

Loyd Ray Farms, Inc.

Innovative Animal Waste Management System

Permit No. AWI990031

Permit Compliance Semi-Annual Report

July 1, 2018 – December 31, 2018 Semi-Annual Reporting Period

Submitted January 31, 2019

Submitted on Behalf of:
Loyd Ray Farms, Inc.
2049 Center Rd.
Boonville, NC 27011

This Semi-Annual Compliance Report provides an overview of the manner in which the subject facility, Loyd Ray Farms, has maintained compliance with the conditions of the Innovative Animal Waste Management System permit for the reporting period from July 1, 2018 through December 31, 2018. During this reporting period, the system was operated in accordance with the Innovative Swine Waste Treatment System and subject to the requirements thereof.

Overview of System

The animal waste treatment system installed at Loyd Ray Farms is designed to meet the Environmental Performance Standards set forth by North Carolina law for new and expanded swine facilities through the use of nitrification/denitrification and further treatment. This report confirms on a semi-annual basis that the innovative waste management system is in compliance with NC Department of Environmental Quality and its divisions, to insure that the utilization of the anaerobic digester technology to turn raw animal waste into biogas for the purpose of reducing greenhouse gas emissions minimizes the overall environmental impact of the swine farm, and explains the occurrences of operations, and testing requirements over the six month period, to monitor the

system, as it continues to produce renewable energy, generate carbon offsets, and reduce odor on the farm. The report is designed to not only show a synopsis of the maintenance activities on the farm, but also to supply the analysis of the system's performance and further describe the results of the monitoring and testing activities.

In addition to addressing compliance with the conditions of the permit, the following summaries provide an overview of the system operations including graphs of systems performance, the Microturbine performance, and biogas levels (pages 2-5), and lists all sampling and reporting requirements per the Innovative Animal Waste Management System Permit No. AW1990031 (pages 16-18). For each requirement, this report records on-site monitoring that occurred, with a brief explanation for each farm site visit (pages 6-16) for this reporting period. Additionally, detailed site visits recording maintenance and repairs completed during the second half of 2018, from July 1 through December 31, 2018 are also included in this report. In summary, From July 1, 2018 through December 31, 2018, all processes that comprise the innovative swine waste treatment system were fundamentally operational, and electricity generation was capable for the greater percentage of the reporting period, except for several weeks in September and October, which required the system to undergo repairs which are specified in more detail later in this report. Overall, except for a few disruptions for minor repairs, the system performed well from operational, power generation, greenhouse gas emission reduction and environmental performance perspectives. The maintenance activities were a little more accelerated as the system is getting older, and as the farm staff was unable to maintain a regular flushing schedule. Additional observations of system performance are exhibited in the operator log attached to this report. (Appendix A)

During this compliance period, ambient air analyses were accomplished on September 25th, 2018, and December 19th, 2018, details of the monitoring events have been added to this report (pages 20-22). The air emissions from water surfaces were found to be in compliance and much lower than the permit allows and show that the system is performing according to expectations.

This report was completed on behalf of Loyd Ray Farms, Inc., by Cavanaugh & Associates, P.A., under the direction of the Duke Carbon Offsets Initiative (DCOI). Please contact Matthew Arsenault at 919-613-7466 (Matthew.Arsenault@duke.edu) with any questions. A copy of this report will be provided to Loyd Ray Farms, Inc., and will be maintained on-site with the other permit compliance documentation.

Environmental Treatment System

Figure 1. below, **Environmental Treatment System Uptime**, depicts the operation of the aeration system that performs the nitrification function for the monitoring period. The environmental treatment system performed well and remained consistent for most of the year with the exception of a few weeks in September 2018. A few required Operations and Maintenance activities over the months of September and October will be explained in more detail in the Site Observation logs. Once corrected, the environmental treatment system returned to normal operations, and continues to generate electricity derived from hog manure and wastes.

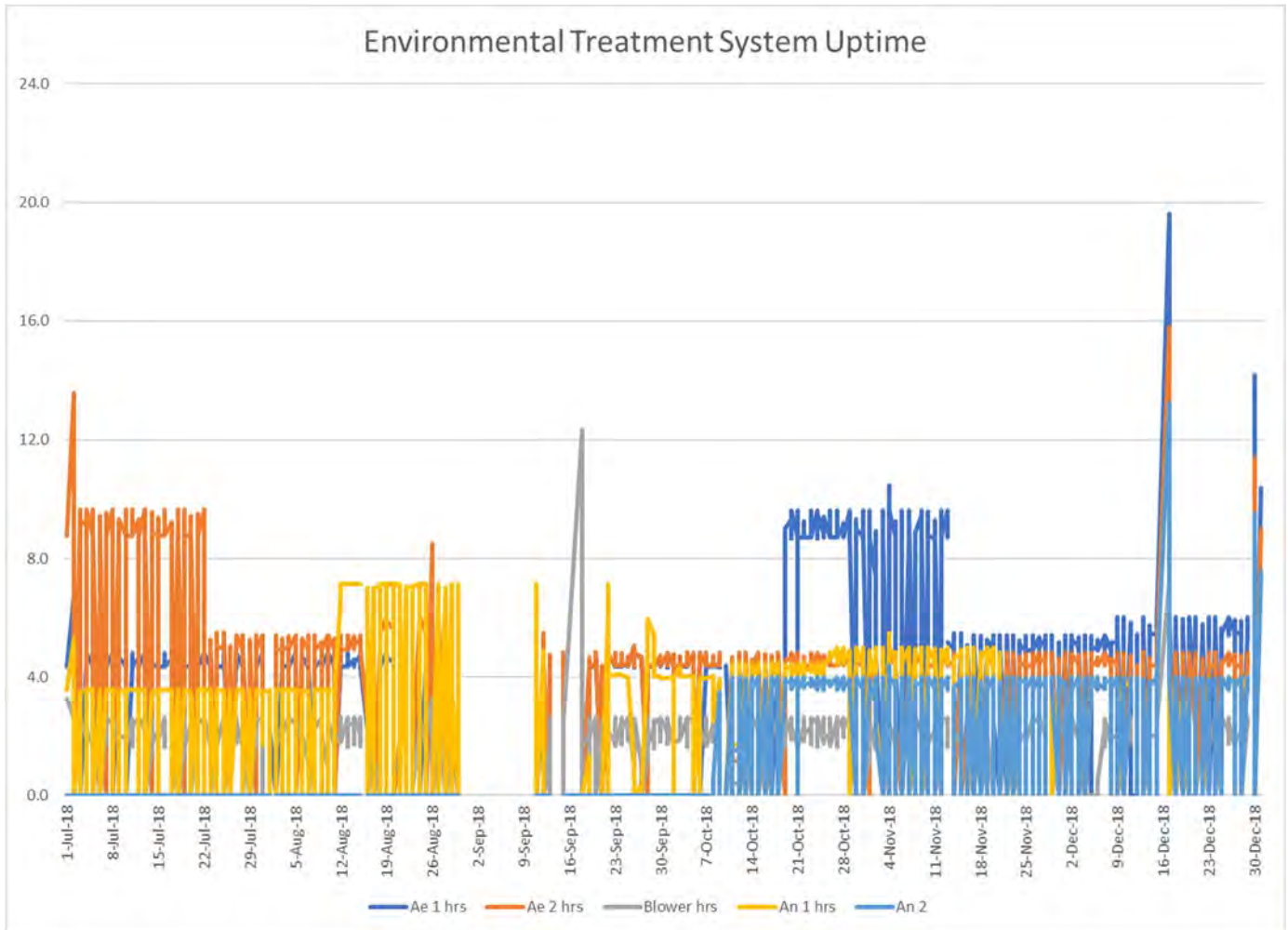


Figure 1. Environmental Treatment System Generator Uptime 7-1-2018 through 12-31-2018

The information in the daily log sheets correlates directly with the graph above, an electrical shutdown occurred during the first two weeks of September, which required replacing some parts to get the environmental system and the SCADA system back operational. Another complication during that time was a clogged digester mixing pump. After troubleshooting the problem, the operations staff was able to open the valves, back flush the system, rectify the bilge pump, and get the system operational again. Many areas in North Carolina received historical flooding in September, and Loyd Ray Farms received an unusually heavy amount of rain. However, the digester and operations remained intact and were not particularly affected by the storms nor rainfall. During the electrical outage that occurred around September 16th the flare was kept burning via gravity feed of the biogas continuously until we could get the system back online, as evidenced in Figure 1. Another atypical occurrence was October 8th, when the system required a repair of the digester pump. A spike in blower hours also occurred in December, when installation of like replacement fans and like replacement circuit boards in the Phase converter were required to properly cool down the system. Once corrected, the environmental treatment system returned to normal operations. Both aerobic and anaerobic performance during the compliance months are recorded in the **Environmental System Uptime** graph above. The anaerobic mixing system uptime was 71% for the reporting period, while the aeration system uptime was reported as 70%.

Figure 2. below depicts the **Microturbine Output in kilowatt hours (kWh)** during the compliance period. Biogas flow is also monitored and recorded for the system. The biogas may only be disposed of through use by the microturbine and flare, controlled release through venting, or leaks from the system, which cannot be measured.

