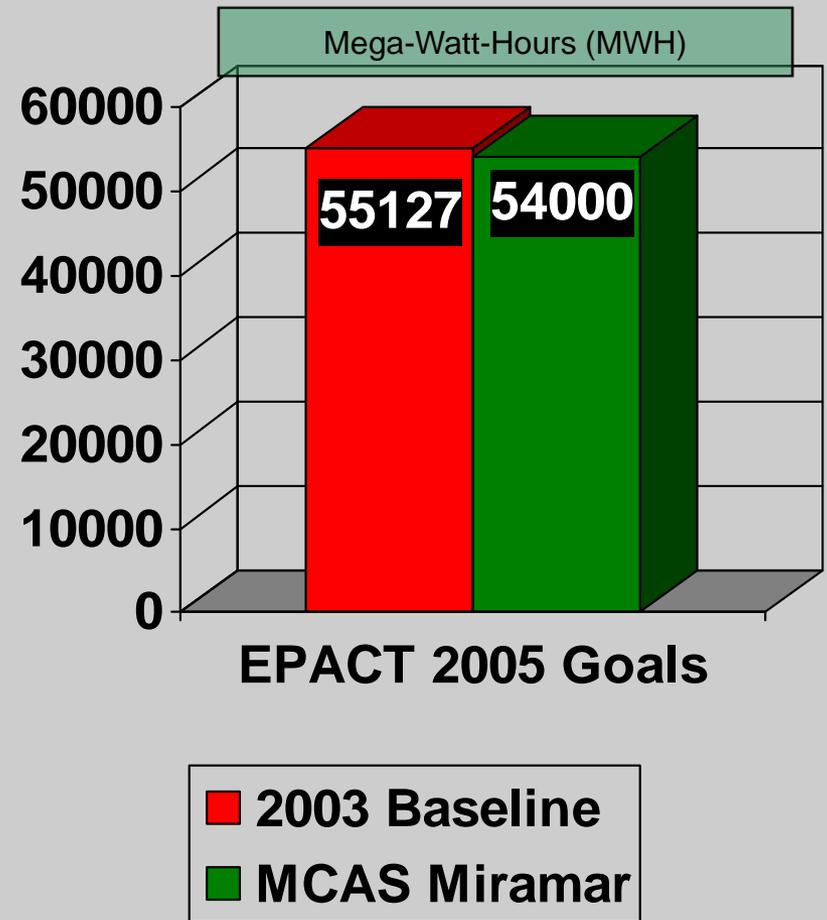
After the stimulus package & ESPC is complete estimated 2014:
Projected -79% below baseline & 12 MBTU/KSF

- Executive Order 13423
- MCAS Miramar without help
- Stimulus Package & PPA
- Combined S/P, PPA, ESPC (Net Zero)



