Log Book
Campaign 02

2014-07-07

08:05 Started systems
08:20 Started steam jacket of Prop 2B
08:30 Vacuum pump not working (cooling water was off)
09:11 Reached 250°F in 2B
09:30 Start sterilization of 2A
10:01 Reached 250°F in 2A
10:19 Stopped steam to Prop 2B
10:58 Pumped Hz into Prop 2B
11:10 Stopped steam to Prop 2A
11:24 Hz was added to 2B→Level ~11.7% (~12.8 gal)
11:31 Level in 2B is now ~13.7% (slowly increased) 14.4 gal
11:31 Added UV water to level of 40.3%.
Level readings fluctuating a lot (from 31% to 41%)
11:45 Level now ~49.7%.
It is possible the UV water valve was leaking into the tank.
Once the main drain was closed, the level stopped increasing.
11:53 Start pH conditioning (Target pH=9.0; Pump Speed=5.9 GPH)
Shift Change
12:33 Began adding 28 gallons of UV Water to Prop 2A
Target was 17.7% level
12:38 Finished UV water add to Prop 2A with 19.4% level
12:47 Began adding Hz to Prop 2A from tote via C5 Pump
12:53 C5 Pump off @ 32% level
12:55 Reached 9.0 pH in Prop 2B.
Base B Pump #5 off
Wait period start
13:01 C5 Pump back on to finish Prop 2A
Off after 80 seconds
13:05 Final level ~36.1%
Total volume ~40.7 gal
13:08 Began pumping Waste Water out
Level=75.7%
pH=11.11
Cond ~2.47 mS/cm
13:17 Began raising pH in Prop 2A for conditioning
13:26 Reached 9.1 pH in Prop 2A.
24hr wait period start
Was MUCH faster than 2B
13:30 Began dumping Caustic Tank
13:47 Began adding water to Phosphoric Acid Mix Tank
Stop water addition @ 50% level
400 gallons=3332lbs; Flowrate=4.7 GPM shown; Actual ~4.9 GPM
15:07 Turned off water addition to see if level stabilizes
Stable @ 41.4% and 3632lbs

15:33 Began adding acid to Mix Tank
Target Weight is 3750lbs
15:48 Swapping Acid drums (current weight=3669lbs)
15:59 Acid Metering Pump to Mix Tank back on
Shift Change
16:30 Acid off, flushing lines, with flush Cond reached 25.8 mS/cm
16:45 Holding off for lab results, Cond at 25.5 mS/cm from screen and holding
17:00 Filling Caustic Tank with H_2O
17:30 Lab readings are one unit lower than meter
Plan is to stop @ 24.4 mS/cm and add water in morning if needed.
17:46 Caustic Tank @ 40%
Going to put 2 barrels in and see where we end up.
17:49 Pumping Caustic over to Tank
Joe's calc is just under 1200lbs, doing same with Acid
Rather end up too strong and add water later than the other way around.
Leaving Agitation on acid tank overnight

2014-07-08
08:40 Starting SIP 3B
08:50 Pulling Vac. On 3B
09:17 250^{o}F in 3B, calibrating pH probe and sterilizing transfer lines to 2A/2B
10:18 Steam off to 3B
10:27 Cooling down 3B
13:20 Adding Hz to 3B, target 15.1% Level
14:26 Hydz in 3B, 15.1%
14:31 Putting UV in 3B→37.7% Target
14:52 Agitation on, tank 37.6%←→38.1%, raising pH with Pump#8
15:21 Nutrients going into 2B, level~44%
15:38 Adding Phos Acid to 2B (manual valve)
15:50 Inoculating Prop 2B; Temp→99.7^{o}F; Level→51.4; Pressure→1.39 psi; pH→7.23
16:20 Bleach Scubber ON
18:40 Looking at Base B Pump#8, taking too long to increase pH
19:08 Stopped Pump#8 to look into.
Bad O'rings replaced and much better.
Plan is to look into all of them
19:50 3B @ pH=9.0. Pump#8 off, wait time
Shift Change
~~20:31 Approximate start of Steam Gun acid soak~~
21:05 Steam Gun Acid Soak started
21:35 Began adding steam into pH Adj Tank
Temp Control into SIP mode, set to Auto
21:43 pH Adj Tank reached +5 psi, turned off steam and turned-on Vacuum Pump
21:49 Reached -10 psi in pH Adj Tank
Turned off Vacuum Pump and turned Temp Control back on
Might have had some air leak into the tank
22:38 Reached 250^{o}F in pH Adj Tank.
Began holding at that Temp for one hour.
23:43 Turned Temp Control to Manual and 1hr SIP wait

