

**City of Carson City
Agenda Report**

Date Submitted: February 18, 2011

Agenda Date Requested: March 3, 2011
Time Requested: 30 minutes

To: Mayor and Supervisors

From: Public Works Department

Subject Title: Staff Report Regarding the Waste Water Reclamation Plant. (Andy Burnham)

Staff Summary: Staff and Carollo Engineer's will give a presentation on the condition and planned future improvements to the Waste Water Reclamation Plant (WWRP).

Type of Action Requested: (check one)
 Resolution Ordinance
 Formal Action/Motion Other (Report to Board)

Does This Action Require A Business Impact Statement: Yes (XX) No

Recommended Board Action: No action required. Staff Report Regarding the Waste Water Reclamation Plant.

Explanation for Recommended Board Action: N/A

Applicable Statue, Code, Policy, Rule or Regulation: N/A

Fiscal Impact: N/A

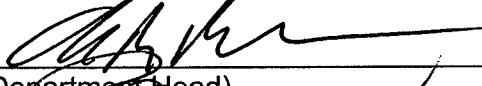
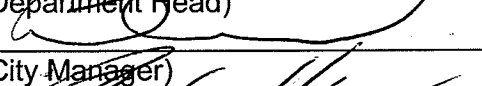

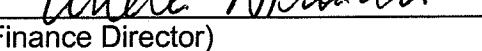
Explanation of Impact: N/A

Funding Source: N/A

Alternatives: N/A

Supporting Material: N/A

Prepared By: Ken Arnold, Environmental Chief

Reviewed By:  Date: 2-22-11
(Department Head)
 Date: 2/22/11
(City Manager)
 Date: 2/22/11
(District Attorney)
 Date: 2/22/11
(Finance Director)

3/3/11 Board Report on WWRP, continued;

Board Action Taken:

Motion: _____

1) _____

2) _____

Aye/Nay

(Vote Recorded By)



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**Carson City
Public Works Department**

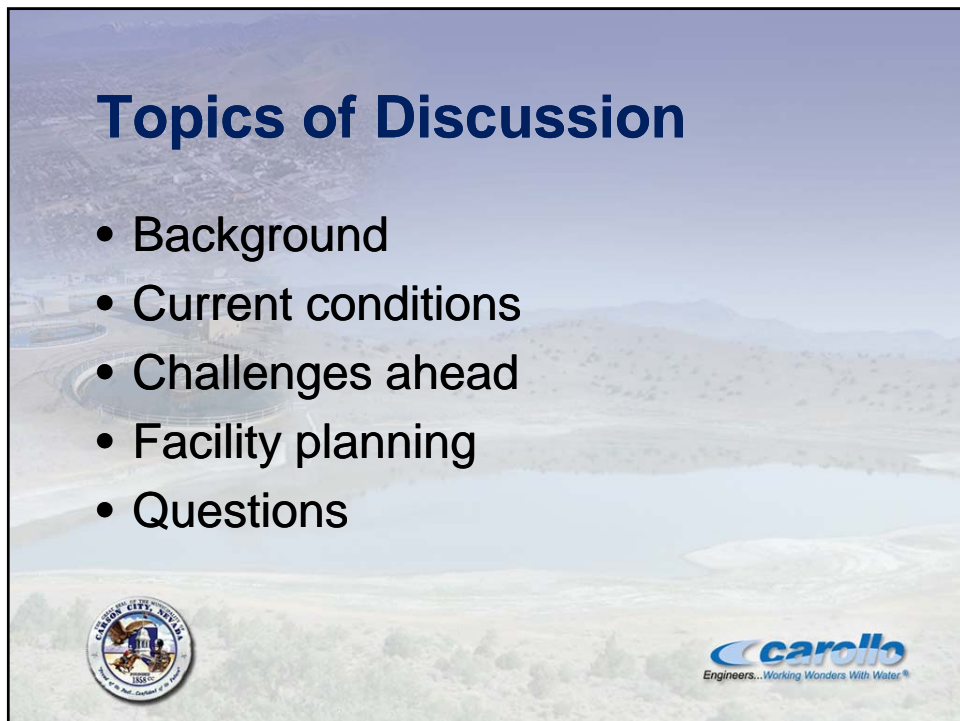
**Design Report Update:
Water Reclamation Plant
Facility Planning**

