Appendix B
Site Visit Interviews

STEARNS & WHELER LLC
Environmental Engineers & Scientists

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SITE VISIT – AMHERST, MA WPCF 5/1/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   Plant started in the 1930s as a primary treatment facility. Current facility went on line January 2, 1979. They decommissioned dissolved air flotation and vacuum filtration in 1993 when they started thickening and hauling to Fitchburg.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is exclusively within Amherst. No major expansion of the collection system is expected.

   About 1.3 or the 4.2 mgd comes from UMASS.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are thirteen employees for the wastewater facility and collection system (including an administrator).

4. **Request information regarding operating mode (number of tanks in service, etc).**
   They run three aerators in the summer and in January. They run four aerators the rest of the year. They run six aerators during wet weather (and could run just 2 during very dry weather).

   Seasonal load variations can even cause adjustments to tanks in use on long weekends.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   No plans to use other portions of the site. The plant lies within Hadley.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   They have a very old collection system (1880s), but they reduced I/I by about 1 mgd 8-10 yrs ago.

   No high load issues. There is no industry in the service area.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   No studies or design.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**

Yes they nitrify at times. They do not suppress.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundations.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Recycle flows are introduced after influent sampling.
    - The effluent sampler is located after disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Electronic copies of DMR data were provided. Effluent nitrogen data is collected.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      This data is collected.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      This data is collected.

   d. **Alkalinity**
      None taken.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      This data is collected.

   f. **Typical RAS rates.**
      This data is collected.

   g. **Sludge wasting rates.**
      This data is collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

a. **Cost of electricity**
Electric bills were provided

b. **Chemical costs**
Chemical bills were provided

c. **Sludge disposal costs**
Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Plant drawings were provided.

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SITE VISIT – ATTLEBORO, MA WPCF 4/24/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   Prior to 1980, the Attleboro treatment facility was a trickling filter plant. The current plant was constructed in 1980.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is exclusively within Attleboro. Septage is collected from North Seekonk, Attleboro, and some form North Attleboro. Seekonk could possibly tie into the plant in the future.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The facility has 30 employees including 26 working at the plant site and four working the collection system.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   The first stage system is not used. They use the second stage – 2 clarifiers normally, but three in wet weather.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   The south end of the site is designated for a future landfill. Available areas include the current contractor staging area, area toward Ten Mile River, and the area to the west toward the leaf recycling area.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   They do get I/I (estimated to be about 1 mgd). There are 30-32 indutrial discharges.

   On occasion they get an unexplained substance that impacts nitrification (white substance).

   Water plant discharges a slug load every 6 hrs.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   Currently undergoing an upgrade that should be done by fall of 2007. The upgrade includes all new equipment and a SCADA upgrade.

   No other studies.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   Yes

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundation conditions.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - All recycle flows at the plant combine with plant influent prior to sampling. Thus, the influent sampler collects samples that include recycle flows.
    - The effluent sampler is located in the filter building prior to disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Electronic copies of DMR data were provided. Various influent and effluent nitrogen data is collected.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      This data is collected.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      This data is collected.

   d. **Alkalinity**
      None taken.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      This data is collected.

   f. **Typical RAS rates.**

This data is collected.

g. **Sludge wasting rates.**
This data is collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

   a. **Cost of electricity**
   Electric bills were provided

   b. **Chemical costs**
   Chemical bills were provided

   c. **Sludge disposal costs**
   Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
   Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
   Plant drawings were provided.

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SITE VISIT – CHICOPEE, MA WPCF 3/13/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The first phase of the facility was built in 1970, and was comprised of a 7.75 mgd primary treatment plant. The second phase upgraded the plant to a 15.5 mgd, pure oxygen secondary treatment facility in 1977. Filter presses were added in the 1980s; one in 1985, and two in 1989. A new oxygen compressor, new sludge conveyors, a new sludge garage, and new support equipment were also added in 1989. A 15 MGD CSO facility was completed on or about July 2006, R.H White was the contractor.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area encompasses all of Chicopee and very small parts of two neighboring towns – Granby and South Hadley. Approximately 5% of the influent flow is from industrial sources. Industrial flow is not expected to increase, and could potentially decrease if the industries leave the area. Current ADF is 9.5 mgd. There are no other expected major flow increases.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There is a total of 36 staff employed by the facility. These include specialists for the collection system (6), flood control (3), CSO facility (1), and industrial pre-treatment (3), in addition to actual plant staff (26).

4. **Request information regarding operating mode (number of tanks in service, etc).**
   There are 8 rectangular primary clarifiers (all in use), 2 pure oxygen aeration tanks (1 in use – alternate every few years), 4 square clarifiers with circular mechanisms (all in use). The 2 exterior sludge storage/thickening tanks and the 2 incinerators are not in use (never been used due to broken pipes). There are 4 interior sludge thickeners, 3 of which were in use during the site visit as one was being painted. Typically, all 4 are in service.

   Oxygen is made on-site. Liquid oxygen comes on automatically when oxygen supply is low. Very little sludge is actually under aeration; therefore RAS has very low DO. MLSS DO is typically 10-15 mg/L.

   Ferric is added to headworks for phosphorus removal (seasonally, 50-100 gpd), as well as to the discharge of the screw pump lift station for better sludge blanket control (most of the year, 50-350 gpd).

PACl is added in winter and during rain events when turbidity is high to the 3rd chamber of the aeration basin (200-400 gpd).

$KMnO_4$ is added before the centrifuges to aid in dewatering.

There are no gates on the aeration basins. This limits flexibility.

RAS returns to a single point; WAS can be wasted directly from the tanks or from the RAS line.

Sludge is thickened in thickeners and dewatered with a centrifuge. Cake is trucked to a landfill in ME.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There are no plans for unused areas on site. A possible area that could be modified for changes in use is the location of the abandoned sludge storage/thickening tanks on the east side of the site. There is also a parcel of land owned by the power company between the river access road and RT 90 that is vacant.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The Parshall flume is calibrated to 40 mgd. The plant can handle up to 25 mgd through one tank of the secondary system, and pass 15 mgd total through the CSO facility. The head operator estimated that the maximum capacity of both systems is around 49-50 mgd. The CSO facility consists of 1 tank rated for 15 mgd. Diversion to the CSO unit is accomplished by maintaining 25 mgd to the secondary system with the rest moving through the CSO unit. Currently, the average flow is 9.5 mgd.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There are no upgrades proposed for the Chicopee facility.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The facility does not need to nitrify.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   All structures are on footings – nothing is on piles.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**

- The influent composite sampler is located immediately before the bar rack, and does not include recycled flows;
- the Parshall flume is located downstream of the primary clarifiers, and does included recycled flows;
- the primary effluent sampler is located at the screw pump lifts, and does include recycled flows;
- the secondary effluent sampler is located immediately upstream of the chlorine contact tank, and does included recycled flows.

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit. Also, an aerial photograph was scanned and provided.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

DMR data provided electronically. Effluent nitrogen data collected occasionally.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      Temperature data is collected 5 Days/week. Data can be found in the spreadsheet provided.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      Year-round BOD and TSS primary effluent data is collected 5 days a week, and can be found in the spreadsheet provided. Primary effluent nitrogen data was not provided. Influent monthly composite nitrogen species data (of a total of 36 months)– 12 ammonia data points, 12 TKN data points; secondary effluent monthly composite nitrogen species data points – 22 ammonia, 25 TKN, 21 nitrate, 11 TN, 11 nitrite+nitrate. As the ammonia data points are often an order of magnitude lower for influent than effluent data taken for the same date, we have no confidence in the nitrogen data.

   d. **Alkalinity**

Influent alkalinity data is collected year round, 5 days a week; primary and secondary alkalinity data is collected only in the summer, 5 days/week.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
MLSS and MLVSS data is collected 5 days a week (spreadsheet).

f. **Typical RAS rates.**
RAS rates are collected 5 days/week (spreadsheet).

g. **Sludge wasting rates.**
Sludge wasting rates are collected 5 days/week (spreadsheet).

h. **Total plant sludge production.**
Total monthly sludge production is provided in the printout.