Going to let it cool normally

2014-07-09

00:40 Temp Control in SIP to Auto for Liq Tank
Began adding steam to it.
00:54 Turned off steam to Liq Tank and turned-on Vacuum Pump.
01:04 Reached -10 psi in Liq Tank
Turned off VacPump and turned steam back on
01:20 Above Atmospheric pressure in Liq Tank
Steam Trap opened
01:30 Reached +10psi in Liq Tank
Vacuum Breaker opened
01:33 CO_2 Scrubber continues to be unpredictable
ESPECIALLY FIC 7201_09 Process Water Valve turning on automatically.
01:41 Reached 250^{o}F in Liquefaction Tank.
Began 1hr SIP wait period
Made some Manual control adjustments on steam valve
Gradual increments from 62% to 24%
02:20 Judging by the increasing slope of 2B pH curve, there might be LIFE in Prop 2B
02:26 Some adjusting on pH Adj. Tank's Vacuum Breaker
02:30 Began adding Process Water to CIP Caustic Tank
Target Level is 52.5%
Concentration @ 45.3% level was 4.6% Caustic
02:41 Finished SIP wait for Liquefaction Tank
Turned SIP mode to Manual and turned off steam
Also finished adding Process Water to CIP Caustic Tank
03:17 Began heating up Prop 2B's sample port
03:36 T=12hr Sample Taken from Prop 2B
Temp= 100.0^{o}F; Level=51.5%→54.3%; Pressure=1.41 psi; pH=7.08
04:42 pH in Prop 2B reached 7.00
06:55 Current rate of pH drop in Prop 2B is about -0.08/hour
Shift Change
09:12 2B pH @ 6.69
13:33 2B has slowed down, pH=6.58. Plan is to wait for 15:30 sample then maybe start Metso
15:30 T=24hr Sample Taken from Prop 2B
Temp= 97.8^{o}F; Level=49.4%; Pressure=1.40 psi; pH=6.58
16:00 Starting Metso Systems
Per Ismael, not starting PSF or transfer until at 50 psi in case solids in systems
16:40 @50 psi, started PSF & PSB transfer
That didn't work, system depressurized
16:50 Nutrients to 3B; Level=42.1%; Press=0.40 psi; pH=8.25; Temp=98.8^{o}F
17:00 Issues with Blowback Damper, won't budge
17:03 Nutrient Pumps off
17:04 Had to go to 90 psi to get damper to move
17:11 Nutrient pumps back on
17:20 Seem to be having trouble getting nutrients to 3B
17:35 Feeding Metso
17:42 Metso Settings

Bin Bottoms=90% (C); PSF=85% (M); CV#1 & 2=100% (M); Hyd=150 psi
PSB Level=72% (A); Press=5 RPM (A); Temp=110°F (A)

18:20 Nutrient finally in

18:22 Metso @ Temp and Pressure

18:30 Phos. Acid→3B for pH below 7.5

18:35 Took 27hr sample from 2B
Temp→98.1°F; Level→47.6%; Pressure→1.41 psi; pH→6.51

18:42 Phos. Acid→3B for pH below 7.3

18:52 Heating up CIP tanks

19:00 Inoculating 3B
Level→43.2%; pH→7.26 (7.45 in Lab); Temp→98.5°F; Pressure→2.18 psi

19:40 Refilling Bleach Scrubber to 50%

19:46 Done refilling Bleach Scrubber

20:00 Phos. Acid→3B until 7.0

Shift Change

20:02 to 20:42 Slowing down PSF

20:06 Finished adding acid to Prop 3B (pH~6.99/7.00)

20:11 Caustic Concentration assumed to be 4.1% based off the previous titration and slight dilution since then.

