

WATER QUALITY SAMPLING, HANDLING, AND ANALYSIS PLAN

**A Compliance Document for
Groundwater Discharge Permit Application**

FOR:

**BLUE MOUNTAIN BIOGAS FACILITY
NEAR MILFORD, BEAVER COUNTY, UTAH**

April 14, 2011

Prepared For:

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Water Quality Handling and Analysis Plan

1.0 INTRODUCTION

The following **Water Quality Sampling, Handling and Analysis Plan** (The Plan) presents the organization and procedures for water quality investigations near Milford, Utah. This plan is required by the Utah State Department of Environmental Quality (DEQ), Division of Water Quality as a condition of the Final Ground Water Discharge Permit for the Blue Mountain Biogas Facility.

1.1 Implementation

The Plan is submitted as a Compliance Document for the Utah Ground Water Discharge Permit (“the Permit”). The Plan has been approved by Alpentel Energy for the Blue Mountain Biogas Facility.

2.0 PROJECT DESCRIPTION

2.1 Purpose

Specific objectives of the Groundwater Monitoring Plan:

- A. To evaluate background water quality at the biogas facility roughly 20 miles west of Minersville, Utah.
- B. To provide information for the DEQ to establish ground water protection levels for the facility.
- C. To establish procedures for groundwater monitoring and sample collection at the facility.

2.2 Methodology

Engineering Activities for Achieving the Specific Objectives: Water quality data reports will be submitted to the DEQ on a regular schedule, in accordance with the requirements of the Groundwater Quality Discharge Permit for the facility.

- A. Installation of monitoring wells in the most shallow aquifer, upgradient and downgradient from the facility.
- B. Measurement of groundwater elevations at the monitor wells.

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- C. Evaluation of hydrologic gradients in all aquifers penetrated by monitor wells.
- D. Collection and analysis of ground water quality samples from the monitor wells according to a schedule recommended by the Utah State Division of Water Quality in the Permit.
- E. Preparation and submission of quarterly “Groundwater Sampling Reports” during the one year accelerated background monitoring period.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

3.1 Organization

Organization for studies and field investigations required by this Plan

A. Construction Management Company:

Alpental Energy Partners

Contact: LeRoy Humke – Vice President

Construction Manager (CM) will be appointed by Alpental Energy Partners.

B. Quality Assurance Company:

GEM Engineering, Inc.

Contact: Joel A. Myers, P.E. – President

Quality Assurance Officer (QAO) will be appointed by GEM Engineering.

C. Department of Environmental Quality Official:

Ed Hickey, P.G. – Environmental Scientist

State of Utah – Department of Environmental Quality

Division of Water Quality

3.2 Responsibilities

- A. The CM and the QAO review and conduct or oversee the field activities described in the Plan. They will review all data generated during the investigation and will be responsible for validating and submitting data to the DEQ.

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- B. Analytical results of each completed sampling round will be submitted to the Division of Water Quality.
- C. The CM and the QAO will review and approve the Plan, review all quality control data and identify problems, if any. The QAO will report directly to the CM and recommend corrective measures.
- D. The state official will advise the owner of any comments, or objections to the Plan, its implementation, or any proposed changes to the Plan.

4.0 MONITOR WELL INSTALLATION

4.1 Site

Monitor wells are installed in the shallowest aquifer where unconsolidated quaternary sand and gravel contain unconfined water.

4.2 Construction

Requirements for monitor wells constructed for the biogas facility are included in the section of the Groundwater Discharge Permit Report. Unless required by the Division of Environmental Quality additional specifications will not be included as part of this Plan.

4.3 Published Standards

Well construction conforms to the EPA RCRA Groundwater Monitoring Technical Enforcement Guidance Document and the National Water Well Association's Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells.

5.0 ANALYTICAL PARAMETERS AND QA OBJECTIVES

Required analytical parameters and holding times are given in Tables A-1 and A-2. Specific conductance, temperature and pH will be measured in the field. Table A-1 provides parameters which will be analyzed on a quarterly basis, until the State official determines an adequate base line has been established. After this the samples will be analyzed on a semi-annual or annual basis, as determined by the state, for the parameters listed in Table A-2.

