

PepsiCo - Palakkad
Water Conservation

CII National Award for Excellence in Water Management
Hyderabad
December 16, 2008

With in the Fence

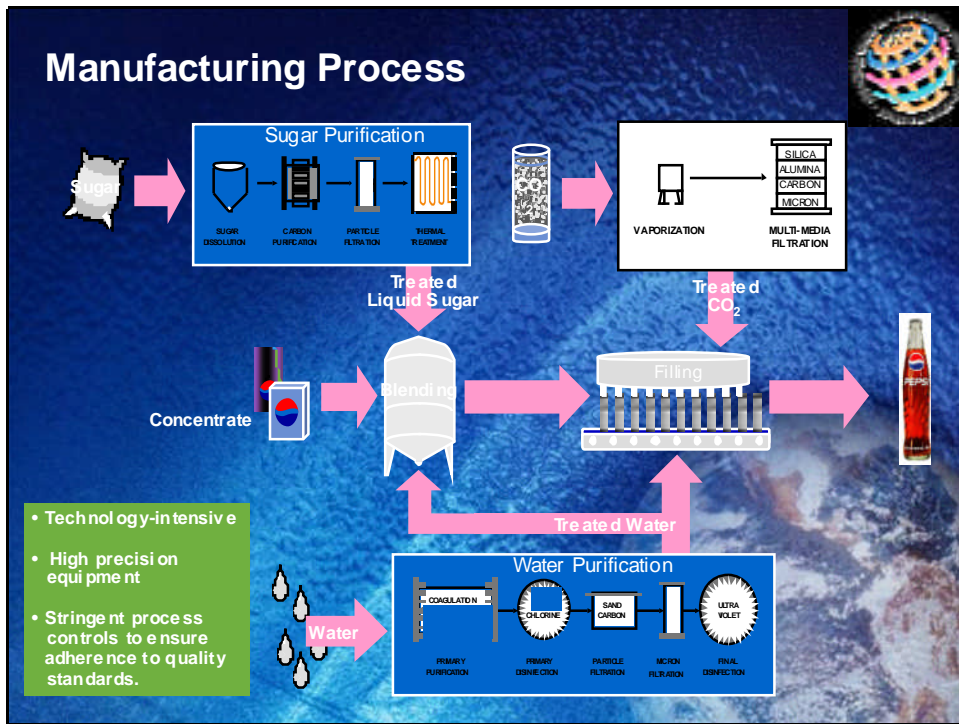
Plant Overview



- Plant located in Industrial Development Area, Kanjikode in Kerala.
- Three filling lines
 - Glass line for CSD
 - PET line for CSD
 - Aqua Fina line
- Plot Area - 50.48 Acres
- Employment - 250

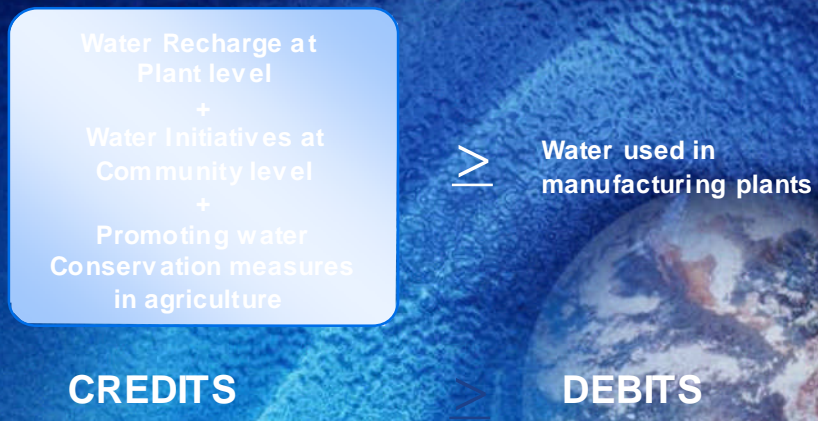


Manufacturing Process



PepsiCo's Vision

Positive water balance — going beyond zero



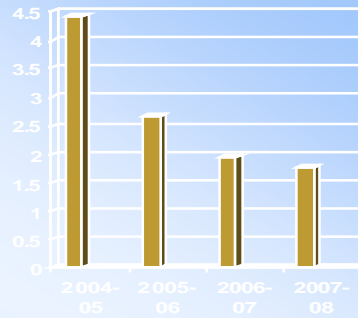
As a result of this focus, water was revalued

What we've accomplished on "debit" side of the equation



SCORECARD 2008

- 60% water usage reduction in 2008 over 2004 (4.41 to 1.77 L/L)
- 77% reduction in effluent over 2001(3.41 to 0.77 L/L)
- The journey continues...



