Utility Commission of New Smyrna Beach

Water System Analysis
Part 2
Water Treatment, Storage and Pumping

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Water Treatment Process

- The Utility Commission of New Smyrna Beach (UCNSB) aka “U.C.” owns and operates a single water treatment plant on Glencoe Road.
- It is a conventional lime softening treatment facility and has a rated capacity of 10.38 MGD.
- Raw water is supplied to the facility from 19 wells in three (3) wellfields, Glencoe, Samsula and Western.

Well Capacity and Capacity Requirements

	2005 (MGD)	2010 (MGD)	2015 (MGD)	2020 (MGD)	2025 (MGD)
Projected ADF	5	6.49	6.71	7.0	7.12
Existing Well Capacity	10.5	10.5	10.5	10.5	10.5
*Capacity Requirement (ADF x 2.0)	10	12.98	13.42	14.0	14.24
Required Additional Well Capacity		2.48	2.92	3.50	3.74

**Allows for Well Rotation*

- **Plans are currently under way to install 5 new wells @ 350 GPM/each.**

Well Capacity and Capacity Requirements

- Five (5) new wells are currently proposed for construction in the vicinity of the U.C.'s existing wastewater treatment facility.
- The five wells should have an average capacity of 350 GPM/well.
- Total Capacity = **2.52 MGD**
- In order to achieve production capacity by 2010, construction is needed in FY '07/'08 with design/permitting no later than FY '06/'07.

Well Capacity and Capacity Requirements

- In addition to groundwater pumping capacity, raw water transmission capacity is a constraint.
- An existing 20” raw water transmission main conveys approximately 60% of the U.C.’s raw water.
- Existing raw water transmission main capacity is adequate through 2020; however, there is no redundancy.
- If the existing transmission main is damaged, or out of service, the U.C. could immediately lose greater than half of its water production capacity!