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5.1 Procedures

- A. Check analyses for the field parameters pH and specific conductance will be run in the laboratory. Chemical analysis for all certified constituents will be performed by a commercial laboratory certified under either, The Clean Water Act, The Safe Drinking Water Act or The Resource Conservation and Recovery Act.

5.2 Quality Assurance

- A. Internal quality assurance for this project will be in accordance with the Utah DEQ protocol. Laboratory certification will be monitored by the QAO.
- B. Routine analysis of samples will be performed in accordance with standard EPA procedures. Special analyses will be performed according to EPA methods for chemical analyses of water and wastes.
- C. Specific analytical methodologies and references are listed in Table A-1. These methodologies specify the documentation needed to complete and evaluate the data. They also define acceptable accuracy and precision criteria that must be met for the data to be considered valid.
 - 1. Accuracy: defined by the EPA as the percent recovery of a spiked sample. Laboratory matrix spikes are actual field samples spiked in the laboratory with a representative group from the list of required parameters as per Table A-1. One sample per alternate set of field samples will be split for matrix spike analysis.
 - 2. Precision: defined by the EPA as the relative percent difference of duplicate sample analyses of similar matrix.
- D. Re-sampling will be required if contaminant concentration in a trip blank (to be submitted on alternate sampling rounds) are within one order of magnitude of actual field sample concentrations.

5.3 Data Quality Objectives

- A. The data collected as part of this investigation is intended for use by the State of Utah DEQ and by Blue Mountain Biogas and its consultants.

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- B. Laboratory and field procedures have been designed to provide a high confidence level in the analytical results based on precision, accuracy, completeness and comparability.

5.4 Data Quality Control Management

- A. Field data quality control will be managed by the QAO in consultation with the State DEQ official for each type of data defined in this Plan.
- B. Field data will be compared to previously collected data at the site to test for probable consistency. Historic data will also be assessed for accuracy to assure consistency and comparability of all data taken at the site.
- C. Data will be compared in the same area and / or at similar depths during this study to determine whether or not the results are reasonable and consistent.
- D. Unreasonable data points will be evaluated by technical personnel who will decide whether re-sampling or retesting are required.

6.0 FIELD PROCEDURES

This section presents the water quality research methods for water level measurements, sample collection and handling.

6.1 Water Level Measurements

- A. Static water level measurements are to be made in all monitor wells during this investigation. Water levels will be measured before sampling with a steel tape or electric sounding device to the nearest 0.01 foot. The measuring device and reel will be cleaned with distilled water before and after each measurement.
- B. Measurements will be made from a standard reference point at the top of the well casing.
- C. Interpolation will be used to estimate the depth to the nearest 0.01 foot. Sufficient “runs” to the top of the ground water will be attempted to assure accuracy of the measurements. The total depth of each well will be measured after the water level is determined to verify the integrity of the well.

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- D. Water levels will be reported as depths below the standard reference point and as elevations relative to mean seal level.
 - 1. Measurements obtained while drilling and immediately after completion of each monitor well will be reported on the boring logs.
 - 2. Measurements obtained during the water quality sampling program will be recorded on a field log (Figure A-1) and will be transferred to permanent records.
- E. All field and office records will be retained for reference.

6.2 Groundwater Sampling for Laboratory Analysis

A. Collection Methods

- 1. Groundwater samples will be collected following monitor well development.
- 2. Development will continue until water removed from the well is reasonably free of sand, silt and clay so that the well can be sampled without damage to the pump or bailer.
- 3. If possible, turbidity will be less than 5 NTU.
- 4. Analytes will be sampled in order of decreasing volatility.
- 5. Teflon, PVC or stainless steel bailers will be used to sample wells that do not yield adequate quantities of water to be purged by pumping. Each well will be ailed until the field parameters (temperature, pH and conductance) have stabilized, thus assuring that the sample will be representative of groundwater conditions.
- 6. Any abnormal sampling conditions that may have an effect on sampling will be recorded in the field sampling notes. Examples of such conditions would include, but would not be limited to; equipment malfunctions, unusual recharge rates of the well, unusual pumping rates, or conditions which could lead to contamination of the sample. Field notes will also record:
 - a. Whether high (pump) or low (bailer) yield procedures for well evacuation were followed.