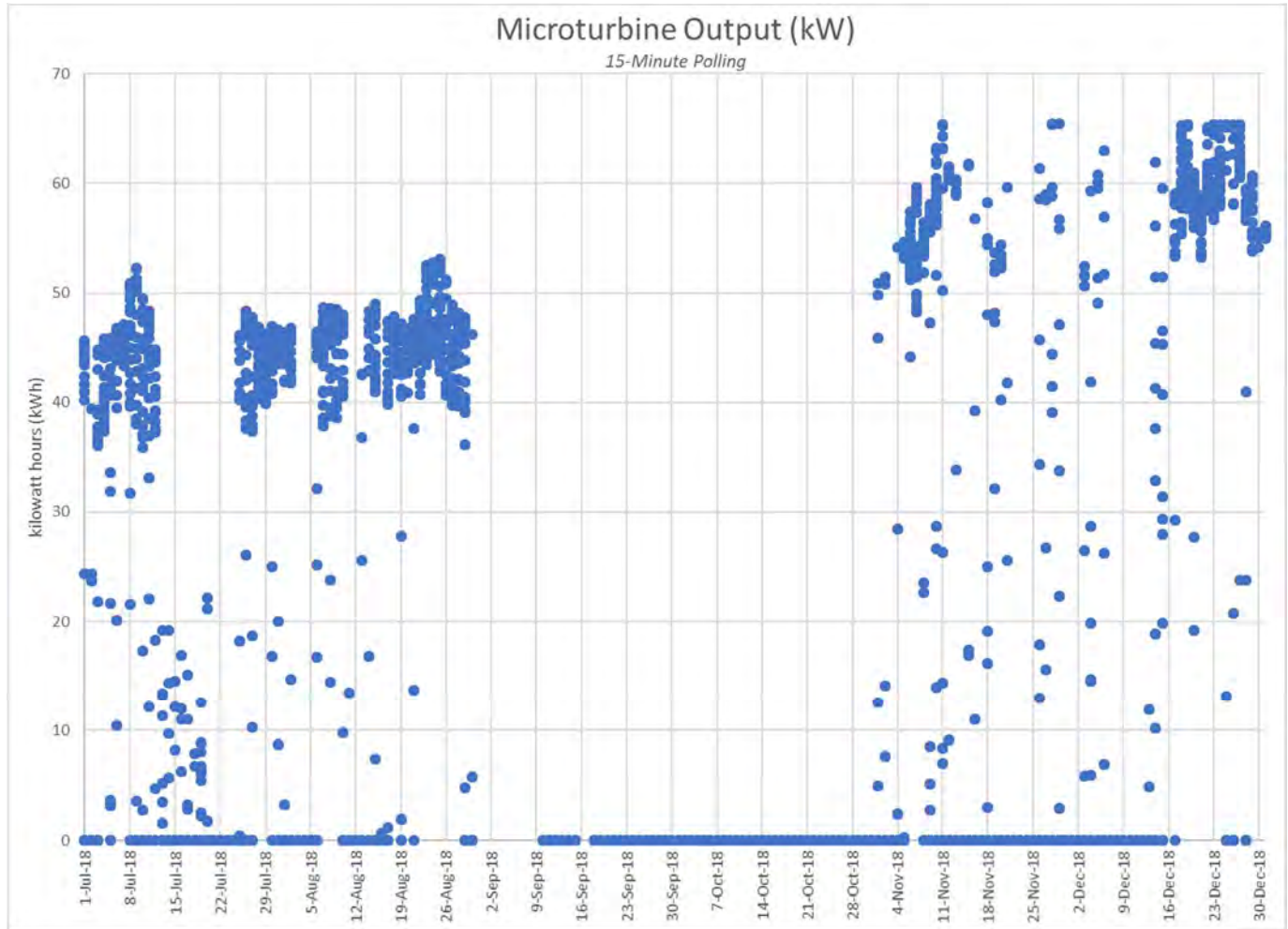


Figure 2. Microturbine Output per Kilowatt Hour (KWh) July 1, 2018- December 31, 2018

Figure 3., **Measured Biogas Flow and Flare Use**, which follows, depicts the dataset relative to the measured biogas flow and flare usage, which utilizes the same dataset for the duration of the compliance period. The measured gas flow directly correlates to Figure 2, the microturbine output above, both reflect the system consistency, except for the downtime in the months of September and October of the reporting period. Once the required maintenance activities were accomplished, and the system returned to operational, the performance was normalized.

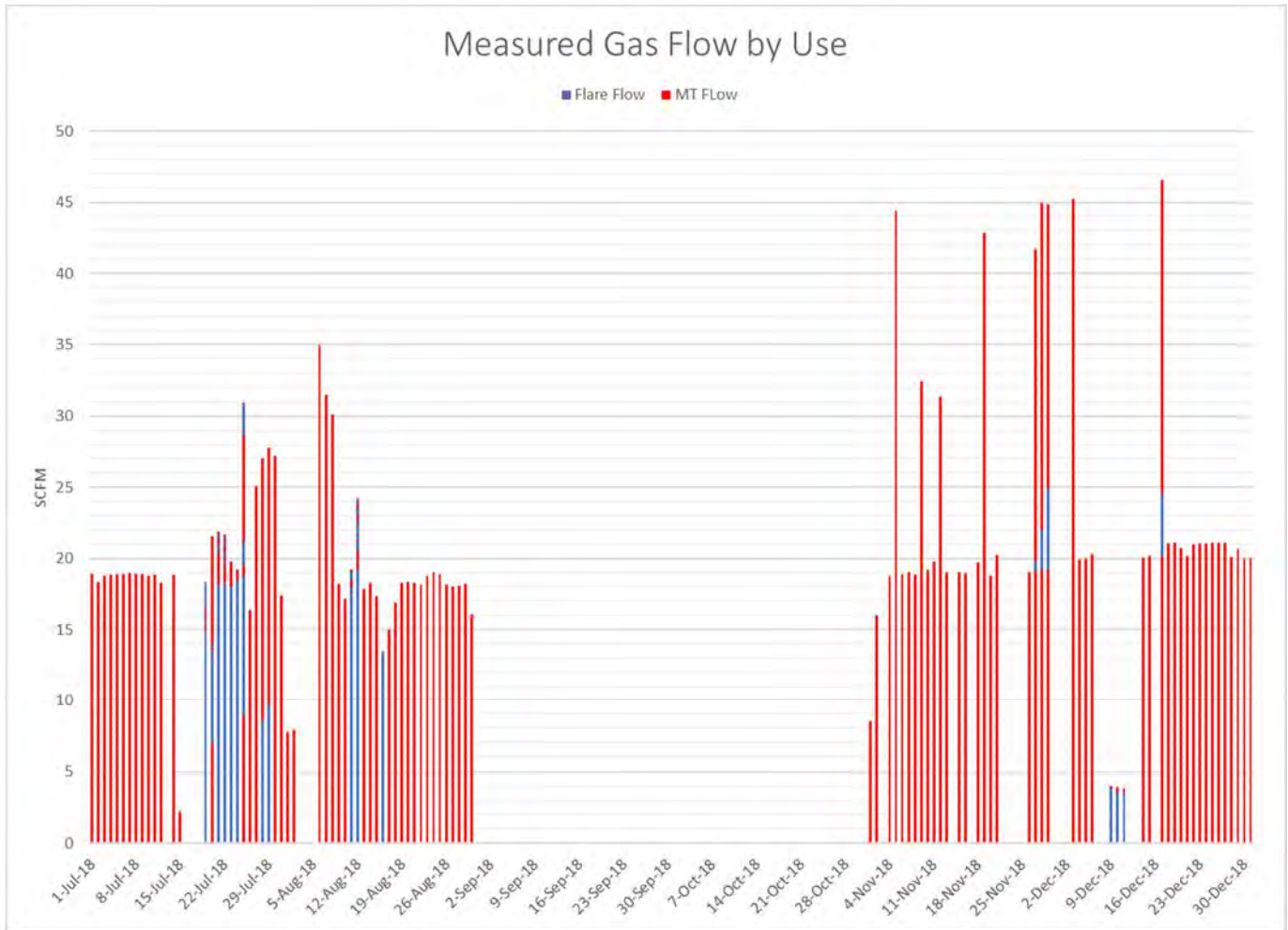


Figure 3. Measured Biogas Flow and Flare Use (July 1, 2018-December 31, 2018)

The above graph illustrates the measured biogas usage for the system. Flare usage, as indicated by measured flow to the flare meter, for the reporting period may also be surmised from the graph. It should be noted that days that indicate zero flow may sometimes indicate a disruption with the data acquisition system. As described previously, system operations had periodic downtime(s) in September and October, which correlates directly with the microturbine output above. After system repairs replacing like parts during these months, the microturbine output was improved and remained high for the months of November and December. The hog barns were also full during those months, compared with only half full in the early months of this report, which may help to explain the increase in electricity generation (kWh's).

The volume of gas is measured in Standard cubic feet per minute (SCFM). During normal operations, July through the beginning of September, the system was fairly consistent in the 18-19 SCFM range, with a little better flow in the months of November through December months averaging between 19 and 21 SCFM, with a few intermittent spikes on days of very high gas flow reaching up to 45 SCFM.

Overview of System Maintenance and Repairs

Overall, the operating biogas system and the environmental treatment system performed well, and remained under compliance. All maintenance exceptions appear in the log below, as maintained and recorded physically in the **Loyd Ray Farms Inspection and Operation Log Sheets**. While remote monitoring occurs on a daily basis, those activities are not normally captured in the report. We will note here only occurrences which required a site visit to resolve, or how the technicians would troubleshoot any problems that arose. If a system alert precipitated a site visit, we have indicated how the monitoring team went about troubleshooting the problem, and logged the experience required to make the corrections. Oftentimes, Cavanaugh’s team was able to resolve the issue, but if a representative from either Unison, the biogas skid provider, or another service technician, such as an electrician, was required for further assessment or repairs, we have also noted the dates of their presence, how they troubleshooted the problem, and if replacement, new or rebuilt parts were required. Please note that the system required a little more frequent servicing as some of the parts in this pioneering system commissioned in 2011 are approaching their expected service life, but most of the service activities are viewed as normal Operations and Maintenance (O&M), and in all instances, no system parts were added to normal operations.

In summary, most of the maintenance activities during this period were gas conditioning skid shutdowns, which required on-site inspections or manual restarts. Please note that at the beginning of this semi-annual report only five of the nine barns were filled with hogs, which affected the biogas produced. Some severe weather occurrences, such as heavy rains required surface water pumping, oftentimes necessitating a reset of the system. While one occurrence, at first was diagnosed to be a bad transformer, but after further investigation, it turned out to be a converter issue. The electrical service technician determined the converter could be rebuilt. Considering the significant rainfall in the state following Hurricanes Michael and Florence, the storms themselves did not particularly disrupt the routine flow of biogas, but sometimes required more frequent pumping of surface water. On occasion, back-flushing of the system was required, along with other remedies to unclog the digester pump, if the bilge pump failed. During the months of November and December, when all the barns were completely full, gas was flowing steadily, and the rate at which the biogas was accumulated and stored beneath the HDPE cover exceeded the capacity of the microturbine, and the flare was used to augment biogas use. A necessary improvement was the installation of a new camera to replace the older model, to enhance images, and provide a clearer picture for remote observances and monitoring. It should also be noted that since this system’s installation in 2011, many improvements in technology and instrumentation have developed.

