

**APPENDIX D**  
**PHASE II FIELD NOTES**

PBR PILOT STUDY

PHASE 2

BOOK 1

AUGUST 2001

NATIONAL

416

FIELD / TRANSIT BOOK

# INDEX

Property of Foster Wheeler Environmental  
1840 E. Deere Ave. #200  
Address Santa Ana, CA 92705  
Telephone (999) 756-7500

This Book is manufactured of a High Grade  
50% Rag Paper having a Water Resisting Surface,  
and is sewed with Nylon Waterproof Thread.

Leticia Woodard - JPL - 818-354-8632  
- 818-632-7628

Mark Arabi - JPL - 818-354-6635

Patrick T. - Cell Ph - 949-283-1312

Mark Lora - Cell - 714-545-6441  
off - 909-788-0508

Dennis R. - MW Labs - ~~626-568-6304~~  
626-386-1104

8-16-01

835

D. Tietje onsite.

900

Per Mark Losi, will collect 3  
samples for fish bioassay analysis,  
1 from each waste stream -  
Na Ac,  $(\text{NH}_4)_2\text{PO}_4$  sol'n, reactor  
water.

Established sample IDs

WPBR1-L-2 = reactor ww

WPBR1-L-3 = Na Ac solution

WPBR1-L-4 =  $(\text{NH}_4)_2\text{PO}_4$  solution

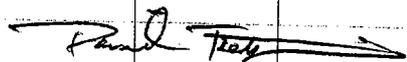
9:30 Collected sample WPBR1-L-2

9:40 Collected sample WPBR1-L-3

9:45 Collected sample WPBR1-L-4

9:50 Complete CAC Form

10:00 Depart site



4/10/01

D. Tietje onsite 0900

Measure available area for installing  
new tanks - between electrical shield +  
trailer on west side of fenced-in area.

Confirmed inventory of waste containers  
on-site. Relabeled w/ perm. marker on  
drum vats - need to bring non-  
haz labels to site.

Met w/ Foster McLean to accept  
signed profile forms and letter  
certifying waste containing bacteria  
is non-pathogenic.

1045 Tietje offsite.

*Paul Tietje*

10/2/01

735 Tietje, Losi onsite.

Begin cleaning up lewes, trash from  
work area + taking inventory of  
pipe materials.

1000 Hazpak Inc. onsite to remove  
waste drums from Phase 1  
work.

1120 Hazpak offsite.

Hazpak forgot to <sup>have FIV</sup> sign work  
order - told them this was OK -  
to just mail me copy.

1135 Depart site.

1230 Return to site. Continue working on  
site cleanup/inventory.

1620 Losi offsite.

1630 Tietje offsite

~~David [unclear]~~

10/5/01

8 00 Tietje onsite. Lost already onsite.

8 45 Lv site to pick up PVC pipe + fittings + work materials.

10 35 Return to site.

<sup>5</sup>  
10 40

Ryan Herco onsite to offload PE tanks.

On standby - waiting for JPL forklift.

11 25 Ryan Herco offsite.

11 30 Depart site to PU lunch.

12 10 Return from lunch.

Begin plumbing of system - begin w/ piping from substrate supplement tanks to original substrate tanks, EA Tank 2 to Bng filter.

14 00 Lost offsite.

16 30 Tietje offsite.

↓ Daniel Thom

10/8/01

7 30 Tietje onsite

Hook up tubing to outlet of T-1 and route to Baker Tank.

< 8 30 M. Geh, Lost on-site.

Preparation for delivery of PC-24s, TW-18; Pump out T-1

9 45 Barneby Sutcliffe onsite for delivery of PC-24s, TW-15.

10 15 Barneby Sutcliffe offsite.

11 30 - 12 30 Lunch

12 40 Begin construction of piping from T-1 to PC-24s.  
Clean out Substrate, Inocula, Equalization Tanks.

1530

Losl offsite

1630

Gah offsite

1715

Tietje offsite.

*David Fieds*

10/9/01

9:15 Tietje, Goh onsite. Stopped  
at home Depot enroute to site  
to pick supplies.

Resume construction.

11:50 - 12:30 Lunch

Continue construction.

1600 - 1615 Offsite.

~~David Tietje~~

10/10/01

8:30 Tietje / Goh onsite.

12:00 - Goh breaks for lunch.

12:35 - 13:05 Tietje - lunch

1630 Goh offsite.

1715 Tietje offsite.

~~David Tietje~~

10/10

Completed Piping From F-1 to EG-Tank  
1 except nutrient & substrate feed  
piping. Begin working on piping from  
~~EG Tank # 1~~ to Anaerobic Bioreactor  
to EG Tank # 2.

10/11/01

800 D. Tietje onsite.

815 Begin working on piping installation for substrate + Nutrient feed Tanks.

900 Mike Goh onsite.

~1030 M. Last on-site. Deliver Hydroxyl media for one of the PC-29 reactor trains.

~1045 Solileo electrician onsite. Conduct site walk to review scope of work.