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- b. The types of samples taken during a particular sampling event.
- c. The sample numbers.

B. Measurements

1. Field measurements and observations will be recorded on field logs which will be copied and stored for reference. A field log from for groundwater sampling is included with this Plan as Figure A-2.
2. Water Levels will be measured before sampling. The height of the water column above the screened completed interval will be used to determine three casing volumes for evacuation prior to sampling.
3. Estimated discharge rates and pumping durations necessary for ensuring evacuation of three casing volumes will be prepared to guide sampling personnel after completion of the monitor well drilling program.

C. Equipment

1. A Groundfos MP1 submersible pump will be used to pump wells. Alternatively a stainless steel PVC or Teflon bailer may be used.
2. Pumping and bailing shall be conducted to ensure that three casing volumes are evacuated before sample retention. A work sheet showing water column calculations for each of the monitor wells is enclosed as Figure A-2. Pump or bailer discharge shall be measured to verify the evacuation volume.

D. Calibration

1. Field instruments for pH and specific conductivity will be calibrated according to manufacturer's recommendations before sampling begins. Cole-Parmer pH and conductivity meter or their functional equivalents will be used.
2. Calibration standards for pH and conductivity will be chosen to be representative of values expected in the naturally occurring waters.
3. Calibrations will be rechecked after sample collection, and all calibration procedures will be documented on the sampling field log. Measurements of pH,

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conductivity and temperature will be made at the beginning and just before the end of voiding three casing volumes.

E. Storage and Handling

1. Groundwater samples will be bottled directly from the discharge of the pump or bailer. Bottles will be labeled prior to filling and stored on ice immediately after collection.
2. Sample bottles of appropriate size and with the required preservative will be obtained from the selected certified laboratory.

6.3 Procedures to Avoid Contaminating Groundwater Samples

- A. Restrict pump and bailing discharge rates so that drawdown does not cause sample aeration.
- B. Decontaminate sampling equipment prior to utilization at another site.
Decontamination methods will include:
 1. Cleaning with a non phosphate detergent.
 2. Rinsing pump and hose with culinary water
 3. Rinsing bailers with deionized or distilled water.

6.4 Sample Handling

- A. Sample containers will be (1) stored out of direct sunlight and (2) preserved, shipped and analyzed within the maximum allowable holding times as specified in Tables A-1 & A-2.
- B. Samples will be shipped to the appropriate laboratory as soon as possible on the same day as collection, but in all cases within the time required by the accepting laboratory.
- C. Other specific laboratory requirements and EPA guidelines will be observed for each parameter, including container type, preservation dosages and refrigeration.

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7.0 SAMPLE CUSTODY

7.1 Field Operations

- A. Documentation of field collection procedures and sample integrity from collection to reporting are essential parts of the Plan.
- B. Documentation of sample possession assures that samples may be traced from the time of collection through analysis and final statistical evaluation.
 - 1. Documentation of the history of the sample is referred to as chain-of-custody.

7.2 Necessary Records and Actions

- A. Sample Labels: prevent misidentification of samples. The sample label shown as Figure A-3 or its equivalent will be filled out and attached to each sample bottle before collection.
- B. Field Sampling and Analysis Records will be maintained. Pertinent field measurements and observation will be recorded.
- C. Equipment used to measure the field parameters shall be calibrated before the collection of each sample.
- D. Appropriate forms such as Figure A-2 will be filled out for each sample site. Documentation of the sources of buffers, standards, reagents, sample containers and so forth will be recorded on these forms.
- E. A chain-of-custody record (equivalent to Figure A-4) will be filled out for each set of samples. A copy will accompany every sample shipment from the time of collection through receipt by the analytical results for inclusion in the yearly reports.
- F. A copy of the form sent to the laboratory with each sample shipment will be retained with the analytical results for inclusion in the yearly reports.
- G. Alpentel Energy, at its option may elect to protect sample integrity by use of seals applied in the field immediately after sampling. Such seals may be required by the State of Utah in the event that sampling is related to enforcement issues.