3. **Operating cost data:**

   a. **Cost of electricity (copy of electric bill is fine)**
   8 electric bill copies provided – 8/06 through 3/07 (Chicopee Electric Light)

   b. **Chemical costs**
   Detailed chemical requirements and dosing rates and costs provided for ferric.

   c. **Sludge disposal costs**
   Sludge disposal cost provided for 2000 through 2006 (printout).

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
   11 x 17 site layout, process flow diagram, hydraulic profile, and aerial photo provided.

5. **Drawings of process tanks and equipment <u>or</u> a copy of a previous engineering report that summarizes tank & equipment sizes.**
   Tank and equipment size sheet provided.

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SITE VISIT – DOUGLAS, MA WPCF 5/3/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   Original plant was built in 1972. This plant was taken out of service and replaced by a new facility on December 3, 2005.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is exclusively within Douglas (except a convenience/gas station in Uxbridge). No major expansion of the collection system is planned, but once project is done, sewer moratorium will likely be lifted.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are two employees that cover the plant and collection system (four pump stations).

4. **Request information regarding operating mode (number of tanks in service, etc).**
   They have 3 SBRs, but use only 2.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   No plans to use other portions of the site.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   They do have some I/I.

   There is no industry nor high load issues.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   No studies or design.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   Yes they nitrify at times. They do not suppress. They add alkalinity.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundations.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**

- Recycle flows are introduced after influent sampling. They do not accept septage.
- The effluent sampler is located after disinfection

11. Take Photos of plant (sign, overview, etc).
Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. DMR reports from January 2004 through December 2006.
Electronic copies of DMR data were provided. Effluent nitrogen data is collected.

2. Three years of process data that you collect that may not be reported on the DMRs, for example:

a. COD data, if collected
None taken.

b. Influent temperature
This data is collected.

c. Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)
N/A.

d. Alkalinity
None taken.

e. Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).
This data is collected.

f. Typical RAS rates.
This data is collected.

g. Sludge wasting rates.
This data is collected.

h. Total plant sludge production.
Total monthly sludge production is provided.

3. Operating cost data:

a. **Cost of electricity**
   Electric bills were provided

b. **Chemical costs**
   Chemical bills were provided

c. **Sludge disposal costs**
   Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
   Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
   Plant drawings were provided.

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SITE VISIT – EASTHAMPTON, MA WPCF 4/26/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The original plant consisted of two primary clarifiers, a primary and a secondary digester and sludge drying beds. The first upgrade was performed in 1971, and consisted of adding a grit chamber and comminutors, two additional primary clarifiers, two aeration tanks, conversion of the digesters/gravity thickeners (one is usually used for storage), and adding the chlorine contact chamber. The lagoons as called for in the 1971 upgrade plans were never constructed. There are no coil filters. In the early 1980's, a 2-m belt filter press was installed. There were further sludge processing upgrades in 2001, as well as secondary clarifier (rake arm replacement) and thickener upgrades.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is located entirely within Easthampton. There are no CSOs. There are three significant, one categorical and three fats, oils and grease (FOG) dischargers. Total industrial contribution is less than 10%. There are no expected flow increases.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   A recent facility staffing report was obtained. There are currently 9 employees, including the chief operator, assistant chief operator, 2 shift operators, a shift operator/pump station operator, a shift operator/pretreatment coordinator, a mechanic, a repairman, and an attendant.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   Under normal operation, all four primaries, one of two aeration tanks, and both secondary clarifier are online.

   Dry weather flows average 1.5 mgd; wet weather flows are typically 4 mgd. Permitted flow is 3.8 mgd.

   The MLSS is typically 1500 – 2000 mg/L.

   Sludge withdrawal from the secondary clarifiers is from the center of the clarifier at 1.5%. RAS is pulled from the RAS box. RAS concentration ranges from 4,000-4,500 mg/L.

   Sludge dewatering occurs 5 days a week, 8 hours a day. Sludge is stored in one of the gravity thickeners. Each thickener is used for storage on alternate years. Sludge is

trucked to Synagro. There is no odor control on the thickener, but sodium chlorite and/or potassium permanganate is used for odor control with good results and no odors. Polymer is used to aid in dewatering.

The septage brought to the plant is from local schools at a rate of ~ 4,000 gallons four times per year. Additional septage from other sources is approximately 10,000 gallons per year.

Waste rates for 2004 are invalid as there was no flow meter for this period.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There are no plans to use existing unused areas on the site. The current fence line is representative of site limits.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   To handle sustained high flows, the second aeration tank is used as an overflow tank. The facility has a high flow operating protocol in order to keep more solids in the system and not in the secondary clarifiers. If washout occurs, it can take a long time to build up the sludge inventory. With high flows, the facility sees the proliferation of filamentous organisms. The facility was chlorinating the RAS between January and the time of the visit, as SVIs had reached 200. The SVI at the time of the visit was 140.

   With flows up to 3.8 mgd, effluent is discharged to the Connecticut River. Higher flows are diverted to the Manhan River.

   The facility does not use D.O. probes, but prefers other methods, which are employed to monitor D.O. 2x per day. Dissolved oxygen is maintained at 1.5 mg/L. The mechanical aerators are on VFDs. Adjustments are made throughout the season.

   The facility would like a larger chlorine contact tank, as residuals were high with the use of chlorine gas. Liquid sodium hypochlorite lowered residuals, but the cost is of concern.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There are no current upgrades planned. There has been and will continue to be I/I reduction studies/work. The 16 pump stations are currently being worked on.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**

Sludge disposal numbers between May and October will demonstrate nitrification, and the facility is definitely nitrifying in the winter. There are no ammonia limits.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   Unknown.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - The influent sampler is located in the headworks building, and does not include side stream flows.
    - The primary effluent includes side stream loads (gravity thickener supernatant and belt filter press filtrate), but not side stream flows. Primary effluent samples are collected only 3 times per week, and are flow proportional composites.
    - Effluent flow rate is monitored to both the Connecticut and Manhan River.

11. **Take Photos of plant (sign, overview, etc).**
    Photos were not taken. A second site visit will be schedule to take photos.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   DMRs were provided.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      Not collected.

   b. **Influent temperature**
      Monthly average temperatures provided.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      5x/week influent & effluent, and 3x/week BOD and TSS data provided; daily process data provided. Very limited effluent nitrogen data provided. Septage data provided.

   d. **Alkalinity**
      Unknown.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
Daily MLSS and MLSS data provided.

f. **Typical RAS rates.**
Daily RAS rates provided.

g. **Sludge wasting rates.**
Daily WAS rates provided.

h. **Total plant sludge production.**
Monthly tonnage provided.

3. **Operating cost data:**

a. **Cost of electricity (copy of electric bill is fine)**
Detailed monthly electricity usage and costs provided.

b. **Chemical costs**
Detailed monthly chemical costs provided.

c. **Sludge disposal costs**
Detailed sludge disposal costs provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Site plan, hydraulic profile, and process flow diagram provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Equipment and tank summary provided, as well as aeration tank drawings.

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SITE VISIT – ERVING CENTER, MA WPCF 5/1/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The plant went online in 1977. Various equipment additions and replacements have occurred since then.

2. **What is the sewer service area? Are there any expected major flow increases?**
   Over 95% of the flow comes from a local papermill (Irving Papermill operated by Irving Industries). The rest of the flow is domestic waste (including 1 million gallons of septage permonth). No plans to add flow to the plant.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The facility includes eight employees (including a ½ time lab tech). They have no collection system responsibilities (Town is responsible for that).

4. **Request information regarding operating mode (number of tanks in service, etc).**
   The plant is nutrient deficient and thus they have to add urea and diammonium phosphate to add nitrogen and phosphorus into the system.

   They use 3 million gallons of the 10 million gallon lagoon volume.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   They have proposals to increase ability of plant to take in more waste, but this work is on hold.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   Consistent flow and load (due to most flow coming from papermill).

7. **Ask if there are any upgrades that are currently in study or design phase?**
   See #5 above.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   N/A.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundations.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - All recycle flows at the plant are introduced before influent sampling.
    - The effluent sampler is located after disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   Limited data provided because plant is not useful to current study.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
   b. **Influent temperature**
   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
   d. **Alkalinity**
   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
   f. **Typical RAS rates.**
   g. **Sludge wasting rates.**
   h. **Total plant sludge production.**

   Data is not useful to study because they add nutrients to the plant.