March 3, 2011

Contract No. 2003-015





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Topics of Discussion

- Background
- Current conditions
- Challenges ahead
- Facility planning
- Questions



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Background



Existing Water Reclamation Plant Processes



- Capacity: 6.9 mgd
- Influent screening
- Grit removal
- Primary settling
- Biological treatment
- Secondary clarification
- Filtration
- Disinfection
- 100% Reuse



Existing Reuse Facilities



Conveyance

- Effluent Pump Station
- 10 miles of pipelines

Storage

- Brunswick Reservoir
- Capacity of 3,500 acre-ft
- Effluent Storage (Winter)

Reuse Sites

- Golf Courses, State Prison Farm, Parks, Cemetery, Carson River Springs



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Current Conditions



Need for Facility Planning

In recognition of the need to plan ahead and to provide long range direction for water reclamation, the City authorized preparation of the Carson City Water Reclamation Plant, Facility Plan Design Report.

- **Key Driver**: Increasing influent plant flow
- **Secondary Driver**: Regulatory (nitrogen)

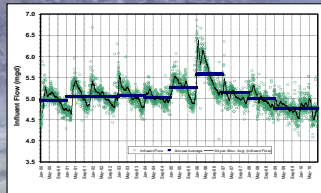


Key Planning Principles

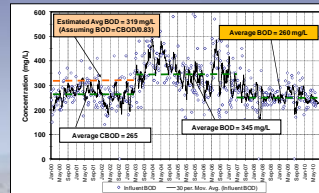
- Plan for a 25-year horizon
- Plan processes which are the same or similar to existing processes
- Size treatment processes to match existing facilities
- Provide a flexible layout
- Plan for incremental expansion to minimize fiscal and administrative impacts



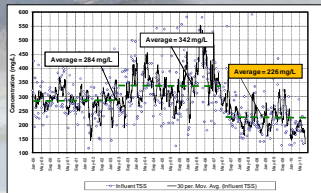
Flow and Load Projections are the Cornerstone of Planning



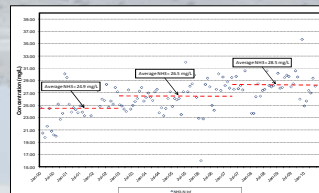
Plant Flow



Biochemical Oxygen Demand (BOD)



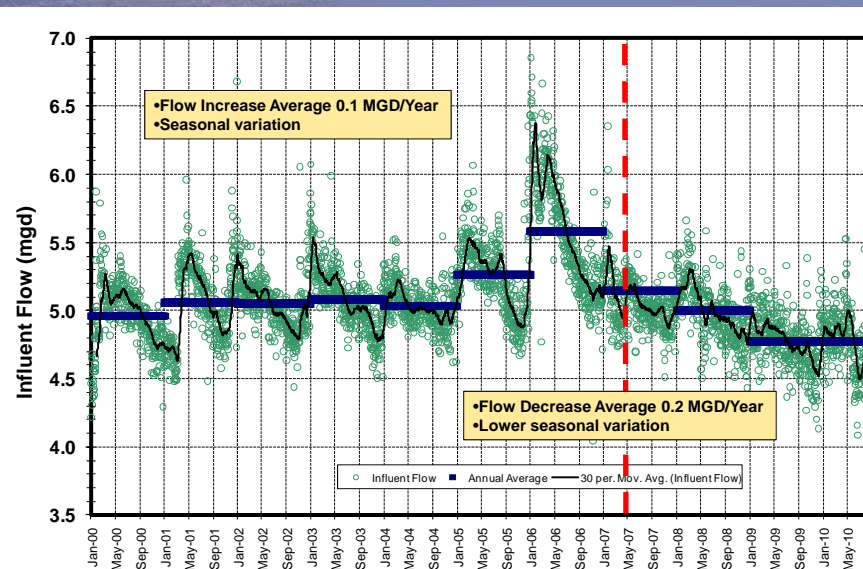
Total Suspended Solids (TSS)



