→ Schiller timeline

Oct 2012 - Assigned + began collecting info + writing draft

Feb 13 - site visit (EPA[4], NHOES[3]) → recommended improvements
↳ tour, outfalls, intake structures, follow-up questions

Feb. 27 - Follow-up email (7 questions: 3 from site visit + 4 additional re: 316(a)(b) mostly)

March 13 - submitted draft permit + fs to Region for review
(cost including 316(a)+(b) sections) ↳ incorporated his comments later

March 18 - emailed PSNH w/ 5 questions re: 316(a)+(b)

April 2 - responded to email questions
(some questions deferred to "Enercon")

June 4 - emailed letter to NHFGD re: thermal limits

July 17 - follow-up email w/ 7 items re: 316(a)+(b)
↳ sent to "Enercon" to add one items
=) Should send to us by August 12

To do: ① Complete 316(b) analysis w/ info from PSNH
=) Many outstanding questions re fs
=) cost effectiveness for each technology w/ biologist input
② Send NHFGD letter requesting concurrence for thermal limits
③ EFH + ESA - species are same =) need to overlap impacts
④ Minor updates to fs, including recent ICIS data

PSNH responses, biologist analysis, verify impacts, CBA effectiveness, final determination

- 316(b) → Need by end of August
  - Verify reduction #'s (Tetra Tech)
    ↓ [illegible] [illegible]
  - biological assessment
    ↓ (Phil)
  - Cost effectiveness => use "net present value" (capital + maintenance)
    (Danielle)

- 316(a)
  - thermal study (2010)
    ↳ meets NH WQS w/ mixing zone (no variance req'd)
  - Send letter to NHFGD

- ESA/EFH
  - Same species as Newington
  - need to overlay impacts from Schiller

SDS 208 5977

Schiller mtng 08/15/2012

Converted a boiler => needs work to be brought up-to-date

thermal plume study, 308 letters

Sierra Club suit for Schiller + Ref Team

=> date for draft permit - March 2014

Our goal Sept 30, 2013 realistic?

No ORC review req'd 22 outfalls (cost like)

Sharon - technical help - steam electric ELG (Newington)

316(b) technology feasibility

Danielle + Phil - bio impacts 316(b) = entrainment, impingement

cost effectiveness

John - EFH + ESA (Atlantic Sturgeon) → in Piscataqua

Thermal

Phil - thermal model, mixing zone 316(a) variance?

↳ 316(a) write-up

Shelly - document control Schiller email group

↳ administrative record database ↳ print, scan, file

Schedule site visit ASAP w/ Sharon (2/13/13)

316(a) - thermal impacts

316(b) - impingement/entrainment → Best Tech Available

↳ BPJ based on 8 factors

Schiller 12/19/12

EFH / ESA from Newington will be same plus impacts from facility on waterbody

316(a) => meets water quality stds = mixing zone (temp)
(No thermal plume into Marine side of river)

316(b) => Sharon will begin in late spring
↳ is chlorine in high/low pressure water?

Site visit = Me, Phil, Sharon, John, Danielle

→ Look thru flow diagram w/ Damien ✓

→ Ask Schiller to provide non-CBI version of 308 response

→ Damien will make first contact => mention site visit and CBI document needs

→ Ask about revisions since 2010

1/10/12 Schiller call w/ J. Andrews, Doreen, Phil

Mixing zone policy = zone of passage → thermal ΔT

F + G Dept worked for mixing zone ⇒ meets NH stds

Mixing Zones for toxics available from state? Need documentation to say "this is our approved mixing zone for Schiller"

Allan Palmer ⇐ site visit 603 634 2439

↳ Feb 13 10AM - 4 PM

Phil, Sharon, John confirmed Jeff, NHDES ?

Fish & Game Dept ⇒ previous permit 82° w/ 250 ft of outfall 85° max

"lack of appreciable harm" — Jeff Andrews

⇒ Need this in writing!

