North City Water Reclamation Plant

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What is Water Reclamation?

- Water Reclamation is the process of treating wastewater to be suitable for reuse
- Not Suitable for Human Consumption
Reasons to Build NCWRP

- Drought of the 1980’s
  - Water Conservation Acts
- Importing 90% of Water Supply
  - Future Reliability Uncertain
- Self Sustaining the City of San Diego
Importing Water to San Diego

- **California Aqueduct**
  - Sacramento San Joaquin Delta
  - 444 Miles Long

- **Colorado River Water Aqueduct**
  - Lake Havasu
  - 242 Miles Long

- 90% of drinking water is imported
Magnitudes and Costs

- Location: San Diego, CA
  - Near Interstate 805
- Facility Size: 16 acres
- Planning for Water Reclamation Program
  - Late 1980’s
- Construction began in 1995
- Opened for Operations in 1997
- Cost: $207 Million (1997)
  - Average $1 Million per mile of purple pipes
25 MGD Wastewater

21 MGD to Point Loma

4 MGD Reclaimed Water

North City Water Reclamation Plant Treatment Process

BAR SCREEN
The wastewater is first sent through a screen that collects and removes large debris.

PRIMARY CLARIFIER
In primary treatment, heavy particles such as dirt sink to the bottom of large tanks and are removed.

GRIT CHAMBER
In the grit chamber heavy debris, such as sand, settles to the bottom of the tank where it is removed.

AERATION TANKS
In the aeration tanks, wastewater is mixed with oxygen to create an environment for bacteria to decompose organic pollutants.

SECONDARY CLARIFIER
In the secondary clarifier, organic solids settle to the bottom of the tank and are separated from the treated wastewater. The organic solids consist primarily of bacteria. Most of the bacteria are pumped back to the aeration tank to continue the treatment process.

TERTIARY FILTERS
Water trickles through anthracite coal filters to remove remaining wastes.

DEMIXERALIZATION
Reduction of dissolved minerals to make water suitable for all reclamation uses.

CHLORINE CONTACT BASIN
At this stage, filtered water is disinfected with chlorine to kill any remaining bacteria.

The water is recycled for use in irrigation and industrial users.
Social & Environmental Benefits

- Decreased usage of drinking water supply for non-potable water purposes:
  - Industrial Usage
    - Cooling Towers Operations
    - Boilers
    - Concrete/Masonry Production
    - Dust Suppression
  - Landscape
    - Parks, Fountains, Golf Courses
  - Agricultural Irrigation
Economic & Environmental Benefits

☐ Self Sustaining Facility

☐ On-Site Cogeneration Methane Power Plant
  ■ Methane piped in from:
    ☐ Miramar Landfill
    ☐ Metropolitan Biosolids Center (MBC)
      ■ Sludge from North City WRP is sent to MBC for digestion.

☐ Sustains a maximum of 3.8 MW
  ■ 75% for plant operation
  ■ 25% sold to local power grid
Technical Issues & Innovations

- **COMNET**
  - Clean water Operations Management Network
  - System handles:
    - Point Loma
    - South Bay
    - North City
    - Metro Biosolids Center
    - WW Pumping stations
    - Reclaimed water infrastructure

- **Public Input & Concern over Aesthetics & Odor**
  - Fully Covered
  - Subgrade basins

- **Malfunction in Operations & Process**
  - Replaces unsuitable reclaimed water with drinking water
Social & Economic Issues

- Congestion due to Construction
  - Installation of Supporting Infrastructure
- Retrofit Customer’s Existing Plumbing
- City’s Financial Aid Incentives
Economic Viability

- Operational costs: $7 million
  - Income: $2.2 million + $1.2 million subsidy
- $18 million to retrofit plumbing for 100 customers
- After a feasibility study the city has stopped providing financial support for potential users
Policy Challenges

- Toilet-to-tap
  - Safety issue

- Mandatory use where available
  - 50% surcharge in water bill penalty

- Overstated forecasts
  - Inability to find market demand

- Reclaimed water: 80¢ per HCF

- Drinking water: $2.42 per HCF
In Summary

☐ Project Use
☐ Magnitudes and Costs
☐ Social & Economic Benefits
☐ Technical Issues and Innovations
☐ Social & Economic Issues
☐ Policy Challenges