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7.3 Laboratory Operations

- A. The analytical laboratory will acknowledge receipt of the samples by signing and dating in the appropriate box in the form shown as Figure A-4. This form will be returned to Alpentel Energy with the analytical results.
- B. The laboratory will maintain internal chain-of-custody control in accordance with protocol as per the Utah DEQ.

8.0 CALIBRATION PROCEDURES AND FREQUENCY

8.1 General

- A. Meters used to measure pH and specific conductance will be calibrated as outlined below prior to and during use. Source and identification of standards used to calibrate will be recorded on the form as presented in Figure A-2.

8.2 Field pH

- A. Field pH will be determined via a Cole Parmer pH Tester Meter (or equivalent). The meter has automatic temperature correction capabilities.
- B. Field personnel will follow the manufacturer's instructions for operation and standardization of instruments.

8.3 Standardization

- A. Standardization will utilize a buffer of 7 pH units.
- B. The meter will be sterilized prior to each sample collection and checked against the standard after each sample collection. Where sample pH values vary widely, the meter will be standardized with buffers having pH of 7 and 10.

8.4 Equipment Storage and Cleaning

- A. The pH meter electrode will be stored in accordance with the manufacturer's recommendation.
- B. Any oil on the electrodes shall be cleaned with methanol f HCL as needed.

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8.5 Field Specific Conductance

- A. Field specific conductance will be measured with a Col-Parmer Model 0481-40, or equivalent. This meter automatically indicates specific conductance normalized to 25°C.
- B. Calibration will be accomplished according to manufacturer's instruction before each measurement.

8.6 Temperature and Water Levels

- A. Temperature will be measured using a good grade mercury thermometer. Temperatures will be reported to the nearest 0 degree Fahrenheit.
- B. Water level measurements will be made with a steel tape or electronic sounding device capable of accuracy to within 0.01 feet.
- C. Water levels will be recorded in the field on the form shown as Figure A-1 along with pertinent observations.

9.0 INTERNAL QUALITY CONTROL

9.1 Field Operations

- A. At least one blind field groundwater duplicate sample will be prepared and submitted to the laboratory during alternate sampling events.
- B. Obtaining Water Samples for Duplicates:
 - 1. Water samples will be obtained directly from the pump discharge line.
 - 2. One field equipment blank will also be collected during alternate sampling events.
- C. Preparing Field Equipment Blank Sample (one of the following methods):
 - 1. Pump distilled water through the submersible pump.
 - 2. Fill sample containers from the bailer in the same manner as is done for a typical sample.

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9.2 Preservation

- A. Preservatives are planned for use in sample bottles.
- B. A trip blank for each one of the preserved sample bottle types will be included for alternate sampling events.
- C. Each of these trip blank bottles will be prepared by the laboratory (filled with distilled water and appropriate preservatives) and be subjected to the same field conditions and laboratory analytical tests as required for ground water samples.

9.3 Laboratory Operations

- A. The laboratory will conduct quality control checks in accordance with the State of Utah certification requirements.
- B. This quality control check will include running at least 5 percent duplicated and spike samples.
- C. The laboratory will summarize the results of these quality control checks and submit them with the analytical results.
- D. At least one groundwater sample from alternate sampling events will be utilized for laboratory matrix spike duplicate analyses. Field personnel will ensure that sufficient sample material is provided to the appropriate laboratory for the matrix spike.

9.4 Summary of Quality Control Samples

- A. The following “extra samples” will be analyzed during alternate sampling events.
 - 1. Groundwater duplicate samples from each upgradient well.
 - 2. One field equipment blank.
 - 3. One trip blank for each of the preserved bottle types (prepared by the laboratory).
 - 4. One laboratory matrix spike duplicate sample.

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10.0 DATA REDUCTION MANAGEMENT, VALIDATION, AND REPORTING

All field data and chain-of-custody forms generated from sampling will be appropriately identified and included in each water quality data report.

10.1 Standardization

- A. Use of standardization forms will enable consistent presentation of the data throughout the project life. Therefore, standardization data forms will be used by all field personnel as well as by the laboratory during the project.

