R2E2 Update
Stakeholder Committee
May 14, 2013
Agenda

• R2E2 Updates Since Last Meeting
• Value Engineering
• Industrial Discharger Pretreatment
• Schedule – What’s next
• Open Discussion
R2E2 Update

• Marquette University study of anaerobic digestion of GBF plant sludge and selected high strength wastes
• Demonstrated that the combined wastes could be readily digested and provided data for sizing the digestion tanks. Proposed design: two 2.5 million gallon capacity tanks
• Pilot test also produced gas samples that were analyzed for heat value and contaminants
Digestion Samples & Centrifuge Pilot Testing

• Samples from the pilot test were distributed to 5 centrifuge vendors

• All vendors reported a lower cake solids concentration than presumed during Facility Plan (FP) —20-23% vs 25% assumed in FP based on other similar plant centrifuge performance

• Cake was also analyzed for caloric value which was also lower than assumed during FP
Digestion & Centrifuge PilotTesting

• So what does this mean?

• Essentially that the cake will require fuel for combustion using the original concept developed in FP

• Current design: a dryer that uses the recovered incinerator exhaust heat to dry the cake from 20% to between 37 and 40% solids

• Resulting dried cake will be autogenous using a cold wind-box reactor design
Basis of Design Report

- Team completed the Basis of Design Report (BODR) with significant input from NEW Water staff
- After providing training for staff in each new unit process, NEW Water participated in design workshops
- Cost reduction began in FP and the team continued to propose ideas to improve the design and lower construction costs in developing the BODR
Cost Reduction Ideas

– Use existing GBTs to co-thicken primary and secondary sludges $1,000,000
– Re-use of recently re-tubed boiler $500,000
– Re-use flood event pumps $100,000
– Re-use abandoned DAF tankage to receive high strength wastes for co-digestion $500,000
– Re-use existing dewatering feed tanks $300,000
Facilities Changes

- Team modified the *original* concepts and consolidated the *multiple* buildings = decrease

- The digestion tanks were reconfigured into deep cone silos to reduce operating costs and reduce footprint = no change

- Will re-use a section of existing building basement as a service tunnel and pump room = decrease
Project Scope Adjustments

- As usual, changes are accompanied by increases and decreases in construction costs
- Changing from steam boiler and steam turbine on hot wind-box incinerator exhaust to a dryer on a cold wind-box incinerator exhaust = decrease
- Using existing GBT for co-thickening PS and WAS, eliminated GT upgrade and improved process performance = decrease
Project Scope Adjustments

- Changing from mechanical ash dewatering to ash decant cells = decrease
- Changing to higher capacity cogeneration units to better utilize available biogas and reduce more purchased electricity = increase
Cost Estimate

• Team updated the cost estimate in BODR
  – Facility Plan = $147,000,000 in 2011 dollars
  – BODR = $136,000,000 in 2013 dollars
  – = $128,000,000 in 2011 dollars
  – = $149,000,000 in 2016 dollars (midpoint of construction)
• Recognize that BODR estimate is a level 4 cost estimate
Value Engineering

• The Value Engineering draft report is being reviewed by NEW Water and the design team to confirm suggested potential savings identified

• Findings will be incorporated into final VE report in late May

• Design team will implement recommendations accepted by NEW Water in the next phase of design
Value Engineering

- A recommendation that the design team plans to accept is to bid a separate early contract for the new primary electrical substation.
- This will allow all service relocations and all power restored to the existing operation and this will not be interrupted during subsequent construction.
- Also clears the location for new facilities so that GC can start excavation on day one.
Industrial Discharger Pretreatment

• A major industrial contributor, Fox River Fiber (FRF), has advised NEW Water that they will pre-treat beginning in 2014

• No comment from Thilmany for pretreatment

• Design team determined that this would reduce sludge loads by ~ 8%

• Because of available sizes the cost for:
  – centrifuges, cogeneration units, incineration, and dryer would not change
Industrial Discharger Pretreatment

• The following can be reduced in size:
  
  – Digester vessels and associated ancillary equipment, including mixing pumps, heat exchangers, biogas storage, conditioning, and flares, but not the Control Building
  – Centrifuge feed pumps and cake pumps
  – Polymer system
  – Ash thickening system
Industrial Discharger Pretreatment

• The following would not be reduced in size:
  – Odor control system
  – Storm water treatment system
  – Septage and co-digestion receiving
  – Nonprocess spaces: Control Room, locker rooms, etc.
  – Demolition scope
  – Modifications required for co-thickening
  – Plant heating boilers
  – Rehabilitation of dewatering feed sludge storage tanks
  – Rehabilitation of existing solids building as a tunnel
Industrial Discharger Pretreatment

- The estimated construction cost reduction as a result of FRF pre-treatment is $2,500,000 to $3,000,000 (2%)
Design Schedule

• Revise the BODR to account for VE recommendations and the major user pretreatment May/June 2013

• Issue pre-purchase bids to qualified vendors:
  – Incinerator and dryer package June 2013; award August 2013
  – Centrifuges package June 2013; award August 2013
  – Co-generators package September 2013 award November 2013
  – Primary Switchgear September 2013 award November 2013
Design Schedule

• 30% Design review workshop including estimate update August – September 2013

• Process Hazard Analysis November 2013

• 60% Design review workshop including estimate update January/February 2014

• Begin construction in late 2014, substation would begin in spring 2014?
Open Discussion
Next Stakeholder Meeting

• Mid – September 2013
R2E2 Update

Thank you for coming!