QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PLAN

FOR

ONEIDA COUNTY DEPARTMENT OF WATER QUALITY & WATER POLLUTION CONTROL ANAEROBIC DIGESTER GAS (ADG) SYSTEM

Agreement # 73665

June 17, 2019

Submitted to:

New York State Energy Research and Development Authority
17 Columbia Circle
Albany, NY 12203-6399

and

Oneida County Sewer District WPCP
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Submitted by:

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Introduction

This plan describes the approach that will be used to monitor the performance of the anaerobic digester gas system (ADG System) that is currently being installed by Oneida County Sewer District Water Pollution Control Plant (WPCP) at that Oneida Wastewater Treatment Plant (WWTP) in Oneida, NY, to produce biogas and electricity. Biogas will be used to fuel three 200 kW microturbines to produce power that will be consumed on site and/or exported back to the local utility. A monitoring system will be installed to measure and collect the data necessary to quantify the electric power produced and amount of biogas used by the microturbine. The data will serve as the basis for payment of ten (10) years of performance incentive payments, which the plant has applied for under a Standard Performance Contract with NYSERDA based on a Total Contracted Capacity of 600 kW.

ADG System Description

The digester system at the plant was designed by GHD Consulting Services, Inc (GHD). The microturbine equipment will be provided by Capstone Turbine while the gas conditioning equipment will be supplied by Unison Solutions. Gas and power metering are provided by Fox Thermal Instruments, Inc. and Electro Industries GaugeTech Inc, respectively. The site will operate three 200 kW microturbines. Gas conditioning equipment, piping, and controls will be located near to the microturbines. The electrical system includes controls to synchronize the microturbines to the grid as well as Beckwith M-3410A and Beckwith M-3520 protective relays and a grid monitoring device to automatically isolate the units from the utility grid in the event of a utility power outage. Due to the ability to modulate microturbine operation to match biogas production, the plant expects to observe up-time of approximately 97 percent. In addition to power production, the plant also plans to recover heat from the microturbines to offset natural gas consumption.

Hydrogen Sulfide Removal System Description

The gas conditioning system was designed by Unison Solutions. The Unison Solutions model CGS-250-HS gas conditioning system includes a single H_2S iron sponge inlet that will remove H_2S prior to siloxane adsorption to prevent fouling of the siloxane adsorption media. H_2S concentrations below 10 parts per million (ppm) is needed to prevent degradation of the siloxane media life. An Advanced Micro Instruments (AMI) model 3010BR hydrogen sulfide analyzer is used to measure H_2S concentrations up to 2,000 ppm. The gas conditioning system is designed for a biogas flow rate of 250 standard cubic feet per minute (scfm) containing up to 1,000 ppm of H_2S.

Figure 1: Aerial View of Oneida County Sewer District WPCP (left) and Digester Construction Progress (right)

Figure 2: Microturbine installation

Table 1 - Biogas Systems at Oneida WWTP

Digester	• Primary: (2) Digesters, completely mixed, egg-shaped with cone-sphere geometry, heated, 2.4 million gallon capacity (total), minimum 20 day retention time • Secondary: (1) Digester for sludge and biogas storage, flexible dual membrane, 1 million gallon capacity, contains heating and mixing systems to allow for primary digester operation
Feedstock	Municipal wastewater sludge, approximately 7,760 tons/yr
Microturbine	(1) Capstone C600S 5-bay Power Package, 480 VAC, 3 phase, 600 kW on biogas, (3) 200 kW microturbines
Boilers	(3) natural gas boilers for supplemental/backup heating. (2) duty, (1) standby, 2,800 MBH/each
Biogas Conditioning	H_2S removal system, gas compression and moisture removal skid, siloxane removal system
Microturbine Backup/startup Fuel	Biogas Only for Microturbine Start-up
Heat Recovery Use	Digester and plant buildings

Figure 3 and Figure 4 show the plant site plan and digester complex. Two primary egg-shaped digesters (ESDs) will be used to handle 7,760 dry tons per year of sludge feed. Each ESD will produce 47 MCF of biogas per year for a total of 94 MCF per year. The biogas will flow into a secondary digester/storage tank for holding. The secondary digester includes a flexible dual membrane, which includes a low-pressure internal chamber for biogas storage and an external structural membrane. The external membrane is continuously inflated by air and supports environmental loads (snow and wind) experienced by the gasholder cover throughout its operating life. The supplied biogas conditioning system includes a gas compression/moisture removal/siloxane removal skid, a hydrogen sulfide removal system, a glycol chiller, and associated gas safety equipment, piping, valves, instrumentation, and controls. From the gas conditioning system, the gas will flow into the three microturbines that are staged to energize/de-energize microturbines as necessary to match the incoming gas flow. Energy generated from the microturbines will be used on-site or sent back to the grid. Heat generated from the microturbines will feed directly into three heat exchangers that will be used to heat the ESDs and secondary digester. The ESDs have two 20 HP recirculation pumps (one duty, one standby) that circulates the heat transfer fluid between the digesters and the heat exchanger. Alternatively, heat generated from the microturbines will also be used to heat buildings on-site. Three supplementary boilers (2,800 MBH each) will be used for start-up, backup, and additional building heating as needed. Two main 10 HP hot water recirculation pumps will be used for the building heating. There are secondary recirculation pumps of unknown size that provide additional hot water pumping capacity. Any remaining heat generated that cannot be captured will leave the plant as waste heat.