3. **Operating cost data:**

   a. **Cost of electricity**
   b. **Chemical costs**
   c. **Sludge disposal costs**

   Data is not useful to study because they add nutrients to the plant.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
   None provided.

5. **Drawings of process tanks and equipment <u>or</u> a copy of a previous engineering report that summarizes tank & equipment sizes.**
   None provided.

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SITE VISIT – GRAFTON, MA WPCF 4/10/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The facility was originally constructed in 1979 as a secondary treatment facility. The major changes that have occurred on the site since it was constructed is the sludge processing facilities are no longer used.

2. **What is the sewer service area? Are there any expected major flow increases?**
   Service area includes Grafton and one building in Shrewsbury. No major extensions expected outside of private developments.

   Leachate is accepted from Southbridge landfill.

   Septage accepted form Westborough, Northboro, and Grafton.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are five employees at the facility plus a summer laborer. This group serves the plant, pump stations and collection system.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   For the past two years, all tanks have been on line at the request of EPA.

   The plant adds lime for alkalinity and ferric chloride for phosphorus removal.

   WAS is sent to the primary for co-settling.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   The available areas onsite are for plant expansion.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The plant does see high flows due to inflow. They see high loads form time to time. They receive 40,000 gpd from Wyman Gordon (airplane parts) which includes Aluminum, Cadmium and Molybdenum from the rinse tanks.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   A study is underway to explore plant expansion.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The facility always operates with two tanks in service.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   The main building on site has piles. Tanks do not have piles (flap – check – valves).

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - All recycle flows at the plant combine with plant influent prior to sampling. Thus, the influent sampler collects samples that include recycle flows.
    - The effluent sampler is located after chlorination/dechlorination

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   Electronic copies of DMR data was provided. Only effluent nitrate and ammonia data is collected.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      Influent temperature is recorded.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      Some primary effluent data is collected.

   d. **Alkalinity**
      None taken.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      MLSS is collected.

   f. **Typical RAS rates.**

RAS rates are collected.

g. **Sludge wasting rates.**
Sludge wasting rates are collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

   a. **Cost of electricity**
   Electric bills were provided

   b. **Chemical costs**
   Chemical bills were provided

   c. **Sludge disposal costs**
   Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
   Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
   Plant drawings were provided.

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SITE VISIT – GREENFIELD, MA WPCF 4/27/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The original facility was constructed in 1935 and included 2 primary clarifiers and sludge digesters. In 1974, a secondary system was installed, consisting of trickling filters chosen to take advantage of their resistance to washout. There were many metal industry dischargers at the time. The trickling filters achieved single digit TSS and BOD effluent values. Removal began to deteriorate over time due to rock erosion, resulting in ponding. Recently, the decision was made to redirect the outfall to the Deerfield River. As a result, the plant was upgraded in 2000. The tanks were increased in height, and the rock media was replaced with stacked plastic media. The drives were replaced, VFDs were installed for the blowers, the outfall was relocated, and new chlorine contact chambers were constructed. Dechlorination equipment was added. The headworks was also redesigned and improved to increase capacity to 4.5 mgd from 3.4 mgd, as the headworks was a critical point limiting capacityof the original design. The permitted capacity remains at 3.2 mgd. The site is located within a wetland in a floodplain, and all original and subsequent foundation drains discharge into the sewer. Relining operations to reduce infiltration is being performed in-house.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The facility services ~80% of Greenfield. There are 3 pump stations within the sewer service area. There are no significant categorical industrial dischargers, and the only septage arriving at the plant comes from the remaining unsewered sections of Greefield.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The staffing organizational chart was obtained for the Department of Public Works. Currently there are allocations for a superintendent, an operations supervisor, a lab technician, and 4 operators (funding for 5.5 total individuals).

4. **Request information regarding operating mode (number of tanks in service, etc).**
   Under normal operation, all four primary clarifers, both trickling filters, and one of the two secondary clarifiers are online. During low river flows (typically June to October) the facility is operated to achieve maximum treatment in order to benefit the river.

   The grit chamber is pumped out once every two months.

   The trickling filters are operated in parallel most of the time. When flows are really low, the trickling filters are operated in series.

CSO's were eliminated in the 1980s. These were paid for on a 9.2 million, 20 year bond which is still being paid off.

Primary sludge is pumped continuously. Secondary sludge pumps are operated on a timer at 2 hours on, 2 hours off.

A tanker on the side of the gravity thickener is used for daily sludge storage prior to shipment offsite for incineration.

The old vacuum filters are maintained for emergency sludge processing. This sludge is disposed of at a landfill.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There are no plans to use unused areas on the site. However, installing any new tankage or buildings either on-site or on the surrounding lands will be difficult due to the existence of Native American burial grounds located in the area as well as the location of the site in a floodplain. Compensatory storage is an issue.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   During winter months, the temperature is too low for operating the trickling filters in series. Also during cold temperatures ice accumulates at the clarifiers.

   Only three primary clarifers are operated in the summer, as the low flow conditions result in long residence times and cause odor problems.

   Under normal operation, the plant can just barely maintain flow by gravity. During flooding, the sub-basement is intentionally flooded by 3 feet to prevent uplift of the building.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There are no current upgrades planned.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   Unknown.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   Unknown.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - The influent sampler is located upstream of the Parshall flume and does not include side streams.
    - Grab samples are taken from the primary effluent channel and include side streams (gravity thickener supernatant).
    - The effluent sampler is downstream of the de-chlorination process and do not include side streams.

11. **Take Photos of plant (sign, overview, etc).**
    Photos were not taken. A second site visit will be schedule to take photos.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   Actual DMRs not provided.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      Not collected.

   b. **Influent temperature**
      Monthly average temperatures provided.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      Monthly average influent, primary effluent, effluent BOD and TSS data provided; monthly average TKN data provided; process data provided. Also, septage data provided.

   d. **Alkalinity**
      Typically 30 mg/L (as $CaCO_3$).

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      Not an AS facility.

   f. **Typical RAS rates.**
      Not provided.

g. **Sludge wasting rates.**
Not provided.

h. **Total plant sludge production.**
Monthly tonnage provided.

3. **Operating cost data:**

a. **Cost of electricity (copy of electric bill is fine)**
The most recent electric bill was provided, as well as annual electrical costs.

b. **Chemical costs**
Annual chemical costs provided.

c. **Sludge disposal costs**
Monthly sludge disposal costs provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Site plan, hydraulic profile, and process flow diagram provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Design sheets from O&M manual provided.

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SITE VISIT – HOLYOKE, MA WPCF 4/26/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The first facility was built in the 1950s. The last major upgrade was in 1977.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is exclusively within Holyoke. No major increase in flow are expected.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are 19 employees that serve the following: flood pumping, CSO facility, treatment plant, street sweeping, and collection system.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   Since Aquarion assumed control of the facility, they have run both aeration tanks. Prior to then, the plant ran only one tank for six years.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   A CSO treatment facility is currently being constructed on the site. No other plans for expansion.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The plant receives CSOs.

   There are 5 industries the are part of a pretreatment program. They occasionally get high loads (TSS) from a paper plant. Color also comes in from paper plant.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   See #5 above.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   See #4 above.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundation conditions.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Recycle loads are introduced after the influent sampler.
    - The effluent sampler is located after disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Harcopies of DMR data were provided. Various influent and effluent nitrogen data is collected.

Nitrogen data can be summarized as follows:

	TN	TN/BOD
Min	7.0	
Max	66.1	
Avg	21.2	0.13
Seas. Avg	25.6	

Based on average concentrations, the TN is low (a text book TN/BOD ratio for this facility is 0.18)

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      This data is collected.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      This data is collected.

   d. **Alkalinity**
      None taken.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
This data is collected.

f. **Typical RAS rates.**
This data is collected.

g. **Sludge wasting rates.**
This data is collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

   a. **Cost of electricity**
   Electric bills were provided

   b. **Chemical costs**
   Chemical bills were provided

   c. **Sludge disposal costs**
   Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
   Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
   Plant drawings were provided.