The summary of the detailed operations log of on-site activities and monitoring for the period of July 1, 2018 through December 31, 2019 is presented as follows:

Date	Observation
7-2-2018	Monitored system remotely
7-25-2018	Site Visit to meet with Alex Gusnes of E-finity. We serviced the Microturbine (MT) and replaced air filter and the faulty fan we had been running. We found a faulty Rosemount meter which was registering incorrectly going to the MT. Also pumped surface water and did a site inspection.
7-27-2018	After remote monitoring, did a site visit. Pumped surface water and did a walk around site check. Turned flare on with 10 CMF going to flare.
7-30-2018	After remote monitoring, did site visit. Pumped surface water and performed site check. Flare off the balloon is getting low, as 5 of the 9 hog farms are empty. I installed a temporary

	cover for gas MH and dug a small ditch to help divert water away from the MH. Most operations automatic, with the exception of flush pumps by hand.
7-31-2018	Remote system monitoring during storms and heavy rainfall.
8-1-2018	Remote system monitoring, then site visit to inspect and review storm damage. After 6 inches of rain, worked all day with all entities to try and restore system back to normal operations. Monitored operations after storm damage trying to keep it running
8-2-2018	Remote system monitoring, then site visit to review storm damage. After 6 inches of rain, worked all day with all entities to try and restore system back to normal operations. Monitored operations after storm damage trying to keep operations running in stable mode.
8-3-2018	Monitored system remotely, checking to make sure post storm operations are normal.
8-6-2018	Monitored system remotely, then site visit to try and start the system. The gas balloon is growing, I started the flare, and pumped surface water and nursed the system to run. It failed twice due to heat, the outside temperature was in the 90's today.
8-7-2018	Monitored system remotely, then site visit to restart and monitor the operations. I shut the Flare off, as the balloon reach the level needed to shed rain. Pumped surface water and nursed the system to run. Communicated with reps at Unison and E-finity. A technician from E-finity is scheduled to be here on Thursday.
8-11-2018	Monitored system remotely, then site visit to do a restart after skid shut down because the MT would not start remotely. I ran a test and found that the MT failed to restart automatically after a skid shut down, so I started the flare. I will do a follow-up email with Nick at Unison.
8-13-2018	Site visit to do a restart of system with E-finity. We had a good start up, but now a skid warning for 33/342 reheat temp at 2:45 p.m. Will do a follow up email to Nick at Unison.
8-14-2018	Site visit to do a restart of system with E-finity. After the heat up at 2:45 p.m. yesterday, the skid was restarted, but the MT would not start, so I shut it down. I have restarted the skid today and will get E-finity to unblock the MT, and re-start it. Did a walk around inspected the system and started the auto pump for surface water.
8-16-2018	Monitored system remotely, Site inspection. Started the surface water pump. During the night, the Flare would not start. I turned on the mail at the MT, and it ran fine. I took influent, digester and effluent samples.
8-19-2018	Monitored system remotely, we had a shut-down today (Sunday). This was due to the outside temperature, after it cooled, I accomplished a successful restart of both the skid and the MT.
8-20-2018	Walk around inspection and site visit, operations are working normally.
8-21-2018	Monitoring system remotely, experienced a couple of shut downs, but was able to restart remotely.
8-22-2018	Monitoring system remotely, experienced a couple of shut downs, but was able to get back on line remotely.

8-23-2018	Site visit to meet with Matt Arsenault, Alex Gusner of Duke University, and Sarah Lanier (a student there). We took samples from the Lagoon Basin and Digester and also gas samples. I performed a site inspection and restarted the automatic pump and another non-automatic pump to handle surface water on the cover. System operations are normal.
8-27-2018	Site visit to do an On-site inspection, system and ground check. I worked on the camera with little success, system operating normally.
8-29-2018	After remote monitoring, did a site visit, tried to adjust the camera, system operations are running normally.
8-30-2018	System monitored remotely, then Site visit to do a system and ground check. Found the Unison system down. I tried to hard boot it, with no success. Unison is scheduled to be here on 9-10-2018, and I will call Unison to discuss.
9-5-2018	Remote monitoring this week.
9-10-2018	Site Visit. Met Marty Kass of Unison there to do service work. Flare is burning gravity gas. We found out we had no power. I called Salem Electric to do an emergency visit. They think the transformer is bad, and are checking on a source for a replacement one.
9-11-2018	We are still without power. Marty Kass of Unison, and Keith and Bryan from ProPump were on site, and I asked them to assess the no-electricity situation. They found the phase converter was bad, which showed like a bad transformer. They took down the two-phase converters and will ship them off to be rebuilt. They are also troubleshooting to change the flush pump from 3-phase to single phase, and are working to rebuild the IT. Marty Kass of Unison could not finish his service, and went to another job close by.
9-12-2018	ProPump returned with the converter rig for the flush pump and wired it inside the building to the pump with Kevin's help. We were able to get it back online and were able to flush.
9-13-2018	Flare is burning gravity gas. Kevin and Marvin worked to unclog the digester pump, but it is still clogged.
9-14-2018	Flare is burning gravity gas. Site visit to monitor operations and to prep for upcoming Tropical Storm Florence, which may be a hurricane.
9-15-2018	Monitored system remotely, flare is burning gravity gas.
9-15-2018	Monitored system remotely, then site visit to check system and water levels, flare is burning gravity gas.
9-16-2018	Remote monitoring, Flare is burning gravity gas, Site visit to check system and water levels.
9-17-2018	Remote monitoring, Flare is burning gravity gas
9-18-2018	After remote monitoring, went to Site to do a system and ground check. Found digester pump still clogged, tried to back flush system, but was not able to get valves open. The balloon is growing so I vented for one hour. The auto bilge pump failed, so I pumped surface water with two pumps for two hours.
9-22-2018	Remote monitoring, then site visit to check gas levels. Still flaring, but only had to vent once.
9-23-2018	Monitored system remotely, No Site visit today. System is still flaring, but not venting, only once.

9-24-2018	Monitored system remotely, No Site visit today. System is still flaring, but not venting, only once.
9-25-2018	Site visit to do a system and ground check, and found the digester pump still clogged, tried to backflush to see if I could unclog. I am still flaring but vented only once. The auto bilge pump failed so I pumped surface water with two pumps for the entire visit.
9-26-2018	Site visit to do a system and ground check, and found the digester pump still clogged, tried to backflush to see if I could unclog. I am still flaring but vented only once. The auto bilge pump failed so I pumped surface water with two pumps for the entire visit.
9-27-2018	Site visit to do a system and ground check, and found the digester pump still clogged, tried to backflush to see if I could break it free. I finally got the Digester pump to work, and plan to let it run all night to get it cleaned out. Still flaring the gas, vented only once. The auto bilge pump still failing, so I pumped surface water with two pumps for the entire visit.
9-28-2018	Site visit to do a system and ground check. Found the digester pump still working, so I moved it to the auto cycle. Pumped surface water during the site visit, vented at 2 ports for two hours.
10-1-2018	Site visit for system and ground check. Found digester pump still working, so I kept it on the auto cycle. Pumped surface water during the site visit.
10-2-2018	Site visit for a system and ground check. Operations are normal and the digester pump, remains on auto cycle. Pumped surface water. Conducted a tour of Duke University students and professors who came to observe operations.
10-3-2018	Site visit for a system and ground check. Digester pump still operating correctly, remains on auto cycle. Pumped excess surface water during the site visit.
10-4-2018	Monitored system remotely, no Site visit today.
10-5-2018	Site Visit to do a system and ground check and found our digester pump still working so I kept it on the auto cycle. Pumped surface water during site visit. Vented at two ports for 2 hours
10-6 & 10-7	Monitored system remotely without incidence.
10-8-2018	Site Visit to do a system and ground check and found digester pump still working so I kept it on the auto cycle. Pumped surface water during site visit. Met with Josh Amon to get the repaired Digester Pump installed. We worked on getting pumps unclogged, we are going to try to run as long as possible but not leave them unattended for a while, as sometimes they clog up and no fluid is being pumped.
10-9-2018	Site Visit for system and ground check, digester pump still working. Pumped surface water during site visit. I changed the timers and after the Digester pump restarted with a prime, I am going to try it through the evening.
10-10-2018	Site Visit to do a system and ground check and found our digester pump still working. Pumped surface water during site visit. I changed the timers and after the Digester pump restarted with a prime I am going to try it through another evening.
10-11-2018	Pumped surface water during site visit. I changed the timers and after the Digester pump restarted with a prime I am going to try it through another evening. Heavy rains from