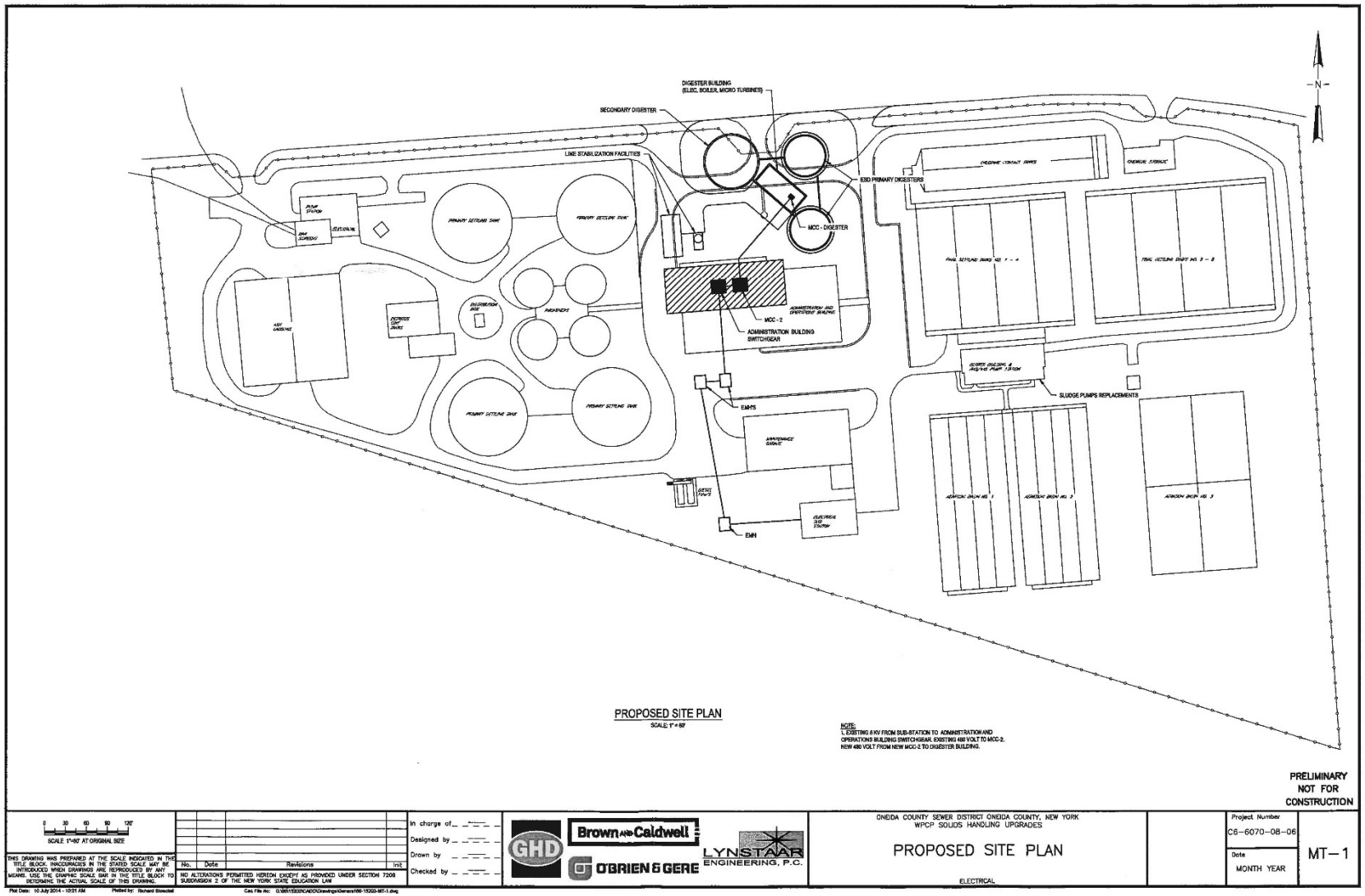

Figure 3: Site Plan

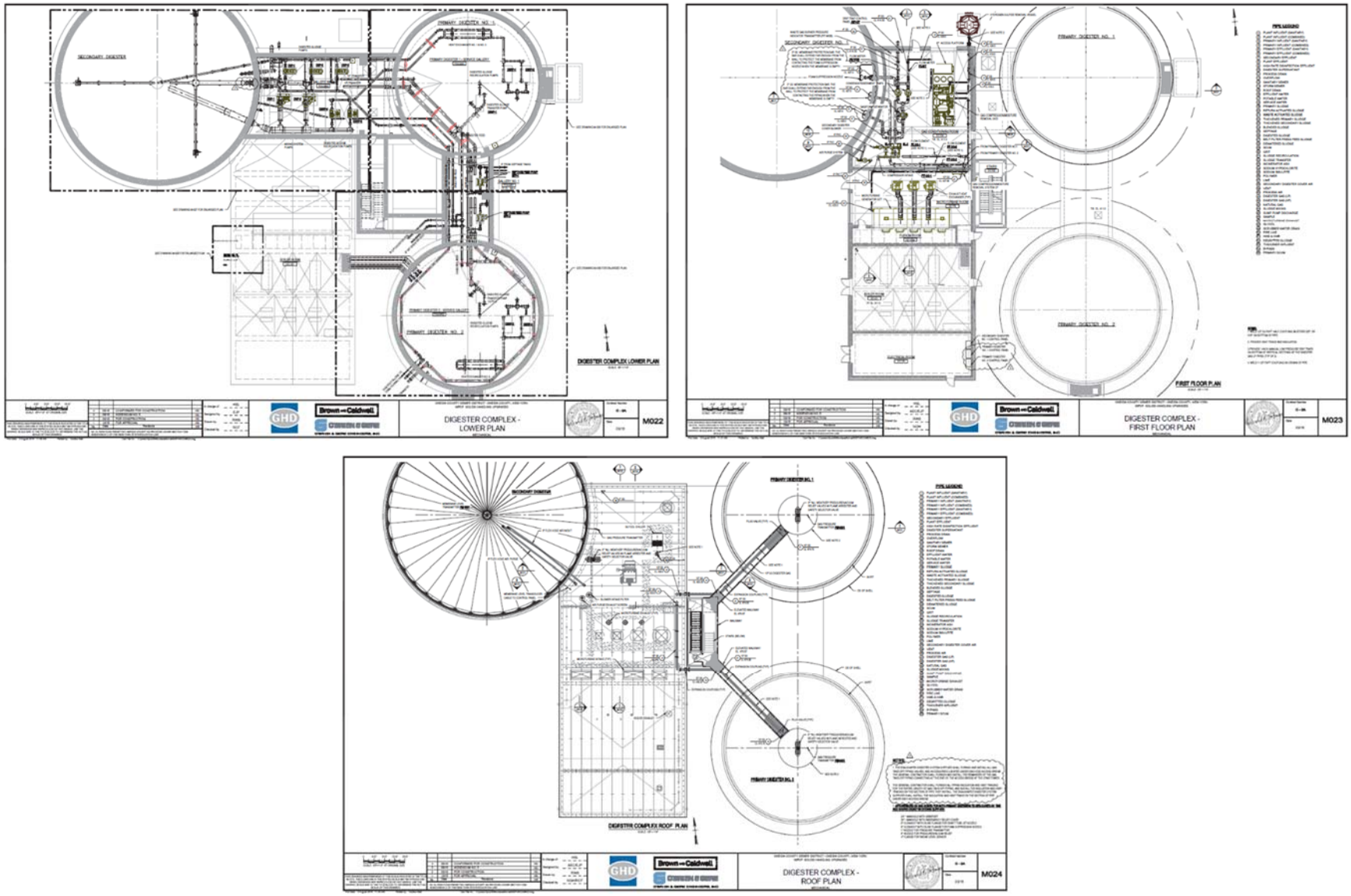

Figure 4: Digester Complex Lower Plan (Top Left), First Floor Plan (Top Right), and Roof Plan (Bottom)

Figure 5 shows the process diagram for the digester and Microturbine system. Thickened primary and waste sludge will be blended in sludge blend tanks (converted gravity sludge thickeners) and pumped to the two ESDs for sludge stabilization. The plant will also be provided with a septage receiving station where external waste hauled from food industries, dairy industries, fats, oils, and greases collected in the system will be screened and pumped to the dual 1.2 million gallon capacity ESDs (2.4 million gallon total capacity). Each ESD is approximately 67 feet in diameter and 80 feet tall. Digested sludge from the ESDs will be transferred to a common secondary digester for sludge storage where decanting will be performed. The secondary digester will be equipped with a flexible dual membrane cover where the biogas produced by the anaerobic digester process in the ESDs will be stored.

Biological removal of hydrogen sulfide from the biogas will occur using an iron sponge process. Biogas is streamed through a vessel with iron particles. Air is injected into the biogas to promote chemical conversion of H_2S into elemental sulfur. The microturbines are conservatively expected to operate at a capacity factor of approximately 93% after accounting for biogas production rates and expected maintenance intervals of the microturbines and digester. The planned biogas distribution will be used completely for power generation with potential excess biogas flared in a waste gas burner as needed for backup.