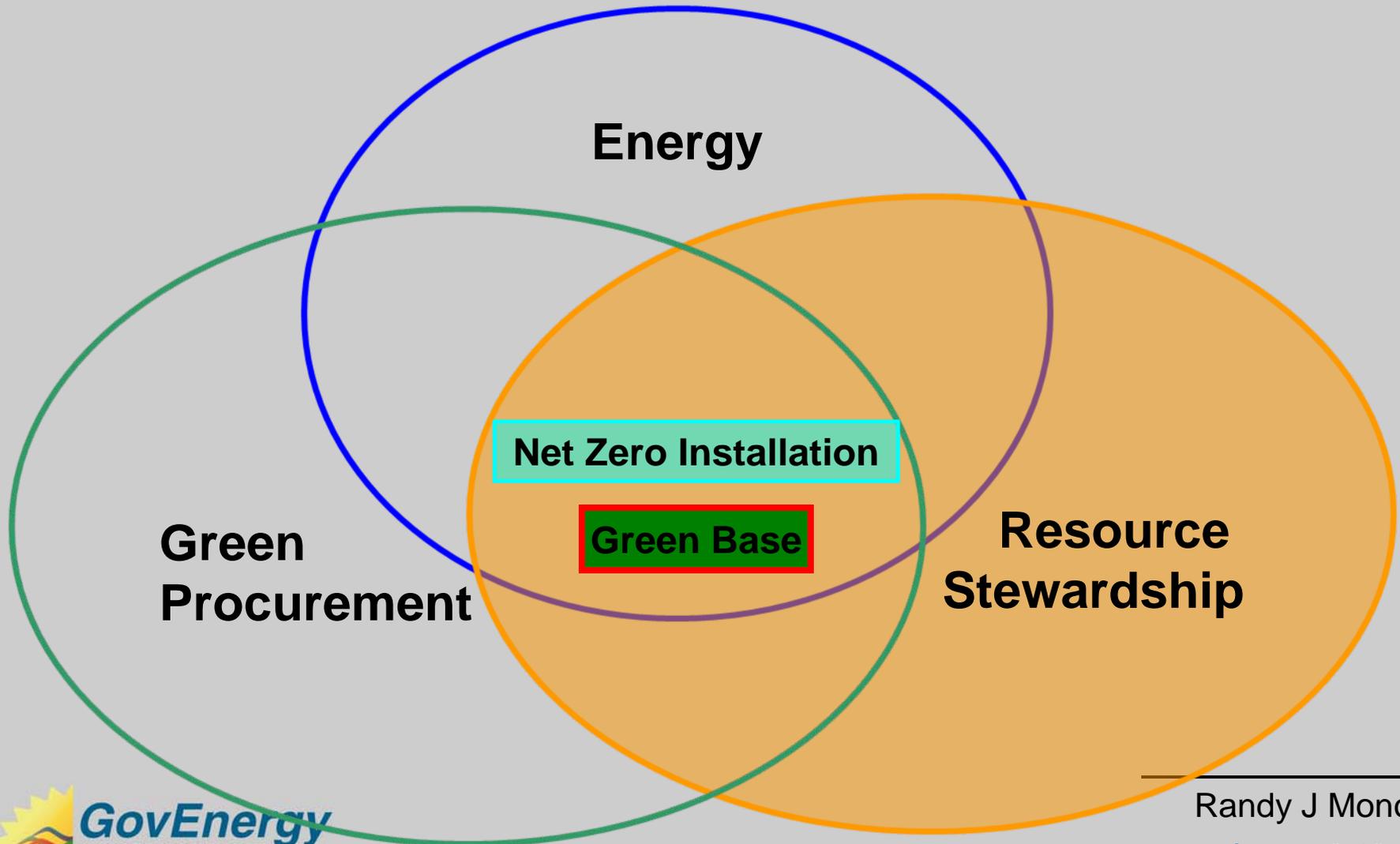
Energy Policy Act of 2005

- **Double credit for renewable energy under EPACT 2005;**
 - ☐ **If: The renewable energy is produced and used on-site at a Federal facility**
or
 - ☐ **If: The renewable energy is produced on Federal lands and used at a Federal facility**
- **Sec. 203, Federal Purchase Requirements mandates purchasing renewable energy of not less than 5% in 2010**
 - ☐ **5% = < 3,000 MWH**
 - ☐ **98% = 54,000 MWH**