	Michael with some flooding in the ditch. Mr. Bryant not happy with the ditch. Lost power for an hour or so all back running and seeing breaks in the clouds
10-12-2018	Pumped surface water during site visit. I changed the timers and after the Digester pump restarted with a prime I am going to try it through another evening. The Flare continues to run on gravity gas flow of 8-10 CFM I needed to vent today at two ports for 2.5 hours
10-14-2018	Monitored system remotely, particularly the flare.
10-15-2018	Site Visit to do a system and ground check and found our digester pump still working. Pumped surface water during site visit. The timers are working well with the restart of the Digester pumps. I am going to leave them as they are for now. The Flare continues to run on gravity gas flow of 8-10 CFM. No venting since Friday 10-12-2018.
10-17-2018	Pumped surface water during site visit. The timers are working well with the restart of the Digester pumps. I am going to leave them as they are for now. The Flare continues to run on gravity gas flow of 8-10 CFM. No venting since Friday 10-12-2018.
10-18-2018	Remote monitoring
10-19-2018	Pumped surface water during site visit. The timers are working well with the restart of the Digester pumps. I am going to leave them as they are for now. I worked on Drainage some. The Flare continues to run on gravity gas flow of 8-10 CFM. No venting since Friday 10-12-2018.
10-21-2018	The Flare continues to run on gravity gas flow of 8-10 CFM. No venting since Friday 10-12-2018.
10-22-2018	Site Visit to do a system and ground check and found our digester pump still working. Timers continue to work well, worked on drainage more. No venting since Friday 10-12-2018.
10-23-2018	Site Visit, no changes since yesterday.
10-24-2018	Site Visit, Pumped surface water during site visit. The timers are working well with the restart of the Digester pumps. The Flare continues to run on gravity gas flow of 8-10 CFM. No venting since Friday 10-12-2018.
10-25-2018	Site Visit, no change since yesterday.
10-26-2018	Site Visit needed to check system the team viewer was not working dependably we need to install cameras ASAP to save on visits. Timers still operating correctly to restart pumps. No venting since 10-12-2018.
10-28-2018	Monitored system remotely.
10-29-2018	The Flare continues to run on gravity gas flow of 8-10 CFM. No venting since Friday 10-12-2018. Technicians from ProPump were on site installing the Phase converters and setting up for the wiring changeover of Flush Pump from 1 Phase back to 3 Phase
10-30-2018	ProPump was on site installing the Phase converters and setting up for the wiring changeover of Flush Pump from 1 Phase back to 3 Phase, Kevin Harward joined us to assist. We put boat in Basin for the wiring change on the Flush Pump.
10-31-2018	Site visit, Kevin Harward came to the farm to install a power part on the Unison system. We attempted to start the system, but the chiller had a failure and would not start. We are trying to get help resolving the problem. ProPump will probably need to come back and help with

	the SCADA. Kevin and I moved the hose to push some of the digester sludge water to the Lagoon
11-1-2018	Site visit to accomplish a manual restart after an overnight failure, then working with folks from ProPump, trying to get SCADA to communicate with the Unison skid. The MT and skid were running again and no flare. Talked to ProPump via phone to set up for the SCADA repair.
11-3-2018	Steve Cavanaugh made a Site visit to start the conditioner. The MT failed after several tries it shut down.
11-4-2018	Site visit to start conditioner and MT. I found conditioner running but the MT not running and SCADA not recording properly. The MT failed after several tries it shut down. I then did a hard boot and it has been running since 11:05 AM. The MT is producing 59.6 output 54.9 on 18.3 CFM. I will monitor and keep records of output until SCADA can be fixed.
11-5-2018	Bryan from ProPump came to farm to work on SCADA, I was able to talk him through a restart. He had to drain the water from the gas pump on the south end of the skid and then the skid would start. I made a site visit to meet with Bryan. We were able to get the Skid and SCADA communicating and we are now running full bore. We have a lot of gas and I plan to stay as long as possible running both flare wide open; and the MT wide open burning about 50 CFM. I shut the Flare off at 4:30 PM
11-7-2018	I turned the flare off before I left on Monday and monitored remotely all-day Tuesday. Site visit today, the gas is still up, and the MT has been running since Monday.
11-8-2018	Site visit today, had a power blip that shut off team viewer, when I got to the site there were no alarms and the computer was back up the skid was just sitting there and not running, and the MT was in standby mode. Started the skid and when it was ready and sending to the MT; the MT would not start it was on, but not starting. I had to shut-off the breaker as before and when I turned it back on the MT started automatically. The gas volume is still up, and I will return tomorrow, and we may need to flare. Eight of the 9 hog houses are full of animals, loaded one out just now leaving the 8. The MT has been running since Monday,
11-9-2018	Site visit today, we have been running up until around 12:33PM we had a skid fault of high condensate at 741. I reset and restarted skid and the MT came on as it is supposed to at 2:00 PM. I started the flare to run while I am on site as the gas volume is still up. I did a walk around and up on the cover all is well. I installed a replacement fridge today. I received a new camera and will try and install it next week.
11-10-2018	Remote monitoring all day; we had three shutdowns and then late we had a MT fault. No site visit

11-11-2018	Site visit to restart the MT, as remote monitoring indicated a fault on the screen and the breaker had tripped. I had cut the skid off when the MT was in fault, so I restarted it, reset the breaker and opened the Flare valve. Everything restarted as it should have.
11-12-2018	Site visit to restart the MT I found a fault showing on the screen and the breaker had tripped. I had cut the skid off when the MT was in fault, so I restarted it, reset the breaker and opened the Flare valve. Everything restarted as it should have. This is the same as yesterday. I started the Gravity-flow Flare and it is running 10+ CFM, even though it does not seem to register on SCADA
11-13-2018	Remote monitoring, shutdown today, will do a site visit tomorrow.
11-14-2018	On Site Visit, I started the Gravity Flow Flare and it is running 10+ CFM even though it does not seem to register on SCADA and I am glad because we had a shut down on Tuesday.
11-15-2018	Site visit to restart system it refused to restart, but after 3 tries, I finally got the system restarted.
11-16-2018	Site Visit, due to shut-downs this week. I started the Gravity Flow Flare and it is running 10+ CFM even though it does not seem to register on SCADA and I am glad because we had a shut down on Tuesday and Wednesday and another during the evening on Thursday. Site visit to restart system and I found that the skid is not communicating with the SCADA and I am unable to start and stop or monitor skid data. I was able to re-start the skid and the flare continues to burn on gravity as above. The MT started as it should, and is running fine. I will monitor but if we shut down then it will be Sunday before I can manually restart. We need to burn all the gas that we can, the volume is high.
11-18-2018	During the evening on Thursday and again after site visit on Friday we had shut-downs. Monitored off and on Saturday, Flare burned at 10+CFM all the time. We need to burn all the gas that we can the volume is high. Site visit to try and restart system I had to do a hard boot of the Skid and the MT before I could get the System to run properly. When I did the hard boot on the Skid the communication with SCADA came back?? We are up and running again.
11-19-2018	Site visit to try and restart system Kevin restarted and was able to re-establish the communication Skid to SCADA by resetting at the panel several times. The MT started as it should at 12:52 PM. We started the flare through the conditioner and opened 2 vents at 1:45 PM. We had a shutdown at 3:16 PM and a quick restart. We shut the vents off at 3:45 venting for 2 hours. I cut the flare off coming through the Skid and restarted the Gravity Flow Flare and it is running 10+ CFM.

11-20-2018	Kevin and Marvin did a Site visit and took quarterly water samples. Had to reset the communications on the Unison panel as it shut down yesterday, acting like power is lost on the panel or something is going bad. Able to restart Skid and MT at 10:30a.m. Contacted Unison to let them know the issues hopefully get it fixed and or schedule a site visit soon. Think we have 2 bad level switches on the skid, they keep tripping-off and on, for 5- 30 seconds, once they are on for 30 seconds, the alarm is tripped, one is a high-level switch and is causing a shut down, again will let Unison know. We installed the new camera and set it up on team viewer. We did a walk around and up on top to check for leaks
11-21-2018	We did a site visit to restart same problem shutdown for condensate that is not there and faults out, so we cannot restart remotely but have to go to site to manually restart. Gravity Flare is burning at 10+ CFM
11-22-2018	Monitored system remotely most of week, trying to burn all the gas we can while the volume is high.
11-26-2018	Had to reset the communications on the Unison panel which shut down yesterday, acting like power is lost on the panel or something is going bad, was able to restart Skid and MT at 4:00PM. I emailed Unison to try to troubleshoot site issues and requested a site visit hopefully to get it fixed as soon as possible. Think we have 2 bad level switches on the skid, they keep tripping off. We did a site visit to restart, without success. The same problem occurred; shutdown for condensate that is not there, and the system short circuits, or faults out, disrupting the normal flow of the system, so we cannot restart remotely but must visit the site manually to restart. Gravity Flare is burning at 10+ CFM Started venting at two vents at 4:05 PM and closed them at 5:05 PM. By the time I got home at 8 it shut down.
11-27-2018	Monitored all during the night to see if flare was continuing to burn at 10 CFM. Site visit today to restart the system. I shut off the Gravity Flare at 11:00 AM and opened the valve and flared with gas through the skid at feed=28.4 and flow = 21.4 CFM. The skid is running with the fault light showing on SCADA, but the MT and skid are running full. Every shut down, or system failure, is requiring an on-site visit. At 2:00 PM I went back to Gravity Flare at 10+ CFM. The skid and MT have been running 4 hours. The red fault light is still showing on SCADA, but the system is running, and it will continue to fault out. We need to burn gas and make KWs. System shutdown at 3:10p.m. Flare continued to burn at 10+ CFM.
11-28-2018	Monitored all during the night to see if flare was continuing to burn at 10 CFM. Site visit today to restart the system. I shut off the Gravity Flare at 2:38p.m. and opened the valve and flared with gas through the skid at feed=30.4 and flow = 25.4 CFM. The skid is running with the fault light showing on SCADA, but the MT and skid are running full. At 2:00p.m., I shut