2008 vs. 2004: > 250 Million L saved
2008: We could save another 16 Million liters

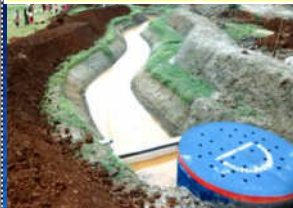
Now...what about the credits?

We continue to achieve water "credits" through recharge of water resources



- Roof water harvesting at our facilities
- Surface water structure-pilots
 - Palakkad plant

Surface water desilting chambers



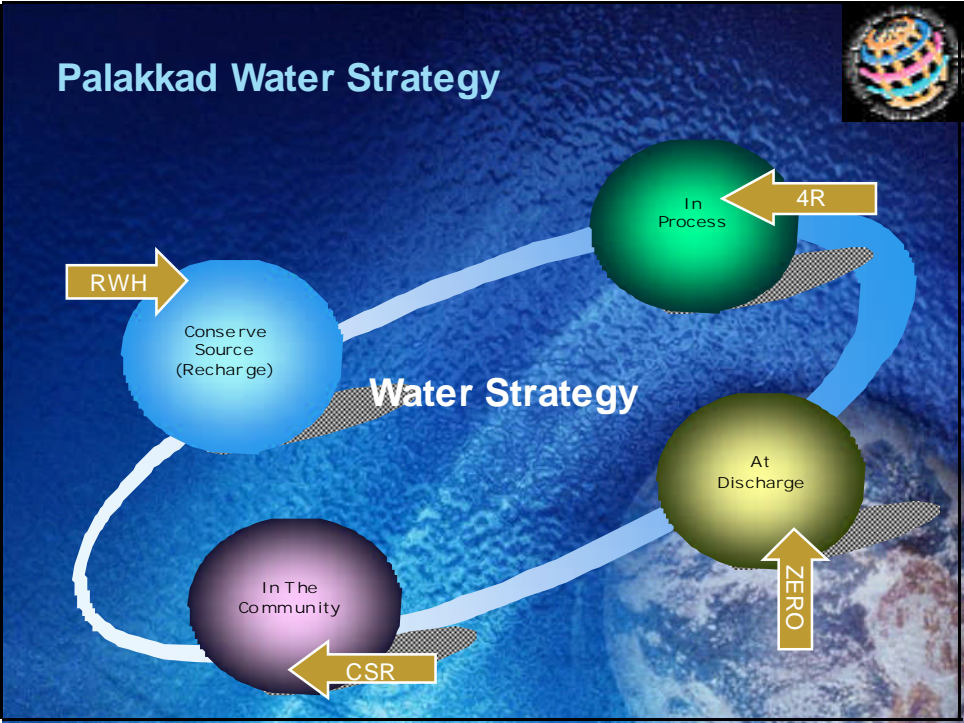
Rain water surface infiltration pond



Water balance

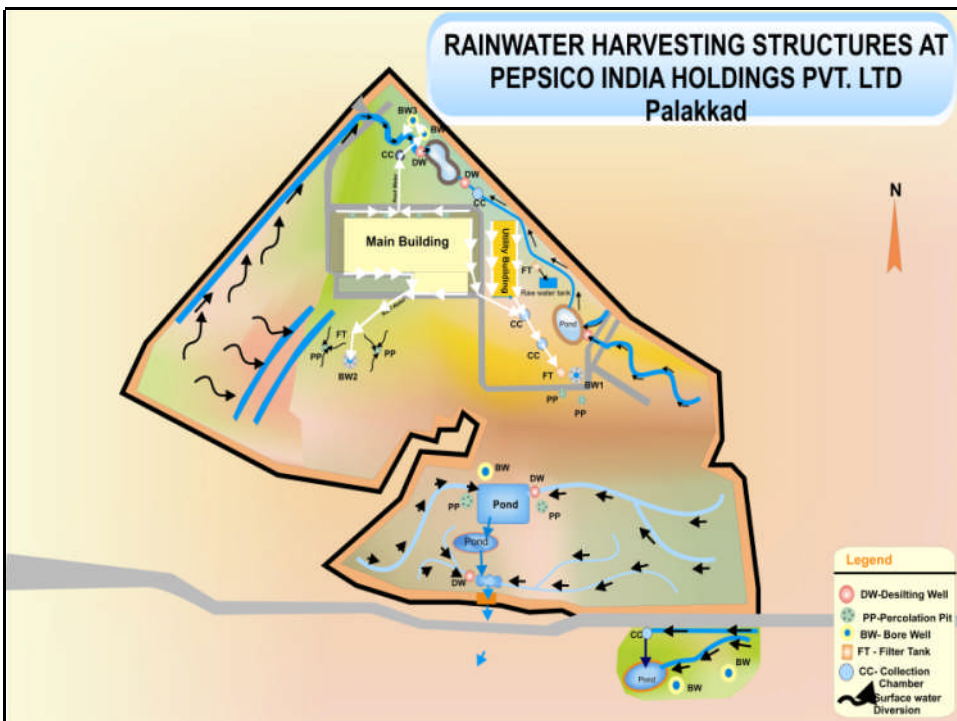
- Total Cons:153
 - million L/yr
- Total recharge:
 - 108 million L/yr
- The results:
 - 71% recharge of the aquifer at Palakkad

These results reinforced that our goal of positive water balance is possible!



