2018

# Greenhouse Gas Emissions from Soil Applied Nitrogen Fertilizers

Samuel Thies
*South Dakota State University*

# GREENHOUSE GAS EMISSIONS FROM SOIL APPLIED NITROGEN FERTILIZERS

BY

SAMUEL THIES

A thesis submitted in partial fulfillment of requirements for the

Master of Science

Major in Plant Science

South Dakota State University

2018

GREENHOUSE GAS EMISSIONS FROM SOIL APPLIED NITROGEN FERTILIZERS

SAMUEL THIES

This thesis is approved as a creditable and independent investigation by a candidate for the Master of Science in Plant Science degree and is accepted for meeting the thesis requirement for this degree. Acceptance of this does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

David Clay, Ph.D. Date
Thesis Advisor

David Wright, Ph.D. Date
Head, Department of Agronomy, Horticulture, and Plant Science

Dean, Graduate School Date

# ACKNOWLEDGEMENTS

This thesis would not be possible without help from many individuals who have assisted me throughout my graduate career. I would like to thank my major advisor, Dr. David Clay, for taking me on as a graduate student and his guidance as I learn about higher education and research. I would like to thank all of my committee members, Dr. Douglas Malo, Dr. Sharon Clay, Dr. Stephanie Bruggeman, Dr. Peter Kovacs, and Dr. Jonathan Jenks for their support and guidance as I complete my research and thesis. I would like to thank Dr. Stephanie Bruggeman for teaching me how to operate the equipment used in my graduate research. I would like to thank Graig Reicks for helping me understand field research from design to implementation to completion. I would like to thank Dr. Gregg Carlson for his input in ways to analyze my data along with the development of a computer program to help with said analysis. Dr. Carlson also taught me the ways of computer programming and helped me develop a soil data logger. I would like to thank Janet Miller for helping me with laboratory work. I would like to thank Douglas Fiedler for helping with soil sample collection, chamber placement, and his assistance in class work. I also would like to thank the student workers who have helped with, but not limited to, soil sample collection, soil grinding, chamber placement, and spraying of plots. I also would like to thank my family for supporting me throughout my undergraduate and graduate educational careers.

TABLE OF CONTENTS

# ABBREVIATIONS

| | |
|---|---|
| °C | degrees Celsius |
| $CH_4$ | methane |
| cm | centimeter |
| Control | no treatment added |
| $CO_2$-C | carbon dioxide-carbon |
| DAT | days after treatment |
| DCD | dicyandiamide |
| DFA | days following application |
| EEF | enhanced efficiency fertilizer |
| EF | emission factor |
| ESN | environmental smart nitrogen (polymer coated urea) |
| FFT | fast Fourier transformation |
| g | gram |
| g $cm^{-3}$ | grams per cubic centimeter |
| g $CO_2$-C $ha^{-1}$ $hr^{-1}$ | grams carbon dioxide-carbon emitted per hectare per hour |
| g $ha^{-1}$ $hr^{-1}$ | grams per hectare per hour |
| g $N_2O$-N $ha^{-1}$ $Day^{-1}$ | grams nitrous oxide-nitrogen emitted per hectare per day |
| g $N_2O$-N $ha^{-1}$ $hr^{-1}$ | grams nitrous oxide-nitrogen emitted per hectare per hour |
| g $NH_3$-N $ha^{-1}$ $Day^{-1}$ | grams ammonia-nitrogen emitted per hectare per day |
| g $NH_3$-N $ha^{-1}$ $hr^{-1}$ | grams ammonia-nitrogen emitted per hectare per hour |
| GHG | greenhouse gas |
| kg | kilogram |

| | |
|---|---|
| kg $CO_2$-C $ha^{-1}$ $Day^{-1}$ | kilograms carbon dioxide-carbon emitted per hectare per day |
| kg $NH_4$-N $ha^{-1}$ | kilograms ammonium-nitrogen per hectare of soil |
| kg $NO_3$-N $ha^{-1}$ | kilograms nitrate-nitrogen per hectare of soil |
| m | meter |
| $m^2$ | square meters |
| mg | milligram |
| mg SOC $gram^{-1}$ | milligram soluble organic carbon per gram of soil |
| mL | milliliter |
| N | nitrogen |
| NBPT | N-(n-butyl) thiophosphoric triamide (urease inhibitor coated urea) |
| $N_2O$-N | nitrous oxide–nitrogen |
| $NH_3$ | ammonia |
| $NH_4^+$ | ammonium |
| $NH_3$-N | ammonia-nitrogen |
| $NH_4$-N | ammonium-nitrogen |
| $NO_3^-$ | nitrate |
| $NO_3$-N | nitrate-nitrogen |
| Picarro | Picarro Cavity Ringdown Spectrometer |
| PLFA | Phospholipid Fatty Acid |
| ppb | parts per billion |
| ppm | parts per million |
| PVC | Polyvinyl chloride |
| SOC | soil organic carbon |

| | |
|---|---|
| Start | initial values at beginning of experiment |
| SuperU | NBPT and DCD coated urea |
| $T_{ave, cool}$ | average night time temperature |
| $T_{ave, heat}$ | average daytime temperature |
| UAN | urea ammonium nitrate |
| Urea ` | treatment receiving urea |
| Urea + U | urea coated with urease enzyme inhibitor |
| Urea & Water | treatment receiving urea and supplemental irrigation |
| Water | treatment receiving supplemental irrigation |
| WFPS | water filled pore space |

# LIST OF FIGURES

# LIST OF TABLES

# ABSTRACT

GREENHOUSE GAS EMISSIONS FROM SOIL APPLIED NITROGEN FERTILIZERS

SAMUEL THIES

2018

Greenhouse gases (GHG) absorb and emit radiant energy in the thermal range. Their concentrations in the atmosphere are increasing and becoming an ever increasing issue as the Earth's average temperature continues to rise. Agricultural practices, such as applying nitrogen fertilizer to increase crop yield can be a major source of GHG emissions and methods are needed to decrease these emissions. The measurements of GHG emissions have been difficult, expensive, and erratic. However, advancing technologies have increased the accuracy and confidence in measuring GHG emissions. The objectives of this study were to determine the 1) effects of different nitrogen fertilizer sources, 2) application dates on greenhouse gas (nitrous oxide and carbon dioxide) and ammonia emissions and 3) sampling requirements and associated errors. Gas samples were collected and measured for 21 days following nitrogen fertilizer application every four hours. A polymer coated urea (Environmentally Smart Nitrogen, ESN), urease inhibitor (NBPT) coated urea, and urea fertilizer were used as the nitrogen fertilizer source and applied at a rate of 224 kg N $ha^{-1}$. Soil was sampled at the start and completion of each fertilizer application date for ammonium and nitrate concentrations and the microbial community was evaluated using the Phospholipid Fatty Acid (PLFA)

technique. The enhanced efficiency nitrogen fertilizers (urease coated urea and polymer coated urea) reduced nitrous oxide emissions but did not influence carbon dioxide or ammonia emissions. Fertilizer application date, fertilizer source, and application season had a large impact on greenhouse gas emissions. Applying urea fertilizer, regardless of season, increased ammonia and nitrous oxide emissions, but did not increase carbon dioxide emissions. In the fall, as soil temperature decreased, nitrous oxide and carbon dioxide emissions decreased; although, ammonia emissions was less influenced by soil temperature. The decrease in carbon dioxide and nitrous oxide emissions were was attributed to decreasing microbial activity and nitrification rates. In the spring, the relationship between temperature and nitrous oxide emissions was less prevalent. Seasonal differences may have resulted from changes in the microbial community structure. Nitrous oxide results followed a similar trend to available nitrate detected in the soil (0 – 60 cm). Sampling for $N_2O$-N at average air temperatures resulted in underestimating emissions and different fertilizer application dates resulted in changes in variance structure. This study showed that GHG emissions could be reduced by applying enhanced efficiency nitrogen fertilizers (urease coated urea and polymer coated urea) and adjusting the fertilizer application date.

# Chapter 1: Polymer Coated Urea (ESN) and Urease Inhibitor Coated Urea (NBPT) Reduced Nitrous Oxide Emissions Following Application

## 1.1 ABSTRACT

It has been theorized that enhanced efficiency fertilizers (EEF) are effective in reducing nitrogen (N) losses through ammonia volatilization and nitrous oxide emissions. This project was designed to determine if EEF are effective in decreasing nitrous oxide, carbon dioxide, and ammonia gas emissions when compared to a conventional urea fertilizer. Furthermore, few experiments have assessed multiple GHG emissions simultaneously. Therefore, this study used three different N fertilizer products [Urea, polymer-coated urea (environmentally smart nitrogen, ESN), urea coated with a NBPT urease inhibitor (Urea + U)]. Furthermore, this study was conducted in the laboratory at an air temperature of 23$^{o}$C and it contained two N rates (0 and 224 kg N ha$^{-1}$). Nitrous oxide, ammonia volatilization, and carbon dioxide emissions were measured every four hours for a period of 20 days following fertilizer application. Over the study period, Urea had higher $N_2O$-N emissions than ESN, Urea + U, and the no-fertilizer treatments. Ammonia volatilization and carbon dioxide emissions differences were not detected among the fertilizer sources. These findings indicate that ESN and Urea + U were effective in reducing $N_2O$-N emissions when compared with Urea.