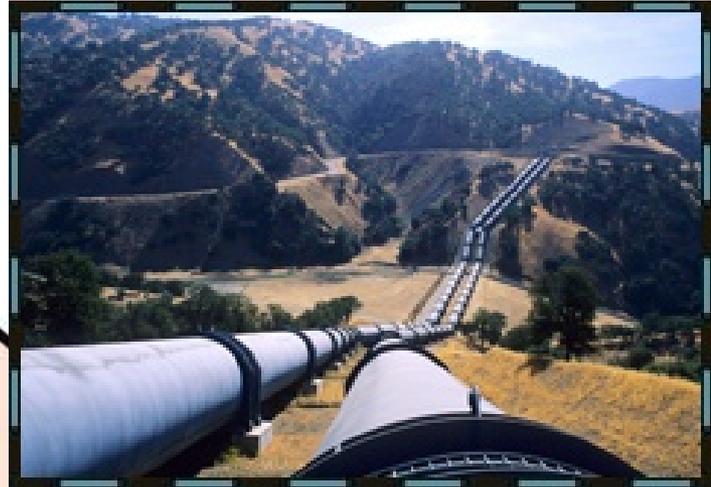


Miramar's Plan



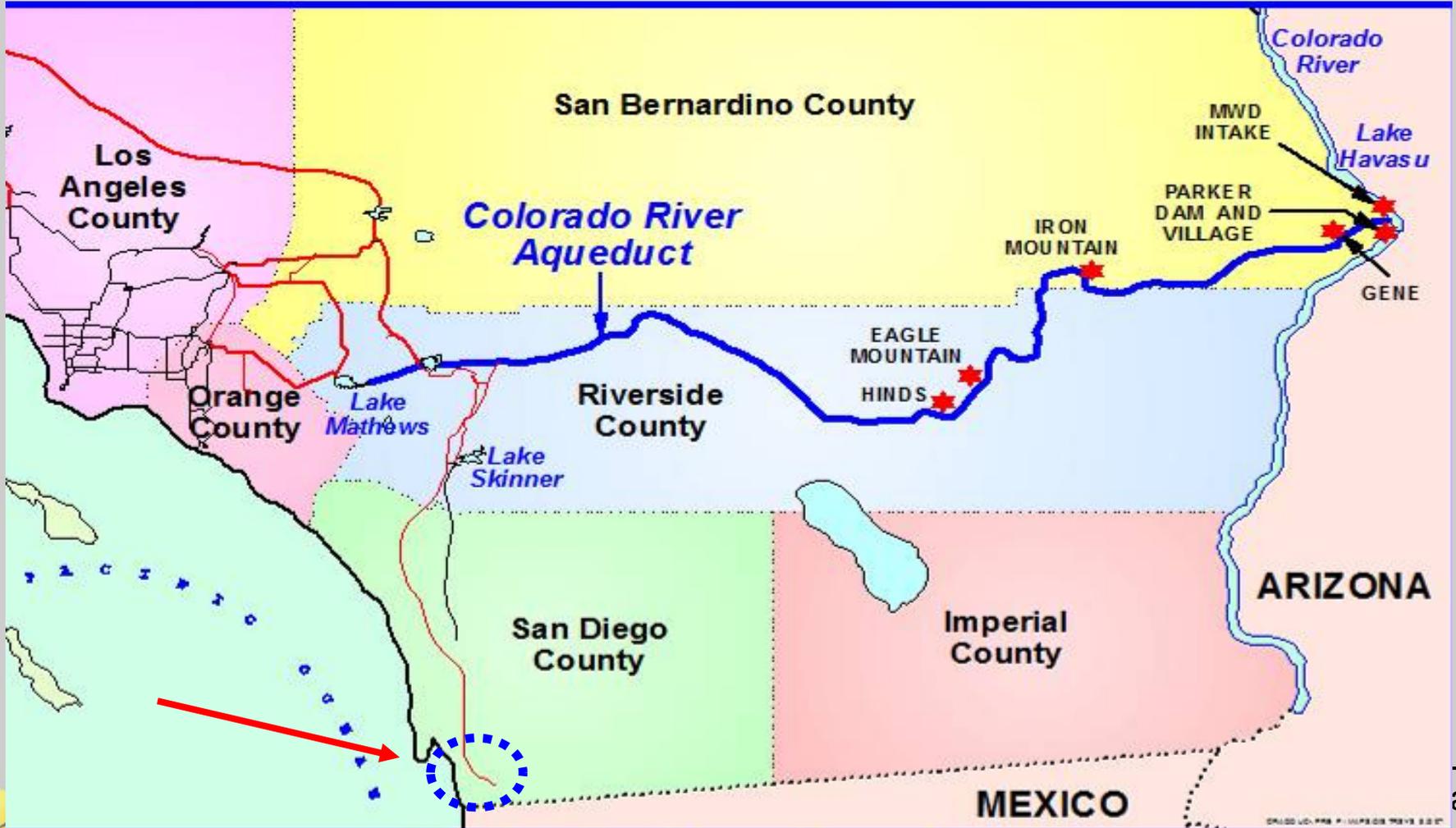


California Water Supply





San Diego Water Supply







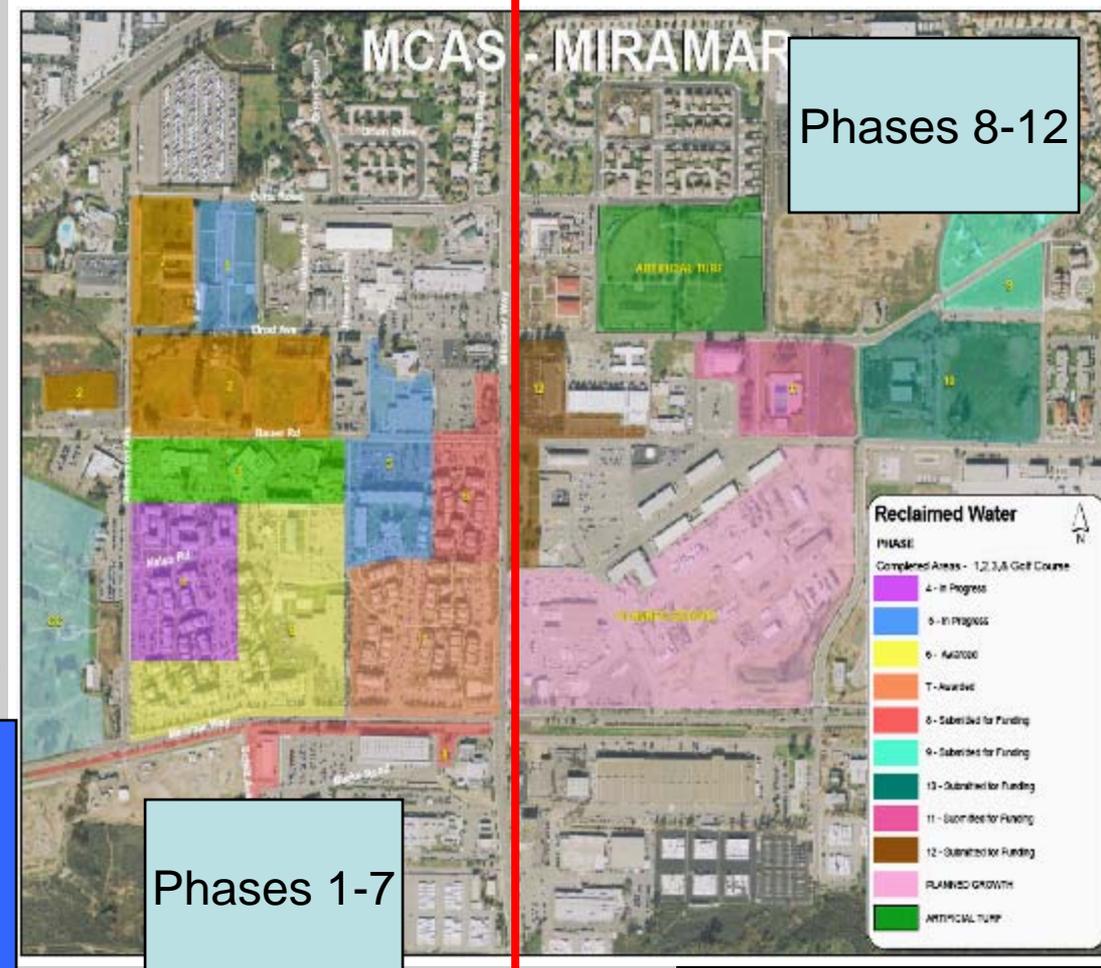


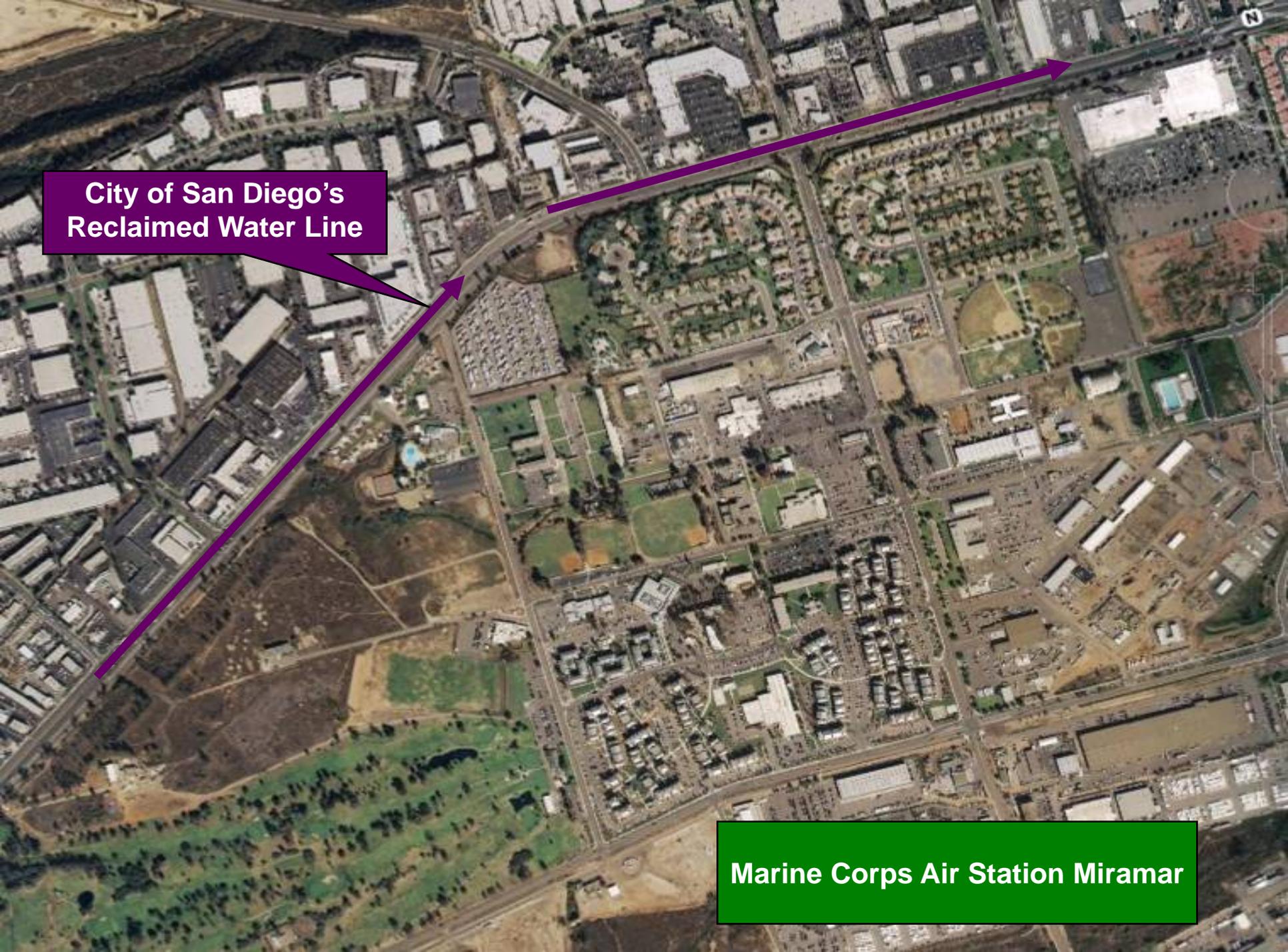
Resource Stewardship

- **Miramar's Resource Stewardship Plan**

- Water conservation through using reclaimed water
- Central Irrigation Control
- Dual Plumbing New Buildings
- Street Cleaning
- Construction Dust Control

Why use drinking water for these?



An aerial photograph of the Miramar area in San Diego. A purple line with arrows at both ends traces a path from the Marine Corps Air Station Miramar in the bottom right towards the top left. The line follows major roads and passes through various urban and industrial zones. A purple callout box with a white border and a pointer is located in the upper left quadrant, containing the text 'City of San Diego's Reclaimed Water Line'. A green callout box with a white border is located in the bottom right corner, containing the text 'Marine Corps Air Station Miramar'. A small 'N' in a circle is visible in the top right corner of the image.

**City of San Diego's
Reclaimed Water Line**

Marine Corps Air Station Miramar

Reclaimed Water

- Golf Course
- Phase 1 (Co)
- Phase 2 (Co)
- Phase 3 (Un)
- Phase 4
- Phase 5
- Phase 6
- Phase 7

Complete
Awarded
Awarded



New Silver LEED
SNCO and Golf Course
Club House





Reclaimed Water
Phases 8 -12

New Building

New Building

New Building

New Building

New Building



Libra Ln

Hamel Ave

Hamel Rd

Elrod St

Castor Ave

Jupiter Rd

Deneb Ave

Miramar Marine Corp Air Station

Kochab Rd

Media Rd

Miramar Way

Mir



Conserving Our Drinking Water

- Converting Station's irrigation from using drinking water to recycled water.
- Using recycled water for:
 - ☐ Dust control management
 - ☐ Street cleaning
 - ☐ Dual plumbing new buildings
- **Other water reduction efforts**
 - ☐ **Design**
 - ☐ **Artificial Turf**