	<p>the system down and did a hard boot and this time the fault light on SCADA picture of the skid went off and the Unison screen started registering data. At 2:08 p.m., we are running full bore. Back to Gravity Flare at 10+ CFM. The skid and MT have been running 4 hours. The red fault light is still showing on SCADA, but the system is running, and after troubleshooting I discovered we need to burn gas and make KWs. System shutdown at 3:10p.m., re-fired at 4:10p.m., shutdown@5:27p.m., restart at 8:57-shutdown@11:57p.m. Flare continued to burn at 10+ CFM.</p>
11-30 through 12-2-2018	<p>Monitored all during the day and night to see if flare was continuing to burn at 10 CFM</p>
12-3-2018	<p>Monitored all during the night to see if flare was continuing to burn at 10 CFM. Site visit to restart system started at 11:45a.m. --Flared using skid at 24CFM 12:45p.m. until 3:50p.m. Reset gravity Flare at 10+ CFM for the night.</p>
12-4-2018	<p>Monitored during the night to see if flare was continuing to burn at 10 CFM. Site visit to meet with tech from Unison. Worked with Curt Schiesl of Unison to try to resolve the problem with the skid. I shut the flare off at 9:00a.m. He changed out switches and tried all kinds of things to keep it running. He had to order parts shipped overnight, and will continue troubleshooting tomorrow.</p>
12-5-2018	<p>Monitored system with Curt Schiesl, Field Service and Start-up Technician for Unison by computer and phone as he continued to try and fix the problem with the skid. He left for his home stating that he thought the problem was that the Phase converters were overheating. We had a shut down and panel fault as before.</p>
12-6-2018	<p>Site visit to restart the system and found we had a shutdown but no loss of power to panel, it just faulted as before. All I had to do to start the skid and MT running was to press the start button. I still do not have any data on skid panel screen, but we are running. We had a shutdown and showing no power to Unison panel. I did a hard boot to PC and after a short pause the Unison panel lit up with information, it ran for about 30 minutes and shutdown still showing power to the Unison panel. I restarted without any numbers and it is running; if and when we have a shutdown, it will have to be restarted by onsite visit. I started the Gravity Flare burning at 10+ CFM and plan for it to run until Monday regardless of what the Skid and/or the MT does.</p>
12-11-2018	<p>Site visit to restart the system and found we had a shutdown, but no loss of power to panel. The Gravity Flare has been burning at 10+ CFM continuously since I left on 12-06. I met with Norman and Bryan of ProPump and plan for it to run until Monday regardless of what the Skid and or the MT does.</p>

12-12-2018	Site visit, met with ProPump and we continued to troubleshoot along with Doug from Unison.
12-13-2018	Site visit to restart the system and found we had a shutdown, but no loss of power to panel. The Gravity Flare has been burning at 10+ CFM continuously since I left on 12-06. Met with Bryan from ProPump and we continued to troubleshoot along with Doug from Unison. We added some new parts and it seemed to be fixed. Then in the evening we continued to have shut downs, Flare still running.
12-14-2018	The Gravity Flare has been burning at 10+ CFM continuously since I left on 12-06. Bryan from ProPump came to site and he installed a part and we were running. I monitored and sent text to Norman and Bryan of ProPump, and Doug from Unison. We added some new parts and it seemed to be fixed. Then in the evening we continued to have shut downs. Flare still running. I monitored all weekend during that time I lost communication due to a power Failure by Surry-Yadkin, Flare continued to burn.
12-17-2018	Site visit to restart the system and found we had a shutdown but no loss of power to panel. The Gravity Flare continued to burn all weekend. At 10.0+ CFM. I met with Bryan of ProPump and we spent the day troubleshooting system with concentration on Phase converter. With the help of a conventional fan we were able to cool Phase converter enough to run until we could get parts to repair. Started running at 10:50a.m. We shut the gravity flare off on the restart of the Skid and MT and ran the flare hard until 3:15 PM.
12-18-2018	Monitored system remotely by SCADA and Camera The system has been running from 11:00a.m. Monday without a shut down. Gravity Flare is off.
12-19-2018	Site visit to do a system check, the parts did not arrive, so after the inspection and repair of a small leak, I traveled home to return tomorrow. Gravity Flare is off.
12-20-2018	Site visit to do a system check. I met with Bryan of ProPump and he installed fans and circuit boards in Phase converter. We restarted system and we are up and running. The Gravity Flare is off.
12-21-2018	Site visit to do a system check. I met with Matt Arsenault of Duke U. We have been running solid since we replaced PC Fans yesterday. The Gravity Flare is off.
12-30-2018	Site visit to do a system inspection. The Gravity Flare is off. System was working but computer was down.
12-31-2018	Site visit to do a system check The Gravity Flare is off. System was working but computer was down again. Rebooted it again Checked Team Viewer with Nancy at home.

The following table lists the compliance requirements as per the permit for the subject system, and the performance / compliance relative to each requirement:

	Description of Monitoring Requirement	Status	Result
1	Maintenance of adequate records by Permittee to track the amount of sludge/separated solids disposed.	N/A	No solids or sludge disposal occurred during the reporting period; some sludge returned to the anaerobic digester for further breakdown in accordance with the Division approved Operations & Maintenance Plan.
2	Inspection of entire Innovative System waste collection, treatment, and storage structures and runoff control measures at a frequency to insure proper operation but at least monthly and after all storm events of greater than one (1) inch in 24 hours; Permittee maintenance of inspection log or summary including at least the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken by Permittee.	<input checked="" type="checkbox"/>	Inspections and observations conducted by representatives of Loyd Ray Farms, Inc., Cavanaugh & Associates, P.A., and DCOI. Observations recorded, and actions taken to adjust the operation of the System are recorded in log book kept onsite, and emailed in.
3	Maintenance of a log of all operational changes made to the Innovative System including at least the process parameter that was changed, date and time of the change, reason for the change, and all observations made both at the time of the change and subsequently as a result of the change by Permittee/ Permittee’s designee.	<input checked="" type="checkbox"/>	Log book entries, as described in item #2, above, maintained on site; copies attached to report (Appendix A).
4	Representative Standard Soil Fertility Analysis to be conducted annually on each application site receiving animal waste.	<input checked="" type="checkbox"/>	NCDA&CS Agronomic Division Report No. FY19-SL009269, shows the results of the Predictive Home & Garden Soil Report for Loyd Ray Farms. The samples were compiled on 10/22/2018, and were completed on 11/01/2018, which are added to this report, they can also be accessed here: http://www.ncagr.gov/agronomi/
Wastewater Analysis			
5	Quarterly tests shall be conducted once within each of the following windows w/ at least sixty (60) days between any 2 sampling events. Water quality samples include analysis of copper, zinc, total suspended solids, pH, total nitrogen, TKN, NO2 + NO3, phosphorus, ammonia, and fecal coliform.		
	Quarter 3 (July 1 – September 30)	<input checked="" type="checkbox"/>	Sample Collected: 8/17/2018 Sample Analyzed: 9/18/2018 Results Reported: 9/18/2018

			Results included in the attached report from Research & Analytical Laboratories, Inc. (Appendix B)
	Quarter 4 (October 1 – December 31)	<input checked="" type="checkbox"/>	<p>Sample Collected: 11/20/2018 Sample Analyzed: 12/20/2018 Results Reported: 12/20/2018</p> <p>Retest of Fecal Coliform: Sample Collected: 1/9/2019 Sample Analyzed: 1/11/2019 Sample Reported: 1/11/2019 Results included in the attached report from Research & Analytical Laboratories, Inc. (Appendix B)</p>
Ambient Air Sampling			
	Fall Season Ambient Air Sampling	<input checked="" type="checkbox"/>	A fall season ambient air sample taken on September 25, 2018. Results included in the Explanation of Results and Sampling Methods.
	<i>Waste Treatment and Storage System</i>	<input checked="" type="checkbox"/>	
	<i>Barns</i>	<input checked="" type="checkbox"/>	
	<i>Sprayfields</i>	<input type="checkbox"/>	
	Winter Season Ambient Air Sampling	<input checked="" type="checkbox"/>	A second ambient air sample (winter analysis) was completed on December 19 th , by Duke University, and has been added to the report. Results included in the attached Explanation of Results and Sampling Methods.
	<i>Waste Treatment System</i>	<input checked="" type="checkbox"/>	
	<i>Barn Exhaust</i>	<input checked="" type="checkbox"/>	
	<i>Sprayfields</i>	<input type="checkbox"/>	
Odor Sampling			
6	Permittee shall monitor for odor compliance quarterly at both upwind and downwind locations on the property boundary. Permittee shall document monitoring locations on a site map, indicating prevailing wind direction, for each monitoring event.		
	Quarter 3 (July 1 – September 30)	<input checked="" type="checkbox"/>	Odor sampled by Duke University Explanation of Results and Sampling Methods. September 25, 2018.

7	Quarter 4 (October 1 -December 31)	<input checked="" type="checkbox"/>	Odor sampled by Duke University Explanation of Results and Sampling Methods. December 19, 2018.
Record Keeping			
8	All records, including operation, maintenance, and repair records, shall be maintained on site and in chronological and legible form for a minimum of five (5) years by the Permittee; records shall be maintained on forms provided by or approved by the Division and shall be readily available for inspection.	<input checked="" type="checkbox"/>	A copy of the report and all monitoring records are maintained in a binder in the System Control Building; the electronic form combines inspection and operations records on a single form, entitled "Loyd Ray Farms Inspection, Operations & Maintenance Log Sheet" which are being collected electronically, and submitted to the Regional Office via email.

EXPLANATION OF RESULTS AND SAMPLING METHODS

1. Amount of Sludge or Separated Solids Disposed

N/A. No disposal of sludge or separated solids was required from the Innovative System during the 7/1/2018-12/31/2018 reporting period. Some sludge was returned from the aeration basin to the anaerobic digester for further breakdown, as per usual and typical operations, in accordance with the design and Operation and Maintenance Manual.8

2. Log of System Inspections

See Operator Log Book, Appendix A. (digitally attached)

3. Log of Operational Changes to the Innovative System

See Operator Log Book, Appendix A. (digitally attached)

4. Results of Standard Soil Fertility Analysis

Two separate reports, by NCDA & CS Agronomic Division, analyze independent soil samples which were taken at Loyd Ray Farms on October 22, 2018, as stated in the reports completed on November 1, 2018. The actual test results and recommendations for each sample can be found in Appendix C. The following tables are compiled to easily view the aggregated results.