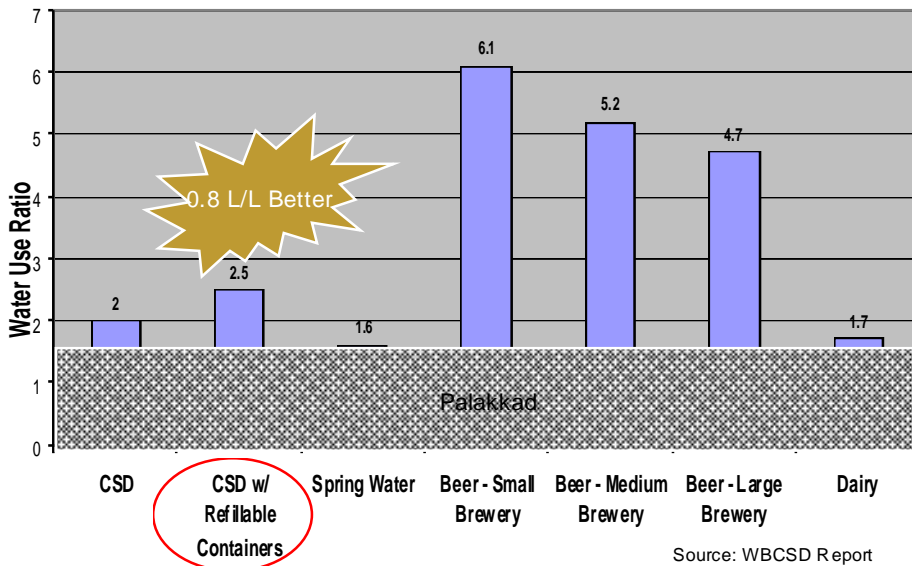


Roof Water Harvesting – Palakkad Plant



Global Best in Class WUR in Beverages

from Benchmarking Survey

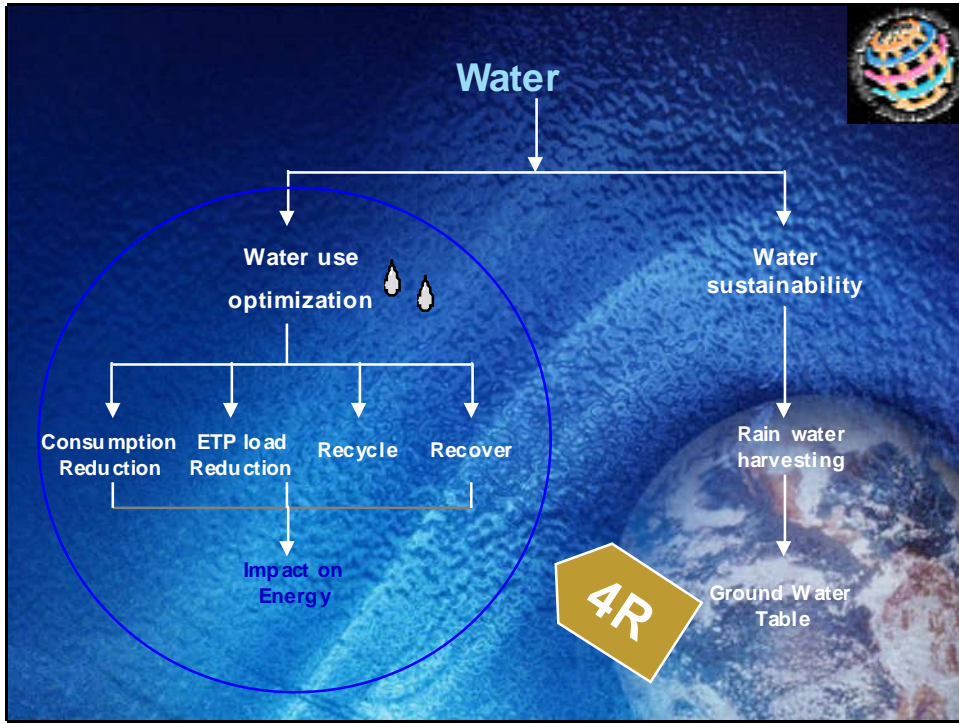


Zero based targeting



Roadmap for reduction

- Define specifications of water to be used at each step in the process
- Determine quantity and quality of discharge at each stage
- Identify opportunities for recycling, treatment and technology to be deployed
- Discard as effluent after establishing that it is unfit for recycling