1145 Solileo offsite - will begin work Monday - estimated 3 days labor to complete project.

~1115 - 1215 ? R. Zurowski onsite for site walk / project status review. Per Richard, it appears that we will be able to discharge to ~~the~~ sanitary sewer - he is waiting on discharge req'ts and nature of discharges allowed (e.g. batch).

1240 - 1315 Lunch break.

1500 Lost offsite.

1700 M. Goh offsite.

1720 D. Tietje offsite.

Today, completed piping associated w/ metering pumps. Began work on piping for dilution feed. Called Burneby Sutcliffe to request a replacement PC-29 vessel - this will be done next week. Forget to install tap for air injection into PC-29 - may use 1/2" drain port - should plumbe prior to start-up.

10/11

10/12/01

80

830

D. Tietje onsite.

81

900

M. Goh onsite.

Continue construction. Work on secondary treatment piping (finish) and clean up electrical, etc. Also working on piping for dilution feed.

1235

D. Tietje offsite - to PU parts + lunch.

1330

Return to site.

1345

Resume working.

1630

D. Tietje offsite.

Today: Completed piping for secondary treatment components. Completed piping for MUR-7 well feed to EQ Tank 1. Completed piping from Fresh water feed tank to LPGAC to EQ Tank 1.

10/15/01

0900

D. Tietje onsite. M. Goh already onsite.

Today: will work on a <sup>inlet</sup> piping to freshwater feed Tank and hose connections to inocula tanks. Will also PU 1-in hose @ Ryan Harco (-for discharge).

0945

Sollec onsite. Told us it would take them week to complete job w/ 2 persons (Jerry + Dave - support).

1000

Called Gunnar Bradek to discuss situation - that we understood 1 person would be present to do the work, that we were never notified of a second person, + need to know what we will be charged, etc.

1215 - 1315

LUNCH

1345

M. Goh offsite.

1400

S/W Lost - said we did not need to seal inlet to Water Holding Tank.

1500

S/W Lost - told him we will be checking w/ Jacobs on location of nearest sanitary sewer hookup. Lost will communicate this to Zaromski. We are not to install hookup until authorized by Zaromski.

Begin filling 1 PC-29 w/ Hydroxyl media - will fill about 2/3 full - i.e. ~ 2 ft.

# boxes - 1111

Filled 1 PC-29 w/ scrubbers impregnated w/ Celite - took 1 3/4 boxes

1330 So Neo offsite.

1630 P. Tietje offsite.

Paul Tietje

10/16/01

825

D. Tieje onsite M. Goh already onsite.

SIW Jacobs Eng. "electrician" -  
told me we should ask  
our JPL contact to send  
a Jacobs facilities person to  
site to show us the nearest  
sewer connection.

845

Perform site walk of M. Goh.  
Determined that today we  
need to focus on site  
housekeeping + safety - need to  
build platform over piping &  
hose by blowers + constant  
secondary containment (check of  
Leak)

- checked w/ Leak on conveying  
to Richard that we should  
set up mtg. w/ JPL facilities  
to confirm sewer location -
- checked w/ Wm on Secondary  
~~Cont~~ Containment

562-716-1798 - JOE - B-S (cont)

- Told me to go ahead and add media to bioreactors (but not aerobic bioreactor)

915 Left msg for Joe / Barnaby re: rd. tomorrow's delivery

930 Solleco onsite

1015 Saw Joe / Barnaby - said PC-29 would most likely be delivered Fri, w/ Thur. PM as the best scenario - I told him to try to expedite <sup>for Thursday</sup>, but we can accommodate Fri. if necessary.

30-12N Mike Goh offsite to PU vinyl tubing for discharge

LUNCH BREAK

1430 Solleco completes electrical installation  
Saw. Begin testing electrical outlets + equipment

TESTED:

- Freshwater Feed Pump - On until LSHHTI trips it off
- Solenoid - tested manually
- P-1 - tested on/off (off until receding high level (LSH))
- All electric outlets - for metering pumps & centrifugal pumps - OK

Flow ~~restrictor~~ restrictor -  $\Delta P$  too high - not enough P for inlet to PC-29 (~0)  
→ removed flow restrictors, repaired piping.

Tomorrow -

- Resume hydratesting
- Build platform over piping btwn. T-1 & bioreactors
- Replace P R-1

1630 Offsite

~~Dine/Tech~~

10/17/01

835 Tie for onsite. Goh already onsite.

845 Resume System Testing

- Test piping pieces from T-1 through 1 train of PC-29s to EQ Tank 1 - OK
- Change out recirculation pump P-R1
- Reverse direction of solenoid - installed w/ outlet on feed side; during testing solenoid did not close properly (completely).

1045-1230 offsite to PU hardware for PC-29, wood to construct platform over piping. & get lunch.

Re-test solenoid:

Closes when power is off (breaker in off position)  
Closes when H-H float in Freshwater Feed Tank trips

(at max water level ~ 575 gal)

1300

Install hardware in PC-29 → Re-start test - flow from EQ1 to EQ2, etc.