2/7/13 Schiller w/ Bowden

Unit 5 - fluidized bed boiler
↳ what flow changes were made

Timing =) defer to Bowden "high priority"

App says Units 3,4 - 50 gpd =) should be 50 MGD
=) if 50 MGD, is it average or max?

O&I - why no DMR data for Tank + Yard drains?

O/w Separator deemed "low volume waste equipment"
=) Needs Oil + Grease limits and maybe TSS limits too

Schiller Site Visit 2/13/13 p.7 of 14

coal fired originally

1-3 physically exist but retired in 60's

1980's "coal conversion" retrofitted Units 4, 5, 6 for coal

001 - retired for cooling water but still heat exchanger discharges

2006 - Unit 5 converted to wood 100% but capable of burning coal

WWTF 016 - goes into

Unit 5 = baseload 24/7 Units 4, 6 = cycle < off at night / on in morning / seasonal

↳ capacity factor 80-90% ↳ cap. factor - less

] ⇒ Keep pumps running during small outages but off for extended outage periods

How much of flow is for generating electricity vs. keeping pumps going

Never operate w/ only 1 pump. Not variable speed

5/6 intake flush w/ river bank [Screenhouse 2]

4 intake 25 ft tunnel ⇒ near lobster gate [Screenhouse 1]

[Q] Dimensions of tunnel for intake for 4 (Screenhouse 1)?

006 - drains from roof, etc. from 3 units = Now contained

↳ deaerator overflow or other upset

boiler condensate tested for pH <1/yr ~100 gallons

[Q] Feasible to send to WWTF #2 for neutralization?

Stormwater drainage from parking lot w/ rock filter + chemical delivery

↳ make an outfall in permit? [Q] industrial activity ≥ in permit?

016 - requesting reduced composite sampling

017 - chemical cleaning once every 10 yrs for each Unit
can be evaporated in boilers
15-20,000 gallons bled in slowly w/ discharge => monitoring
runoff from wood yard also contained in trench before
going to 018 outfall
not doing tie in after sampling location
↳ only wood conveyor
020 - Unit 4 return => splashes
021/022 - same as well as 020
200 ft - <84°F = mixing zone ΔT - 25°F, 95°F - max limit
316(a) - not a variance => need letter from Fish + Game? [Q]
chlorination - 15 minutes, 1/hr not coordinated w/ screens
screens manually operated
consolidate discharges as much as possible
Air heater wash, other washes (Units 4,6) - annual at most
=> dry vac washes mostly → high pressure, low volume
[illegible] want to monitor in 017 (internal) => 018 (external)
chemical cleaning => frac tanks to allow to settle + pH neutralization
sorbent injected for air emissions $Ca(CO_3)_2$ - drain category
may not settle on using pH ↳ for acid gases
+ Hg removed into fly ash

Requested changes

Signature

001 - No chlorine, no foam inhib., no ^heat

002/3/4 - 95/25 → 100/30 =) Not necessary if

mixing zone is affected from F + G

→ an issue in hot summer days → or 100° max? → Phil says NO acute toxicity

=) retain 2-hr allowance to 30° ΔT? [Q] during ISO demand for condenser maintenance

011 - not a problem b/c discharge is unrelated

→ calculation, runoff coefficient?

016 - historical track record compliant => weekly → monthly ok?

why iron + copper at all? conduits waste streams

018 - no need for 64-4 grabs?

021/022 - can combine b/c same discharge

impin/entr - impinge ~0 entr - 1 M adult equiv.