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SITE VISIT – HOPEDALE, MA WPCF 4/18/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The current facility was built in 1983. Prior to 1983, a primary treatment facility existed on the site. Changes that have occurred since 1983 include the addition of UV, addition of fine bubble aeration and sludge processing has ceased.

2. **What is the sewer service area? Are there any expected major flow increases?**
   No planned extensions, but there are a few potential expansions including an old mill and 110 acres of undeveloped land.

   Septage is accepted from sites within Hopedale only.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The plant has three full time, one administrator and one ½ time laborer. This crew serves the plant and pump stations.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   They run all tanks. WAS is sent to the primaries for co-settling.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There is available land (about 18-21 acres total land area).

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   I/I is an issue at the facility. High loads are not an issue.

   There is no real industry in Town.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There is currently a pilot study for membranes. In addition there is a study investigating polishing filters after secondary treatment for phosphorus removal.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The facility does not suppress nitrification.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundations.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - In plant recycle flows are returned to the pump station on site which precedes the sample point. The sampler is located after grit removal. WAS is not returned to the primaries on sample days to get a better representation of influent flow.
    - The effluent sampler is located after UV disinfection.

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Electronic copies of DMR data was provided. Only effluent nitrate and ammonia data is collected.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      Influent temperature is recorded.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      Some primary effluent data is collected.

   d. **Alkalinity**
      None taken.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      MLSS is collected.

   f. **Typical RAS rates.**
      RAS rates are collected.

   g. **Sludge wasting rates.**
      Sludge wasting rates are collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

a. **Cost of electricity**
Electric bills were provided

b. **Chemical costs**
Chemical bills were provided

c. **Sludge disposal costs**
Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Plant drawings were provided.

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SITE VISIT – NORTH ATTLEBOROUGH, MA WPCF 3/15/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The first treatment facility was constructed in 1909 and upgraded in 1948 and 1959. The current secondary treatment facility was completed in 1980.

2. **What is the sewer service area? Are there any expected major flow increases?**
   This facility serves North Attleborough as well as Plainville. There are about 4500 connections. There are no major additions to the collection system expected in the near future.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are 11 employees at the treatment facility, three that serve the collection system and pumping stations and one that serves on the pretreatment program.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   They bypass the First Stage aeration and clarifiers. They do not take tanks out of service to suppress nitrification, but two of the eight tanks are used for RAS storage and an anaerobic zone for phosphorus removal.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   No current plans to further develop any part of the property.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The plant receives high flows during rain events. Loads are consistent.

   The Emerald Square mall contributes 250,000 gpd to the plant via the pretreatment program.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There is a collection system study that is underway. Only equipment replacement is taking place currently.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The facility operates as indicated in #4 above..

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9. **What kinds of foundations are predominant on the site (piles, etc).**
   Nothing unusual.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - All recycle flows at the plant combine in the onsite pumping station. The influent sampler collects samples that include recycle flows.
    - The effluent sampler is located after disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Electronic copies of DMR data was provided. Influent and effluent total nitrogen data is collected monthly.

Nitrogen data can be summarized as follows:

	TN	TN/BOD
Min	8.2	
Max	47.9	
Avg	22.4	0.19
Seas. Avg	23.9	

Based on average concentrations, the TN is typical (a text book TN/BOD ratio for this facility is 0.18)

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      Influent temperature is recorded.

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c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
This data is collected

d. **Alkalinity**
This data is collected.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
MLSS is collected.

f. **Typical RAS rates.**
RAS rates are collected.

g. **Sludge wasting rates.**
Sludge wasting rates are collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

a. **Cost of electricity**
Electric bills were provided

b. **Chemical costs**
Chemical bills were provided

c. **Sludge disposal costs**
Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Plant drawings were provided.

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SITE VISIT – NORTHAMPTON, MA WPCF 4/18/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The original facility began construction in 1979, and was completed in 1981. One filter press was added in 1989 (first upgrade). In 1994, the aeration system was converted to fine bubble diffusers, upgrades were made to the GBT building (including new blowers), a second filter press was added, an odor control building a process was added, and a lime silo was added. The lime was for sludge stabilization. This second upgrade was performed by R.H. White. Lime and the gravity belt thickener are no longer used. More recently, the third upgrade replaced the screw pumps (which transfer flow from the headworks to the primary clarifiers) to submersible flight pumps. The two digesters were converted to sludge holding tanks for the GBTs, but are now empty and not in use.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The facility services all of Northampton (~31,000 people) and parts of Williamsburg (~425people). The current flow is 4.1 mgd average. Flow at the time of the site visit was ~ 10 mgd due to a recent storm. Over the few days prior to the visit the plant observed flows approaching 20 mgd, which is where the monitoring chart stops. The permitted flow is 8.6 mgd. There is an ongoing I/I study, there are no regulated CSOs. There are five permitted, significant industrial users and five major, non-reporting users. Approximately 8% of the total flow is from industrial/commercial dischargers. There are no categorical dischargers. There are high sewer use fees. Coca Cola has cut back its flow, but few industries have left.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The yearly staffing report was requested. There are currently 11 staff: 5 operators, 4 maintenance personnel, a lead operator, and an IP officer.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   A written description of the current operation as of February, 2007 was provided.

   There are 2/3 primary clarifiers, 8/8 aeration tanks, and 2/3 secondary clarifiers. Currently, the first two tanks of each train (4 tanks each) are being operated as anoxic zones.

   Dissolved oxygen is monitored daily at the secondary clarifier distribution box with a hand held YSI unit. This measurement is used for process control – the target DO concentration is 2.0 mg/L. There are three positive displacement blowers with VFDs.

Waste activated sludge is wasted continuously from the RAS line; the WAS pumps are not used. The RAS and WAS meters are mag meters in the basement.

There are 2 grit chambers, both of which are usually in operation. At the time of the visit, one was down for maintenance. Grit and rags (approximately ¼ - ½ yard of grit per day) go separately to the landfill.

Typically an F/M of 0.25; 2,000-2,500 mg/L MLSS and an SVI of 150-300 is targeted.

There is occasionally trouble with sludge blankets in secondary clarifiers if the MLSS too high.

When a storm is imminent, the blowers and the RAS pumps are turned off in an attempt to maintain biomass within the system and prevent washout.

The headworks can overflow into the basement.

There is no bypass at the front of the plant.

The pumps after the primary clarifiers have a capacity of 25 mgd.

There are low septage loads (~1,000 gpd, $100/load for up to 1,000 gallons, $100 each 1,000 gallons after that), which are dumped directly into the manhole upstream of the headworks.

The entire plant can be run on the generator.

2 gravity thickeners, produce sludge with 2-3% solids, 20-25% solids from BFPs. Sludge is shipped out of state to CT (Naugetauk) by WeCare.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There are no plans for existing unused areas on site. The abandoned digesters might be an ideal location for future upgrades.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   Coca Cola has been alternating its product and intermittently using sucrose, which results in slug loads of sucrose to the plant. These slugs are typically around 1,000 mg/L BOD and introduce pH fluctuations. These changes cause problems for the plant. Variable fructose loads are not an issue.

The grease from the VA hospital gets into the grease collection area.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There are no current upgrades planned.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   Unknown.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   The foundations are exclusively slab foundations. The subsurface conditions are very bad – there are many alternating layers of sand and clay. There is evidence of sinking, rising, and cracking throughout the plant.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Primary effluent is sampled from the pit in front of the lift pumps.
    - RAS/WAS is sampled from the RAS line in the basement every morning.
    - Recycle flows are included in the influent flow and load.
    - The influent is sampled at the Parshall flume.
    - Raw influent, primary effluent, and final effluent are pumped to the lab for composite sample analysis.

11. **Take Photos of plant (sign, overview, etc).**
    Photos were not taken. A second site visit will be schedule to take photos.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   DMRs and daily process data provided for period in question.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      Not collected.

   b. **Influent temperature**
      Daily temperature provided.

c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
Weekly primary BOD and TSS provided.

d. **Alkalinity**
Monthly summaries provided.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
Daily MLSS and MLVSS data provided.

f. **Typical RAS rates.**
Daily RAS data provided.

g. **Sludge wasting rates.**
Daily RAS data provided.

h. **Total plant sludge production.**
Monthly tonnage provided.