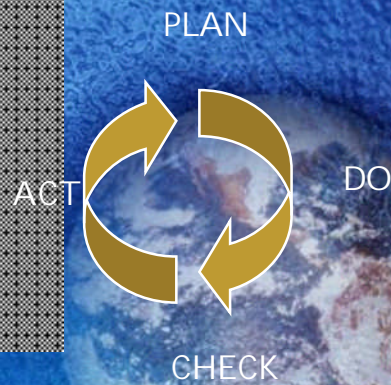


“When the well is dry, we learn the worth of water.”
--Benjamin Franklin

Approach



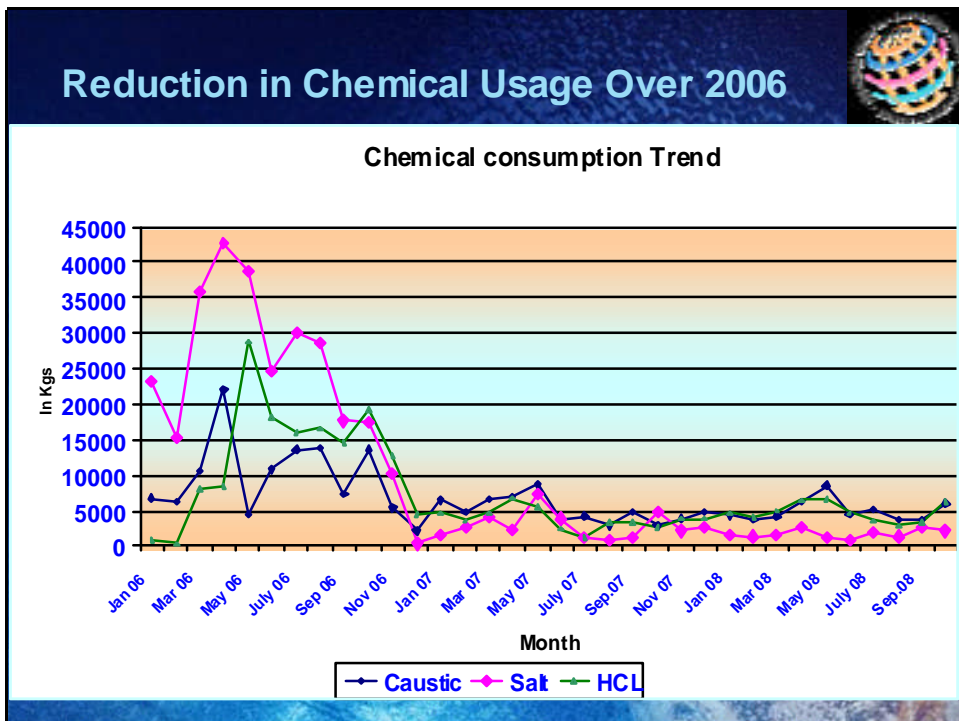
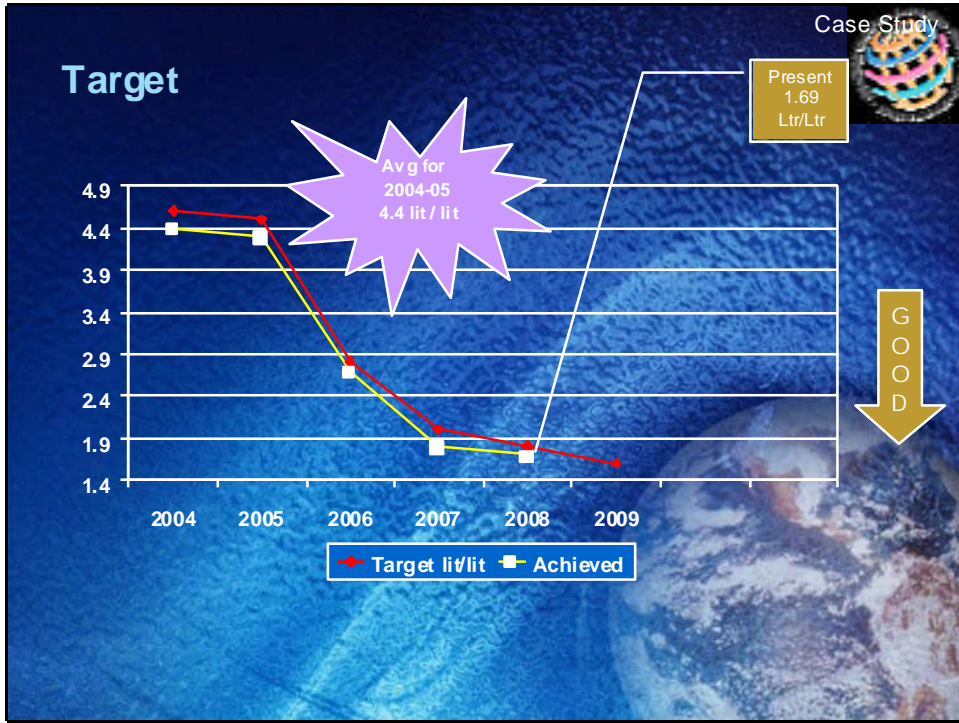
- Assess current situation
- Estimate Losses
- Take Loss Reduction Target
- Identify Losses
- Identify Projects
- Formation of Task force / Teams
- Deploy 4R Tool
- Implement Solutions
- Check Results
- Plan further actions



Estimate Losses