## 1.2 INTRODUCTION

Agriculture contributes about 6% of global greenhouse gas (GHG) emissions (Greenhouse Gas Working Group, 2010) of which nitrous oxide contributes 64% of these emissions (Larsen et al., 2007). Some management strategies to reduce $N_2O$ emissions include applying EEF, delaying when the nitrogen fertilizer is applied, and multiple applications of the nitrogen fertilizer. Enhanced efficiency fertilizers are defined as "fertilizers that reduce N losses to the environment and/or increase nutrient availability when compared with conventional fertilizers." (Olson-Rutz et al., 2009). Some commonly used nitrogen EEF's include: polymer coated urea (ESN), urease and nitrification inhibited urea (NBPT), and urea ammonia nitrate (UAN) mixed with urease and nitrification inhibitor.

Several studies compared nitrous oxide emissions from urea and EEF's. However, these studies have conflicting findings with nitrogen based EEF's in conventional tillage with some studies reporting EEF reduced nitrous oxide emissions (Halvorson and Del Grosso, 2013) and others reporting that EEF did not reduce nitrous oxide emissions (Halvorson et al., 2014; Parkin and Hatfield, 2014). Nitrification and hydrolysis inhibitors affect different components of the N cycle. Nitrification inhibitors reduce the conversion of ammonia to nitrate, whereas hydrolysis inhibitors slow the hydrolysis of the urea molecule. Slowing urea hydrolysis can reduce ammonia volatilization (Clay et al., 1990a) whereas theoretically slowing nitrification has the potential to increase ammonia volatilization. Nitrous oxide is emitted during multiple steps on the N cycle; it is likely that depending on the local conditions, EEF can have different impacts on emissions. Clay et al. (1990b) reported that the nitrification

inhibitor, dicyandiamide (DCD) reduced ammonia volatilization from bare soil but did not reduce volatilization from residue covered soil, and the hydrolysis inhibitor NBPT reduced volatilization in both residue and bare soil. In both the bare and residue covered soil, losses were not instantaneous but peaked three days after the application of the nitrogen fertilizer sources. Burzaco et al. (2013) reported that the nitrification inhibitor nitrapyrin reduced nitrous oxide emissions from 2.34 to 1.77 kg N $ha^{-1}$, and that pre-emergence N had 22% lower losses than side dressed N. Woodley et al. (2018) reported that UAN treated with a urease inhibitor increased $N_2O$ emissions by 17.3% when compared to UAN. Halvorson and Del Grosso (2013) reported that nitrous oxide emissions were reduced by 1.48 to 1.74 times when comparing polymer coated urea and urea treated with nitrification and urease inhibitors. With an inconsistency in findings, the objective of the study was to determine if ESN and NBPT coated urea reduced nitrous oxide, ammonia gas, and carbon dioxide emissions in a controlled environment when compared to urea.

## 1.3 MATERIALS AND METHODS

### Experimental design

A laboratory study was conducted under controlled conditions with the ambient air temperature around 23 °C (±1 °C). The soil was a Brandt silty clay loam (fine-silty, mixed, super-active, frigid Calcic Hapludolls) (Soil Survey Staff, 2018) of which the top 15 cm of soil was collected using shovels following corn (*Zea mays)* harvest in November of 2017. The soil contains approximately 28, 65, and 7% clay, silt, and sand, respectively. The surface 15 cm soil depth contains approximately 36 Mg SOC-C $ha^{-1}$. Additional information on this soil is available in Kim et al. (2008) and Clay et al. (1995,

1996, 2015). Air dried soil was mixed, and large, greater than two cm in length, pieces of residue were removed. The soil was loosely placed in 20.3 cm diameter Polyvinyl chloride (PVC) rings that were ten cm in height. Each ring received 2350 grams of air dry soil followed by the application of the treatment which was covered with an additional 200 grams of air dry soil with the total soil mass at 2550 grams of air dry soil. This resulted in an eight cm total soil depth with one cm of soil on top of the treatments. The moisture content of the dry soil was 0.11 g water (g dry soil)$^{-1}$. The soil in the PVC rings had an average bulk density of 0.84 g cm$^{-3}$; field bulk density at collection was 1.29 g cm$^{-3}$ for the 15 cm depth. Following application of the treatment, 500 mL of water was added to the soil in each PVC ring. Additional water (200 mL) was added every 3-4 days depending on soil moisture conditions of the PVC rings.

**Treatments**

The treatments consisted of three different nitrogen fertilizer sources applied at 224 kg N ha$^{-1}$ along with a Control, which received no additional nitrogen fertilizer. The fertilizer treatments were Urea, urea coated with Factor® (Rosen's Inc., Liberty, MO), which is the urease inhibitor (NBPT, N-(n-butyl) thiophosphoric triamide), (Urea + U), and a polymer coated urea (ESN, environmental smart nitrogen) (Agrium U.S. Inc., Loveland, CO). The Urea + U treatment was urea coated with the urease inhibitor at the rate of 3.40 mL Factor® kg$^{-1}$ urea. Factor® and ESN are listed as trade names for reference and the author does not endorse the product. Treatments were placed in a randomized complete block design. Since only eight LI-COR LI-8100-104 chambers were available for analysis, only two blocks could be analyzed at a time for the 20 day analysis period. The remaining two blocks were analyzed following the completion of

the first set of two blocks. The difference between the two analysis periods was considered minimal due to a controlled indoor environment with air temperature held constant for all blocks.

**Gas Sampling Protocol**

A LI-COR LI-8100-104 Long-Term Chamber (LI-COR, Lincoln, NE) was placed on top of each PVC ring according to LI-COR protocol. The chambers automatically sampled one at a time in a designated sequence, mixed the air in the chamber, and the air that was analyzed was returned to its respective chamber. Samples were collected for 15 minutes every four hours, this resulted in six readings per chamber per day. The gas samples were transferred through plastic hoses to the LI-COR LI-8150 multiplexer (LI-COR, Lincoln, NE). During each chamber closing, gas samples were collected and analyzed every second for $CO_2$ using a LI-COR LI-8100A Automated Soil $CO_2$ Flux System (LI-COR, Lincoln, NE). The gas samples were then transferred through a sampling harness to the Picarro Cavity Ringdown Spectrometer (Picarro) (Picarro Inc., Santa Clara, CA). The Picarro measured the gas samples for $N_2O$, $CO_2$, and $NH_3$. Nitrous oxide and $CO_2$ were measured at parts per million (ppm) and $NH_3$ was measured at parts per billion (ppb). Soil emissions were collected for 20 days which started on the day of treatment application.

**Calculation of Flux**

The Picarro measured the gas samples at one second intervals for fifteen minutes. This resulted in 900 readings per chamber closing. Flux was calculated using LI-COR SoilFluxPro™ software (ver 4.0.1) (LI-COR, Lincoln, NE). Corrections were applied individually for the collar offset from the PVC base on each of the eight LI-COR LI-

8100-104 chambers. Flux was then calculated from 45 to 900 seconds after chamber closing for $N_2O$, and $NH_3$, and from 45 to 165 seconds following chamber closing for $CO_2$.

**Soil Analysis**

One soil sample was collected before treatments were applied in each block. Also, a soil sample was collected after completion of the 20 day analysis period in each individual chamber. Soil samples were collected using a hand trowel. When the samples were collected, it was noticed that the fertilizer materials were still visible in the soil sample. The fertilizer materials were dried and ground together with the rest of the soil sample to pass through a two mm sieve in preparation for ammonium and nitrate analysis (Clay et al., 2005).

**Data Analysis**

Nitrous oxide and ammonia emissions were multiplied by 0.636 and 0.822, respectively, to represent N emissions and carbon dioxide was multiplied by 0.273 to represent carbon (C) emissions. Therefore, emissions for $N_2O$ are described in terms of $N_2O$-N, emissions for $NH_3$ are described in terms of $NH_3$-N, and emissions for $CO_2$ are described in terms of $CO_2$-C. The six individual measurements that occurred within a day were summed and units are represented in grams $ha^{-1}$ $day^{-1}$ for $N_2O$-N and $NH_3$-N and kg $ha^{-1}$ $day^{-1}$ for $CO_2$-C.

The model used for a randomized complete block design is the following:

$$y_{ij} = \mu + \alpha_i + \beta_j + \varepsilon_{ij}$$

where $y_{ij}$ is the mean emissions of the $\beta^{th}$ block of the $\alpha^{th}$ treatment, $\mu$ is the grand mean, $\alpha_i$ is the fixed effect of treatment i for i=1,2,3,4, $\beta_j$ is the effect of block j for j=1,2,3,4, and $\varepsilon_{ij}$ is the random error effect.

The ANOVA function in R (ver 3.4.3) (R Core Team, 2017) was used to determine treatment differences. If the p-value was less than $\alpha$ of 0.05, a Fisher LSD was conducted using the agricolae (de Mendiburu, 2009) package in R. The data analysis was similar for the four 5-day average daily emissions except the dataset was reduced to the five day emissions in question.