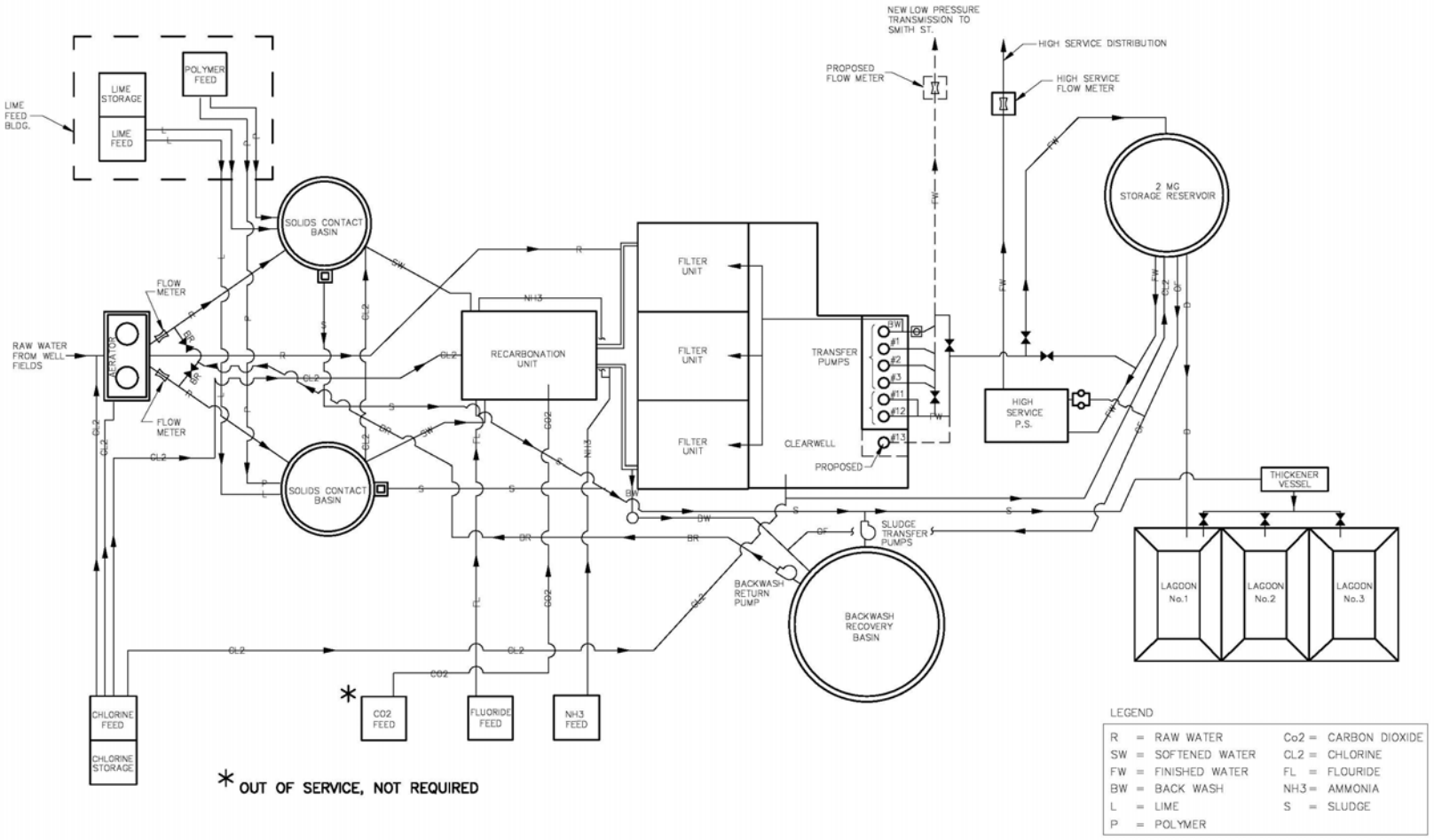
Well Capacity and Capacity Requirements

- In order to provide operation redundancy and long term sustainability, the U.C. should pursue the following:

  - ⇨ **Additional Finished Water Interconnects.**
  - ⇨ **Alternative Water Supplies.**
  - ⇨ **A Secondary Raw Water Main.**

Treatment Processes

- **Aeration**
  - **The aeration structures have sufficient capacity for a 12.4 MGD rating.**
- **Softening**
  - **Thus, overall available softening capacity is 12.4 MGD.**
- **Filtration**
  - **The filters at the Glencoe Plant have the Capacity of 10.38 MGD.**
  - **It may be possible to ‘re-rate’ the filters to 12.4 MGD.**



GLENCOE WTP PROCESS SCHEMATIC

Treatment Processes

- **Disinfection**
  - Chlorine solution is fed first, followed by ammonia to form chloramines.
  - The Glencoe Water Treatment Plant is subject to modified ‘CT’ requirements.
  - The WTP must demonstrate ‘CT’ compliance by January 1, 2006.
  - Actual CT (370) > Required, CT (321).

System Does Meet CT Requirements

Treatment Processes

- **Chlorination Equipment**
  - Chlorine gas is fed from one ton cylinders.
  - Average chlorine demand is less than 500 # / day, therefore, adequate capacity exists for disinfection of 12.4 MGD.
  - The chlorine gas feed system is subject to federal risk management guidelines.
  - An element of the plan includes public notification for residents and businesses within close proximity of the plant.

Treatment Processes

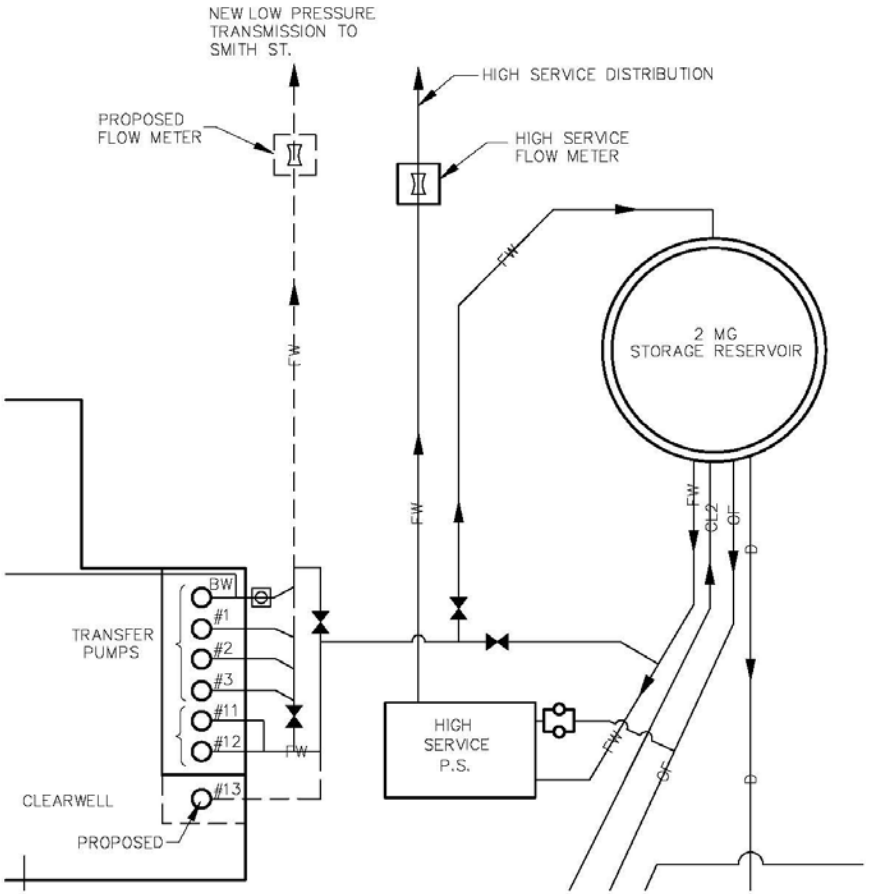
- **Chlorination Equipment**
  - **As development moves closer to the plant, the U.C. may wish to consider safer disinfection options.**
  - **Options which should be evaluated are:**