Other Water Reduction Efforts

Landscaping Design



Randy J Monohan

August 9-12, 2009



**Year round green area
with little to no water!**



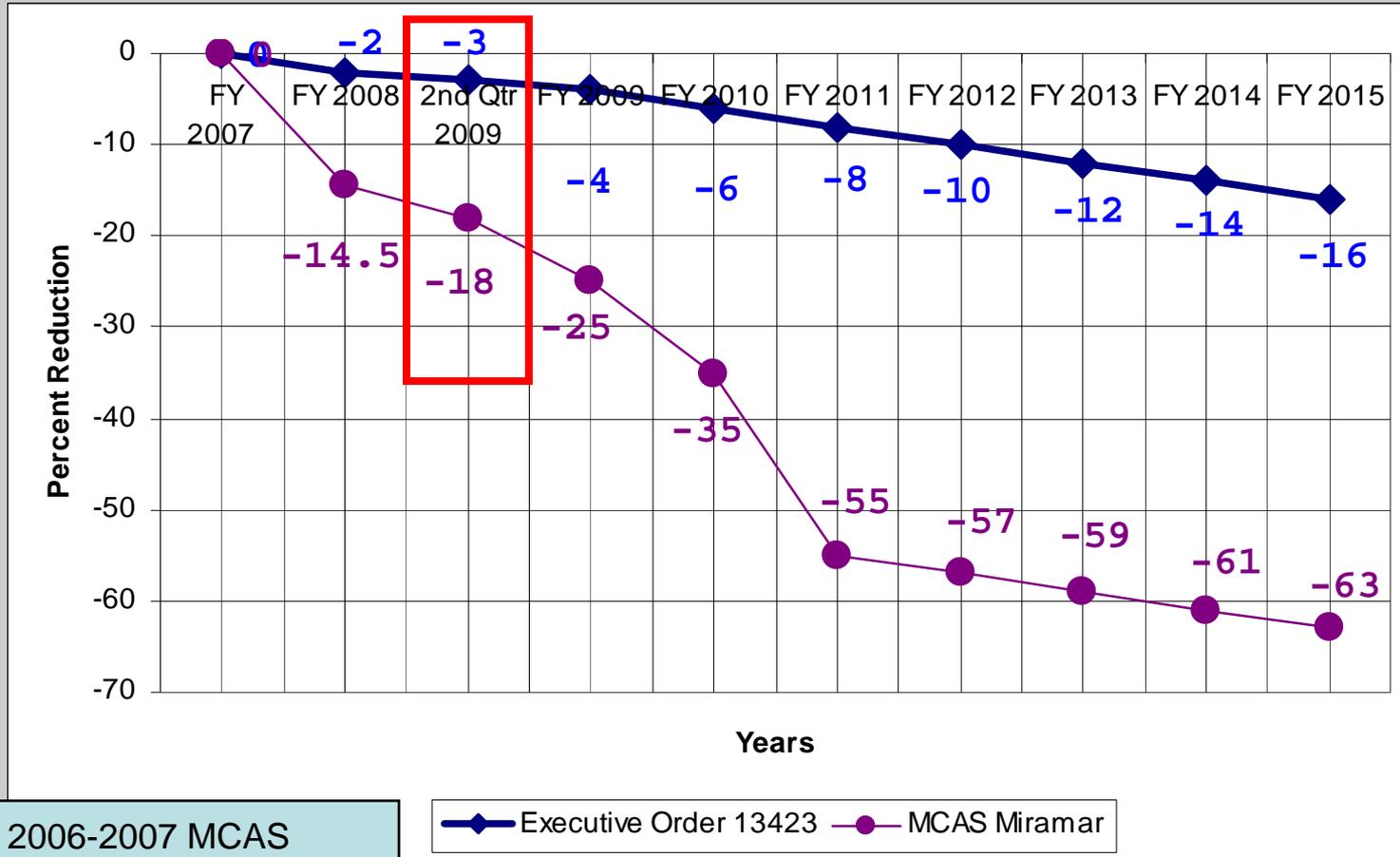
These ball-fields used >7,200,000 gallons of drinking water.
Costing more than \$72,000 annually for brown grass







Results



During 2006-2007 MCAS decreased their water consumption by 15%
But it didn't count