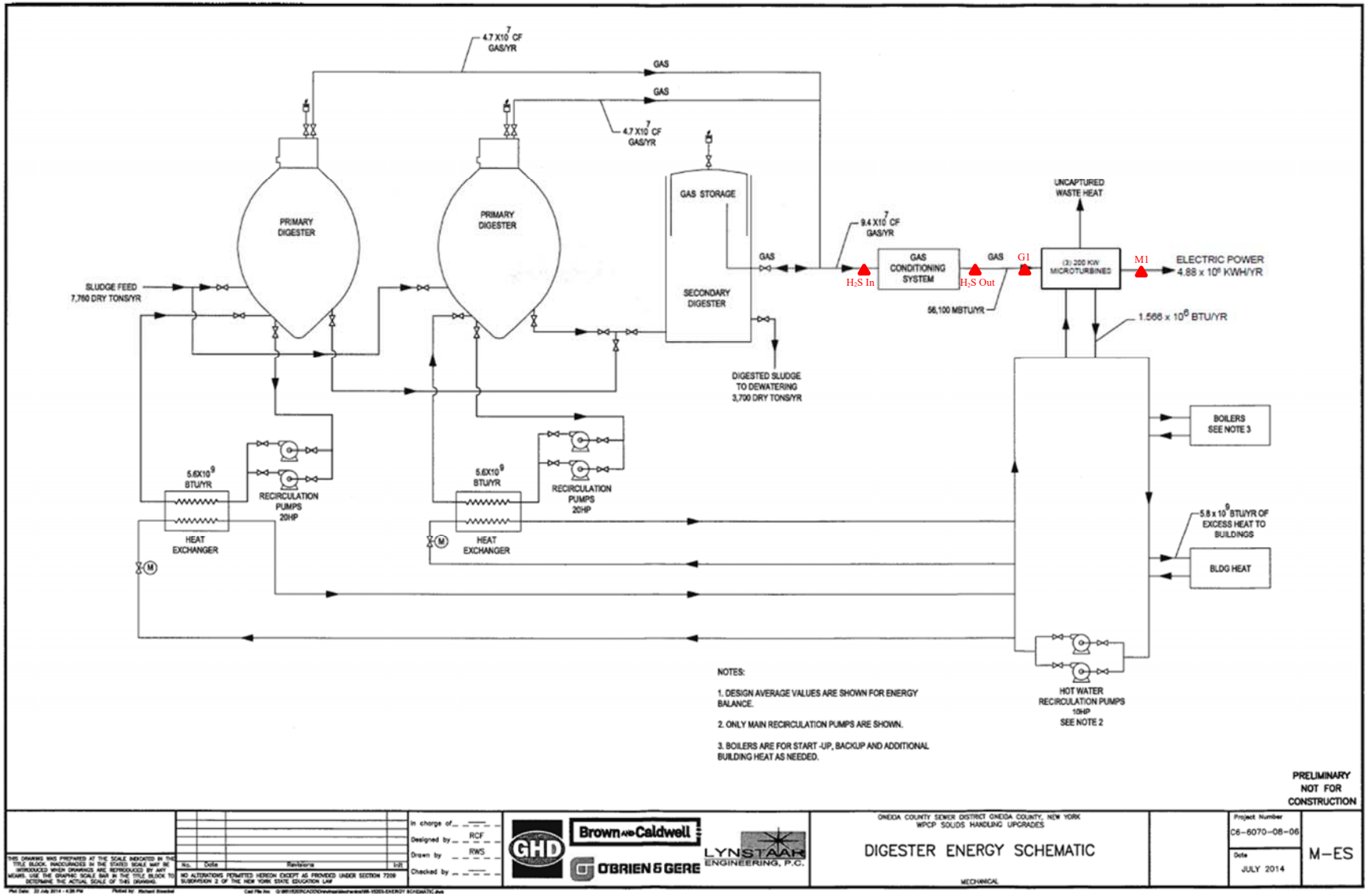

Figure 5: Proposed Digester Process Diagram

Fox Thermal Instrutments, Inc. devices will measure gas flow to the microturbine. A Shark 100 Revenue grade meter will measure the energy output and power data of the microturbine to determine the Annual Performance Incentive. The H_2S removal vessel will use an iron sponge to help reduce H_2S in the biogas. This limit is to protect the microturbines from damage or overheating due to concentrations of H_2S. Measurement of H_2S will be performed using an Advanced Micro Instruments hydrogen sulfide analyzer Model 3010BR. The analyzer features built-in data logging of hydrogen sulfide and temperature with a real-time clock.

Heat is recovered from the microturbine exhaust in the form of hot water. This hot water is circulated through the heat exchanger where it provides heat to the digester contents, pumped by the recirculation pump. A similar system is used to offset the heating requirements in other plant buildings on-site. For start-up, backup, and additional building heat requirements, supplementary boilers are on standby.