⇨ ***Option #1*, Bulk Liquid Sodium Hypochlorite (NaOCl).**

⇨ ***Option #2*, On-site NaOCl generation.**

⇨ ***Option #3*, Ozonation.**

STORAGE AND PUMPING



GLENCOE WTP PUMPING SCHEMATIC

Age and Status of Existing Transfer Pumps

Pump #	Capacity	Approx Age (YRS)
#1	2,000 GPM	30+
#2	Out of Service	N/A
#3	3,500 GPM	30+
#11	2,200 GPM	14
#12	2,200 GPM	14
TOTAL	**9,900 GPM (14.26 MGD)**	

Storage and Pumping

- **Transfer Pumps (Continued)**
  - The useful service life of vertical turbine pumps is 15-20 years.
  - All pumps should be replaced. The pumps should be equipped with variable frequency drives, (VFD's) and new instrumentation.
- **Storage**
  - The U.C. operates four (4) storage tanks. (1) at Glencoe WTP, (2) at Smith Street and (1) on the South Peninsula.
  - A new 1 MG tank is needed at Third Avenue.

Storage and Pumping

High Service Pumping

- The U.C. operates three (3) high service pump stations. Glencoe WTP, Smith Street and Beachside South.
- The existing Smith Street pump station is constructed below the 100 year flood plain and is subject to inundation.
- The existing structure electrical and mechanical equipment is in poor condition.
- Existing flooded suction centrifugal pumps limit the useful storage capacity of the tanks.
- The existing structure will not meet current wind load requirements; retrofit of the existing structure would cost more than building new.
- **A new pump station at Smith Street is recommended.**

Emergency Power

- The emergency power generator at the Glencoe Water Treatment Plant is not equipped with an Automatic Transfer Switch (ATS).
- At Glencoe WTP, an ATS should be installed in addition to new power distribution equipment.
- The existing generator is marginally sized to handle all plant loads and simultaneous high service pumping.
- A separate generator, enclosure, and ATS is proposed for installation at the high service pump station at Glencoe WTP.

Project Summary Spreadsheet

Item #s	Project Description	Implementation Date	Est. Cost
1	Wellfield Expansion	2008	$**1,625,000**
2	Lime Softening Upgrades (lime slaker and softener rehab)	2006/07	$**210,000**
3	Rebuild/Replace Softener Drives	2008	$**50,000**
4	Rehab. Lime Silo, Electrical & Instrumentation	2010	**200,000**
5	Filter Upgrades	2008	**250,000**
6	Glencoe WTP Low Pressure & Transfer Pumping	2006/07	$**793,500**
7	Glencoe WTP High Service Pumps	2008	$**75,000**
8	Smith Street Pump Station	2006/07	$**1,087,500**
*9	3rd Avenue Storage Tank & Pump Station	2006/07	$1,375,000
10	ATS & Power Distribution @ Glencoe WTP	2006/07	$**100,000**
11	Smith Street Generator	2006/07	$**280,000**
12	3rd Avenue Generator	2006/07	$**160,000**
13	Glencoe H.S. Generator	2008	$**280,000**
	*(3rd Avenue Project also listed in Part 1 Study, not included in this total)		
TOTAL	**2006/07 Projects**		$**2,631,000**
TOTAL	**2008 Projects**		$**2,280,000**
TOTAL	**2010 Projects**		$**200,000**

QUESTIONS