## 1.4 RESULTS

### Soil Test Results

Soil samples were collected at the start of the experiment and the average values were; 5.25 pH, 2.49 kg $NO_3$-N $ha^{-1}$ and 0.82 kg $NH_4$-N $ha^{-1}$ (Table 1.1). Urea + U had higher $NO_3$-N soil test results of 406 kg $ha^{-1}$, which was followed by Urea, ESN, and the Control with 237, 167, and 3.47 kg $NO_3$-N $ha^{-1}$, respectively (Table 1.1). Urea + U also had the highest $NH_4$-N soil test results of 20.3 kg $ha^{-1}$ which was followed by ESN, Urea, and the Control treatments with results of 16.65, 12.81, and 0.72 kg $NH_4$-N $ha^{-1}$, respectively (Table 1.1).

ESN and Urea + U did not lower soil $NO_3$-N or $NH_4$-N when compared to the Urea treatment. Urea + U actually had higher $NO_3$-N and $NH_4$-N soil test results of 406 and 20.3 kg $ha^{-1}$, respectively, when compared to the Urea treatment which had $NO_3$-N and $NH_4$-N results of 237 and 12.8 kg $ha^{-1}$, respectively. The reason Urea + U had higher soil test values than the applied rate of 224 kg N $ha^{-1}$ is unknown. These results suggest

that after 20 days, most of the urea had been hydrolyzed and nitrified. Higher ammonium and nitrate concentrations were attributed to the hydrolysis inhibitor slowing $N_2O$-N loss.

ESN soil test's results for $NO_3$-N or $NH_4$-N were similar to Urea. These results were attributed to the polymer coating which slowed N release from the granule. Slowing the rate that nitrogen is released from the fertilizer granule should lower soil ammonium and nitrate levels. All fertilizer treatments had higher $NO_3$-N and $NH_4$-N soil test results than the Control treatment which had results of 3.47 and 0.72 kg $ha^{-1}$, respectively. From the soil test results, we can conclude that Urea + U and ESN did not decrease the amount of plant available nitrogen 20 days following fertilizer application when compared to the Urea treatment.

All treatments had lower pH when compared to the starting pH value of 5.25 after 20 days. The Urea treatment had the lowest pH of 4.80 which was followed by Urea + U, ESN, and the Control with pH values of 4.89, 5.05, 5.16, and 5.16, respectively. The pH decreases were attributed to nitrification.

**Table 1.1: Soil test results for pH, $NO_3$-N, and $NH_4$-N for both the initial (start) and completion of the 20 day analysis period, nitrogen fertilizer was applied at 224 kg N $ha^{-1}$.**

| Treatment | pH | $NO_3$-N | $NH_4$-N |
|---|---|---|---|
| | | ----------kg $ha^{-1}$---------- | |
| Start | 5.25a† | 2.49c | 0.82c |
| Urea | 4.80e | 237b | 12.8b |
| Urea + U | 4.89d | 406a | 20.3a |
| ESN | 5.05c | 167b | 16.7ab |
| Control | 5.16b | 3.47c | 0.72c |
| p-value | <0.001 | <0.001 | <0.001 |

Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen
values within a column that have the same letter are not significantly different at $\alpha = 0.05$

## Nitrous Oxide Emissions

Average $N_2O$ daily emissions were separated into four 5-day time periods. In the Urea, ESN, and Control treatments $N_2O$-N emissions increased from the start of the experiment to 15 days after treatment (DAT), but a decrease in $N_2O$-N emissions was noticed in the 16-20 DAT time period (Table 1.2). In the Urea + U treatment, emissions increased as time progressed across all days. This data suggests that $N_2O$-N emissions peaked between 11 and 15 DAT for Urea, ESN, and the Control treatments. However, Urea + U did not reach its peak $N_2O$-N emissions during the 20 day study period. The Urea treatment had the highest average daily $N_2O$-N emissions. These results suggest that enhanced efficiency nitrogen fertilizers can reduce $N_2O$-N emissions in laboratory conditions.

When evaluating the temporal relationship between sampling period and losses, Urea and Urea + U had the highest $N_2O$-N emissions for the first ten days after treatment, however, emissions from Urea increased during the final two time periods. Urea mean

emissions increased from 4.75 and 5.11 g $N_2O$-N $ha^{-1}$ in the first ten DFA's to 23.3 and 18.0 g $N_2O$-N $ha^{-1}$ during 11 to 20 DAT (Table 1.2). The mean $N_2O$-N emissions from Urea + U remained relatively constant throughout the study with 5.45, 6.15, 6.79, and 7.34 g $N_2O$-N $ha^{-1}$ $day^{-1}$ during 1-5, 6-10, 11-15, and 16-20 DAT, respectively. ESN always had lower mean emissions than Urea and Urea + U except for 6-10 DAT when ESN was similar to Urea and 16-20 DAT when ESN was similar to Urea + U. ESN also had higher mean emissions than the Control treatment except during the first five days after treatment when ESN was similar to the Control treatment. Overall, Urea had the highest mean $N_2O$-N emissions which was followed by ESN, Urea + U, and ended with the Control treatments with 20 day mean emissions of 12.8, 6.74, 6.43, and 1.94 g $N_2O$-N $ha^{-1}$ $day^{-1}$, respectively.

**Table 1.2: Mean $N_2O$-N emissions for the 20 day analysis period (All) along with mean $N_2O$-N for the four 5-day time periods, nitrogen fertilizer was applied at 224 kg N $ha^{-1}$.**

| Treatment | Mean Emissions | | | | |
|---|---|---|---|---|---|
| | 1-5 DAT | 6-10 DAT | 11-15 DAT | 16-20 DAT | All |
| | ----------g $N_2O$-N $ha^{-1}$ $day^{-1}$ ---------- | | | | |
| Urea | 4.75a† | 5.11ab | 23.3 | 18.0a | 12.8a |
| Urea + U | 5.45a | 6.15a | 6.79 | 7.34b | 6.43b |
| ESN | 2.22b | 3.60b | 14.8 | 6.39b | 6.74b |
| Control | 1.86b | 1.61c | 2.55 | 1.76c | 1.94b |
| p-value | <0.001 | <0.001 | 0.232 | <0.001 | 0.002 |

Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen, DAT = days after treatment

†values within a column that have the same letter are not significantly different at $\alpha = 0.05$

## Ammonia Emissions

Ammonia-nitrogen emissions remained relatively low until the 16-20 DAT time period. On the average, daily $NH_3$-N mean emissions decreased as time progressed except for 16-20 DAT when there was a drastic increase in mean $NH_3$-N emissions. The mean daily $NH_3$-N emissions for all treatments were 7.95, 6.76, 3.49, and 30.9 g $NH_3$-N $ha^{-1}$ for 1-5, 6-10, 11-15, and 16-20 DAT, respectively. The factor responsible for the increase in emissions from 11-15 to 16-20 days remains unknown to the author.

**Table 1.3: Mean $NH_3$-N emissions for the 20 day analysis period (All) along with mean $NH_3$-N for the four 5-day time periods, nitrogen fertilizer was applied at 224 kg N $ha^{-1}$.**

| Treatment | Mean Emissions | | | | |
|---|---|---|---|---|---|
| | 1-5 DAT | 6-10 DAT | 11-15 DAT | 16-20 DAT | All |
| | ----------g $NH_3$-N $ha^{-1}$ $day^{-1}$---------- | | | | |
| Urea | 8.15 | 3.80 | 2.53 | 28.5ab† | 10.7 |
| Urea + U | 12.6 | 7.05 | 2.93 | 9.15b | 7.93 |
| ESN | 8.58 | 9.23 | 4.26 | 38.6a | 15.2 |
| Control | 2.46 | 6.97 | 4.22 | 47.4a | 15.3 |
| p-value | 0.554 | 0.831 | 0.953 | 0.025 | 0.386 |

Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen, DAT = days after treatment

†values within a column that have the same letter are not significantly different at $\alpha = 0.05$

**Carbon Dioxide Emissions**

Over the course of the study, Urea + U had the highest $CO_2$-C mean emissions of 14.6 kg $ha^{-1}$ $day^{-1}$ which was higher than Urea, ESN, and the Control treatments which had mean emissions of 11.2, 12.1, and 10.4 kg $CO_2$-C $ha^{-1}$ $day^{-1}$, respectively (Table 1.4). Carbon dioxide emissions were highest in the 1-5 and 6-10 DAT time intervals regardless of the treatment (Table 1.4). Urea + U had the highest mean $CO_2$-C emissions at 1-5 DAT with 26.8 kg $CO_2$-C $ha^{-1}$ $day^{-1}$ which was followed by Urea, ESN, and the Control treatments with 20.4, 17.3, and 14.6 kg $CO_2$-C $ha^{-1}$ $day^{-1}$, respectively (Table 1.4). On the 6-10 DAT time interval, Urea + U once again had the highest $CO_2$-C emissions at 12.8 kg $CO_2$-C $ha^{-1}$ $day^{-1}$ which was similar to the ESN treatment with emissions of 12.3 kg $CO_2$-C $ha^{-1}$ $day^{-1}$ (Table 1.4). Mean emissions from the Urea + U and ESN treatments were greater than the Urea and Control treatments which had $CO_2$-C emissions of 8.9 and 9.8 kg $CO_2$-C $ha^{-1}$ $day^{-1}$, respectively (Table 1.4). In the 11-15 DAT and 16-20 DAT time intervals, treatment differences were not detected and $CO_2$-C emissions levels were lower than in the previous ten days.