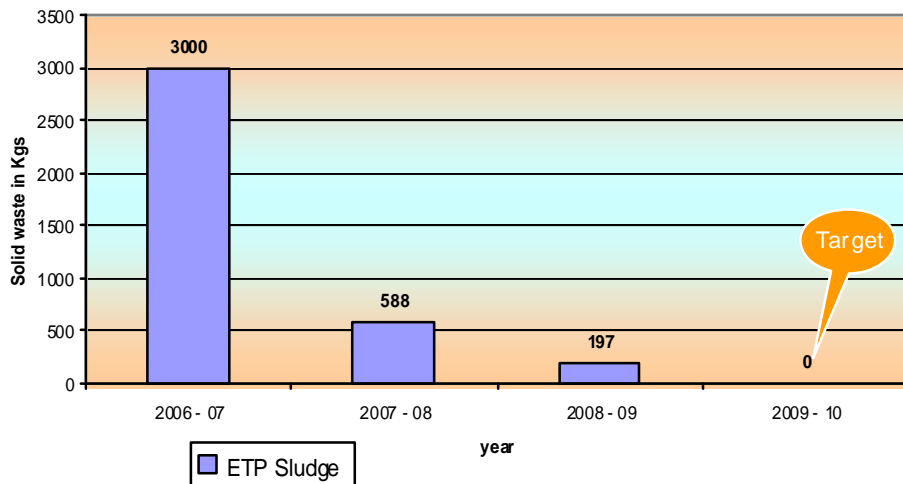
- Best in Pepsi 1.6 lits/lit
- Palakkad plant @ 4.4 lits/lit (25 lit/8oz case) in 2004
- Potential for reduction = 2.8 lits/lit (15.9 lit/8oz case)
 - This translates to 350 kL of water saving potential per day.
- Zero based calculation
 - 8 oz case contents = 5 664 lits
 - Evaporation losses = 1.0 lits
 - This equals to 1.2 lits/lit of water consumed – this is the absolute minimum if the effluent discharge from ETP is to be ZERO