Loyd Ray Farms Report No. FY19-SL009268

	Sample #	1A 01	1B 02	IC03	3A	3B	3C	9B
HM	Percent humic matter	0.41	0.41	0.41	0.41	0.36	0.42	0.51
W/V	Weight per volume	1.12	1.15	1.16	1.08	1.10	1.09	1.08
1	Cation exchange capacity	7.2	7.4	7.6	9.8	9.4	10.2	9.4
9	Manganese Index	165	167	172	119	120	140	232
Zn-1	Zinc Index	782	486	443	542	492	629	499
Cu-I	Copper Index	135	143	137	102	106	128	110
128	Sulfur Index	32	32	32	31	32	34	33

P-1	Phosphorus Index	53	57	56	84	91	92	86
K-1	Potassium Index	41	39	41	474	50	363	345
pH	Acidity	6.4	7.2	7.2	7.2	7.2	7.0	6.7

Loyd Ray Farms Report No. FY19-SL009269

	Sample #	2	4	5	6	7	8	9A	9B
HM	Percent humic matter	0.41	0.41	0.46	0.41	0.51	0.36	0.51	0.51
W/V	Weight per volume	1.07	1.08	1.10	1.04	1.07	1.02	1.07	1.10
CEC	Cation exchange capacity	10.7	10.7	12.1	11.2	9.9	11.4	9.0	8.8
Mn-I	Manganese Index	153	150	131	162	198	166	222	224
Zn-1	Zinc Index	616	608	1601	735	569	696	475	445
Cu-I	Copper Index	147	141	128	121	105	114	108	108
S-I	Sulfur Index	36	35	36	35	32	33	32	29
P-1	Phosphorus Index	87	89	116	90	88	91	85	83
K-1	Potassium Index	535	539	643	574	595	618	334	351
pH	Acidity	7.1	7.1	7.2	7.2	7.3	7.3	6.8	6.8

In almost all samples, the Phosphorus Index (P-I) and Potassium Index (K-I), were found to be *Above Optimum*. The range for *Optimum* is between 50 and 70, Sample 1B 02, and 1C 03 were a little below the *Optimum* range, but all others were very desirable. All of the samples in the 0269 group, in bold lettering above, exceeded those limits, and were *Above Optimum*. All of the samples in the 0268 group were at least at *Optimum* level, and many of which were in the *Above Optimum* range. The pH test for acidity results were higher than the 5.8 to 6.5 *Optimum* range, averaging about 7.1 on Report #FY19-SL009269. Similarly, the Sample # FY19-SL009268, was also in the *Optimum* range, averaging about 6.9.

The exact agronomist’s comments and recommendations for fertilizer application can be found in the Actual Soil Reports See **Appendix C**.

5. Results of Water and Air Quality Sampling

a. Results of Waste Water Analysis

Water quality samples were taken in each quarter, a synopsis of the results is found below. Samples were analyzed by Research Analytical Laboratories, Inc. in Kernersville. The 4th quarter sample of 2018, as well as 1st and 2nd quarters of 2018, resulted in higher fecal coliform counts than expected, and thus, additional samples were taken. While the re-sampling was done in January 2019, we have added it to the report for clarity. The following table compares the results of the water quality analysis of the final effluent from the Innovative System:

Parameter	8/17/2018	11/21/2018
TOT N	1080	972
TKN	1080	972
NO ₂ +NO ₃	0.27	<.05

TP	62.2	215
NH ₃ -N	689	702
COPPER	0.088	0.334
ZINC	0.489	2.32
TS	848	1300
FECAL	1400000	33000000
pH	8.23	8.17

The fecal coliform count for most of the sampling events exceeded the permit limit, and this has not been resolved. Almost all other constituent parameters as recorded above are decreasing since the beginning of the year, as indicated in the final effluent recordings in the chart above. The chart above describes the waste water analyses that is required to be conducted on a quarterly basis. These parameters are: total N, NH₃-N, NO₃-N/NO₂-N, total P, % solids, copper, zinc, pH and pathogens. Samples are to be taken from the digester and the effluent (leaving the aeration basin). All sampling was conducted:

1. Given the resampling produced fecal coliform counts that were quite high compared to the permit limit, an additional resampling event was conducted on January 9, 2019. Again, a composite sample was obtained of the effluent, split into three (3) sample bottles, then sent to the laboratory for analysis. The results are as follows:
 1. Sample ID: Effluent #1; Fecal Coliform – MPN = 400000 MPN/100mL
 2. Sample ID: Effluent #2; Fecal Coliform – MPN = 1700000 MPN/100mL
 3. Sample ID: Effluent #3; Fecal Coliform – MPN = 330000 MPN/100mL

The results were much improved over the previous fecal coliform samples.

b. The Results of Air Sampling

Duke University’s Dr. Marc Deshusses took Fall and Winter ambient Air Samples on September 25, 2018, and December 19th, 2018, respectively, the results of which are described below.

Odor Sampling #1

Odor was monitored to comply with Section I.6.b.ii of the Swine Animal Waste Management Permit. Two monitoring events occurred over this compliance period. The first monitoring event was conducted on September 25, 2018.

Sampling took place at about 11:30 am. It was an overcast day (70° F) with relatively steady wind (1.3-1.8 m/s). Several measurements for wind speed and direction were taken. The predominant wind direction and sampling points for odor were selected as shown in Figure 4.

Odor was monitored by Marc Deshusses, whose findings are reported here. Odor panelist rules were listed in the previous report and are not repeated here. Odor was monitored using a Nasal Ranger (<http://www.nasalranger.com/>) field olfactometer, following the manufacturer recommended instructions.



Figure 4. Aerial view of the facility and location of the monitoring points for odor for the June 26, 2018 sampling. The arrows indicate the prevailing wind direction the day of the sampling.

Sampling upwind

Odor could not be detected at the 2 D/T level. This indicates that the odor level was lower than 2 D/T. Then the Nasal Ranger was taken off the nose and ambient air was sniffed and compared to odorless air from the Nasal Ranger. This was to determine whether a difference could be detected between ambient air and odorless air from the Nasal Ranger. No significant difference could be detected.

Sampling downwind

Odor was measured at first downwind odor monitoring point (Downwind #2, see Figure 1). Odor could be detected at the 7 D/T level, but this location is still on the property. A second monitoring point was chosen at the property line, as specified in the permit (Downwind #3), no odor could be detected at the 2 D/T level at this location. This indicates that the odor level was lower than 2 D/T. Then the Nasal Ranger was taken off the nose and ambient air was sniffed and compared to odorless air from the Nasal Ranger. This was to determine whether a difference could be detected between ambient air and odorless air from the Nasal Ranger. No difference could be noticed.

These results indicate that odor levels complied with Section I.6.b.ii of the Swine Animal Waste Management Permit.

Odor Sampling #2

Odor was monitored to comply with Section I.6.b.ii of the Swine Animal Waste Management Permit. A second ambient air sampling was conducted on December 19, 2018, and monitored by Marc Deshusses.

Sampling took place at about 9:00 am. It was a partly overcast cold day (29° F) with quasi no wind (barely measurable to 0.3 m/s). Several measurements for wind speed and direction were taken. Although wind was quasi nil, the predominant wind direction and sampling points for odor were selected as shown in Figure 5.

Odor panelist rules were listed in the previous report and are not repeated here. Odor was monitored using a Nasal Ranger (<http://www.nasalranger.com/>) field olfactometer, following the manufacturer recommended instructions.



Figure 5. Aerial view of the facility and location of the monitoring points for odor for the June 26, 2018 sampling. The arrows indicate the prevailing wind direction the day of the sampling.

Sampling upwind

Odor could not be detected at the 2 D/T level. This indicates that the odor level was lower than 2 D/T. Then the Nasal Ranger was taken off the nose and ambient air was sniffed and compared to odorless air from the Nasal Ranger. This was to determine whether a difference could be detected between ambient air and odorless air from the Nasal Ranger. No significant difference could be detected.

Sampling downwind

No odor could be detected at the 2 D/T level at location #1. This indicates that the odor level was lower than 2 D/T. Then the Nasal Ranger was taken off the nose and ambient air was sniffed and compared to odorless air from the Nasal Ranger. This was to determine whether a difference could be detected between ambient air and odorless air from the Nasal Ranger. There was a faint piggery/barn odor with notes of ammonia, but as mentioned before these odors were below the 2 D/T level.

These results indicate that odor levels complied with Section I.6.b.ii of the Swine Animal Waste Management Permit. Ammonia nitrogen emissions from the aeration basin and lagoon were quantified to determine if significant volatilization of NH₃-N occurred from this part of the waste management system. Emissions from the water surfaces were determined using a buoyant convective flux chamber (BCFC) which method was described in detail and illustrated with pictures in the February 15, 2012 report.

Emissions from Animal Waste Treatment and Storage System – September 25, 2018

Ammonia nitrogen emissions from the aeration basin and lagoon were quantified to determine if significant volatilization of NH₃-N occurred from this part of the waste management system. Emissions from the water surfaces were determined using a buoyant convective flux chamber (BCFC) which method was described in detail and illustrated with pictures in the February 15, 2012 report. Sampling took place at about 12 pm. It was an overcast day (70° F) with relatively steady wind (1.3-1.8 m/s).

Results were as follows:

- Size of the chamber: 52.1 cm wide by 52.1 cm long and 2.5 cm in headspace height.
- Air sampling flow rate: 0.30 L/min
- **Average ammonia concentrations** in sweep air from the aeration basin while aeration was off: **114 ppm** (3 samples) or on average in mass concentration 0.064 g-N/m³
- Ammonia concentrations in sweep air while aeration was on was not measured, earlier monitoring indicated that ammonia concentration in sweep air during aeration was slightly lower.

The total emission from the aeration basin can be calculated from the air sampling flow rate, the surface of the chamber and the surface area of the aeration basin. The latter surface is nominally 24,500 ft² (or 2277 m²). Emission rate is calculated as follows:

$$\text{NH}_3 \text{ emission rate} = \text{NH}_3 \text{ concentration} \times \text{Sampling flow rate} \times \text{Aeration basin area} / \text{Buoyant chamber area}$$

After unit conversion, one obtains values of 9.7 g/h. This corresponds to a NH₃ emission rate of **1.63 kg NH₃-N/week**. This is a very low value compared to the **allowable emissions of 106 kg NH₃-N/week** from the swine waste treatment and storage structures as specified in Section I.6.a.i of the Swine Animal Waste Management Permit.