Overall, $CO_2$-C mean emissions were highest and significantly different in the first ten days of the study and emissions decreased towards the end of the study. Since the highest emissions occurred in the first ten days, it is unknown if the increase in emissions was due to the nitrogen fertilizer application, which stimulated microbial growth, from enhanced microbiological growth resulting from soil drying and rewetting, or from the mixing of the soil. It is likely is a combination of all factors involved to produce these results.

**Table 1.4: Mean $CO_2$-C emissions for the 20 day analysis period (All) along with mean $CO_2$-C for the four 5-day time periods, nitrogen fertilizer was applied at 224 kg N $ha^{-1}$.**

| Treatment | Mean Emissions | | | | |
|---|---|---|---|---|---|
| | 1-5 DAT | 6-10 DAT | 11-15 DAT | 16-20 DAT | All |
| | ----------kg $CO_2$-C $ha^{-1}$ $Day^{-1}$---------- | | | | |
| Urea | 20.4b† | 8.88b | 7.98 | 7.43 | 11.2b |
| Urea + U | 26.8a | 12.8a | 9.97 | 7.86 | 14.4a |
| ESN | 17.3bc | 12.3a | 10.2 | 8.66 | 12.1b |
| Control | 14.6c | 9.83b | 9.11 | 8.04 | 10.4b |
| p-value | <0.001 | <0.001 | 0.102 | 0.123 | 0.001 |

Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen, DAT = days after treatment

† values within a column that have the same letter are not significantly different at $\alpha = 0.05$

## 1.5 DISCUSSION

Nitrous oxide emissions generally increase with increasing nitrogen fertilizer rates (Halvorson et.al, 2014). The objective of EEF's is to reduce $N_2O$ emissions without negatively affecting crop performance. Crop performance can be negatively affected by the lack of synchronization of EEF's and plant uptake requirements. For example, ESN is designed to slowly release N and to match crop nitrogen demand to minimize N losses. In a three year-study, Parkin and Hatfield (2014) reported that 20 days following fertilizer application $N_2O$ emissions were similar between their treatments; however, as the growing season progressed, significant differences were noticed. In our study, significant differences between the treatments occurred within the five days following application. Over 20 days, Urea had the highest $N_2O$-N emissions and it was significantly greater than the Urea + U, ESN, and the Control treatments. Differences between our study and Parkin and Hatfield (2014) were attributed to temperature differences. Our study was

conducted at a constant air temperature of 23 °C whereas Parkin and Hatfield's (2014) study was conducted outside in the spring when temperatures were much cooler.

Gao et al. (2015) reported that the effectiveness of EEF's is likely due to environmental factors, when nitrogen was applied to a warmer and wetter soil it increased urease and hydrolysis activity, thus resulting in higher $N_2O$-N emissions than in cooler and drier soils. Clay et al. (1990a) reported that N losses are highest when soil is drying and temperatures are at a maximum. Drury et al. (2017) reported that urea treated with a urease inhibitor had higher $N_2O$ emissions than untreated urea and urea treated with urease and nitrification inhibitors. In Colorado, ESN had no significant difference on conventionally tilled soils but in no-till and strip-tilled soils, $N_2O$ emissions were reduced (Halvorson et al., 2010). Halvorson and Del Grosso (2013) reported that Urea had the highest $N_2O$ emissions which were followed by polymer coated urea and SuperU (NBPT and DCD coated urea). These studies had similar results to this study which showed Urea having the highest emissions which was followed by a polymer coated urea; in our case we used ESN. However, the effect of different soil moisture regimes on the effectiveness of EEF's in reducing nitrous oxide emissions needs further examination.

Carbon dioxide emissions from nitrogen fertilizer application are variable (Al-Kaisi et al., 2008). Sainju et al. (2012) also reported similar results in their multiple year study, where $CO_2$ emissions were higher in the fertilized treatments in 2009 but lower in 2008 and 2011. Our study had similar results where the treatments that received fertilizer had higher $CO_2$ emissions within the first five days after treatment application. However, after the first ten days, results were mixed and there were no $CO_2$-C emission differences between treatments at the end of the study. Roberts and Chan (1990) reported that

tillage increases carbon dioxide emissions by increasing soil aeration and through the movement of soil aggregates. Therefore, the differences in $CO_2$ emissions are a result from the soil aeration and movement of the soil aggregates as the treatments were applied at the beginning of the study.

Ammonia volatilization levels were relatively low during the first 15 days after treatment application, which was followed by a large increase in the 16-20 DFA block in all treatments except Urea + U. This is due to the urease inhibitor NBPT which slowed the hydrolysis of the urea molecule (Silva et al., 2017). Silva et al. (2017) also reported that NBPT reduced $NH_3$ losses by 50% in most of their conditions; however, our study did not see differences in $NH_3$ emissions. Drury et al. (2017) also reported that Urea coated with urease and nitrification inhibitors reduced ammonia losses by 60% when compared to the untreated urea treatment. These results are different from Clay et al. (1990a) where the hydrolysis inhibitor NBPT reduced ammonia losses. Differences between the current study and Clay et al. (1990a) were attributed to the experimental protocols, whereas soil was placed on top of the applied fertilizer treatment in this study. Clay et al. (1990a) reported that NBPT coated urea reduced ammonia emissions by 100 times over the four day study. In the 20 day mean emissions for the Urea and the Urea + U were 10.7 and 7.93 g $NH_3$-N $ha^{-1}$ $day^{-1}$. These values were not significantly different, $p=0.386$. Our results showed that the urease inhibitor NBPT did not reduce ammonia emissions as greatly as other studies have reported in our laboratory conditions.

## 1.6 CONCLUSIONS

This study concluded that ESN and Urea + U reduced $N_2O$ emissions in a laboratory setting when compared to a conventional urea fertilizer. ESN and Urea + U did not increase $CO_2$-C or $NH_3$-N gas emissions. Furthermore, ESN and Urea + U did not reduce the soil test levels of $NO_3$-N or $NH_4$-N. Altogether, this laboratory study confirmed that EEF can reduce $N_2O$ emissions without reducing plant available nitrogen. The study did not report EEF's reducing greenhouse gas emissions as greatly as previously reported in other field studies.

## 1.7 ACKNOWLEDGEMENTS

Support was provided by USDA-AFRI (2017-05485), USDA-NRCS (69-3A75-285), and the South Dakota Corn Utilization Council.

## 1.8 LITERATURE CITED

Al-Kaisi, M.M., M.L. Kruse, and J.E. Sawyer. 2008. Effect of nitrogen fertilizer application on growing season carbon dioxide emission in a corn-soybean rotation. J. Environ. Qual. 37:325–332.

Burzaco, J.P., D.ER. Smith, and T.J. Vyn. 2013. Nitrous oxide emissions in Midwest US maize production vary widely with band-injected N fertilizer rates, timing, and nitrapryin presence. Environ Res. Letters. 8 137.216.178.78

Clay, D.E., G.L. Malzer, and J.L. Anderson. 1990a. Ammonia volatilization from urea as influenced by soil temperature, soil water content, and nitrification and hydrolysis inhibitors. Soil Sci. Soc. Am. J. 54:263-266.

Clay, D.E., G.L. Malzer, and J.L. Anderson. 1990b. Tillage and dicyandiamide influence on nitrogen fertilizer immobilization, remineralization, and utilization by maize. Biol and Fertil Soil 9: 220-225.

Clay, D.E., S.A. Clay, Z. Liu, and S.S. Harper. 1995. Leaching of dissolved organic C in soil following anhydrous ammonia application. Biol. Fert. Soil. 19:10-14.

Clay, D.E., S.A. Clay, T.B. Moorman, K. Brix-Davis, K.A. Scholes, and A.R. Bender. 1996. Temporal variability of organic C and nitrate in a shallow aquifer. Water Res. 30:559-568.

Clay, D.E., S.A. Clay, D.J. Lyon, and J.M. Blumenthal. 2005. $^{13}C$ discrimination in corn grain can be used to separate and quantify yield losses due to water and nitrogen stresses. Weed Sci. 53:23-29.

Clay, D.E., G. Reicks, C.G. Carlson, J. Moriles-Miller, J.J. Stone, and S.A. Clay. 2015. Residue harvesting and yield zone impact C storage in a continuous corn rotation. J. Environ. Qual. 44:803-809.

De Mendiburu, F. 2009. Agricolae: Statistical Procedures for Agricultural Research, R package version, 1.0-7.

Drury C.F., X. Yang, W.D. Reynolds, W. Calder, T.O. Oloya, and A.L. Woodley. 2017. Combining urease and nitrification inhibitors with incorporation reduces ammonia and nitrous oxide emissions and increases corn yields. J. Environ. Qual. 46:939–949.

Gao, X., H. Asgedom, M. Tenuta, and D.N. Flaten. 2015. Enhanced efficiency urea sources and placement effects on nitrous oxide emissions. Agron. J. 107:265–277.