3. **Operating cost data:**

a. **Cost of electricity (copy of electric bill is fine)**
The most recent electric bill was provided, ~ $20,000/month.

b. **Chemical costs**
An estimate of a typical monthly chemical provided ($13,800/month); $KMnO_4$ $1.71/lb, polymer $1.49/lb, caustic (25%) $1.89 gallon (10,000 gallons/year), hypochlorite (15%) $1.59/gallon (12,000 gallons/year).

c. **Sludge disposal costs**
$83/wet ton for disposal and transportation; $450,000 budgeted annually; estimate of $38,900 /month.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Site plan, hydraulic profile, and process flow diagram provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Design sheets from O&M manual provided.

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SITE VISIT – NORTHBRIDGE, MA WPCF 4/24/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The facility was originally constructed prior to the 1940s as a Primary Treatment facility. A trickling filter was added in the 1940s. Secondary clarifiers were added in the 1960s. A dewatering process and chlorine disinfection were added in the 1970s. A UV system was installed in 1997 (and the coil press was decommissioned). Finally in 2002, the current SBR process was constructed.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is exclusively within Northbridge. The only flow increases are due to continued housing developments.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The plant and collection system are maintained by 6 people (superintendent, administrative assistant and 4 operators)

4. **Request information regarding operating mode (number of tanks in service, etc).**
   The SBRs operate under aeration mode only and both tanks are used.

   Aluminum sulfate and soda ash are added.

   They currently co thicken in the gravity thickener. Synagro hauls sludge from the plant.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   The available areas onsite are available for plant expansion.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The plant does see high flows due to inflow and infiltration. There are no high load issues and there is very little industry.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There is currently a study underway for P removal (PAC trial about to start).

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The only change in the facility is alum is not added in the winter. They generally run one primary clarifier, but activate a second during high flows.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundation conditions.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - All recycle flows at the plant combine with plant influent at the Rockdale Pump Station (on site) prior to sampling, which is done prior to primary clarifiers. Thus, the influent sampler collects samples that include recycle flows.
    - The effluent sampler is located after disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Hardcopies of DMR data were provided. Only effluent nitrate and ammonia data is collected.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      None taken.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      None collected.

   d. **Alkalinity**
      None taken.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      None collected.

   f. **Typical RAS rates.**
      None collected.

g. **Sludge wasting rates.**
None collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

a. **Cost of electricity**
Electric bills were provided

b. **Chemical costs**
Chemical bills were provided

c. **Sludge disposal costs**
Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Plant drawings were provided.

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SITE VISIT – PALMER, MA WPCF 3/15/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The original plant was constructed in 1980. The permitted capacity is 5.6 mgd, and the plant is currently operating at 2-3 mgd. There was an aeration upgrade in 1994 - two tanks were upgraded to fine bubble diffused air (tanks # 3 and #4), and two tanks were upgraded to coarse bubble diffused air (tanks #1 and #2). Belt filter presses were installed in 1998. The facility is positioned on a 9 acre site.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The service area includes the towns of Palmer and Monsen. As industries have left, flows have decreased. The industrial fraction is currently zero. No flow increases are expected. There are 6 CSOs in the service area.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are 10 full-time municipal staff employed by the WPCF, including the secretarial staff (1).

4. **Request information regarding operating mode (number of tanks in service, etc).**
   The facility is comprised of two primary clarifiers (both in service), two aeration trains (one in service), two secondary clarifiers (one in service – the second clarifier goes on line only during rain events), and two chlorine contact tanks (one in service). Waste sludge is thickened with gravity thickeners to 3-5%. The sludge then goes to BFPs (16%). The sludge cake is trucked to Synagro for incineration.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There are no plans to use the existing unused areas, of which there are essentially none.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   There are no high load issues, and increased flows are only observed during precipitation events. Flow has decreased over the years as industries have left the area.

   Chemicals are added for seasonal phosphorus removal and year round metals removal. HPEC 58 is added seasonally (100-125gpd), the rest of the time it is added at a rate of 60-80 gpd. Dual point addition was attempted, but no advantages were observed.

   Caustic is used for pH adjustment.

Polymer is used to assist in dewatering with the BFPs. Occasionally, the BFPs go down, and liquid sludge is trucked away – 90,000 lbs/ week for wet tons.

The facility has an increase in septage deliveries in the summer. It also receives (landfill) leachate out of Vermont.

Aeration tank DO ranges from 0.5 to 2 mg/L. SRT is 5-10 days in the summer and 4-8 days in the winter.

An additional clarifier is typically turned on in preparation for rain events.

A second aeration tank is used with CSO events.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   A new flow meter is being installed in March, 2007. A new generator is also being installed to run the entire plant. The VFDs were recently replaced, as were motors for the RAS, tertiary, primary, and WAS pumps, which were upgraded to premium efficiency motors.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   Nitrification is not required; there is evidence of summer nitrification due to reduction in alkalinity.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   It is unknown what types of foundations are on the site, but probably piles as a result of the high groundwater.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - The influent composite sampler is located after the grit chamber, and includes recycle streams (thickening & dewatering).
    - The primary effluent composite sampler is located after the lift screws, and includes recycle streams.
    - The effluent composite sampler is located after the chlorine contact chamber, and does not include recycle streams.
    - The influent Parshall flume is located after screw lift pumps, and includes recycle streams.

- The effluent Parshall flume is located after the chlorine contact chamber, and does not include recycle streams.

11. Take Photos of plant (sign, overview, etc).
Photos were taken the day of the site visit (March 15th, 2007).

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   DMR data provided in spreadsheet format for 2004-2006. Effluent nitrogen data provided on printout for Ammonia, Nitrite, Nitrate, and TKN (monthly data, one 24-hour composite).

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
   Not collected.

   b. **Influent temperature**
   Provided in spreadsheet.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
   All but nitrogen provided in spreadsheet.

   d. **Alkalinity**
   Provided in alkalinity spreadsheet, monthly summary data.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
   Provided in spreadsheet.

   f. **Typical RAS rates.**
   Provided in spreadsheet.

   g. **Sludge wasting rates.**
   Provided in spreadsheet.

   h. **Total plant sludge production.**

Provided in spreadsheet. Thickened sludge is typically 3-5%.

3. **Operating cost data:**

   a. **Cost of electricity (copy of electric bill is fine)**
   Monthly bills from June 12, 2006 through February 9th, 2007 (8 bills)

   b. **Chemical costs**
   Estimated at $150K/year, breakdown by chemical provided in email.

   c. **Sludge disposal costs**
   Monthly bills from August 2, 2006 through March 1, 2007 (7 bills).

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
   Process flow diagram provided

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
   Original and current tank and equipment sizes were provided on design data sheets.

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SITE VISIT – SOUTH HADLEY, MA WPCF 5/12/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The first phase of the facility was built between 1959 and 1960, and consisted of two primary clarifiers, digesters and drying beds. Between 1979 and 1980, a grit chamber, a third primary clarifier, a new secondary treatment system (conventional activated sludge), a chlorine contact chamber and vacuum presses were added, and one (of five total) pump stations was upgraded. A belt press was added to replace one of the vacuum filters in 1991 (the second filter remains unused). A CWMP was recently completed by Tighe & Bond in 2002.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area encompasses most of the Town of South Hadley and small portions from the Town of Granby and the City of Chicopee. Less than 1% of the influent flow is from industrial sources. There is one significant and two categorical users. There is an industrial pretreatment program. Current ADF is 2.9 – 3.0 mgd, with a permitted ADF of 4.2 mgd. The plant discharges directly to the Connecticut River. There are three CSOs in the sewer service area. There are no other expected major flow increases.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The plant is staffed from 7am – 3pm, 5 days a week, with one operator on-site for 4 hours each day on the weekend. According to the CWMP from 2002, there is approximately 6 staff. The current interim staffing report has been requested.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   All three rectangular primary clarifiers, two of four aeration tanks, both clarifiers, both gravity thickeners, and both chlorine contact tanks are typically in service. The lime system which provided lime for dewatering was abandoned when the town landfill no longer accepted cake.