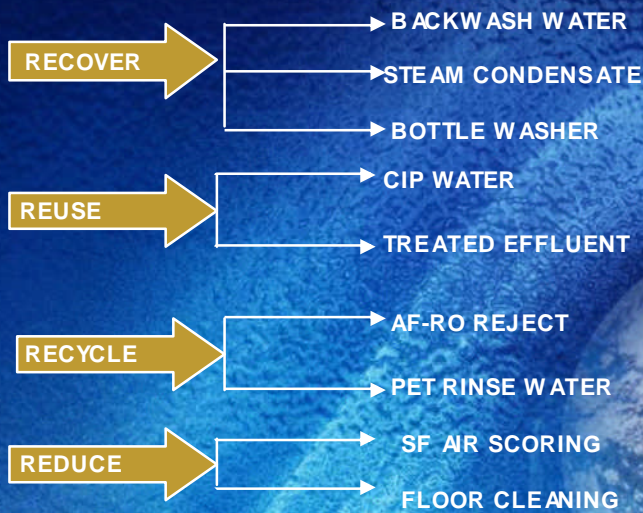
Solid waste Management – ETP Sludge



Sludge Generation Avg/Month



4-R TOOL



Case Study



Water Conservation

**REDUCTION OF WATER USE BY
COMPLETE USAGE OF ETP
TREATED EFFLUENT**

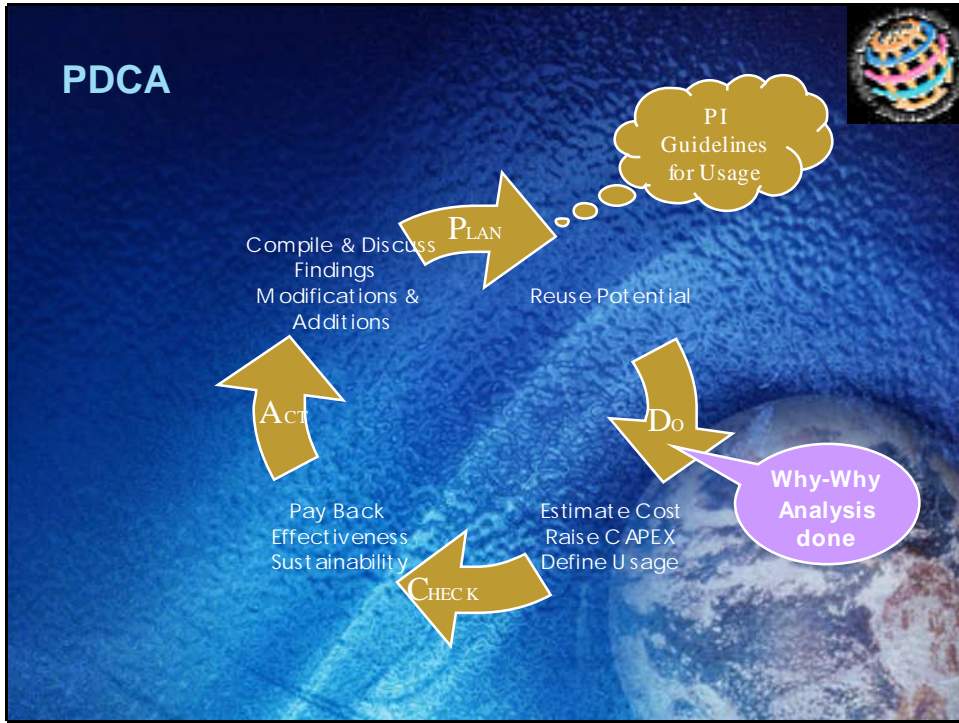
AFRO Reject – Opportunity to Improve



Opportunity: Currently AFRO reject being used in ETP Tertiary Treatment & permeate used for Utilities & TDS balancing.