Greenhouse Gas Working Group. 2010. Agriculture's role in greenhouse gas emissions and capture. Greenhouse Gas Working Group Rep. ASA, CSSA, and SSSA, Madison, WI.

Halvorson, A.D., and S.J. Del Grosso. 2013. Nitrogen placement and source effects on nitrous oxide emissions and yields of irrigated corn. J. Environ. Qual. 42:312–322.

Halvorson, A.D., S.J. Del Grosso, and F. Alluvione. 2010. Tillage and inorganic nitrogen source effects on nitrous oxide emissions from irrigated cropping systems. Soil Sci. Soc. Am. J. 74:436–445.

Halvorson, A.D., C.S. Snyder, A.D. Blaylock, and S.J. Del Grosso. 2014. Enhanced-efficiency nitrogen fertilizers: potential role in nitrous oxide emission mitigation. Agron. J. 106:715–722.

Kim, K.-I., D.E. Clay, C.G. Carlson, S.A. Clay, and T. Trooien. 2008. Do synergistic relationships between nitrogen and water influence the ability of corn to use nitrogen derived from fertilizer and soil? Agron. J. 100:551–556.

Larsen, J., T. Damassa, and R. Levinson. 2007. Charting the Midwest: An inventory and analysis of greenhouse gas emissions in America's heartland. World Resources Institute, Washington, DC.

Parkin, T.B. and J.L. Hatfield. 2014. Enhanced efficiency fertilizers: effect on nitrous oxide emissions in Iowa. Agron. J. 106:694–702.

Olson-Rutz, K., C. Jones, and C.P. Dinkins. 2009. Enhanced efficiency fertilizers. EB0188. Montana State University Extension, Bozeman, MT.

R Core Team. 2017. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/.

Roberts, W.P., and K.Y. Chan. 1990. Tillage-induced increases in carbon dioxide loss from soil. Soil Tillage Res. 17:143–151.

Sainju, U.M., W.B. Stevens, T. Caesar-Tonthat, and M.A. Liebig. 2012. Soil greenhouse gas emissions affected by irrigation, tillage, crop rotation, and nitrogen fertilization. J. Environ. Qual. 41:1774-1786.

Silva, A.G.B., C.H. Sequeira, R.A. Sermarini, and R. Otto. 2017. Urease inhibitor NBPT on ammonia volatilization and crop productivity: A meta-analysis. Agron. J. 109:1–13.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2018. Web Soil Survey. Available online at the following link: https://websoilsurvey.sc.egov.usda.gov/.

Woodley, A.L., C.F. Drury, X.M. Yang, W.D. Reynolds, W. Calder, and T.O. Oloya. 2018. Streaming urea ammonium nitrate with or without enhanced efficiency products impacted corn yields, ammonia, and nitrous oxide emissions. Agron. J. 110:444-454.

# Chapter 2: Seasonal Changes Impact Microbial Community Structure, Carbon Dioxide, Nitrous Oxide, and Ammonia Emissions from Nitrogen Fertilizer Application.

## 2.1 ABSTRACT

Season induced changes in the microbial community structure may influence the relationships between soil temperature and moisture enough to impact nitrogen (N) losses through volatilization and denitrification. Current technologies allow for the near continuous measurement of these losses. The objectives of this research were to determine the influence of fertilizer application dates, in two different seasons (spring and fall) on residual inorganic N remaining in the soil, microbial community structure, and the relationships between soil temperature and soil water contents along with monitoring $NH_3$ volatilization, $N_2O$, and $CO_2$ emissions. Soil temperatures and moisture contents and $N_2O$, $NH_3$, and $CO_2$ emissions were measured for 21 days following the application of two N rates (0 and 224 kg urea-N $ha^{-1}$) at two soil moisture regimes (natural rainfall and natural rainfall + supplemental irrigation). The dates of application in the fall were 20 September 2017, 11 October 2017, and 1 November 2017 and the dates in the spring were 1 May 2018, 22 May 2018, and 12 June 2018. During each date, emissions were collected for 15 minutes at six time intervals daily (1.5-2.5, 5.5-6.5, 9.5-10.5, 13.5-14.5, 17.5-18.5, and 21.5-22.5 hours). Within each of the six fertilizer application dates, each treatment was replicated twice. The fall soil had a higher percentage of bacteria and actinomycetes than spring samples, whereas the spring samples had a higher percentage of undifferentiated microbial biomass that could not be characterized to specific organisms. These findings suggest that from fall to spring the

microbial community structure changed. In the fall, $CO_2$ and $N_2O$ emissions decreased with decreasing soil and air temperatures. A similar relationship between temperature and emissions was not observed in the spring. Supplemental irrigation increased $N_2O$ and $NH_3$ emissions; however, mixed results were noticed in $CO_2$ emissions.

## 2.2 INTRODUCTION

Greenhouse gas emissions (GHG) produced by agricultural activities are an important component of the carbon footprint (Clay et al., 2012; Stone et al., 2012; Lupo et al., 2013). In agriculture, the principal greenhouse gases are carbon dioxide, nitrous oxide, and methane. Nitrous oxide and $CH_4$ have a disproportionate impact on the carbon footprint because $N_2O$-N emissions are multiplied by 298 and $CH_4$-C emissions are multiplied by 20 to calculate the carbon dioxide equivalent-C value ($CO_{2e}$-C).

The amount of greenhouse gases that are emitted from agricultural activities depends on many factors including soil temperature, air temperature, rainfall, tillage, cover crops, and fertilizer applications. Each factor produces a unique signature on total emissions. For example, natural rainfall or irrigation can increase carbon dioxide and nitrous oxide emissions by increasing microbiological activity and carbon (C) and N mineralization (Sainju et al., 2010). Sainju et al. (2012) also reported that $CO_2$-C emissions increase with increasing soil moisture content. However, at high soil moisture contents, oxygen diffusion into the soil is slowed, which decreases aerobic respiration and increases denitrification (Linn and Doran, 1984). One of the gases emitted under anaerobic conditions is $N_2O$.

Tillage events typically increase short-term carbon dioxide emissions from the disruption of soil aggregates (Roberts and Chan, 1990). Also, the reduction of tillage decreases $CO_2$ and $N_2O$ emissions due to a reduction in microbial activity (Drury et al., 2006). The addition of nitrogen fertilizer typically increases nitrous oxide emissions but a varied effect on carbon dioxide emissions has been noticed (Dusenbury et al., 2008; Al-Kaisi et al., 2008). However, carbon dioxide emissions tend to increase with increasing soil and air temperatures as microbiological activity increases.

The general effects of natural and man influenced activities on GHG emissions are generally known, however, no known studies to date have looked at different soil moisture regimes, temperature regimes, and nitrogen fertilizer rates on GHG emissions across seasons using a near continuous measurement system. Therefore, the objectives of this study were to determine (i) the effects of different soil moisture and temperature regimes on GHG emissions, (ii) to quantify the effects of nitrogen fertilizer application on GHG emissions, and (iii) compare and contrast GHG emissions from fall and spring fertilizer application dates.

## 2.3 MATERIALS AND METHODS

### Study site

A field study was conducted at the Aurora Research Farm near Aurora, South Dakota (44$^o$ 18’ 20.57” N, 96$^o$ 40’ 14.04” W). The soil type was a Brandt silty clay loam (Fine-silty, mixed, superactive, frigid Calcic Hapludolls) (Soil Survey Staff, 2018), with percentage of clay, silt, and sand at 28%, 65%, and 7%, respectively. The initial soil organic carbon (SOC) for the surface 15 cm was 36 Mg ha$^{-1}$, and the carbon (C)

mineralization kinetics were previously discussed in Clay et al. (2015). The soil parent materials were loess (0-60 cm) over glacial outwash. The surface soil hydraulic conductivity (ksp = 0.72 m $d^{-1}$) for this site was previously measured and reported (Clay et al., 1994). The water contents at field capacity and the wilting point were 0.315 and 0.177 g $g^{-1}$, respectively, and soil bulk density (0-15 cm soil depth) at the beginning of the study was 1.29 g $cm^{-3}$. A more complete description of the soil is available in Kim et al. (2008) and Clay et al. (1995, 1996, 2015).

**GHG chamber installation and measurement**

Eight LI-COR LI-8100-104 long-term chambers (LI-COR, Lincoln, NE) were installed at the study site. The chambers were placed, in a random pattern on flat, barren soil with no vegetation or surface residue. In the spring of 2017, soybeans (*Glycine max*) were seeded and fertilizer was not applied. In the fall of 2017, the soybeans were cleared from the site. The spring 2018 site was adjacent to the fall 2017 site and it was managed similarly. These two sites had similar crop and soil management practices over the last five years. The total area of each fertilizer application date was approximately ten $m^2$ in which all of the chambers were placed. The chamber base was a 20.3 cm diameter Polyvinyl chloride (PVC) ring that was inserted into the ground approximately five cm, therefore, the total surface area for each chamber was 314 $cm^2$. A LI-COR LI-8100-104 long-term chamber (LI-COR, Lincoln, NE) was placed on top of each individual PVC ring according to LI-COR protocol. Each individual chamber would automatically close for 15 minutes, every four hours, and collect the gas samples at six sampling intervals (0-2.5, 4-6.5, 8-10.5, 12-14.5, 16-18.5, and 20-22.5 hours). These times were selected to match the average air temperature (9.5-10.5 hours), the minimum air temperature (5.5-6.5

hours), and the maximum air temperature (13.5-14.5 hours). The chambers were vented and continuously mixed the air in the chamber. The air that was analyzed was returned back into its respective chamber.