10.2 Validation

- A. Validation of all analytical data will be performed. Laboratory will be required to submit results which are supported by sufficient back up data and QA/QC reports to enable the Quality Assurance Officer to determine the quality of the data.
- B. Validity of all data will be determined from the precision and accuracy assessments outlined in Section 5.0 of this Plan. All data will be stored and maintained according to the procedures outlined.

10.3 Data Processing

- A. Data will be processed through an orderly, easily traceable and logical sequence. Field data will be assessed for accuracy.
- B. Subsequent analysis, interpretation and reporting of results will be conducted by trained professionals, using documents which are initialed and dated whenever appropriate.
- C. Backup copies of electronic media will be prepared daily. Any calculations will be checked and all assumptions necessary for calculations will be approved by the QAO.
- D. Results will be reported with all necessary supporting documentation after proper review.

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11.0 AUDIT PROCEDURES

The CM and the QAO will monitor and audit performance of the quality assurance procedures outlined in this report. The QAO will conduct random field and office audits which will assure that the information being gathered is reliable and of good quality. This information will be provided to the DEQ Official.

11.1 Field Audits

- A. The CM or his representative will conduct unscheduled field activity audits during each sampling event. Audits will evaluate the execution of (1) sample identification, (2) sample control, (3) chain-of-custody procedures, (4) field documentation, (5) equipment calibration and (6) sampling operations.
- B. Evaluation: The following list of items will be used to evaluate the water sampling and handling:
 - 1. Field documents pertaining to sample identification and control will be examined for completeness and accuracy.
 - 2. Field documents will be reviewed to see that (1) all entries are dated and signed with waterproof ink or pencil and that (2) the contents are legible, accurate and inclusive.
 - 3. The field documents form the basis for reports and will contain all measurements and observations.
 - 4. Field instruments will be checked for proper calibration and completely prepared calibration documentation.
- C. Conformance and Security
 - 1. Sampling operations will be evaluated for conformance to Section 6.0 of this Plan. The proper number of samples will be collected at the assigned locations in proper containers with correct labels and appropriate preservatives.
 - 2. Required field measurements and quality assurance checks will be performed and documented as directed by the CM and the QAO.

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3. The CM or his representative will check chain-of-custody procedures and confirm that samples are kept in secure custody at all times.

11.2 Office Audits

- A. Upon completion of each sampling event, the individual files will be assembled, organized and securely stored.
- B. Documents will be examined to determine that all necessary signatures, dates and project numbers are included. The CM or his representative will examine all documents and determine if they have been handled and stored in the proper manner. Such files will be maintained by Alpental Energy.
- C. The CM or his representative will review product quality to assure that the project is being performed in accordance with approved quality assurance procedures.
- D. Prior to the production of the draft Background Groundwater Quality Report, all work products will undergo review by the QAO.
- E. QAO assessment will include review of calculation, test analysis, graphs, tables, computer input/outputs and any other document which involves interpretation of the field data.

12.0 CORRECTIVE ACTION

12.1 Criteria

- A. Corrective action will be undertaken if sample collection deficiencies or unreliable analytical results prevent QA objectives for the project from being met.
- B. Specific criteria for acceptable data collection are given in section 5.0. The QA program(s) of the selected laboratory will provide the criteria for acceptable analytical results.
- C. Analytical results supplied by the laboratory will have been subjected to the internal QA plan and will be considered to be acceptable unless the results significantly contradict previously acquired data.

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- D. If significant contradiction occurs, the QAO will request that the laboratory review the quality control documentation for the sample or analysis in question.
- E. Further corrective action will be based on the results of the documentation review.

12.2 Correction

- A. The principal corrective action that may be required as a result of deficiencies in sample collection is re-sampling. Re-sampling will be required if one or more of the following problems occur:
 - 1. Contaminating samples due to collection procedure errors which result in a sample not representative of site conditions.
 - 2. Loosing sample in transit to the laboratory.
 - 3. Surpassing holding times for required parameters.
 - 4. Trip blank showing contaminant concentrations within one order of magnitude of the original field sample.
 - 5. Ion balance in error (either plus or minus) by more than 5%.
- B. Variations between duplicate analyses, which are outside control limits, will be evaluated by the CM QAO and DEQ Official to determine whether re-sampling is required.
- C. Re-analysis may be substituted for re-sampling if the holding time has not expired and sample condition is satisfactory.
- D. A request for corrective action (RCA) may be initiated by the CM, the QAO or the DEQ Official.