Phil - always try to reduce

spray fish return => 40 psi =) lower pressure

Tour

Sulfuric acid, caustic in parking lot loaded
→ valved to WWTP if spills

Need outfall permitted OR BMPs w/ tanks

Picture ngs. of fish species

#8 Kr - 80,000 gallons => raise pH before WWTP

Not chem. cleaning

WWTF - oxidation tank, polymer (floc solids), gravity settler, neutralization
discharge to 002/3/4 if pH out of range => recycled to lakeside basin

sludge dewatered + landfilled

[Q] Redacted CBI or CBI free version of 2008 316(b) report and 308 letter

Might request us to answer this in writing

[Q] Fish photos
Fish return [illegible]

→ Who is doing impingement/entrain. section = 316(b) writeup?

→ New outfall for parking lot?

→ Maintain temp provision? (old permit?)

→ O/W separator has O&G limit ... justification low volume waste?

→ outfall 018 monitoring before last drain the fm? Need TSS?

M+ Tom Site Visit 12/11/12

internal schedule => dp by Fall 2013 internally => early 2014 de

Sierra club lawsuit => water NPDES permit + 1 hr air quality stds

need capacity factor for fs as % by month

308 submittals => impingement study w/ # of fish
=> b/c of schedule, may move forward w/ info we have
→ permitted at full capacity

chlorine sampling location to hit "peak"

schedule outages May-June around 316(b) consultations (2nd Tues)

impingement + entrainment technologies => cooling towers, wedgewire screens,
expanded intake (↓ velocity) => cost/yr, CORMIX - thermal plume
↓ flow => ↓ entrainment but ↑ ΔT = Trade-off
=> but plant may have limitations (no variable speed pumps => MW↓)
use one/two for various water temps

operational changes
↳ air emissions => ↓ Hg + ↓ SOx

Outfalls screenwash => 2 pressures => low first

CBI (confidential Business Info => could get FOIA'd

9/17/13 Schiller

Emerson report in ✓

Eric Beck → cost ⇒ ask Tetra Tech or PSNH? ← 2008 or 2013 dollars? ⇒ Normalize to any year but not too significant

Phil - proceed w/ PSNH #'s for impingement/entrainment until Tetra Tech response

$ + i/e ⇒ Tetra Tech either concur/adjust or provide if needed

BTA = upgrade fish returns + ?

Once cost done ⇒ Danielle ⇒ "cost effectiveness"

316(a) Concurrence letter received ✓

⇒ FS - emphasize 90-day thermistor data + include 1 day survey

↳ J. Nagle → included w/ EsA, EFH analysis

No public hearing necessary

Send PSNH our draft 316(b) Section + ask if accurate and if any is CBI ⇒ ASK Mark Stein (Sharon)

DP + FS send to Damien by end of Sept. - Michael

↳ wait for Nagle to update

Phil compile 316(b) #'s + send to Danielle or Eric Beck

10/22/13 Damien, Sharon, Erik, Tetratech

closed-cycle ... Wedgewire screens ... all other screens COST

↳ evaluate costs closely ↳ likely to be BTA based on cost effectiveness

↳ Tetratech agrees this is likely best option

1 yr Pilot test good to determine

⇒ slot size ⇒ ↓ entrainment but ↑ debris/algae fouling

Continued

biological methods (needs table summary)

Compare technologies to actual species in vicinity rather than general reduction #'s in literature

affordability - 3162(b) = affordable (M. Stein)

- a) Tetratech will look into this item with plant (not too much detail in other items ⇒ time for this)

141 → 90 comments

Schiller 2/25/2014

Sharon (H) 978 658 0732

To do:

1. SWPPP included? ~~or just comingled discharges?~~ – MC + OH
2. Collect more facility info (tank farm, SW runoff, etc.)
3. Thermal 316(a) section – JN + PC
4. 316(b) section (80 of 90 outstanding comments) – SD + PC
   → cost = Erik Beck compare to Phase II rule ↓ tackle 90 comments
   confirm w/ contractors
   ⇒ determine BTA
5. EFH + ESA → Atlantic sturgeon newly listed – JN
   ↳ only needs mitigation
   ⇒ Needs more work (Informal Consultation)
6. Update DMR data – MC