During each chamber closing the gas samples were transferred through a plastic hose in the field to a LI-COR LI-8150 multiplexer (LI-COR, Lincoln, NE). The gas samples were collected and analyzed every second for $CO_2$ using a LI-COR LI-8100A Automated Soil $CO_2$ Flux System (LI-COR, Lincoln, NE). The gas samples were then transferred through a sampling harness to the Picarro Cavity Ringdown Spectrometer (Picarro) (Picarro Inc., Santa Clara, CA). The Picarro measured the gas samples for $N_2O$, $CO_2$, and $NH_3$. Nitrous oxide, and $CO_2$ were measured in parts per million (ppm) and $NH_3$ was measured in parts per billion (ppb). All $N_2O$, $CO_2$, and $NH_3$ results presented were analyzed by the Picarro.

Soil moisture was measured using a LI-COR LI-8150-205 Soil Moisture Probe (LI-COR, Lincoln, NE) and soil temperature was measured using a LI-COR LI-8150-201 Soil Temperature Probe (LI-COR, Lincoln, NE). The moisture and temperature probes were inserted into the soil approximately 5 cm. The probes measured soil moisture and soil temperature when its corresponding chamber was collecting gas samples. All of the data collection occurred at the sample location. The location was powered from a nearby electrical outlet and a back-up battery and surge protector were present. Analytical equipment was protected from the elements by a portable weatherproof trailer.

**Treatments**

The experiment was repeated three times during the fall of 2017 and three times in the spring of 2018. The first fall fertilizer application study was conducted between 20 September 2017 and 11 October 2017 (emissions measured 23 September to 11 October) when air temperature was 25°C at application. The second fall fertilizer application date was from 11 October 2017 to 1 November 2017 (emissions measured from 11 October to 1 November) when air temperature was 17°C at application. The third fall fertilizer application date was conducted from 1 November 2017 to 15 November 2017 (emissions measured from 1 November to 15 November) when air temperature was 7°C at application. The first spring fertilizer application date was conducted from 1 May 2018 to 22 May 2018 (emissions measured from 4 May to 20 May) when air temperature was 12°C at application. The second spring fertilizer application date was conducted from 22 May 2018 to 12 June 2018 (emissions measured from 22 May to 12 June) when air temperature was 32°C at application. The third, and final, spring fertilizer application date was conducted from 12 June 2018 to 3 July 2018 (emissions measured from 12 June to 3 July) when air temperature was 29°C at application. For each experiment, the chambers were moved to a new location within the study area. The move of chambers was less than five meters.

The experiment contained two N rates (0 and 224 kg urea-N $ha^{-1}$) and two soil moisture regimes (natural and natural + supplemental irrigation), each treatment was replicated twice. The urea fertilizer was dissolved in 10 mL of water and distributed onto the soil surface inside the PVC ring. The supplemental irrigation treatments received water every three to four days depending on natural rainfall. The supplemental irrigation consisted of a 1000 mL of water being deposited in the PVC ring. This resulted in an

irrigation event of 3.15 cm. The goal of the supplemental irrigation was to raise water filled porosity above 80%.

Supplemental irrigation was added to the treatments receiving supplemental irrigation (Urea & Water and Water treatments) at 11.00 hours after gas sampling had occurred. Due to high rainfall between 20 September and 1 October, the 20 September 2017 fertilizer application date only received supplemental irrigation once on 29 September 2017. Supplemental irrigation was added to the 11 October 2017 fertilizer application date on 17, 20, and 26 October 2017. In the 1 November 2017 fertilizer application date, supplemental irrigation was only added once on 2 November 2017. During the 1 November date, the Water treatment was not included. Supplemental irrigation was only added once at the beginning of the study as air temperatures were near or below freezing and the additional water could freeze in the chamber rings and damage the chambers. During the 1 November fertilizer application date, snow fell on 5, 7, and 9 November 2017, which remained in the chambers until 11 November 2017 when the snow melted. The total accumulation of snow during the three snowfall events was 3.8 cm. The snow was left inside the chambers and did not directly interfere with gas sampling. In the 1 May 2018 fertilizer application date, supplemental irrigation was added on 4, 15, and 18 May 2018. In the 22 May 2018 fertilizer application date, supplemental irrigation was added on 25 May 2018, 29 May 2018, 1 June 2018, and 6 June 2018. In the 12 June 2018 fertilizer application date supplemental irrigation was not added to any chambers due to the eleven rainfall events previously described above, therefore, the Urea & Water and Water treatments do not exist. This resulted in only two

treatments (Urea and Control) and four replications for this fertilization date were available instead of the originally designed two replications.

**Calculation of Flux**

The Picarro measured the gas samples at one second intervals for fifteen minutes. This resulted in 900 readings for each chamber closing. Flux was calculated using LI-COR SoilFluxPro™ software (ver 4.0.1) (LI-COR, Lincoln, NE). Corrections were applied individually for the collar offset from the PVC base on each of the eight LI-COR LI-8100-104 chambers. These corrections were measured four times for each collar offset which were averaged together. Flux was then calculated from 45 seconds to 900 seconds after chamber closing for $N_2O$ and $NH_3$ and from 45 seconds to 165 seconds for $CO_2$. The Picarro's factory calibration was checked with $N_2O$ standards at the beginning and end of the experiment. The standards were purchased from Airgas Specialty Gases (Airgas, USA, LLC Cinnaminson NJ), and they had concentrations of 0.378 and 149 ppm. The equation between the standard and the factory calibrations, conducted pre and post experiment was, $y=0.02+1.013\times(\text{standard})$, $r^2=0.99$.

**Soil Sampling**

Soil samples were collected for bulk density, soil inorganic N, and soil moisture analysis from the 0- to 15- cm, 15- to 30- cm, 30- to 45- cm and 45- to 60- cm depths prior to and at the completion of each experiment. Beginning soil samples (Start) were collected from an area adjacent to the chambers and final samples were collected from the area within the PVC rings. Eight sample cores (1.25 cm diameter) of each representative depth were combined and frozen until analysis could be performed. A subsample of soil was removed and analyzed for gravimetric moisture content. The

moisture content was determined by drying the soil at 105°C and weighing the difference in initial vs. final weight. The gravimetric moisture content was multiplied by the bulk density to calculate soil volumetric moisture content. A second subsample was taken from the 0- to 15- cm depth for Phospholipid Fatty Acid (PFLA) analysis (Reese et al., 2014). The remaining soil was dried at 40°C and ground in preparation for ammonium and nitrate analysis (Clay et al., 2005).

**Data Analysis**

To calculate % soil nitrate in the 0 to 60 cm depths, soil ammonia and nitrate concentration were summed, and the nitrate portion was divided by the total soil available inorganic nitrogen. Mean values and confidence intervals were calculated in Microsoft Excel® 2010. A significant value of 95% was used for the confidence interval.

Each individual flux measurement was converted to g $ha^{-1}$ $hr^{-1}$. $N_2O$ and $NH_3$ emissions were multiplied by 0.636 and 0.822, respectively, to represent N emissions and $CO_2$ was multiplied by 0.273 to represent C emissions. Therefore, emissions for $N_2O$ are described in terms of $N_2O$-N, emissions for $NH_3$ and described in terms of $NH_3$-N, and emissions for $CO_2$ are described in terms of $CO_2$-C.

The ANOVA function in R (ver 3.4.3) (R Core Team, 2017) was used to test for differences. The model used for analysis was: $\gamma_{ij} = \mu + \tau_i + \varepsilon_{ij}$ whereas $\gamma_{ij} = j^{th}$ observed sample value from the $i^{th}$ treatment (j= 1,2,…,$n_i$), (i=1,2,…,k), $\mu$ = grand mean, $\tau_i = i^{th}$ treatment effect, and $\varepsilon_{ij}$ = random error. If differences were detected at $\alpha$ of 0.05 a Fisher least significant differences was used to determine differences between means using the agricolae (de Mendiburu, 2009) package in R.

To test for differences in air temperature, soil temperature, natural soil moisture, and natural + supplemental irrigation soil moisture content, the same model was used with a hypothesis of $\mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6$, where $\mu_1$= 20 September 2017 fertilizer application date, $\mu_2$= 11 October 2017 fertilizer application date, etc. The model was further split into three, seven day intervals (0-7, 8-14, and 15-21 days following application) (DFA) to test for differences in each corresponding week of each fertilizer application period.

To test for treatment differences within a fertilizer application date, the same model was used with a hypothesis of $\mu_{UW} = \mu_U = \mu_W = \mu_C$, where $\mu_{UW}$= mean emissions of Urea & Water treatment, $\mu_U$= mean emissions of Urea treatment, etc. The model was further split into three, seven day intervals (0-7, 8-14, and 15-21 DFA) to test for differences in each corresponding week of each fertilizer application period. This approach was repeated for $N_2O$-N, $NH_3$-N, and $CO_2$-C.