ETP Treated Effluent is having all the required parameters to treat through ETP UF RO, but due to AFRO reject availability Plant is using effluent for own land discharge to develop green field.

Effective use of Treated Effluent through ETP UF RO could save another 17KL/Hr.



Analysis for Reuse Potential

- AFRO Reject is having more or less same Qualities of Raw Water due to permeate re-circulation.
- Additional Generation of permeate through new CSD RO could save another 12 KL/Hr out of 17KL which is now being pumped to ETP UF RO.
- Proposed CSD RO can be able to treat this Reject.
- This phenomenon prompted team to work on estimated reduction of TDS through New RO.

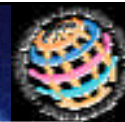
Estimated Savings



- AFRO Run Hours/Day: 20
- Total Reject Generation @ 17KL= $17 \times 20 = 340$ KL
- Permeate Generation through proposed CSD RO @ 12KL/Hr for 20 Hrs = $12 \times 20 = 240$ KL
- Balance 100KL will be pumped to ETP UF RO.
- There will be direct reduction of 240KL/Day in Gross Water Usage of Plant.

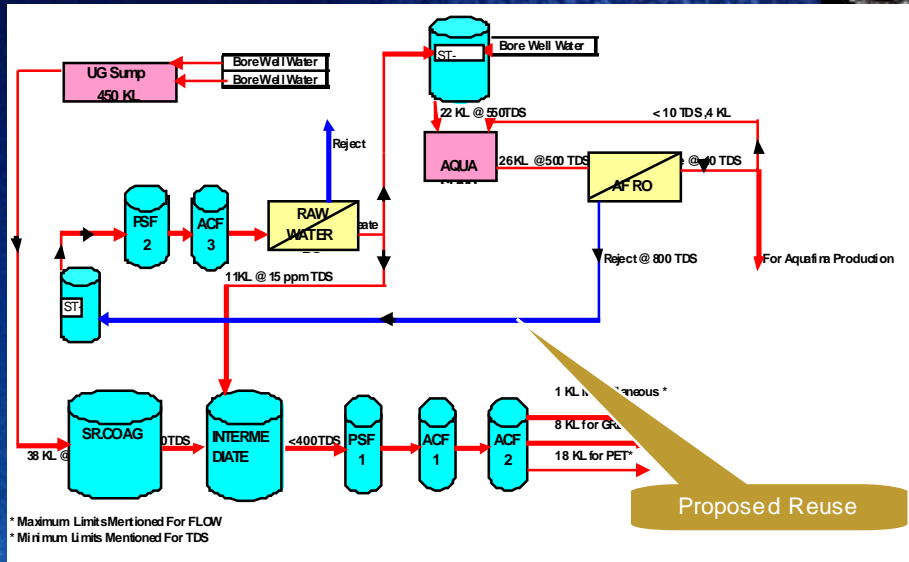
Approximate 70 Million L annualized Water Savings

TASK PLANNING – 5W-1H



What	Where	When	Who	Why	How?
Reduce Usage of AFRO Reject in ETP UFRO	ETP UFRO feed	Daily	QC Exec/ETP associate	This activity prompts complete recycle of Treated Effluent.	Reuse AFRO Reject in the process only.
Reuse of AFRO Reject for process	WTP & Production processes	During AFRO Run	QC Exec/WTP associate	To optimize the water consumption of the Plant	Propose for New RO in CSD WTP to recycle AFRO reject.