1335

SLW Mark lost - said it is OK to run tap water through IX unit into Baker Tank.

15

-1605

Replaced high-high float switch in Freshwater Feed Tank - ball float installed by Solleon would not cause solenoid to open when high high cleared (water fell below level of ball)

1630

offsite.

David Tracy →

10/18/01

830

Tietje onsite. s/w lost enroute -  
Navy COTR + RPM will be  
onsite today 10 - 10:30 for  
site walk.

Clean up site, prep for site  
visit.

920

R. Zurumski stopped by site  
w/ ATR (?) and Sherie  
Larson will return to site  
in ~ 30 min <sup>so</sup> ~~later~~ Losi  
can participate in site walk.

945 -

Met w/ Zurumski, Alex, Sherie

1100

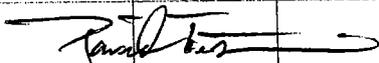
Discussed possibilities for  
effluent discharge. Will not  
be able to discharge to  
storm drain.

12-1

Lunch -

1:15

Tietje offsite



JUNE 12, 2002

1045 D Trefje on-site.

1100 - 1200 Worked on collecting samples from discharge of system - Baker Tank. Collected samples for analysis for VOCs, SVOCs, PCBs, Pesticides, Metals, pH.

1240 Depart site. With transport samples to laboratory in Irvine (Del Mar Analytical).

~~David Tree~~

August 12, 2002

0900 D. Tietje onsite.

0915 LFT msg w/ Letticia Woodward of JPL re: meeting me here @ site.

Inspect recirculation portion of PBZ system to make sure all components are OK, check for leaks, etc.

1000 Met w/ Letticia W. re: staging Baker Tanks. She explained the preferred area for staging, which will utilize the back corner of the lot <sup>space</sup> ~~lot~~ for people backing up) and 5 adjacent parking spaces. I told her I would measure off the area & confirm if that was acceptable.

1015 Confirm hardware needed for lids of RC 2As.

1100 Depart site to PU tools, hardware req'd for start-up.

1230 Return to site

1300 Measured off area recommended by JPL for staging tanks.

This area is OK - 3 tanks will be set up lengthwise, side-by-side, w/ about 3 ft on either side of each tank. Will take up to parking spaces.

1315 Begin working on adjusting amt. of media in bioreactors - should be about 2/3 full per vial and securing hardware for testing.

1530 Saw Mike Losi & confirmed start-up for Thursday. He requested that we fill the reactors / bioreactors tanks w/ water, & that the water should be first

- run through the GAC.

1730 Clean up & Depart.

~~Paul T12~~

AUGUST 14, 2002

0730 Andra on-site, D. Trefje.  
P. Tynes & Island Environmental  
on-site.

Proceed to treatment system.

0745 - Island Env'l hauls 4000  
0815 gallons from Baker Tank  
on-site. Tank is now empty.

0830 Standby - waiting for JPL contact  
to arrive to sign manifest. Left  
message about 0815.

0840 Mark Andra stops by to sign  
manifest. I took the copy  
marked "copy" and a  
copy of the work order for  
our records.

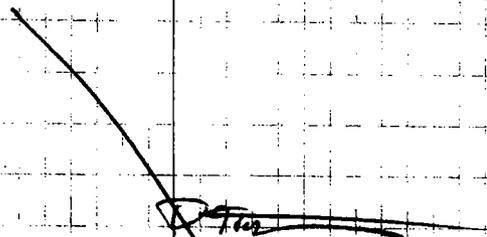
0920 Left msg for Letitia W. -  
JPL - indicating we were  
considering moving back tank  
delivery to EARLY MONDAY /  
TUESDAY.

1030 Rec'd call from Letitia / JPL  
re: delivery <sup>date</sup> times for tanks / fencing  
Said she would check up  
security & get back to me.

1600 Saw Steve of Rain for Rent Tanks -  
he said we should assume the  
tanks will be delivered Mon.  
AM 10 & Tues. AM 11. He  
said he will call back  
tomorrow w/ driver info.

1715 Finished adding approx. 200 gal  
'trip' water, treated w/ cnc,  
into each laboratory system.

1730 Clean up & depart site.



NOTE: PUMPED OUT APPROX. 1000 GALLONS  
OF WATER OUT OF INFLUENT EQ TANK INTO  
BAKER TANK (ALONG W/ APPROX 800 GAL)

FROM FINAL EK TRAIL (ASSUME THIS WAS TAP H<sub>2</sub>O)

AUGUST 15, 2002

0700 D. Tietje arrives on-site

0740 M. Losi - COM calls - says  
he is leaving the lab for  
the site.

0730 P. Timmes on-site.

0930 M. Losi on-site.

1000 Calibrate pH meter to  
pH standard 7, calibrate to  
standard 10 - set slope -  
then recheck pH 7  
pH meter is not calibrating  
well. Losi will be picking  
up new pH electrode

1025 Losi off-site.

sodium acetate  
FTW media,

1115 Added mineral salts and sodium chloride  
to each reactor system in amounts  
prescribed by comp.

1215 Collect water samples from  
effluent of reactors 1 & 2 -

reactor 1: pH = 6.08 \* \* \* incorrect  
readings  
T = 25.9°C

reactor 2: pH = 6.11 \*  
T = 24.5°C

mistakenly  
thought cond.  
meter was  
pH meter

1230 Add ~ 25  
100 mL caustic to  
each reactor system. (per phone  
conv. w/ Losi)

R1 - Added 51 mL

R2 - Added 51 mL

1300 checking pH in R1, R2 effl.