To test for treatment differences (Urea & Water, Urea, Water, and Control) across fertilizer application dates, the same model was used with a hypothesis of $\mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6$, where $\mu_1$= 20 September 2017 fertilizer application date, $\mu_2$= 11 October 2017 fertilizer application date, etc. The model was further split into three, seven day intervals (0-7, 8-14, and 15-21 DFA) to test for differences in each corresponding week of each fertilizer application period. This approach was repeated for $N_2O$-N, $NH_3$-N, and $CO_2$-C.

To test for differences in the PLFA soil results, a two-tailed Student's T-Test of unequal variance was performed. The model used was $\mu_f = \mu_s$, whereas $\mu_f$ = the fall PLFA results and $\mu_s$ = the spring PLFA results. The procedure was repeated for total

biomass, percent bacteria, percent fungi, and percent undifferentiated. This analysis was performed in Microsoft Excel® 2010.

To test for differences in the soluble organic carbon (SOC) soil results, a two-tailed Student's T-Test of unequal variance was performed. The model used was $\mu_f = \mu_s$, whereas $\mu_f$ = the fall SOC results and $\mu_s$ = the spring SOC results. This analysis was performed in Microsoft Excel® 2010.

## 2.4 RESULTS

### Rainfall and soil temperatures

Across the six fertilizer application dates, there were large differences in rainfall and temperature. In the fall of 2017, the mean soil temperatures for the surface 5 cm decreased from 15.0 to 2.86 °C as the season progressed from 20 September to 14 November (Table 2.1). In the following spring, soil temperatures slowly increased and the average temperature for the 0- to 5- cm depth was 12.3 °C for the time period between 5 May and 22 May. For the time period between 22 May and 12 June the average surface soil (0- to 5- cm) temperature was 19.9 ºC and for the 12 June to 3 July time period the average temperature was 20.5 ºC (Table 2.1).

Natural rainfall events also varied greatly between fertilizer application dates. The 20 September to 11 October period had the highest rainfall of the six fertilizer application dates with 14.3 cm of rainfall. This large rainfall total was attributed to large rainfall events on 23 September 2017 and 1 October 2017 which resulted in 6.6 and 2.6 cm of rain, respectively. Rainfall between 11 October and 1 November, 1 November and 15 November, 1 May and 22 May, 22 May and 12 June, and 22 June and 3 July was 0.51,

0.78, 1.8, 2.9, and 10.0 cm, respectively. Between 12 June and 3 July, the chambers received eleven small rainfall events. The largest of these events occurred on 25 June when 0.99 cm of natural rainfall was received.

**Table 2.1: All observations and seven day interval means for soil temperature, air temperature, supplemental soil moisture content, and natural rainfall soil moisture content for the six fertilizer application dates.**

| All | Mean Soil Temperature | Mean Air Temperature | Supplemental irrigation SMC | Natural rainfall SMC |
|---|---|---|---|---|
| Experiment | °C | °C | ----------$cm^3$ $cm^{-3}$ ---------- | |
| 20 September, 2017 | 15.0b† | 12.9d | - | 0.44a |
| 11 October, 2017 | 9.36d | 7.15e | 0.36a | 0.28c |
| 1 November, 2017 | 2.86e | -1.28f | - | 0.24d |
| 1 May, 2018 | 12.3c | 15.8c | 0.36a | 0.37b |
| 22 May, 2018 | 20.5a | 23.7a | 0.30b | 0.24d |
| 12 June, 2018 | 19.9a | 22.6b | - | 0.27c |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |
| 0-7 DFA | Mean Soil Temperature | Mean Air Temperature | Supplemental irrigation SMC | Natural rainfall SMC |
| Experiment | °C | °C | ----------$cm^3$ $cm^{-3}$ ---------- | |
| 20 September, 2017 | 17.5c | 15.6d | - | 0.45a |
| 11 October, 2017 | 10.9d | 9.36e | 0.35a | 0.31c |
| 1 November, 2017 | 3.31e | -2.12f | - | 0.24d |
| 1 May, 2018 | 12.4d | 17.5c | 0.36a | 0.39b |
| 22 May, 2018 | 21.4a | 25.6a | 0.30b | 0.24d |
| 12 June, 2018 | 20.0b | 22.9b | - | 0.23d |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |
| 8-14 DFA | Mean Soil Temperature | Mean Air Temperature | Supplemental irrigation SMC | Natural rainfall SMC |
| Experiment | °C | °C | ----------$cm^3$ $cm^{-3}$ ---------- | |
| 20 September, 2017 | 15.2c | 13.6c | - | 0.45a |
| 11 October, 2017 | 12.2d | 10.7d | 0.39a | 0.27c |
| 1 November, 2017 | 2.19e | -0.03e | - | 0.24d |
| 1 May, 2018 | 10.7d | 13.2c | 0.37a | 0.37a |
| 22 May, 2018 | 20.6a | 23.3a | 0.31b | 0.24d |
| 12 June, 2018 | 18.8b | 21.2b | - | 0.29c |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |
| 15-21 DFA | Mean Soil Temperature | Mean Air Temperature | Supplemental irrigation SMC | Natural rainfall SMC |
| Experiment | °C | °C | ----------$cm^3$ $cm^{-3}$ ---------- | |
| 20 September, 2017 | 11.8d | 9.16d | - | 0.42a |
| 11 October, 2017 | 3.99e | 0.05e | 0.33a | 0.24c |
| 1 May, 2018 | 15.0c | 18.0c | 0.33a | 0.33b |
| 22 May, 2018 | 19.0b | 21.6b | 0.29b | 0.24c |
| 12 June, 2018 | 21.2a | 23.9a | - | 0.30b |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

All = all observations, SMC = soil moisture content, DFA= days following application

† values within a column and within a group that have the same letter are not significantly different at $\alpha = 0.05$

Soil temperature (0- to 5- cm soil depth) was warmest (across the duration of the study) during the 22 May 2018 fertilizer application date at 20.5 °C which was followed by 12 June 2018, 20 September 2017, 1 May 2018, 11 October 2017, and 1 November 2017 (Table 2.1). In the fall of 2017, the experiments were conducted during a period of time that the soil was cooling (20 September to 14 November) and spring 2018 experiments were conducted when the soils were warming (1 May to 3 July). For the 1 November 2017 study, the night-time soil temperatures decreased to less than 0 ºC eight days after the fertilizer was applied. For the spring 2018 fertilizer application dates, the temperatures deviated for short periods of time when soil temperatures increased and for short periods of time when it decreased. For the 1 May 2018 and 12 June 2018 fertilizer application dates, soil temperatures were the coolest during the middle of the study (8-14 DFA).

Air temperatures followed a similar trend to soil temperatures as described above. Some noticeable exceptions include that all 2018 dates had higher mean air temperatures than the 2017 dates. Also, the 2017 fertilizer application dates had mean soil temperatures, which were warmer than the air temperatures. However, for the 2018 fertilizer application dates, the reverse was true. This is important because soil microbial respiration tends to increase with soil temperature.

Soil moisture contents varied greatly across the six fertilizer application dates. When looking at all days within each fertilizer application date, the 20 September 2017 date had the highest mean natural rainfall volumetric soil moisture content at 0.44 $cm^3$ $cm^{-3}$, which was followed by 1 May 2018, 11 October 2017, 12 June 2018, 1 November

2017, and 22 May 2018 with volumetric soil moisture contents of 0.37, 0.28, 0.27, 0.24, and 0.24 $cm^3$ $cm^{-3}$, respectively (Table 2.1).

The supplemental irrigation volumetric soil moisture contents were not measured during the 20 September 2017 (soil moisture sensor failure), 1 November 2017 (soil moisture sensor failure), and 12 June 2018 (no supplemental irrigation was added) fertilizer application dates. In the three fertilizer application dates where supplement irrigation soil moisture contents were available, the 11 October 2017 and 1 May 2018 volumetric soil moisture contents were similar to each other across all seven day intervals. The 22 May 2018 fertilizer application date had lower volumetric soil moisture contents when compared to the 11 October 2017 and 1 May 2018 application dates.

When comparing volumetric soil moisture contents between the supplemental irrigation and natural rainfall moisture regimes; supplemental irrigation tended to raise the volumetric soil moisture content 0.07 $cm^3$ $cm^{-3}$ when the 1 May 2018 fertilizer application date is excluded (Table 2.1). In the 1 May 2018 fertilizer application date, the supplemental irrigation soil moisture content was lower than the natural rainfall soil moisture content in 0-7 DFA and the soil moisture contents were the same for the 8 to 14 and 15 to 21 DFA.

**Soil Test Results**

Bulk density was measured for both the fall 2017 and spring 2018 dates. The fall 2017 bulk density measurements were 1.29, 1.22, 1.22, and 1.22 g $cm^3$ for the 0- to 15-, 15- to 30-, 30- to 45-, and 45- to 60- cm depths, respectively. The spring 2018 bulk density measurements were 1.34, 1.30, 1.30, and 1.30 g $cm^3$ for the 0- to 15-, 15- to 30-, 30- to 45-, and 45- to 60- cm depths, respectively.