Results

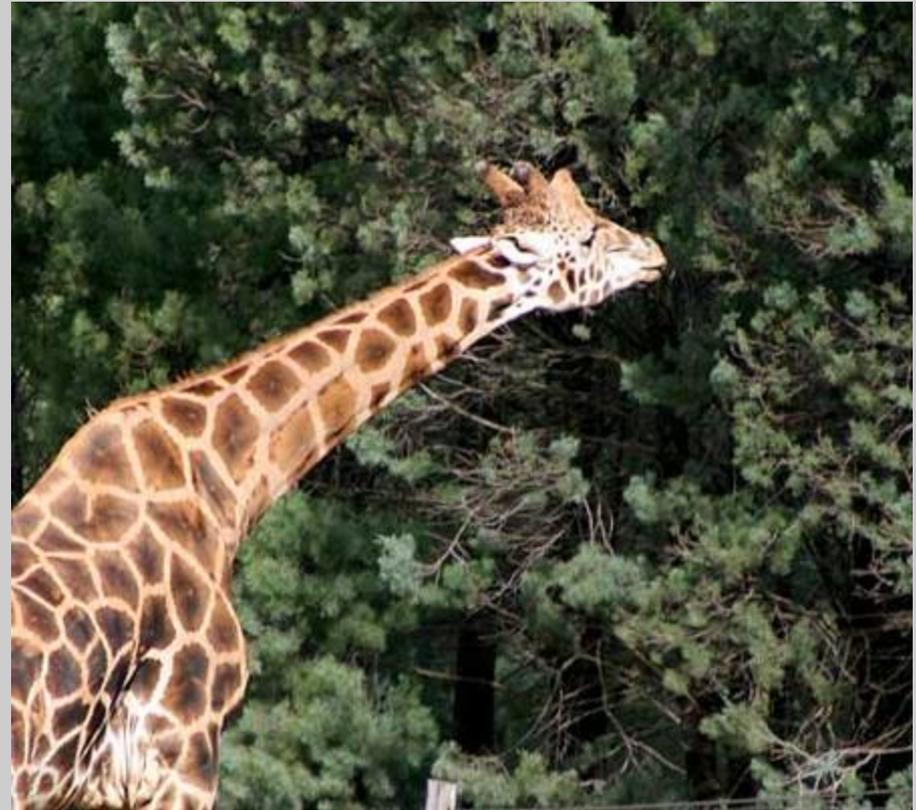
- IAW City of San Diego Water Department, the average household annual use is:
 - ▣ With 3 people and a small yard; 137,800 gallons
- In the last two years MCAS Miramar saved more than 48,000,000 gallons of drinking water supporting the following:
 - ▣ 348 homes with small yards

Cost of water:
\$10 per Kgals plus
\$12 per Kgals for sewer charges



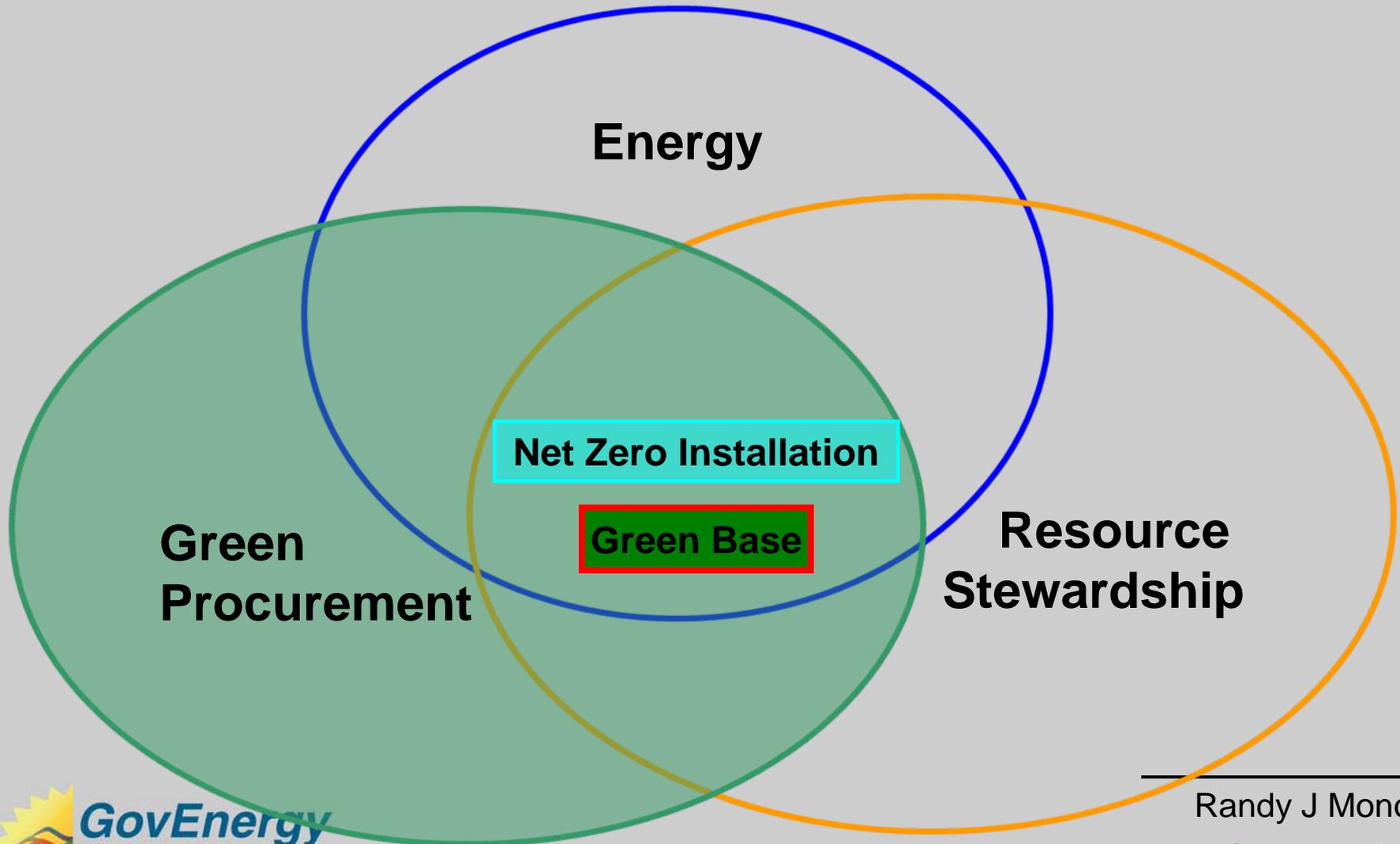
Resource Stewardship

- San Diego Zoo
 - ☐ We are finalizing a partnership with the San Diego Zoo to grow vegetation for animal feed (called “browse”) at various areas aboard the Station.
 - ☐ The browse would replace existing landscaping and require no additional irrigation. This partnership has already been written up in the Zoo’s monthly newsletter, raising community awareness of our sustainable landscaping.