20:24 Began pumping out Waste Water
pH~12.40; Cond is weird; Level=77.5%

20:54 30-second Rinse CIP through Spraybals of Prop 2B
Sample #1 taken

20:57 Turned off Temp Control for Prop 2B
Put into Man SIP

21:06 Began Rinse CIP of Prop 2B, 1 minute through transfer lines

21:10 Began Rinse CIP of Prop 2B through sprayballs

21:11 to 22:06 Making adjustments to PSF

21:27 Finished Rinse CIP of Prop 2B
Sample #2 taken for kill-verification

21:33 Began Caustic CIP of Prop 2B through Vent and C5 Line

21:40 Having issues with Prop 2B's Level Sensor

21:48 Began Caustic CIP of Prop 2B through sprayballs

22:08 Finished Caustic CIP of Prop 2B

22:20 Began UV Rinse of Prop 2B through Vent and C5

22:24 Began UV Rinse of Prop 2B through sprayballs

22:43 Liq Tank pH probe calibrated and in tank
Began Normal Temp Control set @ 122°F in Auto

22:46 Finished UV Rinse of Prop 2B

22:52 Began filling Liq Tank with UV Water.

23:06 Finished adding UV Water into Liq Tank (Level ~26%)

23:17 Started Flow-Rate Test#1
PSF→90%; PSB Level~64%; Screw Press=5.0 RPMs
Feed Bin→100%(C); Temp=185°C; Pressure=150 psi

2014-07-10

00:33 to 01:00 Making adjustments to PSF

00:52 Began adding UV Water to Liq Tank (Target=33%)

00:55 Stopped UV to Liq Tank
01:00 Adding UV Water to Liq Tank
01:02 Resuming UV Water again
01:29 (1hr Late) T=6hr Metso Sample Taken
PSF→95%; PSB Level~74%; Screw Press=5.0 RPMs
Feed Bin→ 62% (C); Temp=185°C; Pressure=150 psi
04:32 Base B Pump#8 set 30% (still off right now)
3B pH=6.65
05:03 Switched Reversing Screw to Froward
Began feeding Biomass to Liq Tank
UV Water @1.0 GPM to Liq Tank
05:21 Liq Tank pH below 6.00
Turning on Cellulas Enzyme Pump
05:25 Aqueous Ammonia Pump#1 ON, pH Control on Liq Tank set to Auto
AAP#1 set to Cascade
05:34 Doing Minor Tweaking to Cellulase Pump & Flow
05:?8 Turned on Interlock Bypass for Reversing Screw in case any issues with knifegate to Liq Tank happen to crop up in false alarms
06:38 to 07:52 Constant tweaks to PSF
06:56 Feed Bin to Manual→120%
07:05 Having issues with CV's Metal Detector going off
07:12 Restting Metal Detector @ Control Panel
07:18 T=12hr Sample Taken from Prop 3B
Level=44.0%; pH=6.53; Temp= 98.4°F; Pressure=0.50 psi
07:28 Fed Bin→80% and then put into CAS
07:42 Feed Bin Livebottoms turned off. (PSB Levelhit 85%)
Air Nozzle removed from CVs. Will Metal Detector still go off?
07:50 Feed Bin Livebottoms ON in CAS
Shift Change
08:02 Liq Agitator speed→50%
08:04 Bin→Manual@110%
08:15 Began SIP Ferm C
08:23 Liq Agitator→30%; Liq Base Pump~15%
08:30 Metal Detector twice
08:34 Vac being pulled in Ferm C
08:39 Pumping WW
08:43 2 more Metal Detector Alarms
08:44 Bin back to Cascade
09:12 -10 in Ferm C, Vac Pump OFF, steam ON
09:39 Ferm C @ 250°F→1hr wait
09:59 Alarm for Metso valve to Liq, luckily bypassed last shift
10:14 Bin in Manual @110%
10:25 Bin in Cascade
10:39 SIP of Ferm C complete, Steam off
10:47 Start cooling down Ferm C, spargers on
11:04 Increased speed of Liquefaction agitator to 60% (level=67.4%)
11:11 Changed speed of Liquefaction agitator to 30%
There was level fluctuation observed after increasing speed of agitator