13.0 QUALITY ASSURANCE REPORTS

Water quality data reports will be submitted every three months during the initial background groundwater quality report study period and annually thereafter. Quarterly sampling reports will document any deviations from field, handling or laboratory procedures contained in the approved plan.

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QA reports will be prepared annually and submitted in conjunction with water quality data reports to the DEQ, Division of Water Quality.

13.1 Contents

- A. Quality Assurance reports will contain:
 - 1. Results of system and / or performance audits of sample collection activities.
 - 2. A summary of the laboratory QA report(s), including notation of QA modifiers.
 - 3. Listing and basis for any unacceptable data.
 - 4. Discussion of significant QA problems and recommended solutions.

13.2 Format

- A. The QA report will be prepared by the QAO and the CM or his representative and distributed to the DEQ Official.
- B. The final background groundwater quality report will contain a separate QA section which will summarize the data quality information.

14.0 MONITORING STATIONS

A map of the monitor wells to be sampled is included as Figure A-5. The map shows the physical location of the wells with respect to the proposed facility location.

ATTACHMENTS

Blue Mountain Biogas Facility

Table A-1 -- Base Line Water Sample Analysis Parameters

Parameters	Units	Analytical Methods		Preservation	Max Holding Time
		EPA	Std Methods		
Alkalinity, Carbonate as CaCO ₃	mg/l		2320 B	Cool, ≤ 6°C	14 days
Ammonia-nitrogen as N	mg/l	350.1	4500-NH ₃	Cool, ≤ 6°C, H ₂ SO ₄ to pH<2	28 days
Bicarbonate	mg/l	310.2	2320 B	Cool, ≤ 6°C	14 days
Bromide	mg/l	300.0		None Req'd	28 days
Calcium	mg/l	215.1	3111 B	HNO ₃ to pH<2	6 months
Carbon dioxide	mg/l				--
Carbonate	mg/l	310.2	2320 B	Cool, ≤ 6°C	14 days
Chloride	mg/l		4500-Cl-B	None Req'd	28 days
Hardness, Ca + Mg	mg/l		2340 B or C	HNO ₃ , H ₂ SO ₄ to pH<2	14 days
Hydroxide	mg/l				--
Inorganic nitrogen (nitrate and nitrite) as N	mg/l	353.2	4500--NO ₃ -F	Cool, ≤ 6°C, H ₂ SO ₄ to pH<2	28 days
Magnesium	mg/l	242.1	3111 B	HNO ₃ to pH<2	6 months
pH					on site
Phosphate-phosphorus as P	mg/l	365.3	4500-P-E	Cool, ≤ 6°C, H ₂ SO ₄ to pH<2	28 days
Potassium	mg/l	258.1	3111 B	HNO ₃ to pH<2	6 months
Sodium	mg/l	273.1	3111 B	HNO ₃ to pH<2	6 months
Solids, Total Dissolved	mg/l	160.1	2540-C	Cool, ≤ 6°C	7 days
Solids, Total Suspended (TSS)	mg/l	160.1	2540-C	Cool, ≤ 6°C	7 days
Specific conductance	uS/cm	120.1	2510 B	Cool, ≤ 6°C	7 days
Sulfur, sulfate (SO ₄) as SO ₄	mg/l	375.2		Cool, ≤ 6°C	28 days
Turbidity	NTU	180.1	2130 B	Cool, ≤ 6°C	48 hours

Table A-1

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Table A-2 -- Steady State Water Sample Analysis Parameters