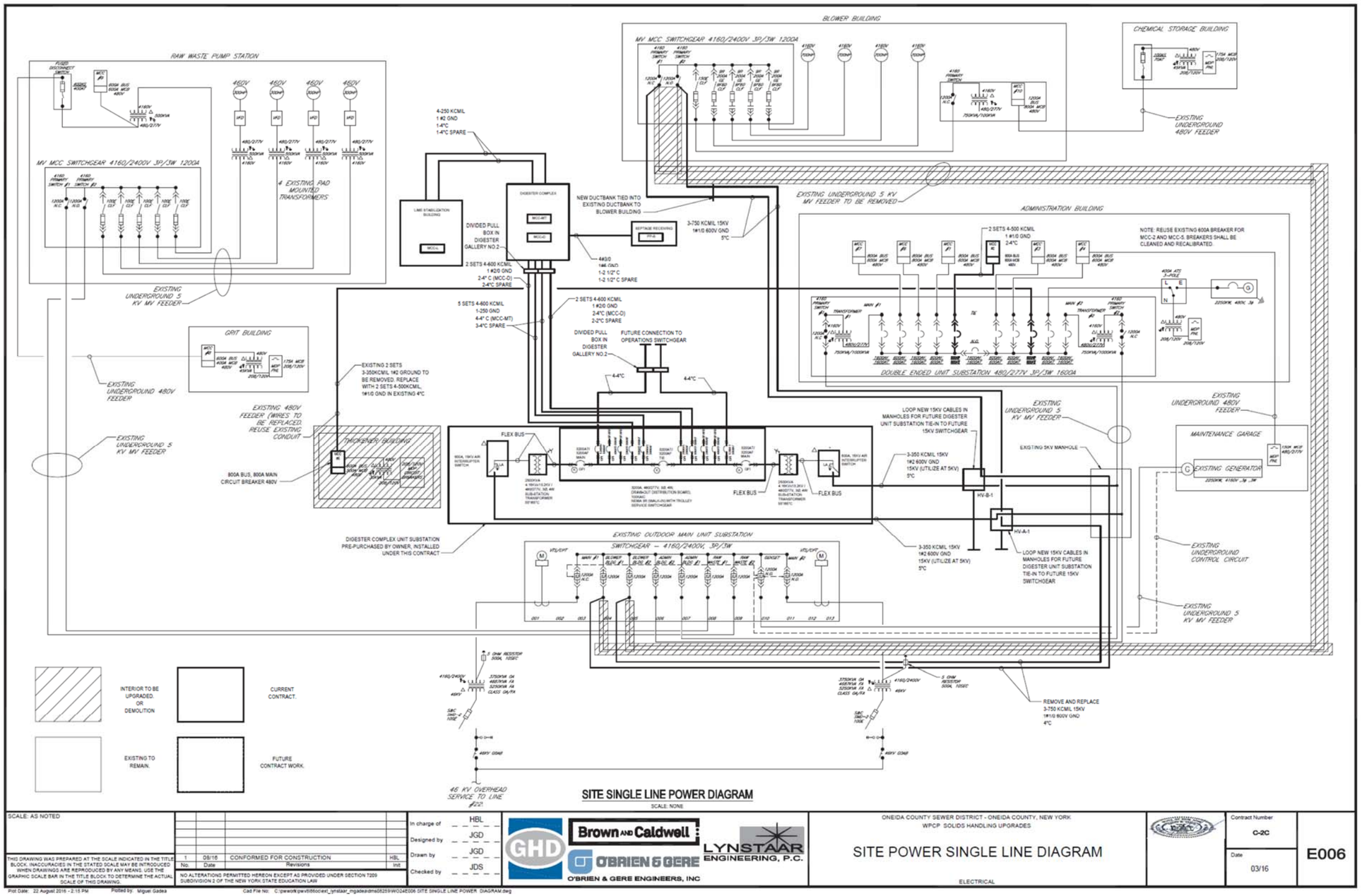

Figure 6: One Line Electrical Diagram

ADG System Capacity Payment Descriptions

This Section describes the Capacity Incentive Payments included in the Agreement, the payment milestones to be achieved in order to receive payment, and the deliverables to be provided in achieving these milestones.

Capacity Payment #1: Up to 15% of the Total Capacity Incentive.

Payment Milestones: Initial payments made for major equipment and other work, such as the microturbine system, the anaerobic digester system, the gas scrubbing equipment, and other major components and fees for system design, engineering, CESIR study and other "soft costs".

Deliverables: Documentation that initial payments have been made to suppliers or service providers for major project components.

Capacity Payment #2: Up to 45% of the Anaerobic Digester component of Total Capacity Incentive.

Payment Milestones: NYSERDA's designated technical consultant has verified that construction/installation/upgrade of the anaerobic digestion system has been completed.

Deliverables: (a) A QA/QC Plan approved by NYSERDA and (b) Site inspection and verification by the NYSERDA technical consultant that the installation is complete and operational in accordance with the approved QA/QC Plan. The digester can be considered complete and operational if the digester structures, piping, controls and equipment are all installed for the feeding mixing, heating and unloading of digester feedstocks and for gas treatment and flaring. The completed installation may be documented with (1) a listing of the digester structures, piping, controls and equipment for feeding, mixing, heating and unloading and gas treatment and flaring and other major equipment to be installed in the design and (2) provision of as-built drawings, photos, verification by on-site inspection by the NYSERDA technical consultant, and/or other means satisfactory to NYSERDA documenting that these have been installed and are ready to operate to produce and manage the design biogas power generation rate of approximately 11,004 scf/hr identified in the updated project Application Package to PON 2828 Appendix B Section B as a total of 96,400,000 scf/yr. The original application submission only included biogas production from total volatile solids. The updated project Application included total sludge to the digester. *(If the installed equipment deviates from that listed in the Application Package, an explanation of the deviation must be provided for*

determination by NYSERDA whether the installed equipment adequately meets the terms of the Agreement.)

Capacity Payment #3: Up to 45% of the Power Generation component of Total Capacity Incentive.

Payment Milestones: The Contractor has provided sufficient documentation to NYSERDA verifying that the power generation system has been delivered to the site (e.g., delivery receipt).

Deliverables*:* Delivery receipts, photos or other documentation acceptable to NYSERDA of delivery of the microturbine equipment as described in the Agreement and adequate explanation of any deviations. *(If the installed equipment deviates from that listed in the Application Package, an explanation of the deviation must be provided for determination by NYSERDA whether the installed equipment adequately meets the terms of the Agreement.)*

Capacity Payment #4: Up to 45% of the Project Enhancement component of Total Capacity Incentive.