11:22 Bin to Manual @ 110%
11:36 pH probes calibrated in pH Adj (both)
11:42 pH probes calibrated in Ferm C
11:46 Liq AG to 60%
11:54 Liq AG to 100%, seemed to settle out @ 73%
12:11 Bin to manual @110%
12:12 UV→Liq now 2.5 GPM
12:15 Pumping Liq→pH Adj
Level=74.4%; pH=5.00; Temp=121.8°F; Pressure=0.37 psi
12:27 Temp Control on pH Adj
12:28 Bin in Cascade
12:38 Looks like we were clogged. Ran Liq Pump backwards a min.
Press~6 psi
12:42 Agitation/pH Control on pH Adj
13:00 Sample Taken from Liq Tank
Level=76.2%; pH=5.00; Temp= 121.8°F; Pressure=0.33 psi
13:05 Sample Taken from pH Adj Tank
Level=86%; pH=6.96; Temp= 97.0°F; Pressure=0.37 psi
Took Level Control off pH Adj Tank, only makes valve close
Running pump in Auto and putting in GPM
13:55 Liq Pump blew a hose
Water off, Biomass to Bin, Enzyme off
14:30 Bin in Manual 110%
14:50 Bin in Cascade
15:24 Taking 21hr sample from 3B Per Ismael
Level=43.4%; pH=6.55; Temp= 98.6°F; Pressure=0.41 psi
Have to keep reversing Liq Pump.
Press ~5, not pumping
15:58 Both pumps need it
16:00 Shut down Liq again, another broken hose
Reverse Pretreatment
Water and Enzymes OFF, pH Adj→0 GPM
16:20 Liq running again
16:47 Phos Hold Tank 8.8%, pumping over
Hold=9%; Mix=49%
Just regularly reversing Liq and pH pumps
18:20 Done pumping Acid
Hold=82.8%
18:33 Inoculating Ferm C
Level=14.7%; pH=5.95; Temp=96.3°F; Pressure=0.34 psi
18:41 Agitation bypassed to start early-16%
18:47 Inoculation done, 6.1 g/l in 3B
Final level=17.3%
18:53 T0 Sample from Ferm C
When Ferm reaches 25% stop Metso and push Liq/pH Adj forward
19:00 CIP heated up
Sample Taken from Liq Tank
HAVEN'T TOUCHED PSF IN ALMOST 12 HOURS

Shift Change

20:28 Liq Pump clogged. Reversing to clear it.
20:31 Liq Pump back into Cascade
21:02 Still having issues with Discharge Valve to Liq Tank
21:08 Loadshare element punctured in Liq Pump Hose
Liq Pump off
21:09 Liq Pump back on (CAS)
21:13 Liq Pump off. More adjustments needed
21:16 Liq Pump ON in CAS
21:18 to 23:35 Constant, minor adjustments to pAP and Liq Pump
21:20 Problems with pAP tripping
21:25 Need to dump Caustic into Waste Water
pH=6.08
10-minute dump starting @ 21:29
21:34 pH Adj Tank Level Sensor just went out @ 85%
21:41 Taking WW sample in 10 minutes
Turned on poor man's recirc loop for WW
21:45 Waste Water sampling now due to WW level @ 94.8%
21:50 Began pumping out Waste Water
Level=95.8%
Cond=1.8 mS/cm
pH=11.00
21:58 Turned on pH control for Ferm C (pump set @ 30%)
22:04 Ferm C pH Control→Auto
Set @ 6.50; Pump @20 GPH
22:07 Both nutrient totes are empty
Letting both pumps run a little longer
22:17 Might have blown out another hose although it still is working okay
22:29 30-second Rinse CIP through Prop 3B sprayballs
Kill-sample #1 taken
22:33 Reached 25% in Ferm C
22:36 Stopped adding Biomass to Liq Tank
UV Water and Enzyme OFF
22:38 Steam to Metso, Presteam Livebottoms
PS transfer conveyor, PSF are all OFF
22:44 Steam back on to Metso
22:48 PSF & Presteam stuff back on
PSF→90%
Just running things out in PSB level
Goal is 40% level
22:56 Biomass Handling completely off
23:00 Presteam Livebottoms, Transfer Conveyor, PSF, and Steam to Metso ALL OFF
23:03 45-second Rinse CIP of transfer lines to 3B
23:07 Began Rinse CIP of Prop 3B through sprayballs
23:25 Finished Rinse CIP of Prop 3B
23:26 Prop 3B Kill-sample Taken
23:29 Prop 3B Temp Control to SIP mode and OFF
23:37 Began 30-second Caustic CIP of Prop 3B's transfer lines