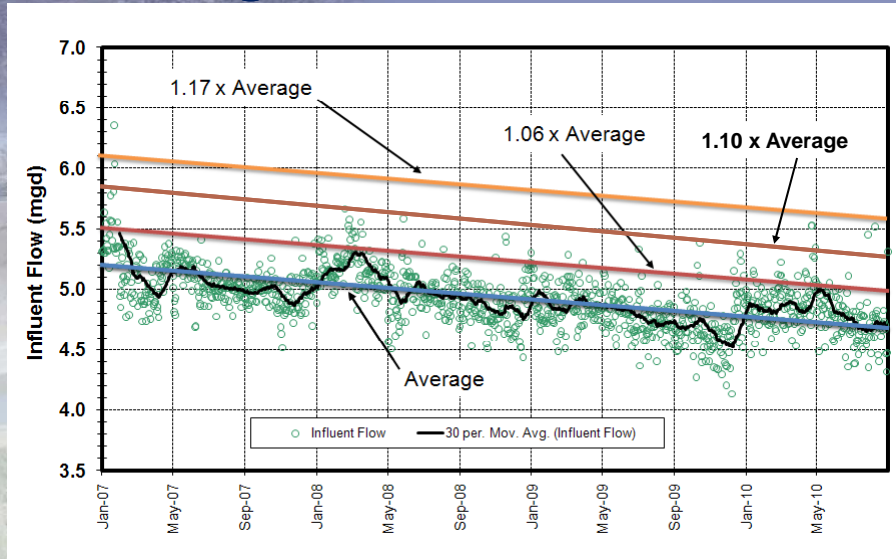
Ammonia



Historical Influent Flow Data



Development of Influent Flow Peaking Factors



Summary of Influent Flow Peaking Factors

Factor	2003/2006 Plan	2007 Update	2010 Update
Average Day Maximum Month Flow	1.24	1.17	1.10
Peak Day Flow	1.35	1.35	1.35
Peak Hour Dry Weather Flow	1.50	1.50	1.50
Peak Hour Wet Weather Flow	2.00	2.00	2.00



Unit Process Capacity Summary

Process Unit	Estimated Capacity (mgd) (all units in service)	Design/Reliability Criteria
Anaerobic Digester	4.0	Add one or two units for regular operation and reliability
Tertiary Filters	5.6	Add one unit for regular operation and reliability
Trickling Filters	Less than 2.0	Based on TF historical performance
Aerated Pond	6.9*	Additional aeration capabilities
Secondary Clarifiers	6.9	Capacity depends on Activated Sludge Process At 6.9 mgd one additional unit shall be considered for reliability
WAS Thickening	6.9	Capacity depends on Activated Sludge Process One additional unit shall be considered for reliability for high loads
Chlorination Basins	6.9	One additional unit shall be considered for reliability
Primary Clarifiers	7.7	One additional unit shall be considered for reliability
Solids Dewatering Centrifuges	6.9	One unit out of service
Grit Removal	15	Peak hydraulic no standby
Screening	15	Peak hydraulic standby manual screen



* Assumes maximum flow to trickling filters of 2.0 mgd.



The Good News....

- The plant continues to meet effluent discharge limits
- Planning is complete to meet future treatment needs through the planning period
- Influent flow to the plant has decreased over the past three years