Parameters	Units	Analytical Methods		Preservation	Max Holding Time
		EPA	Std Methods		
Alkalinity, Carbonate as CaCO ₃	mg/l		2320 B	Cool, ≤ 6°C	14 days
Ammonia-nitrogen as N	mg/l	350.1	4500-NH3	Cool, ≤ 6°C, H ₂ SO ₄ to pH<2	28 days
Bicarbonate	mg/l	310.2	2320 B	Cool, ≤ 6°C	14 days
Bromide	mg/l	300.0		None Req'd	28 days
Carbon dioxide	mg/l				--
Carbonate	mg/l	310.2	2320 B	Cool, ≤ 6°C	14 days
Chloride	mg/l		4500-Cl-B	None Req'd	28 days
Hydroxide	mg/l				--
Inorganic nitrogen (nitrate and nitrite) as N	mg/l	353.2	4500--NO ₃ -F	Cool, ≤ 6°C, H ₂ SO ₄ to pH<2	28 days
Kjeldahl Nitrogen, Total (TKN)	mg/l		4500-Norg B or C and 4500-NH ₃ B	Cool, ≤ 6°C	28 days
pH					on site
Phosphate-phosphorus as P	mg/l	365.3	4500-P-E	Cool, ≤ 6°C, H ₂ SO ₄ to pH<2	28 days
Solids, Total Dissolved	mg/l	160.1	2540-C	Cool, ≤ 6°C	7 days
Solids, Total Suspended (TSS)	mg/l	160.1	2540-C	Cool, ≤ 6°C	7 days
Specific conductance	uS/cm	120.1	2510 B	Cool, ≤ 6°C	7 days
Sulfur, sulfate (SO ₄) as SO ₄	mg/l	375.2		Cool, ≤ 6°C	28 days
Turbidity	NTU	180.1	2130 B	Cool, ≤ 6°C	48 hours

Table A-2

Blue Mountain Biogas Facility Water Quality Sampling Field Record

Well Name: _____ Date: _____

Sampling Personnel: _____

Instrument Calibrations

- pH meter Calibrated? Yes
 Conductivity Meter Calibrated? Yes

Field Measurements

Time	Volume Evacuated	Temp. (F)	pH	Conductivity	Comments

Base intake slots (feet below ground) _____

Top water surface (feet below ground) _____

Water Column (feet): _____ Casing - Inside Diameter: _____

Gallons of Water in Casing: _____ Gallons X 3: _____

Note: One gallon - 231 cubic inches. Height of water column in inches is obtained by multiplying the water column in feet by 12; this column height is then multiplied by the area of the casing to obtain the volume of water in cubic inches. This volume is then divided by 231 to obtain the volume of water in gallons.

Pump Started - Time: _____ Pump Stopped - Time: _____

Pump Started - Time: _____ Pump Stopped - Time: _____

Pump Started - Time: _____ Pump Stopped - Time: _____

Pump Started - Time: _____ Pump Stopped - Time: _____

Pump Rate (gpm): _____ Total Time Pumped (min): _____

Volume evacuated before sampling (gal): _____

Notes: _____

Figure A-2



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**Blue Mountain Biogas Facility
Field Water Sample Label**

Well Name: _____

Sample Number: _____

Analytical parameter(s): dfsd

Date Sampled: _____

Time Sampled: _____

Sampler: _____

Preservative: Acid Base Filtered

Destination Laboratory: _____

Figure A-3



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Blue Mountain Biogas Facility Field Water Sample - Chain-of-Custody Record

Sampler Signature: _____

Sample ID	Sample Source	Sampled Date & Time:	# of Containers	Parameters to Analyze		
				Group 1 Characteristics	Group 2 Characteristics	Other

Group 1 Characteristics:

Alkalinity, Carbonate as CaCO ₃	Ammonia-nitrogen as N	Bicarbonate	Carbon Dioxide
Carbonate	Chloride	Hydroxide	Inorganic nitrogen (nitrate & nitrite) as N
pH	Phosphate-phosphorus as P	Solids, Dissolved	Solids, Total Suspended (TSS)
Specific Conductance	Sulfur, sulfate (SO ₄) as SO ₄	Turbidity	

Group 2 Characteristics:

Calcium	Hydroxide	Magnesium	Potassium	Sodium
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Relinquished By:	Date & Time	Sent Via	Received By:	Date & Time

Notes:

Figure A-4



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