Surface emission rate of NH₃ from the **lagoon** was determined following the same method. Average concentration of ammonia in the sweep air (with the same chamber and at the same flowrate of 0.3 L/min) was 120 ppm (2 samples). With the surface area of the lagoon (19,425 m²), emission of NH₃ from the lagoon are estimated to be **14.7 kg NH₃-N/week**.

Results for the emissions from the aeration basin and the lagoon are summarized in the table below. Total ammonia (TAN) in the aeration basin and lagoon at the time of sampling is also reported for information. These numbers show the system is performing as expected.

	Aeration basin	Lagoon
Surface area	2277 m ²	4.8 acres = 19,425 m ²
TAN	955 mg-N/L	215 mg-N/L
Emission rate	1.63 kg NH ₃ -N/week	14.7 kg NH ₃ -N/week
Total emission (lagoon + aeration basin)	16.4 kg NH₃-N/week	

Thus, together lagoon and aeration basin contribute to the emission of **16.4 kg NH₃-N/week**. This is well below the allowable 106 kg NH₃-N/week.

Emissions from the Barns

Ammonia emissions from the barns were also determined on September 25, 2018. It should be noted that accurate determination of emissions from animal houses is a difficult exercise. This is because of the variable nature of the emission, the difficulty in accurately measuring air flow from the fans on the animal houses, and the fact that fan operation is automated, i.e., they are turned on and off automatically triggered by a thermostat. Thus, uncertainties on the numbers reported below exist and can be important.

Ammonia in the exhaust air from the barns was determined using Draeger tubes. Details on the concentrations and number of fans on at the time of sampling are shown in the table below.

Barn	NH ₃ Concentration (ppm)	Small Fans working	Large Fans working
1	4	1	1
2	1	0	2
3	1.5	1	1
4	0.9	1	0
5	2.7	0	2
6	1.5	1	2
7	5	1	1
8	4	1	2
9	3.5	1	1

The total emission of ammonia can be estimated by multiplying the ammonia concentration in each of the barn's exhausts by the exhaust flowrate of that barn (33,000 cfm for large fans and 13,000 cfm for the small fans). At the time of sampling, total exhaust flow was 487,000 cfm and concentrations ranged from 0.9 to 5 ppm (see Table above). The calculated total weekly ammonia emissions from the barns was **216 kg NH₃-N/week**.

Adding the emission from the treatment system and the lagoon (**16.4 kg NH₃-N/week**) to the emissions from the barns (371 kg NH₃-N/week) amounts to a **total of 232.1 kg NH₃-N/week** from the swine farm. This is below the allowable value of 476 kg NH₃-N/week specified in Section I.6.a.iii of the Swine Animal Waste Management Permit.

Emissions from Animal Waste Treatment and Storage System – December 19, 2018

Ammonia nitrogen emissions from the aeration basin and lagoon were quantified to determine if significant volatilization of NH₃-N occurred from this part of the waste management system. Emissions from the water surfaces were determined using a buoyant convective flux chamber (BCFC) which method was described in detail and illustrated with pictures in the February 15, 2012 report. Sampling took place on December 19, 2018 between 9:30 am and 11:00 am. It was a partly overcast cold day (29° F) with quasi no wind (barely measurable to 0.3 m/s). Temperature was 29° F.

Results were as follows:

- Size of the chamber: 52.1 cm wide by 52.1 cm long and 2.5 cm in headspace height.
- Air sampling flow rate: 0.30 L/min
- **Average ammonia concentrations** in sweep air from the aeration basin while aeration was off: **90 ppm** (3 samples) or on average in mass concentration 0.051 g-N/m³
- Ammonia concentrations in sweep air while aeration was on was not measured, earlier monitoring indicated that ammonia concentration in sweep air during aeration was slightly lower.

The total emission from the aeration basin can be calculated from the air sampling flow rate, the surface of the chamber and the surface area of the aeration basin. The latter surface is nominally 24,500 ft² (or 2277 m²). Emission rate is calculated as follows:

$$\text{NH}_3 \text{ emission rate} = \text{NH}_3 \text{ concentration} \times \text{Sampling flow rate} \times \text{Aeration basin area} / \text{Buoyant chamber area}$$

After unit conversion, one obtains values of 7.7 g/h. This corresponds to a NH₃ emission rate of **1.29 kg NH₃-N/week**. This is a very low value compared to the **allowable emissions of 106 kg NH₃-N/week** from the swine waste treatment and storage structures as specified in Section I.6.a.i of the Swine Animal Waste Management Permit.

Surface emission rate of NH₃ from the **lagoon** was determined following the same method. Average concentration of ammonia in the sweep air (with the same chamber and at the same flowrate of 0.3 L/min) was 65 ppm (2 samples). With the surface area of the lagoon (19,425 m²), emission of NH₃ from the lagoon are estimated to be **7.97 kg NH₃-N/week**.

Results for the emissions from the aeration basin and the lagoon are summarized in the table below. Total ammonia (TAN) in the aeration basin and lagoon at the time of sampling is also reported for information. These numbers show the system is performing as expected.

	Aeration basin	Lagoon
Surface area	2277 m ²	4.8 acres = 19,425 m ²
TAN	1048 mg-N/L	277 mg-N/L
Emission rate	1.29 kg NH ₃ -N/week	7.97 kg NH ₃ -N/week
Total emission (lagoon + aeration basin)	9.27 kg NH₃-N/week	

Thus, together lagoon and aeration basin contribute to the emission of **9.27 kg NH₃-N/week**. This is well below the allowable 106 kg NH₃-N/week.

Emissions from the Barns

Ammonia emissions from the barns were also determined on December 19, 2018. It should be noted that accurate determination of emissions from animal houses is a difficult exercise. This is because of the variable nature of the emission, the difficulty in accurately measuring air flow from the fans on the animal houses, and the fact that fan operation is automated, i.e., they are turned on and off automatically triggered by a thermostat. Thus, uncertainties on the numbers reported below exist and can be important.

Ammonia in the exhaust air from the barns was determined using Draeger tubes. Details on the concentrations and number of fans on at the time of sampling are shown in the table below. It should be noted that at least one barn was empty, and that since it was a relatively cold day, several barns only had one fan operating, some fans where toggling on and off. Still a value of 1 fan on was used for these barns and thus emissions reported may be overestimated.

Barn	NH ₃ Concentration (ppm)	Small Fans working	Large Fans working
1	5	1	0
2	18	1	0
3	not determined	0	0
4	8	1	0
5	8	1	0
6	12	1	0
7	11	1	0
8	9	1	0
9	15	1	0

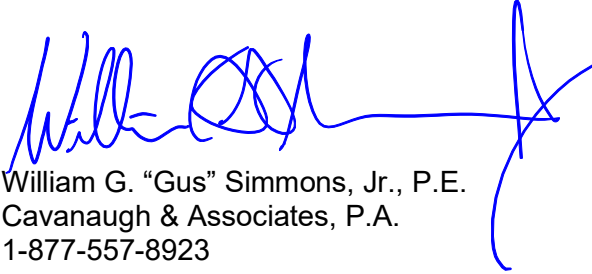
The total emission of ammonia can be estimated by multiplying the ammonia concentration in each of the barn's exhausts by the exhaust flowrate of that barn (33,000 cfm for large fans and 13,000 cfm for the small fans). At the time of sampling, total exhaust flow was 104,000 cfm and concentrations ranged from 5 to 18 ppm (see Table above). The calculated total weekly ammonia emissions from the barns was **181 kg NH₃-N/week**.

Adding the emission from the treatment system and the lagoon (**9.27 kg NH₃-N/week**) to the emissions from the barns (371 kg NH₃-N/week) amounts to a **total of 190.0 kg NH₃-N/week** from the swine farm. This is below the allowable value of 476 kg NH₃-N/week specified in Section I.6.a.iii of the Swine Animal Waste Management Permit.

Additional Observations

The previous DWR Inspection mentioned that interior portion and aeration basin was eroding, and that vegetation should be established to control briars and other broadleaf weeds on embankments. The monitoring staff has been working with the Loyd Ray Farm staff to correct this situation, and has been actively seeding this area, with plans to re-seed again in Spring of 2019. Any undergrowth, including sprouting small trees or broadleaf weeds on the embankments are designated to be cut as soon as the ground can hold the equipment. The application fields appear to be well vegetated.

This Semi-annual Compliance Report is compiled and respectfully submitted by:



William G. "Gus" Simmons, Jr., P.E.
Cavanaugh & Associates, P.A.
1-877-557-8923

Attachments:

- Appendix A – PDF of Actual log sheets
- Appendix B – Sample Collection Dataset
- Appendix C - Soil Report

APPENDIX A Operation and Log Sheets – Digitally Attached

Appendix A.

Loyd Ray Farms Operations Log

OFFICIAL COPY

Feb 26 2019

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 7-25-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 8:00 AM	Site Visit end 12:30 PM
Condition: Temperature 70-88	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours 03.0 inches	Wind: (mph): calm 4-7mph		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night since 7-19-2018 when we shut down the MT and ran only the flare to manage the gas balloon until today 7-25-2018. I did a site visit to meet with Alex Gusnes of E-Finity we serviced MT and replaced air filter and faulty fan we are running. We found a faulty Rosemount meter registering incorrectly going to the MT. I pumped surface water and did a walk around site check.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 7-27-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 9:00 PM	Site Visit end 10:30 PM
Condition: Temperature 70-88	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours 03.0 inches	Wind: (mph): calm 4-7mph		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night since 7-19-2018 . I pumped surface water and did a walk around site check. Turned flare on with 10 CFM going to flare

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 7-30-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 1:00 PM	Site Visit end 2:30 PM
Condition: Temperature 70-88	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours Trace inches	Wind: (mph): calm 4-7mph		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24 – 7 schedule as needed. I pumped surface water and did a walk around site check. Turned flare Off the balloon is getting low we still are way short on Pigs 5 of the 9 are empty. I installed a temporary cover for gas MH. Ditched a little to help get water away from the MH.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date 7-31-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start	Site Visit end
Condition: Temperature 70-88	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours Trace inches	Wind: (mph): calm 4-7mph Heavy storms/high winds/PM		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24 – 7 schedule as needed. Monitored storms and heavy rainfall as well as lighting .