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Challenges Ahead

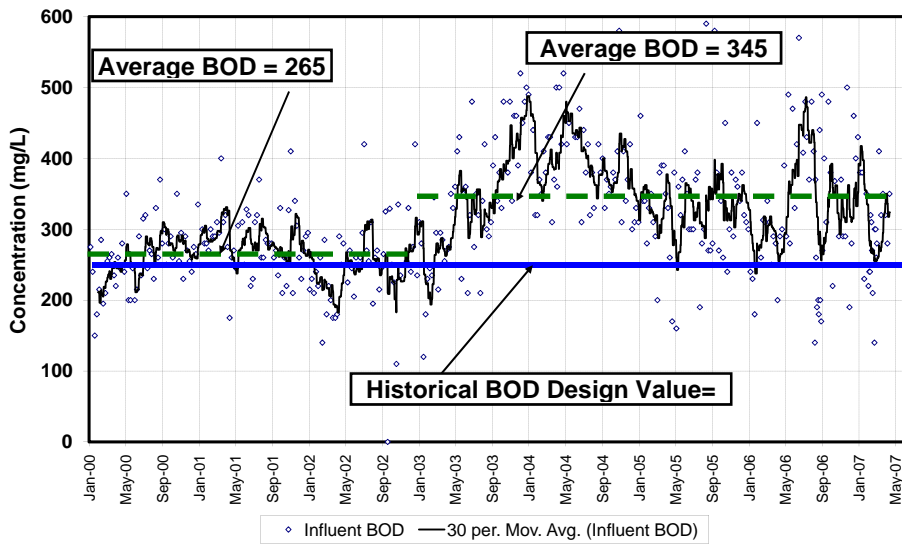


The Challenges Ahead....

- Several existing treatment facilities will need rehabilitation in the near term
- Upgrade and/or replacement of some treatment processes is likely within the planning horizon
- Certain influent constituents have increased over the past several years which could require regulatory changes

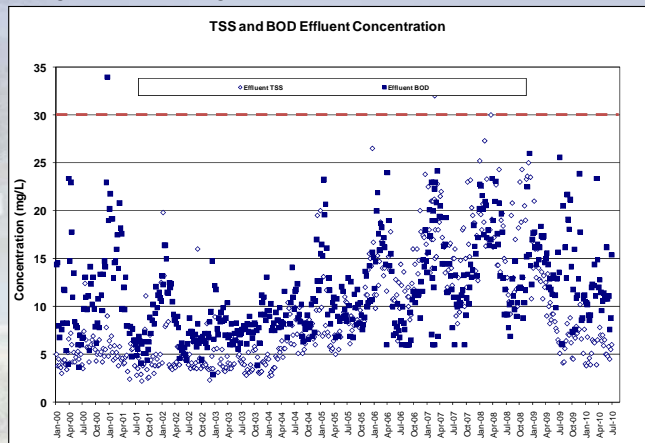


Influent BOD Concentration



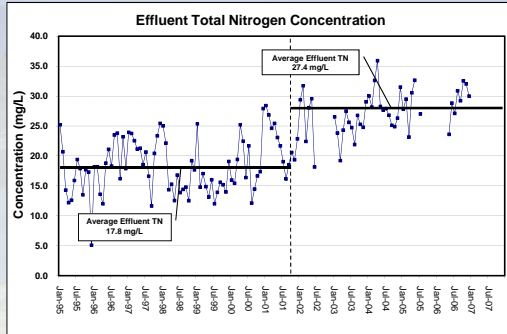
WRP Plant Performance

Although the treatment plant has been able to consistently meet the effluent discharge limits, the plant is showing some signs of stress.



Regulatory Requirements

- The future regulatory landscape could dictate higher levels of treatment
 - EDC's and pharmaceuticals
 - Odor emissions
 - Effluent nitrogen