R2 - 7.00

R1 - 6.97

(Using new pH probes, and new calib. stds.)

R1:

T = 25.9°C

pH = 7.01

cond = 3.42 dS/m

Checking calibration for conductivity  
meter → Losi will check - write  
diff. between sol'n  
meter

R2:

T = 25°C

pH = 7.01

cond = 3.3 dS/m

SW Tom - N41 Construction Rentals

2 confirmed his crew will be onsite

7:00 - 7:30 on Tuesday

1315

Checking perchlorate concentrations:

Verified  $ClO_4^-$  standards - 1 to 100 mg/L  
w/  $ClO_4^-$  ppm meter.

Check  $ClO_4^-$  conc. in R1 - 109.6 ppm  
" " " " R2 - 61.0 ppm

Rechecked  $[ClO_4^-]$  in R2  $\rightarrow$  90.5 ppm

Diff. in starting conc. is  
probably due to greater vol  
of water in R2 system, since  
sponges are more porous than  
Hydroway media.

1400 Insulated both reactors

1415 Losi off-site. He advised me  
to check pH, T, and  $ClO_4^-$   
concentrations for both reactors  
@ the end of the day.

~~1315~~

1545 Collect samples from R1, R2 effluent

Check pH, T, conductivity

R1 - pH - 6.94  
T - 29.2  
cond - 3.77 dS/m

R2 - pH - 7.05  
T - 27.6°  
cond - 3.50 dS/m

Check  $[ClO_4^-]$

R1 = ~~16.40~~ <sup>16.40</sup> mV  $\rightarrow [ClO_4^-] = 75.7$  ppm

R

R2 = 165.5 mV  $\rightarrow [ClO_4^-] = 71.3$  ppm

1625 Confirmed  $\neq$  results w/ Mark Losi.

Said to check concentrations  
again tomorrow AM.

Astro Plumbing -

Gonzalo Alvarez - U.S. Citizen

Jesus -

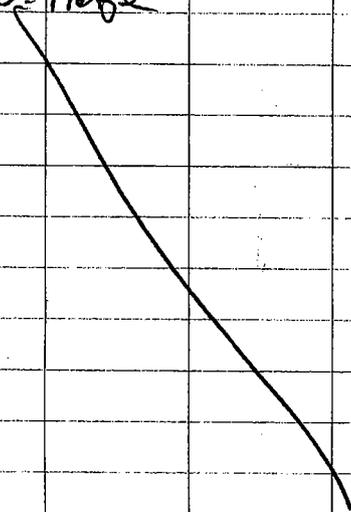
1630 Continued w/ security that they  
are on w/ Monday deliveries.

Recommend we barricade off 6  
spaces. on to move DE tank  
around (?)

1645

offsite

D-Trap



AUGUST 16, 2002

0730 D. Tietje, P. Times on-site.

0745 Set up benthos for Monday's tank deliveries.

Collect samples from each reactor system

0950 Calibrate pH meter - calibrator to 7, 10 - OK.

Check pH, cond, T in samples

RI Eff -

T - 24.7°C

pH - 6.88

Cond. - 342

RZ eff -

T - 24.4°C

pH - 6.98

Cond. - 1.71

~~Calibrate~~ -

Calibrate  $ClO_4^-$  / pH meter

- ① Prepare <sup>100 mL</sup> samples to take readings.
- ② Allow samples to equilibrate w/ standards

③ Checked calibration - checked 75, 50, ~~10, 1~~ ppm standards - OK

④ Checked RI eff - 1.95 ppm  
RZ eff - < 1 ppm

SW MARK LOSI -

ADD  $ClO_4^-$  AND CONTINUE TO MONITOR DISAPPEARANCE

WILL BE ADDING 104.5g  $NaClO_4$  TO EACH REACTOR, AND CHECK  $ClO_4^-$  CONCENTRATIONS IN AN HOUR OR SO.

940 Added 104.5g  $NaClO_4$  to each system.

1005 Depart site to go to ICI. P. Times will be on-site & will check readings in an hour or so.

- 1110
- ① prepare 100 mL samples to take readings
  - ② Allow samples and standards to equilibrate

③ checked calibration with  
75, 50, 10, 1 ppm OK

④ checked R1 eff 47.7 ppm  
R2 eff 33.6 ppm

1220 Added 109.5 g NaClO<sub>4</sub>  
to each system

1530 Return to site

1620 Collect samples R1 eff, R2 eff

- Make up 100 mL samples of  
each reactor effluent w/ ISA  
solution.