Miramar's Plan





Green Procurement

- **Green Procurement Program (GPP)**
 - ☐ The purchase and use of environmentally preferable “green” products and materials containing recycling content in the greatest amount practical



Green Procurement

- **Green Procurement Program**
 - ☐ **An umbrella program covering 7 procurement preference programs**
 - **Recovered Material**
 - **Energy Efficient Products**
 - **EPA Priority Chemicals**
 - **Non-Ozone depleting substances**
 - **Bio-Base Products**
 - **Alternative Fuels**
 - **Environmentally preferable products**



Green Procurement

- **Green Procurement Program**
 - ☐ **All purchase made by a federal agency or by other agencies with appropriated federal funds, including:**
 - Purchase requests
 - Credit card purchasers
 - Contract actions
 - Local purchases
 - Central Supply purchases
 - Purchases from government supply sources
 - Purchases on-line



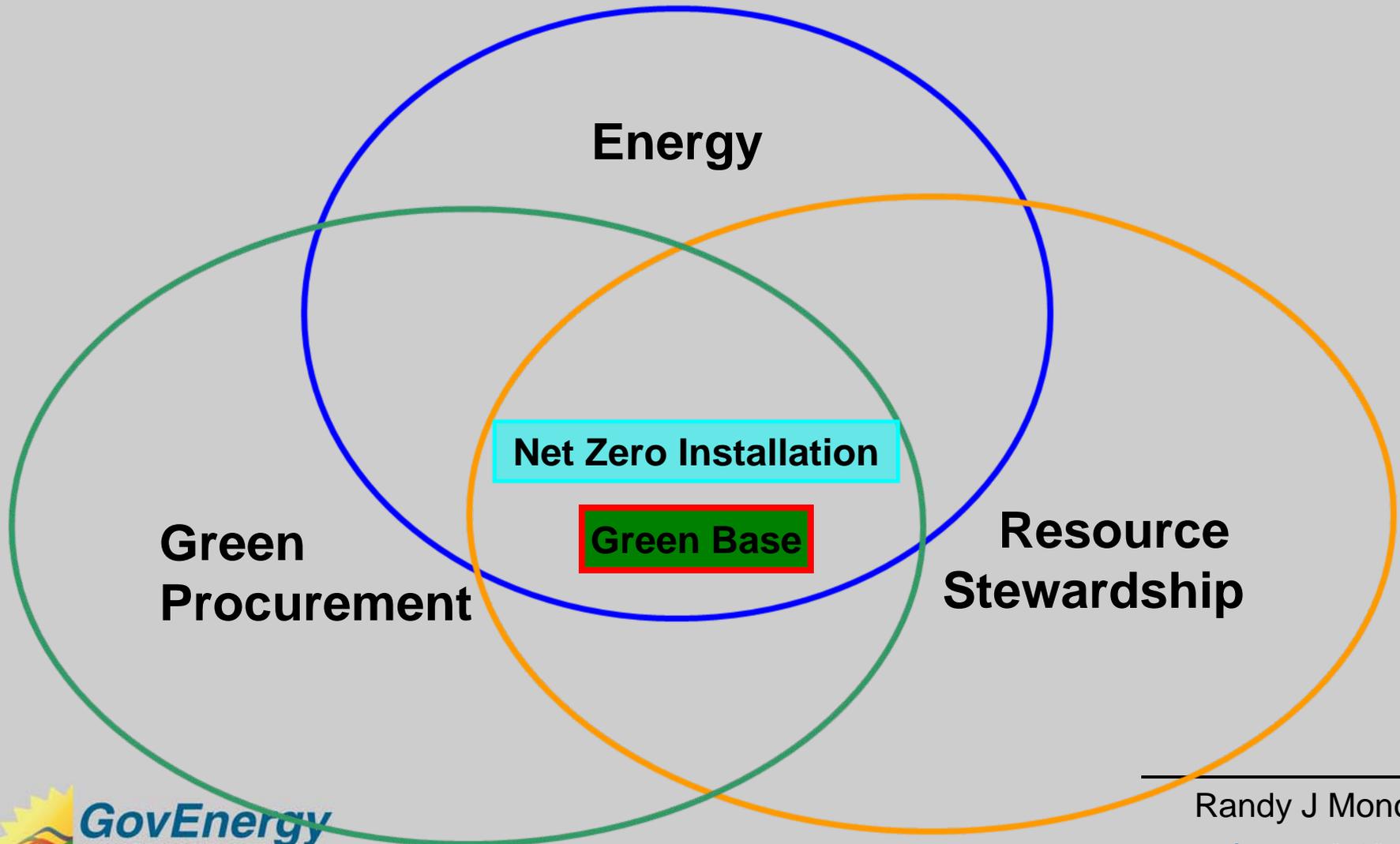
Green Procurement

- **Facilities Procurement**

- ☐ **With all new buildings requiring a minimum of LEED Silver certification, the Station requires meeting a higher point values in the Optimizing Energy performance and on-site renewable energy section.**
- ☐ **All supervisors in the Public Works Department will be LEED accredited**
- ☐ **As custodial contracts come up for renewal, we have mandated that green cleaning products be used.**
- ☐ **We also ensure that as specific building components get replaced, the new components are energy-efficient and promote sustainability.**



MCAS Miramar is closing the gap on the Green and Net Zero concept.