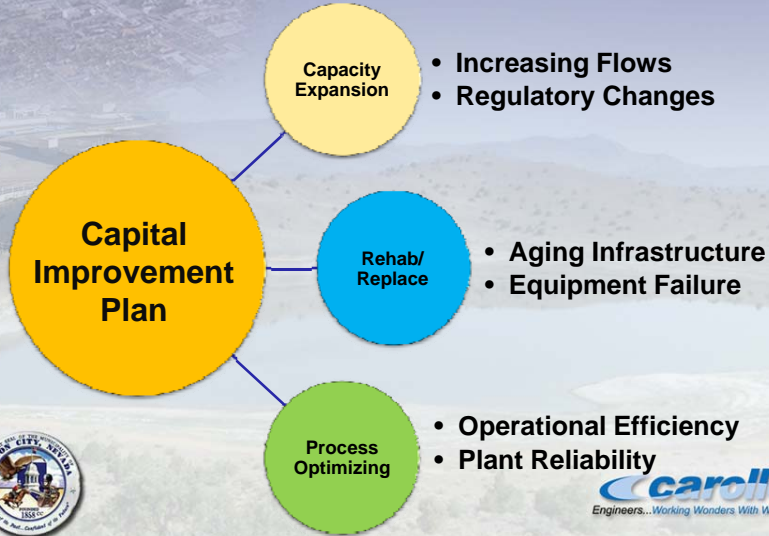


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Facility Planning

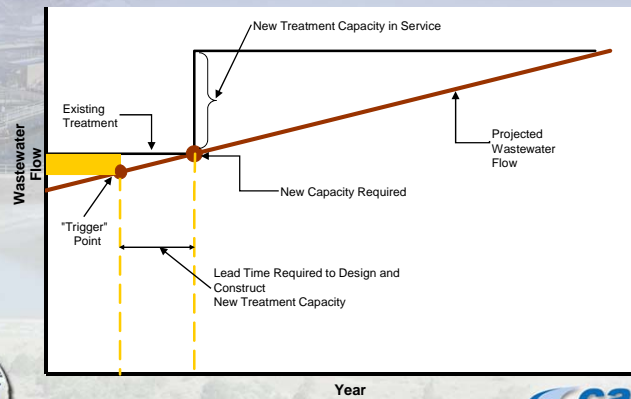


CIP Development Focuses on Three Project Categories

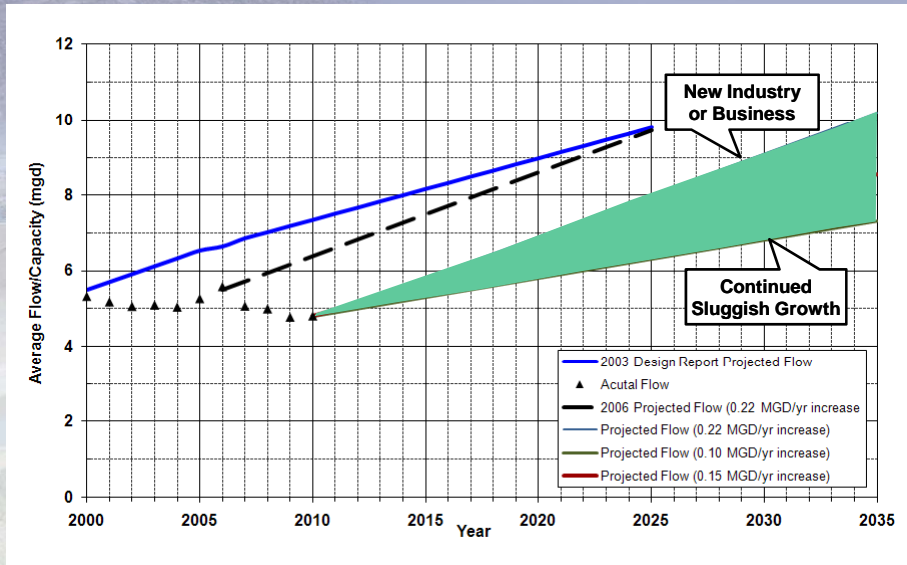


“Trigger Curve” Concept

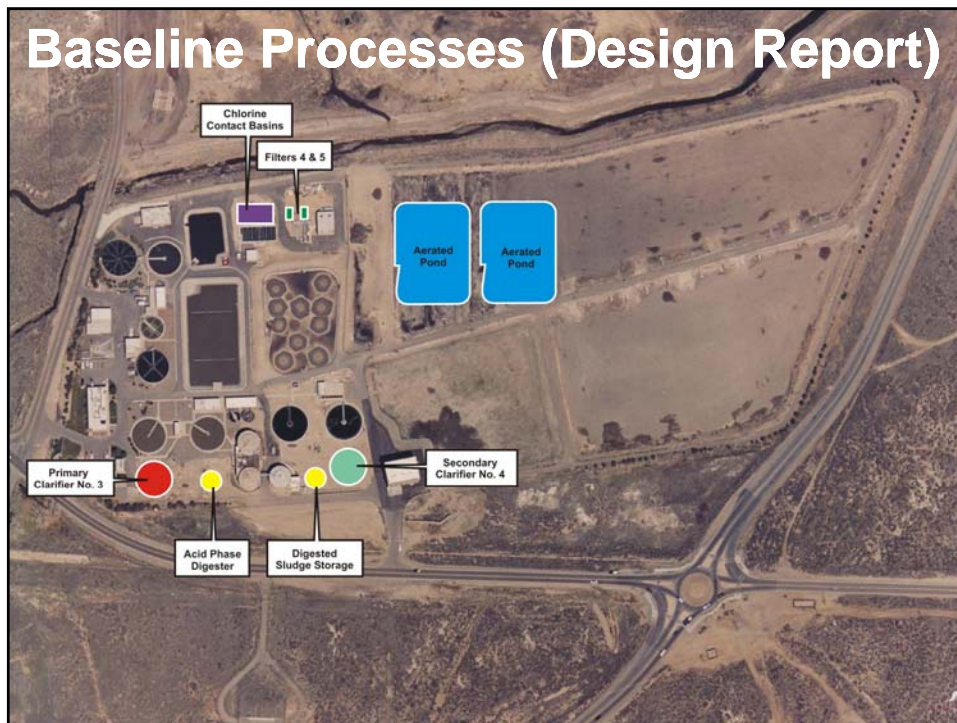
Planning and facility construction is implemented when actual wastewater flows reach pre-determined “trigger” values.