23:38 Began Caustic CIP of Prop 3B through sprayballs
23:42 Prestem Transfer Conveyor & PSF ON
PSF→100%
Pushing everything out through Metso
23:49 Liq Tank Agitator→30% (Level @65%) to avoid splashing
23:54 Finished Caustic CIP of Prop 3B
23:55 Base Pump#3 for Fermentor C→40.0 GPH setting
pH control still in Automatic

2014-07-11
00:00 Began 2-minute UV Rinse of Prop 3B's C5 and transfer lines
00:12 Presteam Trans Conveyor to C5 Hydrolyzer Discharger OFF
00:31 Finished UV Rinse of Prop 3B
00:35 Ferm C Sample Taken
Level=28.9.2%; pH=6.37; Temp= 98.7^{o}F; Pressure=1.10 psi
00:42 Turned off Liq Pump due to downstream hole in hose
00:51 Liq Pump back ON
00:52 HP Water Seal Pump OFF
00:54 Began sterilizing sample ports for Liq & pH Adj Tanks
01:13 Sampled pH Adj Tank
Level=84.9%; pH=7.01; Temp= 99.8^{o}F; Pressure=1.11 psi
01:18 Sample Taken from Liq Tank
Level=53.3%; pH=5.05; Temp= 122.0^{o}F; Pressure=1.02 psi
01:22 Trace Metals Valves and Pump to Fermentor C OFF
01:27 METSO SHUT DOWN totally
01:31 Liq Pump OFF
01:37 Liq Tank Agitator→100%
01:38 Liq Pump ON @ 2.5 GPM
01:44 Liq Pump OFF
01:55 New Liq Pump Pressure Indicator not useful now
02:05 Having issues with Liq Pump
02:06 LiqPump OFF
Will need to backflush with Process Water
02:15 Backflushing LiqPump line with Process Water
02:17 LiqPump ON→3.5 GPM
02:31 Still no increase in pH Adjustment tank level
LiqPump OFF
02:32 LiqPump ON @ 6.5 GPM
02:41 to 04:01 Constant adjustments on LiqPump and pAP.
03:57 Changed Ferm C pH Control set point to 6.6 (was 6.5)
04:01 pH Adj Level Sensor wacked out
Completely useless right now
05:09 Started doing checks every 15 minutes on pH Adj Tank level
05:13 pAP and LiqPump OFF
Turned off pH Adj Agitator too
Reported level really low
pH control off for now
05:21 LiqPump ON→6.0 GPM

05:26 Liq Pump OFF
05:30 LiqPump ON→3.5 GPM
05:36 pH Adj Agitator ON
05:37 pH Adj pH control ON
05:39 pAP ON→3.5 GPM
05:54 1st Check on pH Adj
Reset Liq Pump→3.0 GPM
06:07 pAP OFF
06:09 Liq Tank Agitator Interlock Bypass ON
06:22 Liq Pump ON→5.0 GPM
06:27 Liq Pump OFF
06:32 Liq Pump ON→5.0 GPM
06:36 LiqPump→5.5 GPM
06:37 Started steam to Ferm C sample port
06:41 LiqPump OFF
06:50 Ferm C Sample Taken
Level=37.2%; pH=6.43; Temp= 98.7°F; Pressure=1.25 psi
06:54 Liq Tank 1st Impeller is maybe(?) covered around 26.5%
06:58 Liq Tank Temp Control to SIP mode
Manual, Steam to 50%
07:00 Liq pH Control→Manual and OFF
07:05 Steam into Liq Tank OFF
Liq Temp Control NORMAL→Auto
07:11 pAP ON→3.5 GPM
07:14 pAP OFF
07:17 pAP ON→4.5 GPM
07:18 pAP OFF
07:19 pAP ON→4.5 GPM
07:22 pH Adj pH Control and Agitator Bypass OFF
07:25 Attempting to blast out clogs with Rinse CIP @ 100%
07:32 pH Adj Agitator Override ON
07:37 pAP OFF
07:38 Liquefaction Tank Sample Taken
Level=Unknown (26.5%?); pH=4.98; Temp= 121.7°F; Pressure=2.25 psi
07:47 pAP ON→3.5 GPM
07:50 pAP OFF
Shift Change
08:10 Closed valve pH Adj→Ferm C
08:15 pHA Pump not on but blew hose (all over Kalvin)
09:35 Trying to pump Liq→Decanter Feed Tank
09:37 Temp Control OFF Liq
All systems in manual
09:42 Changed Ferm Agitation 50%→100%
09:47 All pHA systems in manual
10:10 Decanter running 3GPM
Remember to Sample Ferm C ~12:50
All Ammonia & Base Pumps OFF except Base #3 (Ferm C)
10:50 Pulled Liq Level Sensor & cleaned it