   Waste activated sludge is pulled directly from the clarifiers once per day to maintain the intended SRT.

   The plant switched to hypochlorite in 2004. The plant does not de-chlorinate.

   Both primary and waste activated sludge is thickened in thickeners, dewatered with the belt filter press, and the cake is trucked to a landfill. Cake was previously sent to

Synegro for incineration. Sodium chlorite is added to thickened sludge for odor control, and polymer is added to aid in dewatering.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There are no plans for unused areas on site.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   Low influent BOD can be an issue, which can be less than 100 mg/L. The permit requires 85% BOD removal across plant, which can be difficult with such a low influent BOD concentration. Flows can reach 11 – 13 mgd, at which point all aeration tanks are online. Sometimes washout occurs because they are trying to evenly distribute the biomass between the basins that are online.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   The plant is currently in the middle of an upgrade which includes plant equipment upgrades and two pump station upgrades – there are no new tanks or structures planned. Upgrades include replacing the clarifier drives and conversion to diffused aeration. A SCADA system is being installed.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The facility does not need to nitrify. Between 2000 and 2001, the facility was operated with a long SRT to evaluate sludge reduction. During this time nitrification was observed. Typical SRTs are in the range of 7 days.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   The types of foundations at the facility are unknown.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Only effluent flow is monitored at the plant. All flow goes through the Main Street Pumping station, where flow is also monitored.
    - Raw influent is sampled from the grit chamber.
    - Primary effluent sample includes recycle streams (belt filter press and gravity thickener), which are directed into the influent channel of the primary clarifier.
    - Final effluent sample is taken at the Parshall flume.

11. **Take Photos of plant (sign, overview, etc).**
    Photos of the plant were taken with a disposable camera.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
DMR data provided electronically. Effluent nitrogen data collected occasionally.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
   None taken.

   b. **Influent temperature**
   Daily, year round temperature in spreadsheet.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
   Raw and primary effluent BOD and TSS data provided bi-weekly in spreadsheet. No nitrogen data collected.

   d. **Alkalinity**
   Alkalinity data for one of 4 aeration tanks provided in spreadsheet, 2-5 x/week, year-round.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
   Daily, year round-data in spreadsheet.

   f. **Typical RAS rates.**
   Daily, year round-RAS flows in spreadsheet.

   g. **Sludge wasting rates.**
   Daily, year round-WAS flows in spreadsheet.

   h. **Total plant sludge production.**
   Daily, year round-sludge production in spreadsheet.

3. **Operating cost data:**

   a. **Cost of electricity (copy of electric bill is fine)**
   A single recent electric bill with a year's worth of usage history provided.

   b. **Chemical costs**

A single recent chemical invoice each for sodium chlorite, polymers, and sodium hypochlorite was provided.

c. **Sludge disposal costs**
A single recent sludge disposal invoice was provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
11 x 17 site layout and process flow diagram was provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Tank and equipment size sheets provided.

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SITE VISIT – SPRINGFIELD, MA WPCF 5/14/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The original facility consisting of primary clarifiers and anaerobic digestion was constructed in 1940. The facility underwent significant expansion in 1977. Upgrades included activated sludge secondary treatment, flocculation, secondary clarifiers, gravity thickeners for primary sludge, dissolved air floatation for secondary sludge, Zimpro process (wet air oxidation) sludge processing, vacuum filtration, chlorination and de-chlorination. In 1989 the vacuum filters were replaced with belt filter presses, and in 1991 DAF units were replaced with gravity belt thickeners. In 1995, the Zimpro process was shut down due to odor problems. Submersible mixers were installed in the first stage of the aeration tanks in 1997-98. The mechanical aeration system was converted to diffused aeration in 1997-98. This upgrade also included installing an aluminum baffle wall in the first section of the aeration tanks, and provided controls to allow for an optional (swing) pre-anoxic zone. The permitted capacity is 67 mgd, while the annual average is 43.4 mgd.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer area includes eight communities (Springfield, Wilbraham, West Springfield, Ludlow, Longmeadow, East Longmeadow, Chicopee, Agawam). Flow has not increased over the past few years, and there are no expected flow increases.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The annual staffing plan has been requested.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   Under normal operation, two of the four primary clarifiers, all aeration basins, all four secondary clarifiers, and all four chlorine contact tanks are online.

   An 18-20 day SRT is maintained, which results in a MLSS of 3,000-3,500 mg/L. Elevated SVIs are observed (between 130 and 150) in the winter/spring; this is a result of rain and cold temperature swings. These might appear to be within a typical range for SVI, but the facility has resorted to long SRTs to reduce sludge production (by 30%) following a 2-year, full scale study of extended aeration between 1998 and 2000. This operating mode succeeds in producing sludges with low SVIs on average.

   Other operating difficulties occur in the springtime, as there are three dairy industries in area that must increase discharges during this period.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   The 1977 upgrade had set aside areas for expansion by 50% for the primary clarifiers, the aeration basins, the secondary clarifiers, and sludge processing. With the conversion to diffused aeration, however, some (but not all) of the dedicated area for future aeration basins/secondary clarifiers was used for the new blower building.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   Flow to the plant is 18% industrial, 49% domestic and commercial, and 33% I/I.

   There are 56 significant industrial users in compliance. Local limits took effect in 2001. There is not a high level of enforcement. Solids from SIUs have been decreasing due to either improvement in pre-treatment or to industrial emigration.

   Maximum RAS flows are 13 mgd/secondary clarifier, for a total of 52 mgd. Forward flows that require greater than this amount of underflow begin to wash out the clarifiers.

   Flow can go from 40 to 180 mgd in 10 minutes with storm flows, as the service area is comprised of 60% CSOs. 134 mgd can be pushed through the system hydraulically. Over this flow, secondary treatment is bypassed directly to the chlorine contact tanks. The planned, safe emergency overflow is 180 mgd. At 200 mgd the system is overtopped.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There are no upgrades currently planned.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The plant nitrifies in the winter.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   All foundations are on pilings because the site is located in a marsh area.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - The influent sampler does not include side stream flows or loads.
    - The Parshall flume is located downstream of the bar screens and upstream of the primary clarifiers and does not include sidestreams flows or loads.

- The Primary effluent sampler includes gravity thickener return loads, but not flows.
- The effluent sampler does not include sidestream flows or loads.

11. **Take Photos of plant (sign, overview, etc).**
    Photos were taken with a disposable camera.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   DMRs provided.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      Not collected.

   b. **Influent temperature**
      Daily temperatures provided.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      Daily BOD and TSS primary effluent data provided; single monthly value influent effluent data provided.

   d. **Alkalinity**
      Daily alkalinity data provided.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      Daily MLSS and MLSS data provided.

   f. **Typical RAS rates.**
      Daily RAS rates provided.

   g. **Sludge wasting rates.**
      Daily WAS rates provided.

   h. **Total plant sludge production.**
      Daily tonnage provided.

3. **Operating cost data:**

    a. **Cost of electricity (copy of electric bill is fine)**
    Requested.

    b. **Chemical costs**
    Requested.

    c. **Sludge disposal costs**
    Requested.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
    Site plan, hydraulic profile, and process flow diagram provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
    Equipment and tank summary provided.

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SITE VISIT – UPPER BLACKSTONE WATER POLLUTION ABATEMENT DISTRICT IN MILLBURY, MA WPCF 4/18/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The original treatment facility was constructed around the 1880s and has been upgraded several times since. Prior to this decade, the current facility was last upgraded in 1976. The facility is now undergoing a four phase upgrade.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The facility serves the Cit of Worcester as well as Auburn, Cherry Valley Sewer District, Holden, Millbury, Rutland, West Boylston, and portions of Oxford, Paxton, Shrewsbury, and Sutton as well as treating septage and sludge from numerous other communities.

   The plant has a current design flow for Year 2020 iof 45 mgd. The permitted capacity of the facility is 56 mgd.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   The plant has fifty three full and part-time employees. This crew does not serve an collection systems or off site pumping stations.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   The plant has been operating with two of the three aeration tanks and all primary and secondary clarifiers.