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	

Blower		30Hz	
Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
<i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	20.9				
Microturbine	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
<i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date 8-02-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 8:00 AM	Site Visit end 5:30 PM
Condition: Temperature 70-88	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours 6 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24 – 7 schedule as needed. Site visit to review storm damage. Worked all day with all entities to try and restore system back to normal operations. Monitored operations after storm damage trying to keep us running.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10 inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date 8-02-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start	Site Visit end
Condition: Temperature 70-88	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours ? inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24 – 7 schedule as needed. Monitored operations after storm damage trying to keep us running.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 8-03-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start	Site Visit end
Condition: Temperature 70-88	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours ? inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24 – 7 schedule as needed. Monitored operations after storm damage trying to keep us running.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date 8-06-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 10:30 AM	Site Visit end 5:30 PM
Condition: Temperature 70-95	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours 4 inches 8-02-05-18	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. Monitored operations after storm damage trying to keep us running. Site visit to try and start us up and I started the Flare as the the gas balloon is growing I pumped surface water and nursed the system to run, it failed twice due to heat

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 8-07-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 02:00 AM	Site Visit end 5:30 PM
Condition: Temperature 70-95	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours A trace inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. Monitored operations after storm damage trying to keep us running. Site visit to restart and monitor our operations. I shut the Flare off as the balloon was at a level needed to shed rain. I pumped surface water and nursed the system to run. I talked with or emailed folks at Unison and E-Finity. A Tech from E-Finity is scheduled to be here on Thursday.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 8-08-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 02:00 AM	Site Visit end 4:15 PM
Condition: Temperature 70-95	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours: 1.2 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24-7 schedule as needed. Monitored operations after storm damage trying to keep us running. Site visit to meet with Ollie Frazier and folks from Surry-Yadkin EMC. I was running a little behind, but Ollie gave them the tour and I joined. We had lunch and discussed farther. I returned to farm to monitor our operations. I plan to leave the Flare off and build the balloon. I made some minor electrical repairs. Rain is on the horizon Shut down at 2:45 PM restart 1 failed I am trying again at 3:40 PM I had to reboot the MT we are back running at 4:10 PM

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date 8-09-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 10:00 AM	Site Visit end 4:00 PM
Condition: Temperature 70-95	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours: 0.5 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. Monitored operations after storm damage trying to keep us running. Site visit to meet with Tyler Anderson of E-Finity for repair of communications with MT. I have not heard from Unison but so far we have not shut down. I will do a follow up email to Nick with unison.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 8-11-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 6:30 PM	Site Visit end 9:00 PM
Condition: Temperature 70-86	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 48 hours: 0.5 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. Site visit to do a restart after a skid shut down because the MT would not start remotely I ran a test and found that the MT failed to restart automatically after a skid shut down so I started the flsre I will do a follow up email to Nick with unison.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date 8-13-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 12:30 PM	Site Visit end 4:00 PM
Condition: Temperature 70-86	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 48 hours: 0.5 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. Site visit to do a restart with E-Finity. I will do a follow up email to Nick with unison. We had a good start up but now a skid warning for 33/342 reheat temp at 2:45

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date 8-14-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 12:00 PM	Site Visit end 1:15 PM
Condition: Temperature 70-86	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 24 hours: 0.5 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. Site visit to do a restart with E-Finity. I will do a follow up email to Nick with unison. We had a good start up but now a skid warning for 33/342 reheat temp at 2:45 yesterday and eventually shut down after restarting the skid the MT would not start so I shut it down. I have restarted the skid today and will get E-Finity to unblock the MT and start it also. I did a walk around inspection and started the auto pump for surface water.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date Friday 8-17-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 11:00 AM	Site Visit end 1:15 PM
Condition: Temperature 70-86	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Balmy
Precip Past 48 hours: 0.0 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. I did a walk around inspection and started the pump for surface water. I found during night that the Flare would not start. I turned on the mail at the MT and we ran fine. I took samples.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date Monday 8-20-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 12:00 PM	Site Visit end 1:30 PM
Condition: Temperature 65-82	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Cloudy misty	<input type="checkbox"/> Balmy
Precip Past 48 hours: 0.15 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. We ran great until Sunday 8-19-2018 During the day on Sunday we had a shut down and after the outside temperature cooled I had a successful restart of both the skid and the MT. Today Monday 8-20-18 I did a walk around inspection and all seemed to be working fine.

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

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Entry Made By: Marvin	Date Tuesday-Wednesday 8-21-22-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 12:00 PM	Site Visit end 1:30 PM
Condition: Temperature 65-82	<input type="checkbox"/> Clear	<input checked="" type="checkbox"/> Cloudy misty	<input type="checkbox"/> Balmy
Precip Past 48 hours: 0.15 inches	Wind: (mph): calm 4-7mph higher during storms		

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24-7 schedule as needed. We had a couple shut downs but was able to restart by remote

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
CP-1 (Control Panel)	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Flush Pumps	<input type="checkbox"/> Auto <input checked="" type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Digester Mixing Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault

CP-1 DATA & SET POINTS;

Cycles	Set Point	Current	Modified Set Pt	Notes
Static	60	60		
Anoxic	90	90		
Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
Unison Gas Skid <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Rate	Total Flow	Comp. Press.	Outlet Press.	Gauge Press.
	20.9				
Microturbine <i>Fault?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Speed	Exit Temp	Inlet Pressure	Inlet Temp	Power Out
	95852	1174		99	43.7 kw
Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	31.2	29.1	301

UNISON GAS CONDITIONING LOG

Pressure Data	PIT 311 -5 to 10 inWC -0.1	PIT 331 88 to 110psig 97.39	PIT 351 88 to 110 psig 91.8	Pressure Differential 2.0	Panel Door	HM 331 Hours 7060	
Temperature Data	TE 141 32 to 45 F 35.1	TE 311 40 to 115 F 83.1	TE 321 35 to 75 F 46.6	TE 331 80 to 220 F 186.5	TE 341 33 to 45 F 35.2	TE 342 65 to 90 F 88.3	TE 31 35 to 115 F
Glycol Piping	TI 141 32 to 45 F	PI 141 35 to 52 psig	FI 141 2.5 to 3.5 gpm	TI 142 35 to 50 F	PI 142 33 to 50 psig	TI 111 38 to 52 F	PI 111 30 to 48 psig
Oil Piping	PI 231 90 to 110 psig	TI 231 178 to 215 F	PI 232 85 to 105 psig	TI 232 130 to 180 F	PI 233 80 to 100 psig	TI 233 168 to 185 F	PI 234 78 to 100psig
Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email

LOYD RAY FARMS INSPECTION, OPERATIONS & MAINTENANCE LOG SHEET

IMPORTANT: AN INSPECTION, OPERATIONS & MAINTENANCE LOG SHOULD BE COMPLETED FOR EVERY SITE VISIT; PLEASE REVIEW PREVIOUS LOG ENTRY AND PROVIDE INFORMATION TO UPDATE OR RESOLVE ANY ONGOING ISSUES NOTED (INCLUDING BUT NOT LIMITED TO MAINTENANCE, REPAIRS, OR CORRECTIVE ACTIONS).

Entry Made By: Marvin	Date Thursday 8-23-2018	Remote monitor Start: 7:00 AM	Remote Monitor End: 11:30PM
		Site Visit start 10:30AM	Site Visit end 1:30 PM
Condition: Temperature 60-78	<input checked="" type="checkbox"/> Clear <input checked="" type="checkbox"/> Cloudy <input type="checkbox"/> Balmy		
Precip Past 48 hours: 1.4 inches		Wind: (mph): calm 4-7mph higher during storms	

PURPOSE OF VISIT/ITEMS INSPECTED, OPERATIONS

Monitored system remotely. 7:00 AM – 11:30 PM and whenever I wake during the night this goes on a 24–7 schedule as needed. Site Visit to meet with folks from Duke U Matt Arsenault, Alex Gusner and Student Sarah Lanier. We took samples from Lagoon Basin and Digester along with Gas samples, I did my on site inspection and restarted the auto pump and another non-auto pump to handle surface water. All is well, and all went well

ENVIRONMENTAL SYSTEM OBSERVATIONS:

Equipment Observed:	Operational Status
Fluidyne Aeration System, Including:	
Jet Motive Pumps	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault
Blower	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Hand On <input type="checkbox"/> Off <input type="checkbox"/> In Fault:
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Aerobic	180	180		
Blower	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Cycle			
Jet Motive Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Pump #1 <input type="checkbox"/> Pump # 2			
Digester Pumps	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Both <input type="checkbox"/> Sequential			

MOTOR DATA:

Aerobic	Run Time	Set Speed	Notes
Jet Motive Pump # 1		60Hz	
Jet Motive Pump # 2		60Hz	
Blower		30Hz	

Anaerobic			
Mixing Pump 4A		60 Hz	
Mixing Pump 4B		60 Hz	

BIOGAS & POWER SYSTEMS OBSERVATIONS:

Equipment Observed:	Operational Status				
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	20.9				
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Biogas System	BlueSens%	Flare On	Flare Flow	Total Flow	Flare Temp
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UNISON GAS CONDITIONING LOG

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Gas Piping	PIT 311 -10 to 10inWC	TI 311 40 to 115 F	TI 321 35 to 75 F	PDI 321 0 to 6 inWC	PI 331 90 to 110 psig	TI 331 80 to 220 F	PI 332 90 to 110psig
Gas Piping	TI 341 80 to 220 F	PI 341 90 to 110 psig	TI 342 115 to 155 F	PI 342 90 to 110 psig	TE 343 33 to 45 F	PI 343 90 to 110 psig	
Gas Piping	TI 351 65 to 90 F	PI 351 88 to 15 psig	Check Indicators	LI 721	LI 231	LI 741	

PERSONNEL PRESENT:

Name	Affiliation	Phone Number/Email