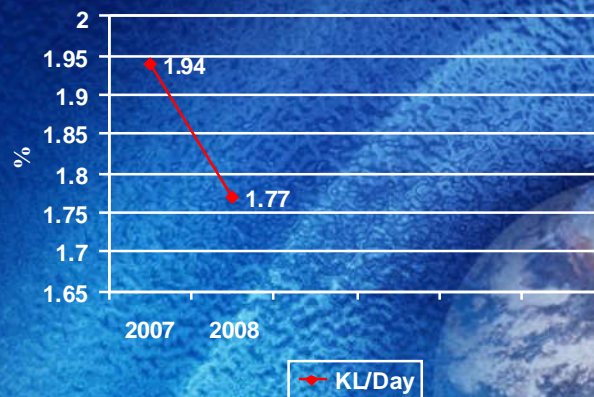
PROPOSED CSD RO SCHEMATIC WITH TDS BALANCING



Supplier: GE Water
Capacity: 12KL/Hr
Project Cost: 40 Lac
Time : 6 Weeks



Consumption Target – Total Plant



REDUCTION OF 0.17 L/L TRANSLATES TO REDUCTION OF 120KL/DAY

Actions towards Water reduction

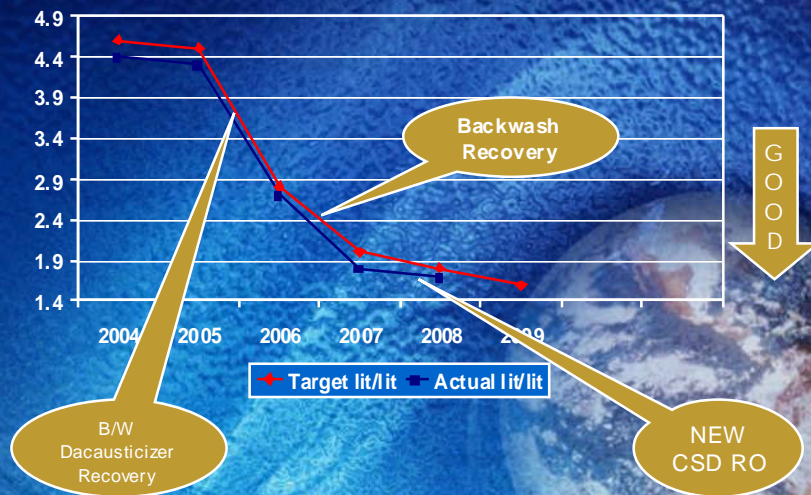


Sr	Actions	Benefits	Cost Rs'000	Date
1	Workout TDS estimations pre & exit RO and proposed use.	Proper usage identification for Reject Stream & Design consideration		Wk - 1
2	Estimate Net Benefit to the Plant and estimated water usage ratio.	Estimating Pay Back & Resource Sustainability		Wk - 2
3	Provide 50KL Storage tanks for both feed & permeate.	Storage AFRO reject in case any stoppages in the new CSD RO.	450	Wk - 3
4	Re-direct Reject line to CSD RO Feed Tank.	Enable AFRO storage	100	Wk - 4
5	Connect CSD RO permeate to Storage Tank	Permeate usage optimization based on the requirement	100	Wk - 5



- ### Implementation
- 2 Major Projects Implemented in 2007-08 resulting in Annualized Water Savings of 70,000 KL (CSD RO & AF Rinse Water Recovery)
 - Redesign, Rethink initiatives Identified & implemented, resulting in a saving of 15,000 KL in the year 2008.
 - 18 Core consumption points metered on daily basis.
 - Abnormalities paid higher attention by top to bottom.

Results



Overall Results

- Total Savings of 240 Million Litrs over 2004.
- No.2 on YTD Basis across 43 Pepsi Plants in India with 1.69 Lit/Lit Water Consumption.
- Zero Discharge from the plant
- Controlled Effluent Generation: (0.69 KL/KL of Bev)

Way Forward



- Identifying further opportunities to save water through process effectiveness.
- Redesign & Rethink Strategy added to 4R (No other stream available to deploy 4R)
- Reduction of Effluent by adopting latest technologies. (Electro Chlorinator)
- Optimizing total recovery from the existing water recovery systems.
- Consulting Experts to generate ideas on water conservation.

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

—Albert Einstein



**PERFORMANCE
WITH PURPOSE**



THANK YOU!