   As part of the Phase I upgrade, a new primary clarifier was constructed and the preliminary treatment system was upgraded. As part of Phase II, a new aeration tank is being constructed and two additional secondary clarifiers are being added.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There is an active expansion of the facility that is underway. There is very limited space available to the south of the site. Hazardous waste has been discovered north of the high flow bypass and east of the preliminary treatment buildings.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The plant receives CSO and thus experiences very high flows at times. It receives industrial flows from various locations.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   The plant is in the second of four construction phases.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   They are required to by permit..

9. **What kinds of foundations are predominant on the site (piles, etc).**
   Some foundations require piles.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Recycle loads are not all caught by samplers.
    - They have an influent sampler after preliminary treatment, a prmarty effluent sampler after primary treatment, but prior to the addition of recycles, and a final effluent sampler after disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Electronic copies of DMR data were provided. The facility collects extensive nitrogen data.

Nitrogen data can be summarized as follows:

	TN	TN/BOD
Min	15.4	
Max	28.3	
Avg	21.3	0.13
Seas. Avg	22.5	

Based on average concentrations, the TN is low (a text book TN/BOD ratio for this facility is 0.18)

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

a. **COD data, if collected**

b. **Influent temperature**
Influent temperature is recorded.

c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
This data is collected.

d. **Alkalinity**
This data is collected.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
MLSS is collected.

f. **Typical RAS rates.**
RAS rates are collected.

g. **Sludge wasting rates.**
Sludge wasting rates are collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

a. **Cost of electricity**
Electric bills were provided

b. **Chemical costs**
Chemical bills were provided

c. **Sludge disposal costs**
Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
   Plant drawings were provided.

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SITE VISIT – UPTON, MA WPCF 3/8/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The facility was originally constructed in 1971 and included aeration tanks, clarifiers, and chlorination/dechlorination. It was upgraded in 1999 to include a solids handling tank and new secondary clarifiers.

2. **What is the sewer service area? Are there any expected major flow increases?**
   There are approximately 530-540 connections all within the Town of Upton. The servie area includes three schools and one large apartment complex. The only known increases in flow include two large housing complexes in Upton.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are a total of three employees that cover the treatment facility and pump stations including the plant superintendent. The Town contracts out heavy collection system work such as blockages.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   The grit chamber, screen and disinfection are always in use. The facility normally operates with both aeration tanks, one of two secondary clarifiers, and both effluent filters.

   Sodium bicarb is added to the RAS and added to the junction box at the aeration tanks. PAC is added to the spillway before entering the secondary clarifiers.

   Flow is pumped to the grit chamber. Sodium aluminate is added to the grit chamber.

   WAS is stored in a holding tank, and then thickened via a gravity belt thickener before being hauled off site by Synagro.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There is work planned in the area of the chlorination/dechlorination area. Public Works uses the old sand bed area, but there are no other plans for the rest of the site.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The plant received high flows during rain events. They seem to get high loads at times, but the plant operator considered those questionable. There are no industrial flows.

The facility has an aeration control system, but the system is unable to maintain DO at its setpoint.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   Improvements to the aeration tanks and installation of a UV system have been put on hold.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The facility always operates with two tanks in service.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   Nothing unusual.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - All recycle flows at the plant combine prior to entering the Control Building. The influent sampler collects samples that include recycle flows.
    - The effluent sampler is located after chlorination/dechlorination

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Hardcopies of DMR data was provided. Only effluent nitrogen data is collected.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      None taken.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      N/A

   d. **Alkalinity**
      None taken.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
MLSS is collected.

f. **Typical RAS rates.**
RAS rates are collected.

g. **Sludge wasting rates.**
Sludge wasting rates are collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

   a. **Cost of electricity**
   Electric bills were provided

   b. **Chemical costs**
   Chemical bills were provided

   c. **Sludge disposal costs**
   Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Plant drawings were provided.

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SITE VISIT – UXBRIDGE, MA WPCF 5/3/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The plant went online in 1979 (collection system is the same age). No upgrades since then. They stopped dewatering 12-13 yrs ago.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is exclusively within Uxbridge. However, they take in a great deal of Septage from areas outside of Uxbridge. No major expansion of the collection system is expected.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are four employees for the wastewater facility and collection system (plus a ½ time administrator). The pump stations have 2 employees.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   They have been running three tanks for 1-1/2 years. Prior to that, they ran one tank. The three tanks are operated with the first tank with no air added, the second tank with air added and the last tank with little air added. The purpose of this is to achieve some nitrogen removal.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   No plans to use other portions of the site.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   They do not have major issues with I/I, but they have some.

   They have high loads due to septage. There is no industry in the area. Mills have left the area, leaving excess capacity at the plant.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   No studies or design.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   Yes they nitrify at times. They do not suppress.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   No special foundations.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Recycle flows and septage are introduced after influent sampling. However, at times, the septage holding tank overflows at times and this overflow is caught by the influent sampler.
    - The effluent sampler is located after disinfection

11. **Take Photos of plant (sign, overview, etc).**
    Digital pictures were taken of the facility the day of the site visit.

Requested information:

1. **DMR reports from January 2004 through December 2006.**

Electronic copies of DMR data were provided. Effluent nitrogen data is collected.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
      None taken.

   b. **Influent temperature**
      This data is collected.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
      This data is collected.

   d. **Alkalinity**
      None taken.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
      This data is collected.

   f. **Typical RAS rates.**
      This data is collected.

   g. **Sludge wasting rates.**
      This data is collected.

h. **Total plant sludge production.**
Total monthly sludge production is provided.

3. **Operating cost data:**

a. **Cost of electricity**
Electric bills were provided

b. **Chemical costs**
Chemical bills were provided

c. **Sludge disposal costs**
Sludge disposal costs were provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Plant drawings were provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Plant drawings were provided.

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SITE VISIT – WARE, MA WPCF 3/15/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The original facility was built as an anaerobic digester. Between 1981 and 1983 the facility was converted to extended aeration activated sludge. At this time the belt presses were decommissioned and sludge was shipped out. The original design was for 2.0 mgd average / 5.0 mgd max. The current permit is for 1.0 mgd – at the time of the visit, the plant was running at 0.678 mgd. At some point the facility was upgraded for chemical addition. Chlorine and H_2S sensors were recently installed in the effluent and influent manholes, respectively. Other minor modifications were made over the years. The generator is capable of running the essentials.

2. **What is the sewer service area? Are there any expected major flow increases?**
   Currently, only the town of Ware (pop. ~5,000) is contributing flow to the facility. This facility has seen a reduction in flow over the years due to the steady migration of industry out of the area. A few large retail outlets (Lowes, Walmart) in the neighboring town will be connecting to the collection system shortly. The facility expects to see an increase in flow over the long term, but nothing major.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   There are 3 full time operators.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   The facility consists of two aeration tanks (1 in service), two secondary clarifiers (both in service), one sludge holding tank (formerly one of two anaerobic digesters - in service) and two chlorine contact chambers (both in service, converted rectangular primary clarifiers). The remaining former anaerobic digester has been converted to a chemical storage tank (currently EPIC 1300). There are no primary clarifiers. Liquid sludge is trucked off site for incineration.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   There are no concrete plans to use existing unused areas on site. The surrounding area is open and owned by the town. There is available garage space left over when the belt filter presses were removed.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**
   The sole remaining industry is the local paper plant (Kanzaki Specialty Papers). This industry contributes highly varying flows and loads to the facility. Flow ranges from

45-100 kgd. Solids in particular can be very high, typically consisting of clay based pigments and white dyes. As a result, the plant is solids-limited. However, this company generates ~15% of the revenue for the facility. Industrial pretreatment reports were obtained for recent years from the DPW director. There is a max day TSS load into headworks in the Draft permit, a portion of which it is believed will be allocated to Kanzaki. There are no high flow concerns. The operators attempt to maintain an F/M of 0.2 for process control. The F/M reaches 0.4-0.5 in the summer. The facility chlorinates in the summer. There is a TMDHL for the headworks.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   There are no upgrades planned for the facility.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   The facility is not required to nitrify. There is evidence of summer nitrification only, as there is a significant drop in alkalinity in the summer. Soda ash is added to keep the alkalinity up in the summer through to the end of October. Typical influent alkalinity is ~ 120 mg/L.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   Foundations are all footings – the site has very good soil.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Influent samples are drawn from DS of grit chamber, do not include recycle flows (there are no recycle flows);
    - Effluent samples are drawn from secondary clarifier effluent launder;
    - Flow is measured at the influent pump station via a magmeter.