- Allow samples to equilibrate w/  
standards

- Check parameters:

R1 eff

pH - 6.8

T - 30.7

Cond - 3.7

R2 eff

pH - 6.88

T - 29.4

Cond - 3.76

- Check calibration w/ 100, 10 ppm - OK

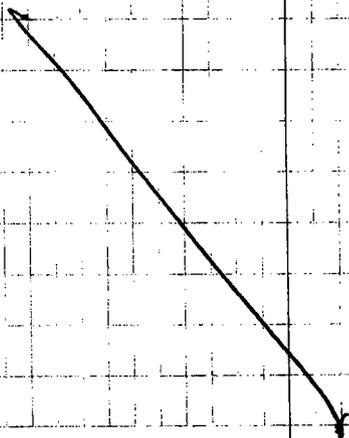
- Check R1 eff - < 1 ppm (reading 314 mV)

R2 eff - < 1 ppm (reading 314 mV)

1645 Slow Manke lost. He requested  
that I add 10 g more CeO<sub>2</sub>  
to each system & also try to  
hook up aquarium pump to  
introduce O<sub>2</sub> into both systems.

1715 Clean up & depart site.

~~D. Fin~~



MONDAY Aug. 19 2002

0600 D. Tietje onsite

prep for arrival of  
Baker Tanks.

0630 Rain For Rent Tanks  
onsite. Delivered 2 21,000 gal  
tanks into allotted area.

Tanks are 40' long and  
2 additional parking spaces  
will be needed to accommodate  
these 2 in 3rd tank.

Left message for Lotters - 3rd  
concerning space required - 2  
additional spaces.

0700 Rain For Rent personnel  
offsite.

0710 Check system -  
Collect samples R1 eff, R2 eff

0715 Flow through R1 system is v. slow -  
hose to pump inlet is clogged -  
may need to replace

Check calibration of pH probe. Calibration  
OK.

Make up 100 ml "samples" of R1 eff,  
R2 eff w/ ISA soln. Allow samples  
to equilibrate w/ standards.

Check pH, T, cond

R1 eff: 7.61, 23.2, 1.82

R2 eff: 7.80, 23.7, 3.29

check standards 1, 10, 50, 75

1, 10 standards OK

50 standard off - 156.6 vs 179.2

75 standard OK

Check R1 eff: 302.7 → 2.2 kPa  $ClO_2^-$   
R2 eff: 263.7 → 1.1 kPa  $ClO_2^-$

0805 <sup>shut off the operation</sup> slow loss/re results. Asked  
me to add 2x 100.5 g to both  
reactors. Check  $[ClO_2^-]$  in about  
1 hour & then @ the end of the  
day. Also informed him that we  
are almost out of  $ClO_2^-$  ~~stock~~.

P. Jones on-site.

0910 P. Jones off-site to PR point  
to replace inlet hose for R1 recirculation  
pump & secondary treatment pump  
replanning.

0920 Left msg. w/ Price Pump Co.  
tech support.

0935 Collect samples R1 eff, R2 eff

Check parameters:

R1 eff: pH - 7.59, T - 23.2, Cond. - 3.62

R2 eff: pH - 7.59, T - 21.9, Cond. - 4.78 (not  
fully immersed)

Verify calibration standards 1, 75, 100 ~~OK~~

Check R1 effl : Reading is 168.7 mV  
R2 effl : " " 166.0 mV  
corresponding to [Cl<sub>2</sub>-] at 62.8  
ppm & 69.9 ppm, respectively.

1005 Dr. Ridge off-site.

1445 changed out centrifugal pump  
for R1 system. System was  
down (not recirculating) for about  
2 hrs during pump troubleshooting.

1500 Shw Yardley Pump & Price Pump  
re: the pump connection problems  
we are having. They recommended  
6-12" straight horizontal run  
into pump inlet, w/ no restrictions  
on the discharge.

of JPL  
1600 Shw Letricia. She said she  
will try to confirm if we  
can get an escort for PFR  
tanks tomorrow, wanted me  
to learn her the names  
of the guys for N41 construction  
(and to let them know they  
will need proof of Perm. residency  
if not U.S. citizen), and that  
Astro Plumbing delivery is approved.