Payment Milestones: NYSERDA's designated technical consultant has verified that construction/installation of the Project Enhancement component(s) has (have) been completed or the required documentation for the Project Enhancement, according to applicable sections of *Using the Incentive Calculation Tool* of Exhibit D has been submitted to NYSERDA. The Contractor may request payment at this time for any Project Enhancements that have been completed and verified. Payment for Project Enhancements completed and verified after the 4th Capacity payment request has been made may be requested with the 6th Capacity payment.

Deliverables: Documentation that the project enhancement for the system designed to accept greater than 20% food waste has been completed, including pretreatment equipment, all meeting the requirement of Enhancements Section 3 of the Using Incentive Calculation portion of Exhibit D.

Capacity Payment #5: Up to 20% of the Total Capacity Incentive.

Payment Milestones: Documentation has been provided to NYSERDA that sufficiently verifies successful operation of the newly installed system and completion of interconnection.

Deliverables: The New Power Generation Capacity can be considered complete and operational if it has produced electricity at a minimum average of 75% capacity factor or 450 kWh/h for at least one hour. Verification of successful operation may include documentation of operation of the equipment with data from meters or hand-held biogas biogas measurement equipment or other methods of verification acceptable to NYSERDA. Interconnection completion can documented with a copy of interconnection acceptance test documentation from the utility or with other documentation acceptable to NYSERDA.

Capacity Payment # 6: Up to 100% of the Total Capacity Incentive.

Payment Milestones: The newly installed system is successfully commissioned. Commissioning includes operating the ADG-fueled energy generation system at a minimum of 75% average capacity factor over seven (7) consecutive days, and demonstrating the ability to upload data generated by the system to NYSERDA's Distributed Energy Resources (DER) Integrated Data System website, if applicable. Any Project Enhancements payments that were not made with the 4th Capacity payment may be requested with this payment.

Deliverables: A Project Commissioning Report documenting the completion of all elements of the Commissioning process required by the QA/QC Plan and successful uploading of data to the website that is adequately consistent to NYSERDA's satisfaction with the data recorded on site. The Project Commissioning Report shall consist of the compilation of the following deliverables is provided to NYSERDA's satisfaction as meeting the requirements for the 6th Capacity Incentive Payment.

1. Documentation that construction of the ADG-to Electricity System is complete;

2. Documentation that the System's New Equipment has satisfactorily operated for at least seven consecutive days, which is defined as operation with a minimum average 75% Capacity Factor of the Total Contracted Capacity or 450 kWh/h;

3. Documentation that the new biogas treatment system produces biogas with less than 400 ppm of H_2S during 75% of the hours in that 7-day period in accordance with the requirements described in the Monitoring section below.

4. Documentation that the System has demonstrated the ability to upload information to NYSERDA's DER website in conformance with the following section of the QA/QC Plan: Monitoring System Equipment, Installation, Operation, and Maintenance;

5. As-Built Diagrams of the installed system, including an explanation of any deviation of the equipment from that listed in the Application Package. Diagrams may consist of electronic copies of as-built drawings.

Monitoring System Equipment, Installation, Operation, and Maintenance

Figure 5 shows the general location of the meters used to measure biogas input to the microturbine (**G1**), the generator electrical output (**M1**), H_2S levels on the gas conditioning skid inlet (**H_2S In**), and H_2S levels on the gas conditioning skid outlet (**H_2S Out**). The same H_2S analyzer is used to calculate both the H_2S In and H_2S Out data points. Information on these data points is shown in Table 2.

Table 2: Monitored Points for ADG System

Point Type	Point Name	Description	Instrument	Engineering Units	Expected Range
Pulse	M1	Microturbine Power	Electro Industries GaugeTech Inc. Revenue Grade Meter Model: Shark 100	kW	0-650 kW
N/A	H_2S In	Iron Sponge Inlet H_2S	AMI 3010BR	ppm	0 – 2,000 ppm
N/A	H_2S Out	Iron Sponge Outlet H_2S	*Same as H_2S In*	ppm	0 – 2,000 ppm
Pulse	G1	Microturbine Biogas Flow	Fox Thermal Instruments, Inc. Model FT2A	SCFM	0-12,000 SCFM

The energy output and power data of the microturbine will be measured with a Shark 100 Revenue grade meter to determine the Annual Performance Incentive. The electrical output of the microturbine system will be measured with the Intelisys NT microturbine controller. The controller provides an external graphical display of instantaneous kWh and total kWh. The controller will be installed according to the requirements in the appropriate operator guide and will be protected by a dedicated circuit breaker. The measurements available on the controller are for backup purposes only.

The biogas input to the microturbine will be measured by a Fox Thermal Instruments mass flow meter that provides isolated 4-20 milliamp (mA) and pulse outputs to measure gas flow. The meters will be installed and maintained according to the "Fox Thermal Instruments, Inc. Model FT2A Instruction Manual" by the facility. A log of maintenance activities for the meters will be maintained at the site.