Project Pictures



Started Trenching



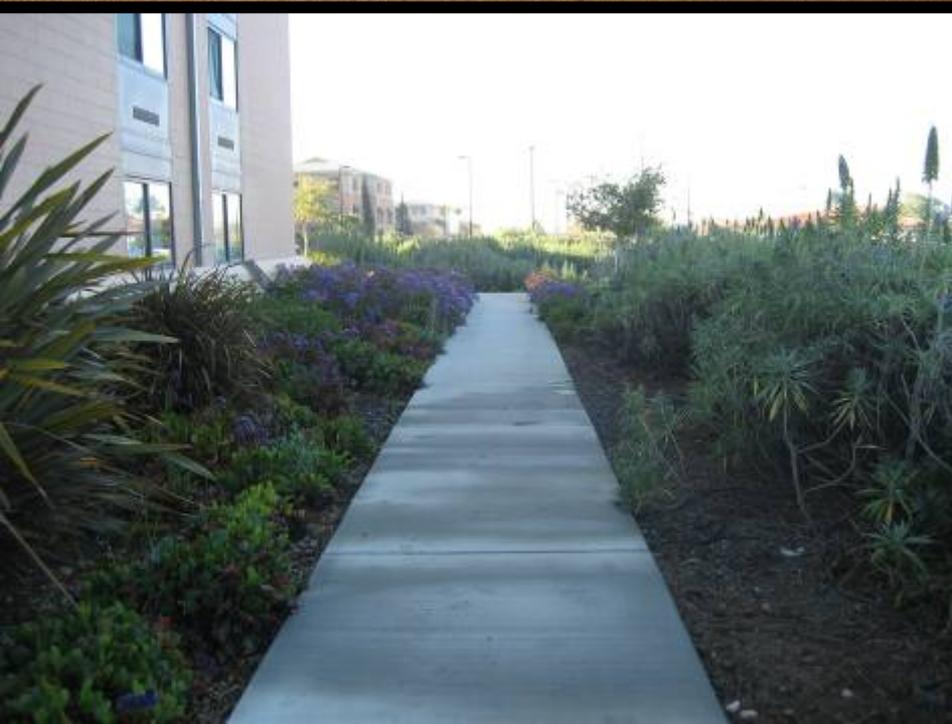


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Obstacles





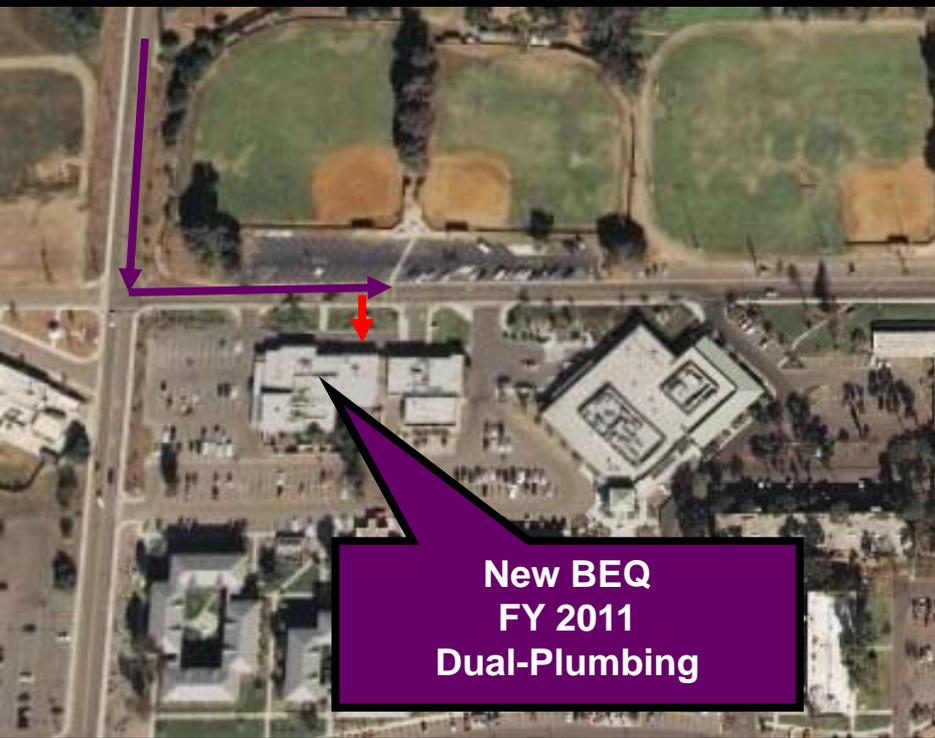


Installing Pipe and Connection Points





Planning for growth



Providing a Stub-out point for Dual Piping for Toilets in the new 400 room BEQ