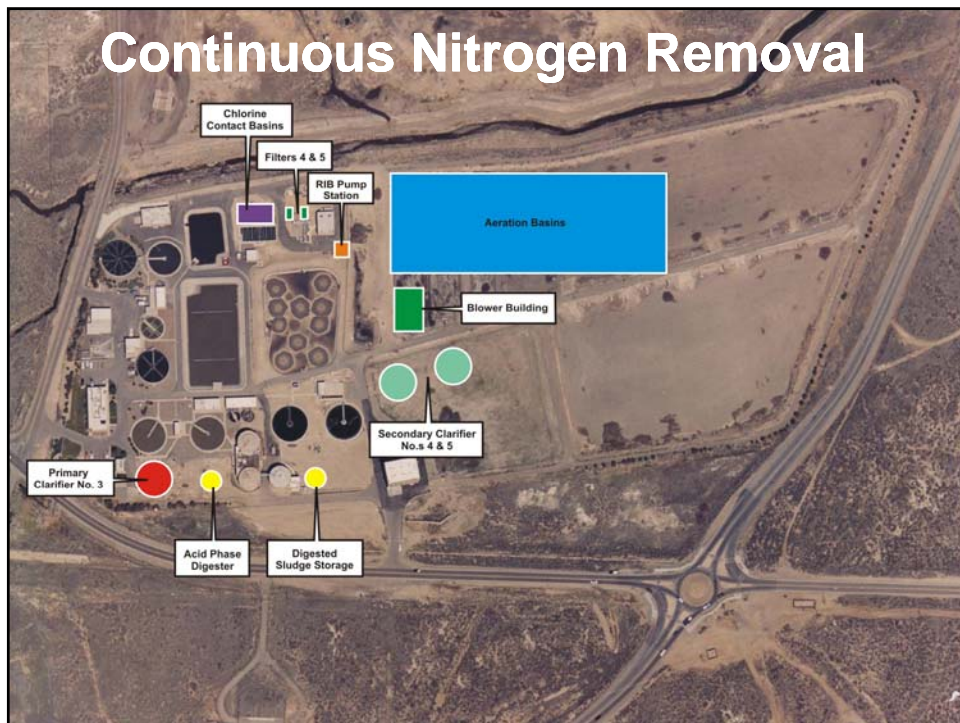
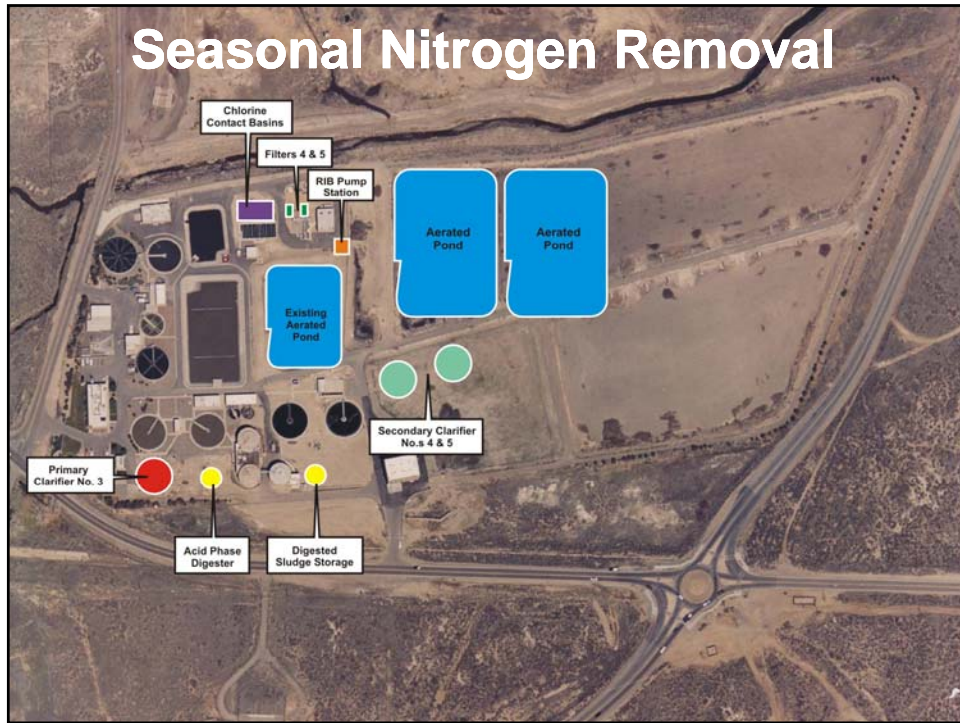