1615 Collect samples from R1 eff,  
R2 eff.

Make up 100 ml samples of 2 ml  
ISA soln. Set samples aside  
to equilibrate w/ standards

Check Parameters:

R1 Off: pH, T, cond.  
7.41 25.8 206

R2 Off: pH, T, cond.  
7.59 25.6 194

Check Standards

100 - OK

50 - OK - 180.9

10 - OK - 220.4

Check R1 Off. — ~~315~~ 315 mV — < 1 ppm

R2 Off. — 314 mV — < 1 ppm

1645 Saw Mark lost: Based on  
results, advised me to

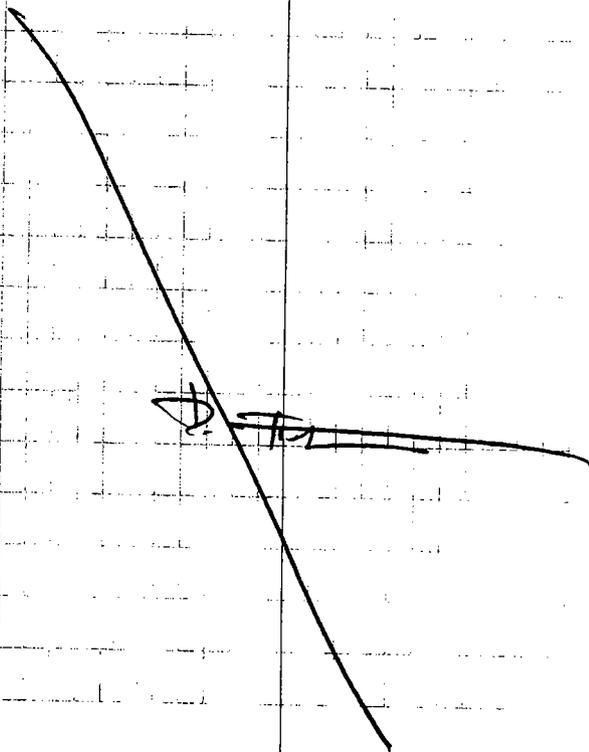
- Turn on aerator
- Add 1.3 kg NaAc to each  
reactor to make 0.5 g/L  
[NaAc] — add this

to build up biomass; biomass will be ~~lost~~  
~~is~~ washed out w/ forward flow. Said  
I should also check w/ Vialkal.

1700 Turned on aquarium pump,  
which feeds O<sub>2</sub> into both  
reactors.

Confirmed personal info. for  
NFI Rental fence w/  
Lettuce (1ft mag.)

1705 offsite.



TUESDAY AUGUST 20

0615 D. Tietje on-site. Reidel call from Steve - Reidel For Rent Tanks - en route to site explaining his driver had been delayed and was trying to make other arrangements for a prompt delivery. I per my request, since he did not expect his driver until 9 A).

On way home from site yesterday, Jesse from N 41 Rent-A-Fence called & said his guys were both permanent residents & would have their proof of residency cards.

Steve Vitthal - said we should only add 1/2 of the quantity needed to make .5 g/L today then the other 1/2 in a day or so.

0630 Collect samples to check parameters. System & running ok - Pressures ok, etc. Quite a bit of framing is still -

In the main tank occurring for R2.

0645 Check parameters for R1 eff: PH - 7.43, Cond - 3.72, T - 23.8 °C

Check parameters for R2 eff: PH - 7.53, Cond - 3.52, T - 23.7 °C

0700 Steve Lost - he concurred w/ Vitthal's suggestion to add 1/2 of the amount needed to make .5 g/L today, then 1/2 later. He also said I may be able to control framing by turning down air.

0715 Steve from Rent-A-Fence called. He said his delivery person would not be able to get to the site until ~ 8:20. I told him that we would need to reschedule - Wed. @ 6:30 A - Parsons

0720 Added 550 g NaAc · 3H<sub>2</sub>O to  
R1 inorganic tank.

0740 Added 650 g NaAc · 3H<sub>2</sub>O to  
R2 inorganic tank.

Also turned down air into  
both tanks.

0815 National Rent-A-Fence on-site.

0915 National Rent-A-Fence off-site.

1000 Astro Plumbing drops off galvanized  
pipe.

1015 Sun Valley Asphalt delivers 1 yard  
cold patch asphalt.

1040 P. Tinnes off-site.

1100 Joe - Barnaby Sutcliffe will  
be coming by site on Thurs  
to bring gaskets & punch them  
(they will have tool).

1300 Begin working on installing galv.  
pipe across parking lot area.

1500 Finish working on pipe 1st  
bump installation.

1530 Collect samples to check parameters.

R1 eff - pH - 7.54, T - 25.5°C,  
cond. - 4.21

R2 eff - pH - 7.67, T - 25.2°C,  
cond. - 4.09

1545 Clean up & depart site.

~~D. F. 21~~



1420 Resumed recirculation in both reactor  
systems (re-started both pumps)

1630 Collect samples R1 eff, R2 eff.

R1 parameters:

pH - 7.76 - OK < 8

T - 26.5°C - OK < 35°C

Cond - 4.39

R2 parameters:

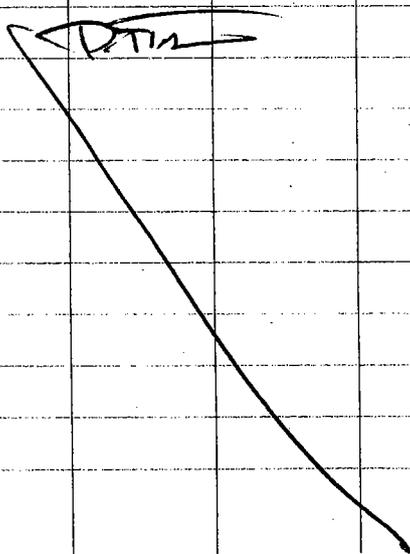
pH - 7.89 OK

T - 25.3°C OK

Cond - 4.11

1645 Clean up & depart site

DTA



THURSDAY AUGUST 22

0830 D. TESTE ON SITE.

P. TESTE ON SITE.

0845 Adding 650 g NaAc to each reactor system.

Collect samples R1 eff, R2 eff.