The lower heating value for the biogas is estimated to be 550 Btu/ft^3 based on past measurements of the CH_4 content of biogas. This value will be verified weekly based on measurements of CO_2 using a Dräger DrägerTubes and accuro Pump. for CO_2 range of 0-100%. The CO_2 concentration (%) is subtracted from 100% to approximate the CH_4 content. The farm staff will perform the CH_4 tests weekly and log the results in the project log. This test is performed by taking a gas sample from the low-pressure gas supply before it enters the microturbine generator equipment.

Data logging is going to be done in one of two ways:

1) The installed system has the capabilities to perform the necessary data logging. This includes receiving signals from the power meter and gas meter (Modbus 485, Modbus TCP, pulse, 4-20mA, BACnet, etc.) and logging time stamped data at 15-minute intervals. Data will need to be transferred to Frontier Energy (the NYSERDA DER Website Contractor) nightly and on an automated basis. This can be done in a number of ways:
    - A nightly automated email to data_collection@cdhenergy.
    - A nightly automated upload to Frontier's FTP server (Frontier Energy will setup and provide server credentials).
    - If a static IP address can be provided, and the data made available online, Frontier could set up automated processes to pull data on a nightly basis.

2) If the installed system does not have the capabilities required, Frontier will provide an Obvius AcquiSuite data logger and panel. Frontier will then terminate sensor wiring to the logger, and verify that accurate measurements are being received. The facility will be responsible to provide Frontier with 110 V power, and an internet connection, preferably with a static IP address.

The worksheet in Appendix A will be used as a template for documenting the capabilities of the iron sponge system. Biogas flow and H_2S input to and output from the iron sponge system will be documented for each hour of the year that samples are taken with the AMI 3010BR hydrogen sulfide analyzer. The ADG System staff shall provide the hourly data on biogas flow and H_2S concentrations to Frontier Energy in the manner described above. The percentage of cumulative outlet H_2S samples (up to a maximum of 90% of the hours in a year) with 399 ppm H_2S and below will be submitted as part of the Annual Performance Reports to provide the basis for calculation of the scrubber portion of the annual performance payments as described below. The summary of samples will show the percentage of cumulative samples with 399 ppm H_2S and below as well as the percentage of cumulative samples with 400 ppm H_2S and above.

Incentive calculation methods for the 6th Capacity Incentive Payment and the annual Performance Payments, which are based on H_2S data, are as follows:

- To satisfy requirements for the 6th Capacity Incentive payment, a minimum of 75% of the samples taken in a 7-day period, while the biogas flow through the new iron sponge system averages 75% of 183 cfm, must be below 400 ppm.
- The annual Performance Incentive payment for H_2S reduction is determined by multiplying the Contract Capacity (600 kW), times the factor of 75% divided by 90%, times the verified hourly samples below the minimum H_2S threshold (during which hours the biogas flow through the new iron sponge system is at least 50% of the design capacity of 183 cfm), times the H_2S Performance Incentive variable for an iron sponge system ($0.0023/kWh). NYSERDA will consider other formulations for calculating the Performance Incentive, in the event that the iron sponge system is unable to operate due to reasons outside of the operation of the iron sponge system itself. NYSERDA may direct its technical contractors to sample the biogas, determine H_2S removal efficiency, and compare the results to the data originally provided by the operator.

Management of Monitoring System Data

The ADG System will perform the following quality assurance and quality control measures to ensure the data produced from our system accurately describes system performance.

On a daily basis, the ADG System equipment manager will perform inspections of the digester and microturbine equipment and record findings into the project log.

On a weekly basis, the ADG System equipment manager will perform inspections of the QA/QC meter installations and complete the routine maintenance on the meters, noting any abnormalities or unexpected readings. The ADG System will also maintain a weekly log of the cumulative power generation (kWh) from the power meter and gas flow (cf or ft^3) recorded by the Fox Thermal Instruments meter in the event that data transfer to the NYSERDA DER website fails or other anomalies occur.

On a weekly basis, the ADG System staff will review the data stored in the NYSERDA DER website (der.nyserda.ny.gov) to ensure it is consistent with our observed performance of the ADG system and logged readings. The ADG System will review the data on the website, including:

- Monitored Data – Download (CSV file)

In addition, the ADG System staff will also use the Monitored Data – Download (CSV file) that is available at the NYSERDA DER website to help track the system performance, including:

- an email report sent out if data is not received at the web site or does not pass the quality checks.

The website will automatically take the data collected from the data-logger and evaluate the quality of the data for each base time interval using range and relational checks. The range checks will be setup based on the expected ranges for the sensors (see Table 2).

The relational check will compare the kWh production data and gas production data for each base time interval to ensure that both meters are reading properly. This check is to ensure that both meters are operating properly; power cannot be produced without gas, and gas cannot be combusted by the microturbines without producing power.

Data that passes the range and relational quality checks will be used to compile the production amounts used for the incentive calculations. However, all hourly data is available from the NYSERDA DER website if the data quality flag of “Data Exists” is selected. In the event of a communications or meter failure, the ADG System will work with Frontier Energy to resolve the issue in a few days.

If unanticipated loss of data occurs when the microturbines continue to produce electricity, the ADG System intends to follow the procedures outlined in Exhibit D, of their contract, i.e. use data from similar periods – either just before or after the outage - to replace the lost data. The ADG System understands that they can use this approach for up to two 36 hour periods within each 12-month performance period. If more than two such data outages occur, the plant will provide information from other acceptable data sources (e.g., weekly recorded logs) to definitively determine the amount of power that was being produced from biogas during the period in question.