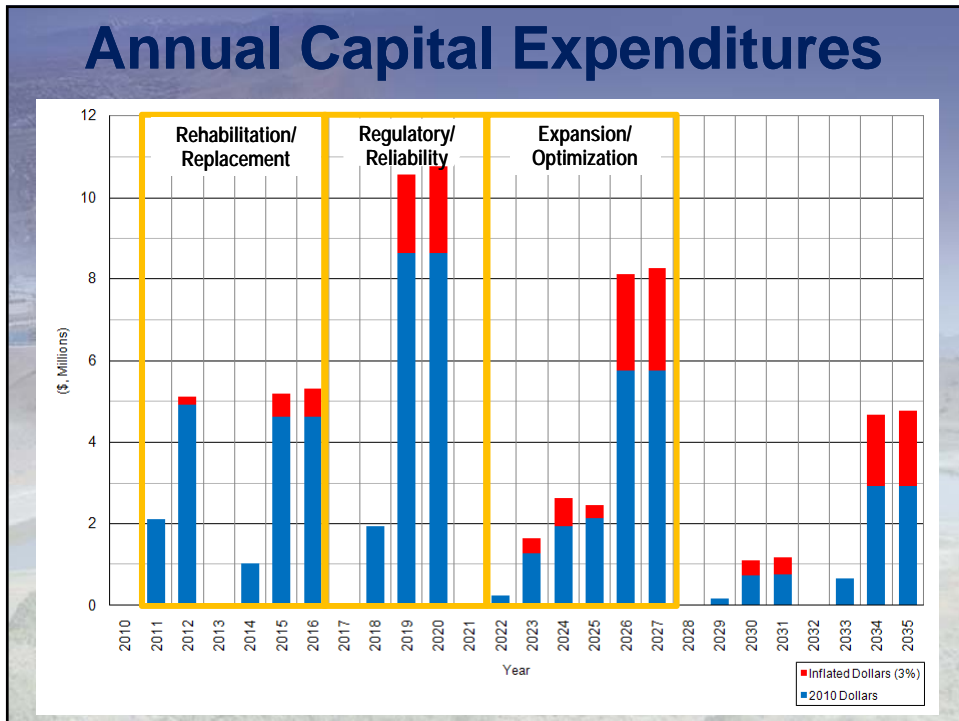
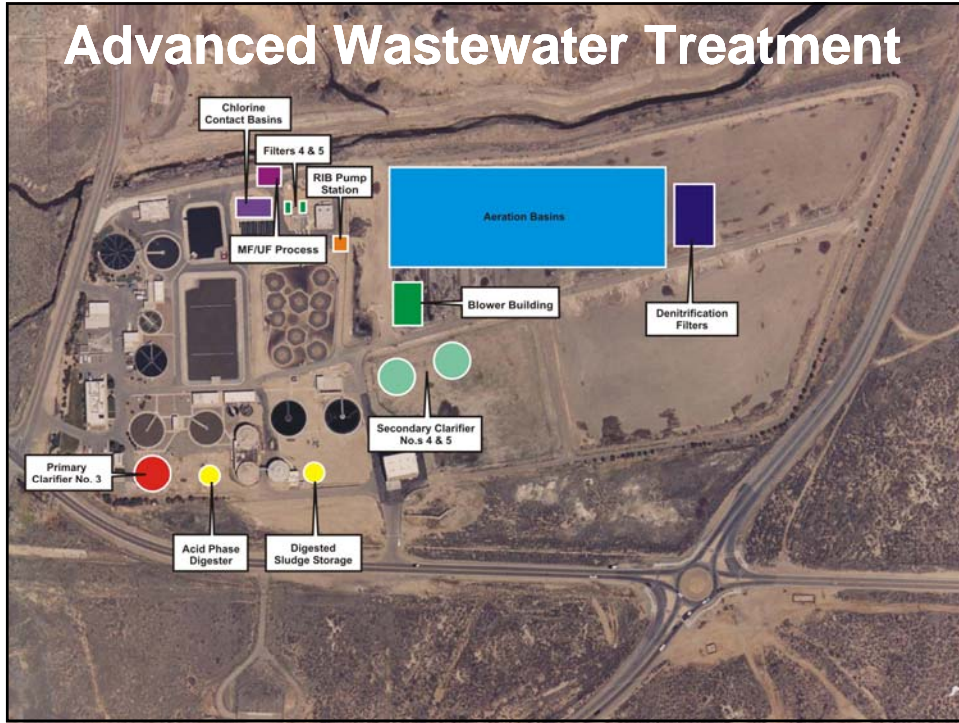
Influent Flow Projection