Calibrate pH electrode —

0900 Check parameters:

R1 EFF

pH - 7.76 - OK

T - 21.2 - OK

Cond ~~3.9~~ - 3.9

R2 EFF

pH - 7.84 - OK

T - 21.2 - OK

Cond ~~3.7~~ - 3.7

0915 Work on setting up, calculating feed rates for substrate, nutrient feeds.

1100 BSC onsite to replace leaking gasket on PC-24. Will also make up additional spare gaskets.

1145 BSC offsite.

1200 Stop system circulation.

1330 Resume system circulation.

1430 Tested secondary portion of treatment for leaks & pump operation — OK.

Begin filling substrate & nutrient feed tanks w/ water passed through CAC 10X.

1545 Per M. Lasi, start w/ 100 mg/L NaAc in total flow.

~~1545~~ enough  $(\text{NH}_4)_2\text{CO}_3$  to make 0.5 mg/L  $\text{NH}_4\text{-N}$  each enough

1600 Add 128 g  $\text{NaClO}_2$  to each  $\text{H}_2\text{O}_2\text{-P-}$  reactor & to mg/L

1635 Shut off  $O_2$  to reactors (per  
Munk loss, this will need to be  
left off now - overnight).

1645 P. Times off-site.

1710 Collect samples R1 eff, R2 eff

Make up 100 ml "samples" w/ ISA  
for testing. Allow samples to  
equilibrate w/ standards

Check parameters:

R1 EFF

pH - 7.63 - OK

T - 27.5°C - OK

Cond ~~Temp~~ - 2.70

R2 EFF

pH - 7.81 - OK

T - 26.4°C - OK

Cond ~~Temp~~ - 4.64

Calibrate  $Cl_{25}$  probe:

Check standards

1 ppm - OK 270.8  
265.0

10 ppm - OK 193.5  
25 ppm - ~~OK~~ - OFF  
50 ppm -

Checked R1 eff - result is 162.5 mV  
STEADY  
~ 75 ppm

R2 eff - result is 213.3 or  
~ 10 ppm

1800 Depart site.

R1 T12

FRIDAY August 23

0720 D. Tietje, P. Thomas on-site.

TODAY: CONTINUE FILLING SUBSTRATE  
FROM TANKS w/ CAC -  
WASH TO WATER &  
MONITOR CLO<sub>2</sub> - DISAPPEARANCE

0745 Collect samples R1 eff, R2 eff -

Make up 100 mL solutions for  
samples.

Allow samples to equilibrate w/  
standards.

0755 Check parameters

R1 EFF:

pH - 7.53 OK

T - 21.9°C OK

Cond ~~1.23~~ - 2.37

R2 EFF:

pH - 7.64 OK

T - 21.6°C OK

~~Cond~~ Cond - 4.20

0845 Calibrate CLO<sub>2</sub> probe -

Check standards

1 ppm - 2680 - OK (vs 272)

10 ppm - 211.8 - OK (vs 214)

25 ppm - 185.9 - OK (vs 191.3)

50 ppm - ~~165.6~~ 165.6

75 ppm - 161.4 OK (vs 174.2)

(vs 214)

(vs 191.3)

(vs 174.2)

(vs 162.6)

Check samples -

R1 EFF -

> 300 ⇒ < 1 ppm CLO<sub>2</sub> -

R2 EFF

> 300 ⇒ < 1 ppm CLO<sub>2</sub> -

915 Reported results to Mike Losh.

He said we do not need to  
add more CLO<sub>2</sub> - just turn on  
the air for the weekend, then  
shut it off ~~over the~~ w/ Monday Am.

Shut off circulation in both reactors.

1040 Turn on recirculation pumps.

1245 D. Tietje offsite.

MONDAY AUGUST 26

0715 D. Tietje, P. Timmes onsite

Add NaAc to ~~reactor~~ substrate  
feed tanks to make [NaAc]  
of 6000 mg/L.

- 3.9 kg per 150 gal tank
- 10.8 kg per 425 gal (tank)  
(Added 3 x 3 kg + 12.3 kg)

Will need more NaAc by  
Friday to refill tanks

Add  $(\text{NH}_4)_2 \text{HPO}_4$  to  
Nutrient Feed Tanks (300  
gal) to make  $[(\text{NH}_4)_2 \text{PO}_4]$   
= 450 mg/L per tank  
= 500 g.