Annual Performance Reports

Oneida County will prepare Annual Performance Reports summarizing the monthly data over the 12-month performance period. The reports will include a table (example provided below) showing the monthly kWh production, biogas use by the microturbines, and other data listed in Table 3, and if used, any propane or other fuel used for the microturbines/boiler. Oneida County may use the data found on the DER website or alternatively, they may provide their own summary of the data using on-site sources along with a narrative justifying why their data and calculations are more appropriate. The methods for calculating these values are provided below.

Table 3 - Summary of Monthly Data for Annual Performance Reports

Start Date of Reporting Period	Number of Days in Each Period	Total Electricity Production of Microturbines, kWhgenerator	Total Biogas Generated (cubic feet)	Biogas Used by Flare, (cubic feet)	Biogas Used by Microturbines, (cubic feet)	Total Biogas Used (cubic feet)	Average Biogas Heating Value LHV_{biogas} (Btu/cf)
TOTALS							

Oneida County will calculate monthly values for lower heating value of the biogas (LHV_{biogas}) and total energy content of the biogas (Q_{biogas}) as follows.

Monthly Biogas Lower Heating Value

The readings of CO_2 concentration in the biogas gathered weekly will be used to estimate the average monthly Biogas Lower Heating Value using the following equation:

$$LHV_{biogas} = LHV_{methane} \cdot (F_{CH4})$$

where:

$LHV_{methane}$ - lower heating value of methane (911 Btu/ft^3 at standard conditions, 60 °F and 1 atm)

F_{CH4} - fraction of biogas that is CH_4 (average of readings for each month)

Monthly Biogas Energy Content

Calculate the average monthly Biogas Energy Content using the following equation:

$$Q_{biogas} = CF \cdot LHV_{biogas}$$

where:

CF - volume (cubic feet or ft^3) of biogas in month

Reasonable Electrical Efficiency

The Annual Performance Report will also provide a comparison of power output and fuel input for the microturbines to confirm their reasonableness. For instance, the electrical efficiency – measured as power output ($kWh_{generator}$) divided by the energy content of the fuel input (Q_{biogas}) in similar units and based on lower heating value – should be in the 31% to 38% range over any interval for the microturbines at Oneida County Sewer District WPCP.

Appendices

Appendix A – H_2S Reduction Spreadsheet

Cut sheets and Manuals for:

Advanced Micro Instruments (AMI) model 3010BR

Capstone C600S Microturbine

Dräger DrägerTubes and accuro Pump

Fox Thermal Instruments FT2A Gas Mass Flow Meter

Shark100 Revenue Grade Meter 100-60-10-V3-D2-INP10-X

Appendix A

H_2S Reduction Spreadsheet

Worksheet to Determine the Number of Hours Qualifying for Use in Payments Based on Hours Scrubber Produces Biogas with H2S <400 ppm							
Data to be supplied by operator					**Analysis can be done by Technical Contractor**		
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Sample Date	**Sample Hour**	**H2S in Biogas Entering Scrubber* (ppm)**	**H2S in Biogas Exiting Scrubber* (ppm)**	**Biogas Flow through New Scrubber (cfm)**	**Worksheet Enters 1 for Hours When Biogas After Scrubber is less than 400 ppm**	**Worksheet Enters 1 for Hours When Biogas Flow is above Minimum****	**Worksheet Enters 1 for Hours When Values in Columns F & G are Both 1**
3/15/19	12:00 AM	ND	ND	ND	0	0	
	1:00 AM	1,400	320	300	1	1	1
	2:00 AM	1,500	340	200	1	0	
	3:00 AM	1,600	399	350	1	1	1
	4:00 AM	1,700	400	300	0	1	
	5:00 AM	1,800	401	325	0	1	
	6:00 AM	1,900	360	200	1	0	
	7:00 AM	2,000	350	350	1	1	1
	8:00 AM	2,100	340	300	1	1	1
	9:00 AM	1,600	330	10	1	0	
	10:00 AM	1,700	320	0	1	0	
	11:00 AM	1,800	310	200	1	0	
	12:00 PM	1,900	390	300	1	1	1
	1:00 PM	2,000	380	300	1	1	1
	2:00 PM	1,300	370	300	1	1	1
	3:00 PM	1,400	360	333	1	1	1
	4:00 PM	1,500	350	300	1	1	1
	5:00 PM	1,600	200	300	1	1	1
	6:00 PM	1,000	100	200	1	0	
	7:00 PM	900	50	333	1	1	1
	8:00 PM	800	0	300	1	1	1
	9:00 PM	ND	ND	ND	0	0	
	10:00 PM	ND	ND	ND	0	0	
	11:00 PM	ND	ND	ND	0	0	
Totals		31,500	6,070	5,201	18	14	12
Average for hours reported		1,313	253	217			Qualifying Hours
* Analyst enter ND for "No Data" in all three data columns C, D, and E when starting the month.							
**Worksheet enters 1 if flow greater than minimum. Minimum for 7-day evaluation is 263 cfm. Minimum for annual calculations is 175 cfm.							