11:45 Liq→Decanter transfer done
11:50 Heating Caustic/Rinse
12:36 Pumping UV→Decanter Tank to rinse feed line, dump the rest
12:50 T=18hr Ferm C sample taken, but not told at time
13:08 Put Ferm C pH Control to 6.35.
Lab results with setpoint 6.6=6.55
14:41 30sec flush on transfer line Liq→pHA
Caustic=44.5→44.1%
14:55 Start Liq CIP (Rinse to the floor until clear)
Caustic=44.1→44.2%
17:35 Liq Done
17:38 Transfer Line pHA→Ferm C cleared and UV rinsed
18:30 T=24hr Sample Ferm C
Level=37.9%; pH=6.44; Temp= 98.6°F; Pressure=1.09 psi
18:50 Steam Trap Drain on pHA plugged, tried putting Rinse in @100%, no go
19:30 Taking line apart, found clog right at bottom 90°
We're getting ROCKS out of it
Shift Change
20:58 Waste Water ON
pH=7.64; Cond=2.25 mS/cm; Level=69.2%
21:38 CIP Rinse of pH Adj transfer lines
21:44 Caustic CIP of pH Adj transfer lines (went to sump)
21:50 UV Rinse of pH Adj transfer lines
22:07 Began Rinse CIP of pH Adj Tank through Sprayball#1
22:23 Began Rinse CIP of pH Adj Tank through Sprayball#2
22:35 Flushing Cellulase Pump and lines with UV Water
22:50 Flushing transfer lines with Caustic then UV Water
23:16 Began Caustic CIP of pH Adj Tank through Sprayball#1
23:24 Flushing Gluconase Pump and lines with UV Water
23:32 Began Caustic CIP of pH Adj Tank through Sprayball#2
23:50 Began UV Rinse of pH Adj Tank through Sprayball#1

2014-07-12
00:07 Began UV Rinse of pH Adj Tank through Sprayball#2
00:12 Enzyme has 280 g/L of glucose
00:18 Getting false level readings in Liq Tank (it's actually empty)
00:23 Finished CIP of pH Adj Tank
00:30 T=30hr Sample Taken from Ferm C
02:26 UV Rinse of Liq Tank (~5 to 7 minutes)
03:01 pH is now 6.33 (was 6.43 @ 1:00) in Ferm C
03:03 Could we just dump the contents of Prop 2A into Ferm C and then CIP 2A?
03:30 Changed pH setpoint to 6.40 because pH still dropping (pH=6.28)
04:21 Changed pH setpoint to 6.35
Want to see if pH drops. (pH=6.28)
Make sure to check pH in 6:30 sampling
Will reconsider within 30 minutes
04:58 pH still going down in Ferm C (pH=6.26)
Changed setpoint to 6.5

06:17 Began steam to Ferm C sample port
06:32 T=36hr Sample Taken from Ferm C
[Ethol]=26.3 g/L; Level=37.7%; pH=6.36; Temp= 98.5°F; Pressure=0.78 psi
Shift Change
08:15 Dumping 2A to the floor, Temp Control off
08:35 Doing CIP Cycle of 2A's C5 Addition line (all to the floor)
08:51 Rinse Cycle 2A started (standard CIP)
09:15 Caustic Cycle 2A
09:40 UV Cycle 2A
13:28 T=42hr Sample Taken from Ferm C
[Ethol]=25.89 g/L; Level=37.7%; pH=6.4; Temp= 98.6°F; Pressure=1.01 psi
Got all the "Sticks" from control ground up.
Had to cut into slices so the hammermill could handle it
16:20 Attempted to replenish Caustic and Brain Malfunctioned.
Anyway, here is where we stand
Level=35.43%→58%
Caustic=+1000lbs
Concentration=2.6%→5.0%
There's your project for the night Chris, should only be a little more water
18:45 T=48hr Sample Taken from Ferm C
[Ethol]=25.6 g/L; Level=37.7%; pH=6.41; Temp= 98.4°F; Pressure=0.94 psi
Sample also taken for WIS
18:45 Heating Ferm C to 140°F.
pH control off, pump in manual.
Record how long it takes.
Started @ 98.4°F.
Notify Lab 1hr after maintaining 140°F.
Shift Change
20:51 Ferm C Temp @ 112.3°F; pH=6.14
20:51 Ferm C Temp @ 116.9°F; pH=6.05
20:51 Ferm C Temp @ 123.9°F; pH=5.87
23:01 Ferm C Temp @ 124.6°F; pH=5.86
23:32 Ferm C Temp @ 127.1°F; pH=5.85