11. **Take Photos of plant (sign, overview, etc).**
    Photos were taken the day of the site visit (March 15th, 2007).

Requested information:

1. **DMR reports from January 2004 through December 2006.**
   Hard copies of DMR spreadsheet provided. Nearly complete monthly, 24 hour composite Ammonia, Nitrite, Nitrate, and TKN data.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

a. **COD data, if collected**
Not collected.

b. **Influent temperature**
Provided in hard copy of spreadsheet.

c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
None collected – no primary clarifiers, and influent N species not monitored.

d. **Alkalinity**
Provided in alkalinity spreadsheet, monthly summary data.

e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
Provided in hard copy of spreadsheet.

f. **Typical RAS rates.**
Provided in hard copy of spreadsheet. RAS bubbles up into a wetwell where solids measurements are taken prior to distribution to the aeration tanks.

g. **Sludge wasting rates.**
Provided in hard copy of spreadsheet. WAS is pulled from the bottom of the clarifiers.

h. **Total plant sludge production.**
Gallons of liquid sludge ('excess activated sludge') stored in converted anaerobic digester, 3- 5 ½ % solids. Trucked periodically; 4 loads @ 9,000 gallons each load (required to empty storage tank?). Total sludge production provided.

3. **Operating cost data:**

a. **Cost of electricity (copy of electric bill is fine)**
Yearly totals provided.

b. **Chemical costs**
Yearly totals provided. Coagulant (EPIC 1300, a brand of PACl) and polymer dosed upstream of secondary clarifiers, typically 8-12 gallons/clarifier/day,

but can get as high as 20 gallons/clarifier/day. Coagulant/polymer added for solids (year round) and phosphorus removal (seasonal). Soda ash added to supplement alkalinity in the summer.

c. **Sludge disposal costs**
Yearly totals provided.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
Site plan, hydraulic profile, and process flow diagram provided.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Original and current tank and equipment sizes were provided on design data sheets from Original O&M manual.

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SITE VISIT – WESTFIELD, MA WPCF 4/18/07

Interview Questions:

1. **Request information about plant history (when first constructed, dates of upgrades).**
   The plant was first constructed in 1973, with a major expansion/upgrade in 1998-2005. the upgrade added a third plug flow train. Aeration was changed from surface aerators to diffused aeration (single stage centrifugals), and a SCADA system was added. A recent treatment plant summary/description report was provided, along with the annual industrial pretreatment report from 2005. A new generator has been recently installed that has capability of running entire plant.

2. **What is the sewer service area? Are there any expected major flow increases?**
   The sewer service area is Westfield and a small part of Southwick. Southwick would want to increase as part of their inter-municipal agreement. The 20 year plan for Westfield anticipates a 0.8 mgd increase in flow. The plant is currently operating around 3.6-3.7 mgd.

3. **Request information regarding plant staffing (number of employees, duties, any contract operations?)**
   A staffing report was obtained, which indicates there are nine current staff members: 1 superintendent, 1 deputy superintendent, 4 plant operators, and 3 plant attendants. The plant is staffed 9 hours a day, 6 days a week, and 5 hours a day on Sundays and holidays. They are currently trying to hire an environmental compliance officer.

4. **Request information regarding operating mode (number of tanks in service, etc).**
   Normal operation includes running all three trains. The plug flow aeration tanks have a first stage that is being operated as an anoxic zone. The operators maintain an F/M of 0.2- 0.3. Sodium aluminate is added at the beginning of the anoxic zones June 1 to October 31 to meet a season TP limit of 1.0 mg/L TP. There is no feedback loop for chemical dosing. It is anticipated that flow-paced dosing will begin next year. They report TP in winter; NaOH is added in winter to raise pH. There is a feedback loop for pH, set at 6.8. The DO meters work great, which help maintain the target of 2.5 mg/L. There is some difficulty turning the single blower down, however. Only one of three blowers is running for normal operation; this blower provides air to all three tanks.

5. **Ask if there are any concrete plans to use any existing unused areas on the site?**
   No plans for unused space on-site.

6. **Ask about operating concerns or problems (high flows, high loads, industrial flows, etc).**

The facility receives a high volume of septage, which currently goes directly (slug loading) to the headworks – there is no holding tank. CDM is in the process of designing/installing a septage holding tank (~30,000gallons) near the entrance to the plant.

It is believed there are no CSOs – any high flows are the result of I/I. CDM is currently performing an I/I study.

There are four significant industrial users, contributing ~ 4 - 5% of the total flow. These include an electroplating company, two metal finishing companies, and an abrasives manufacturing company. In 2005, there were no violations. There are 2 categorical users over 25,000 gpd; mostly metals are of concern.

Energy costs are a big concern – costs increased by 60% between 2005 and 2006. Westfield has its own utility.

Sludge age calculations are highly variable due to atypical wasting practices/rates (wasting is done off of the return line, but they can't waste out of more than one tank at a time); the most reliable sludge age values result from monthly averages. Sometimes they waste manually through the drains on the return pipes.

The treatment plant is located in a floodway (worse than a flood plain) – two days before site visit the plant was almost completely underwater due to a recent storm.

7. **Ask if there are any upgrades that are currently in study or design phase?**
   The only upgrade currently in design is the septage holding tank upgrade.

8. **Does facility currently nitrify in the winter even if not required (or is nitrification suppressed by taking tanks out of service).**
   Unknown.

9. **What kinds of foundations are predominant on the site (piles, etc).**
   The foundation is on spread footings, not piles.

10. **Where are the samplers at the facility? Does the influent sampler include all in-plant recycle flows?**
    - Filtrate/sidestreams go back to the headworks.
    - Influent flow meter includes side streams.
    - Influent sampler is located upstream of where the sidestreams return.
    - Primary sampler is located on the primary effluent line (for Trains 1 and 2 only).

- Final sampler located before the effluent flow meter.

11. Take Photos of plant (sign, overview, etc).
Photos were not taken – a second visit will be undertaken to take photos.

Requested information:

1. **DMR reports from January 2004 through December 2006.**
Complete electronic plant data was provided for most months – a few months of data are missing due to clerical/administrative restructuring between the water and the wastewater departments.

2. **Three years of process data that you collect that may not be reported on the DMRs, for example:**

   a. **COD data, if collected**
   Not collected.

   b. **Influent temperature**
   Daily temperature data provided electronically.

   c. **Primary effluent/ secondary influent parameters (BOD, TSS, Nitrogen, etc)**
   Weekly primary TSS data provided electronically; no N species data.

   d. **Alkalinity**
   Not collected. Once/month alkalinity monitoring began March, 2007.

   e. **Typical MLSS and MLVSS maintained in aeration basins (for activated sludge plant).**
   Daily MLSS data provided electronically.

   f. **Typical RAS rates.**
   Daily RAS rates provided electronically.

   g. **Sludge wasting rates.**
   Daily WAS rates provided electronically.

   h. **Total plant sludge production.**
   Total monthly sludge production provide via hard copy.

3. **Operating cost data:**

a. **Cost of electricity (copy of electric bill is fine)**
Summary of monthly invoices for the past two years provided. Costs between 2005 and 2006 increased 60%.

b. **Chemical costs**
Total chemical costs for the past year provided.

c. **Sludge disposal costs**
A summary of monthly sludge disposal invoices for the past year provided. Sludge is shipped to NY (95% of the time, to be land applied) or to CT (5% of the time, for incineration). Contract is with Synegro, of Waterbury CT.

4. **Drawings of plant site plan, hydraulic profile and process flow schematic.**
A full set of plans which includes these items was provided during the site visit.

5. **Drawings of process tanks and equipment or a copy of a previous engineering report that summarizes tank & equipment sizes.**
Copies of the O&M manual provided.