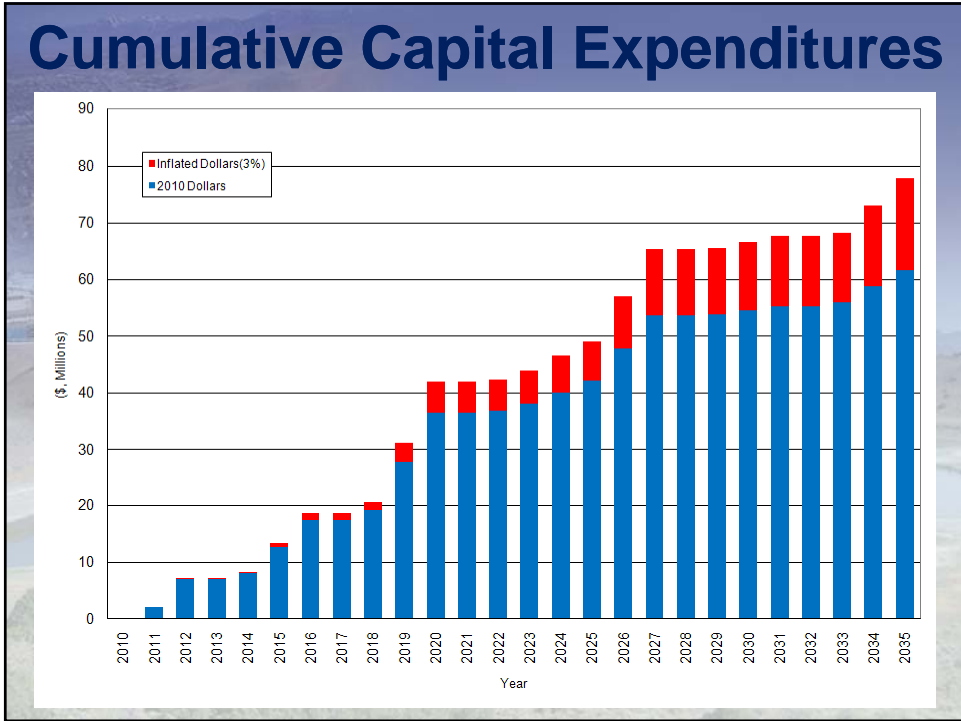


Baseline Processes (Design Report)









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Questions?