2014-07-13
00:03 Ferm C Temp @ 129.3°F; pH=5.85
00:28 Hot Water Heater→185°F
00:31 Ferm C Temp @ 131.4°F; pH=5.84
01:02 Ferm C Temp @ 133.6°F; pH=5.83
01:32 Ferm C Temp @ 135.5°F; pH=5.81
02:02 Ferm C Temp @ 137.7°F; pH=5.80
02:03 Hot Water Heater set @ 187.5°F
02:32 Ferm C Temp @ 139.4°F; pH=5.79
03:46 Ferm C Kill Sample#1
Level=37.9%; pH=5.76; Temp=139.8°F; Pressure=1.46 psi
04:35 Turning on steam to sample port on Ferm C
04:47 Ferm C Kill Sample#2
Level=37.8%; pH=5.75; Temp=139.8°F; Pressure=1.45 psi

05:52 Ferm C Kill Sample#3
Level=37.9%; pH=5.73; Temp=139.8°F; Pressure=1.45 psi
06:30 Supposedly Sample#4 taken around now, was never told if it happened.
05:52 Ferm C Kill Sample#5
Level=37.7%; pH=5.71; Temp=140.0°F; Pressure=1.47 psi
Shift Change
09:00 Heating up CIP, waiting on the call to push Ferm C ahead
09:05 Last Sample from Ferm C
Level=37.7%; pH=5.69; Temp=139.8°F; Pressure=1.47 psi
09:30 Sending Ferm C→BW
Temp Control OFF
Clog @ bottom of tank, on hold (Recirc line?)
09:32 Transfer restarted; hot water system offline
10:25 Transfer complete BW=21.5%
10:45 Rinse Water to Ferm C to floor
LOTS of solids to floor
Propose quick UV Rinse at end of transfers to push solids forward→DENIED
11:08 Rinse Slurry line/C5/Vent
11:15 Rinse Cycle
13:35 Caustic Cycle ~4.9%
Drain was left open, about 20% of tank went to sump
13:54 UV Cycle
17:55 Sending WW→Buckeye

Log Book Keys

Color Coding

blue text	tank refill log (i.e., bleach, caustic acid)
green text	notes from field
purple text	problems
red text	sampling/inoculation-related information
yellow highlight	process notes, major issues

Abbreviations

AAP	Aqueous Ammonia Pump
AG	Agitator
BT	Blow Tank
BW	Beerwell
BWP	Beerwell Pump
C5 Discharger	Hydrolyzer Discharge Screw
CIP	Clean in Place
CV	CableVey-Cable conVeyors
DFP	Decanter Feed Pump
FBLBs	Feed Bin Live Bottoms
FBTC/FBCC	Feed Bin Transfer/Collection Conveyor
GP	Gluconase Pump
HPSWP	High Pressure Seal Water Pump
HSMC	High Shear Mixing Conveyor
LIQ	Liquefaction Tank
LP/LIQP	Liquefaction Tank Pump
PA	Phosphoric Acid
PAHT	Phosphoric Acid Holding Tank
PAMP	Phosphoric Acid Metering Pump
PAMT	Phosphoric Acid Mix Tank
pAP	pH Adjustment Tank Pump
PATP	Phosphoric Acid Tote Pump
pHA	pH Adjustment Tank
Prop	Propagator
PSBLBs	Pre-Steam Bin Live Bottoms
PSF	Plug Screw Feeder
RevSc	Reversing Screw
ScPr	Screw Press
SIP	Sterilize in Place
SV	Steam Valve
WW	Waste Water