0805 Figure ~~out~~ Settings for Metering  
Pumps

NaAc Feed - 6 gal/hr

$$6 \text{ gal/hr} \times \uparrow \times .85 \approx 6.1 \text{ gal/hr}$$

↑      ↑  
SPRNG STROKE

$(\text{NH}_4)_2 \text{PO}_4$  Feed - 3 gal/hr

$$8 \text{ gal/hr} \times .65 \times .6 \approx 3.1 \text{ gal/hr}$$

↑      ↑  
SPRNG STROKE

Set up equipment - prepare for forward  
flow testing.

0930 Begin forward flow testing.

$$Q_{\text{well}} = 5.23 \text{ gpm}$$

$$Q_{R1} = 3.3 \text{ gpm}$$

$$Q_{R2} = 2.0 \text{ gpm}$$

} will try to balance

0945 Zero fertilizer for 3 flowmeters  
(well, reactor 1 influent, reactor 2  
influent)

1130 Slow loss - talk me it was  
impt to get samples on ice  
immediately. Also, we should check  
w/ the lab on how best to  
stop rxn (block → reduction) by changing

the pH so as not to upset the analytical ~~method~~ analysis.

1240 Balanced flow into R1 by throttling back flow - now  $Q_{in} = Q_{out} = 2.5 - 2.6$  gpm.

1245 Collected sample from R1 INT.

Measure 100 ml of sample

Measure pH - 7.67

Added 2 drops 10M NaOH to sample - pH changed to 11.42 - OK

1345 Cannot calibrate Hachon W/O for pH, P.O. Patrick will take back to office today to get assistance & return to Hachon if necessary.

1430 Slow Loss - Learned that I added about 3x more acetate than needed to make 100 mg/l - but this is OK since bugs were

used to 1000 mg/l, then 500 mg/l.

The smell I should dilute this conc.

by 1/2 when the tank pumps down half way (Tomorrow PM or Wed. AM)

Then <sup>for</sup> the next batch that is made up Friday I can make it up @ 100 mg/l.

1445 Left message for Dennis Reyes - ~~arriving~~, letting him know we are

① going to add 1 drop 10M NaOH to 1 (effluent) sample for the 3 analytes, and would also collect companion samples w/o adding the NaOH (per WOSI), and ② we would need a 1 mg/l RL for Acetate.

1500 Stopped flow to reactor 1 to repair leak on In-line mixer connection.

1600 Resume forward flow through R1

1640-1700 Stopped forward flow through R1 again to repair another leak.

1800

Put R1 system in recirculation  
mode - due to leak in  
influent line to R1 - cannot  
repair today, do not have fittings.

Put treated water into start-up  
tank, added 250 g Na<sub>2</sub>CO<sub>3</sub> to  
make 330 mg/l in soln. Then  
re-started recirculation.

Continued forward flow through  
R2.

1815

Depart site.

~~D. H.~~

TUESDAY AUGUST 27

745 D. TUTTSE, P. THAMES ONSITE.  
STOPPED @ HOME DEPOT  
FOR ROUTE TO SITE TO <sup>PUT PARTS TO</sup> REPAIR  
PIPING FOR R1.

0750 SWL LOST RE SAMPLING FOR  
TODAY DUE TO R1 FLOW  
BASING SHUT DOWN. HE SAID  
WE SHOULD PLAN TO SAMPLE  
TOMORROW (WITH LINES @ SAME  
TIME). LEFT MSG FOR  
TENNIS OR MWH LABS  
CONFIRMING THAT WE WILL  
BE POSTPONING SAMPLING TO  
TOMORROW.

0800 DISCOVERED THAT INFLUENT FEED  
PUMP WAS OFFLINE. TRACED  
PROBLEM TO PLUGGED BAG FILTER  
- LOW DISCHARGE & LAUNDED  
RR TANK & TO BACK UP  
WHICH IN TURN SHUT OFF  
THE FEED PUMP FROM  
ER TANK 1, WHICH BANGED  
UP & SHUT DOWN THE INFLUENT

FEED

0810

@ 2.5 gpm.  
FLOW RESUMES THROUGH R2A TREATED 2750

GAL THROUGH R2 SINCE START-UP  
YESTERDAY. BASED ON THIS FIGURE

THE FLOW THROUGH R2 WAS  
DOWN FOR ABOUT 4-4.5 HRS  
LAST NIGHT.

ALSO - FOR NUTRIENT FEED,  
SHUT OFF FLOW INTO R1 LINE  
BUT DID NOT ADJUST DOWN  
OVERALL FLOW (DID NOT CHANGE  
PUMP SETTINGS), ALSO SOME SOLUTION  
UPANED FROM FEED TANK.  
FEED FROM SUBSTRATE TANK  
# 2 LINES ON.

0830

Collected sample from R1 EFF &  
~~PH~~ (IN REVERSE MODE) & Checked  
PH - 7.79 OK

0900

Repaired section of piping for  
R1 INF.

0945

Resumed normal flow feed  
through R1. Flow is ~2.5  
gpm through both systems.