**Table 2.2: Soil sample total inorganic nitrogen, nitrate levels, and nitrate confidence levels for the fertilized treatments (Urea and Urea & Water) in the 0- to 60- cm soil depth for all six fertilizer application dates.**

| Fertilizer Application Date | Total Inorganic N kg N $ha^{-1}$ | $NO_3$-N | |
|---|---|---|---|
| | | % | 95% CL |
| 20 September, 2017 | 218 | 68.9 | 3.36 |
| 11 October, 2017 | 211 | 37.5 | 22.9 |
| 1 November, 2017 | 210 | 28.1 | 1.65 |
| 1 May, 2018 | 131 | 62.4 | 4.18 |
| 22 May, 2018 | 181 | 65.2 | 9.88 |
| 12 June, 2018 | 202 | 65.1 | 7.13 |

N = Nitrogen, CL= confidence level

Total soil inorganic N remained similar during the three fall 2017 fertilizer application dates, however, soil inorganic N levels increased during the three spring 2018 fertilizer application dates. Soil test nitrate levels decreased during the fall 2017 fertilizer application periods from 68.9% during the 20 September date to 37.5 and 28.1% during the 11 October and 1 November dates, respectively (Table 2.2). These findings suggest that nitrification slowed as the season progressed. Ramifications of these findings are that $N_2O$ emissions from nitrification should decrease as the season progressed. For the spring 2018, different results were observed with % $NO_3$-N remaining similar in the fertilized treatment across the application dates (Table 2.2). These findings indicate that nitrous oxide emissions from nitrification should be relatively constant in the spring.

Soil SOC also changed from the fall of 2017 to spring of 2018. Samples were collected during the 11 October and 22 May fertilizer application dates. The 11 October fertilizer application date had 0.37 mg SOC $(g\ soil)^{-1}$ whereas the 22 may fertilizer application date had 0.10 mg SOC $(g\ soil)^{-1}$. These samples were significantly different with a p-value of $<0.001$.

**Nitrous Oxide Emissions**

Nitrous oxide mean emissions during the three fall fertilizer application dates were highest, regardless of treatment, during the 20 September fertilizer application date. This is a result of higher soil and air temperatures as described in Table 2.1 along with higher soil $NO_3$-N levels as described in Table 2.2. Nitrous oxide-nitrogen mean emissions during the 20 September date and within a treatment were similar across the course of study. For the 11 October 2017 fertilizer application date, there was a large mean $N_2O$-N emissions decrease between 8-14 and 15-21 DFA regardless of treatment. This was attributed to the decrease in air and soil temperatures (Table 2.1) and a decrease in soil nitrate levels (Table 2.2). During the 1 November date, mean $N_2O$-N emissions were very low 0.02 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ regardless of treatment and treatments were not different (Table 2.3). In the 20 September fertilizer application date, Urea had the highest mean $N_2O$-N emissions of 2.21 g $N_2O$-N $ha^{-1}$ $hr^{-1}$, which was followed by the Urea & Water, Control, and the Water treatments with mean emissions of 2.01, 1.89, 1.76 g $N_2O$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.3). In the 11 October date, Urea & Water had the highest mean $N_2O$-N emissions of 0.23 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ which was followed by Water, Urea, and the Control treatments with mean emissions of 0.20, 0.13, 0.06 g $N_2O$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.3). For the 1 November 2017 fertilizer application date, mean $N_2O$-N emissions were similar among the treatments. The lack of differences was attributed to the low soil temperatures.

**Table 2.3: $N_2O$-N mean emissions for the three fall fertilizer application dates along with mean $N_2O$-N emissions for each seven day interval.**

| 20 September, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $N_2O$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 1.51b† | 2.47a | 2.03b | 2.01ab |
| Urea | 2.26a | 2.19a | 2.17b | 2.21a |
| Water | 1.09c | 1.61b | 2.63a | 1.76c |
| Control | 1.36bc | 2.17a | 2.15b | 1.89bc |
| p-value | <0.001 | 0.005 | <0.001 | 0.001 |

| 11 October, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $N_2O$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 0.32a | 0.26a | 0.04a | 0.23a |
| Urea | 0.24b | 0.08c | 0.03b | 0.13b |
| Water | 0.34a | 0.15b | 0.03b | 0.20a |
| Control | 0.10c | 0.04c | 0.02b | 0.06c |
| p-value | <0.001 | <0.001 | 0.009 | <0.001 |

| 1 November, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $N_2O$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 0.02 | 0.02b | - | 0.02 |
| Urea | 0.02 | 0.03a | - | 0.02 |
| Control | 0.02 | 0.02b | - | 0.02 |
| p-value | 0.927 | 0.005 | - | 0.086 |

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

For the spring fertilizer application dates, mean $N_2O$-N emissions were highest when fertilizer was applied on 1 May 2018. This application date also had the lowest soil temperatures. These findings are different than the fall, where emissions and temperature were positively correlated, and they suggest that distinct differences between the seasons impacts microbial actively and emissions. In the 1 May date, the unfertilized control treatment had the highest mean $N_2O$-N emissions of 0.81 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ which was followed by Urea & Water, Urea, and Water with mean $N_2O$-N emissions of 0.63, 0.60, and 0.18 g $N_2O$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.4).

For the 22 May 2018 application date, the Urea & Water had the highest mean $N_2O$-N emissions of 0.34 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ which was followed by Water, Urea, and Control treatments with mean $N_2O$-N emissions of 0.10, 0.09, and 0.09 g $N_2O$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.4). In the 12 June date, Urea had the highest mean $N_2O$-N emissions of 0.35 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ which was followed by the control with mean $N_2O$-N emissions of 0.09 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ (Table 2.4).

**Table 2.4: $N_2O$-N mean emissions for the three spring fertilizer application dates along with mean $N_2O$-N emissions for each seven day interval.**

| 1 May, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $N_2O$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 0.67b† | 0.66a | 0.50a | 0.63b |
| Urea | 0.65b | 0.70a | 0.35b | 0.60b |
| Water | 0.23c | 0.16b | 0.12c | 0.18c |
| Control | 1.14a | 0.75a | 0.47ab | 0.81a |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

| 22 May, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $N_2O$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 0.38a | 0.32a | 0.29a | 0.34a |
| Urea | 0.10b | 0.09b | 0.10b | 0.09b |
| Water | 0.14b | 0.08b | 0.05c | 0.10b |
| Control | 0.15b | 0.06b | 0.04c | 0.09b |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

| 12 June, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $N_2O$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea | 0.15a | 0.46a | 0.51a | 0.35a |
| Control | 0.07b | 0.12b | 0.10b | 0.09b |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

Like the 20 September date, the 1 May date had higher mean $N_2O$-N emissions from the treatments receiving Urea, with the exception of the Control treatment during the 1 May fertilizer application period. The 1 May Control treatment had relatively large $N_2O$-N emissions and the cause of this is unknown. It likely was a result of chamber placement but both Control chambers displayed higher emissions. Across the five fertilizer application dates that received supplemental irrigation, supplemental irrigation tended to increase $N_2O$-N emissions, however, increases in mean $N_2O$-N emissions were not significantly different at $\alpha$ of 0.05. Also, mean $N_2O$-N emissions were fairly constant within treatments across the length of each fertilizer application date, except 11 October as described above. The later spring fertilizer application dates did not result in a decrease in $N_2O$-N emissions; this would suggest that delaying nitrogen fertilizer application would not decrease $N_2O$-N emissions. Peak $N_2O$-N emissions were never noticed and this suggests that the 21 day course of study was not long enough to capture the peak $N_2O$-N emissions.

**Ammonia Emissions**

During the 2017 fall fertilizer application dates, mean $NH_3$-N emissions were highest in the 20 September fertilizer application date when soil and air temperatures were warmer than the 11 October and 1 November dates. In the 20 September date, Urea & Water had the highest mean $NH_3$-N emissions of 3.45 g $NH_3$-N $ha^{-1}$ $hr^{-1}$ which was followed by Urea, Water, and Control treatments with mean $NH_3$-N emissions of 3.03, 0.17, and 0.02 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.5). In the 11 October date, Urea & Water once again had the highest mean $NH_3$-N emissions of 1.88 g $NH_3$-N $ha^{-1}$ $hr^{-1}$ which was followed by Water, Control, and Urea with mean $NH_3$-N emissions of 1.08,

0.22, and 0.19 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.5). In the 1 November date, Urea had the highest mean $NH_3$-N emissions of 0.73 g $NH_3$-N $ha^{-1}$ $hr^{-1}$ which was followed by Urea & Water and the Control with mean $NH_3$-N emissions of 0.22 and 0.13 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.5).

Ammonia and $N_2O$-N emissions tend to follow one another. During the 20 September date the treatments receiving urea had higher $NH_3$-N and $N_2O$-N emissions, during the 11 October fertilizer application date, the treatments receiving supplemental irrigation had higher $NH_3$-N and $N_2O$-N emissions. However, during the 1 November date there were $NH_3$-N emission differences but no difference in $N_2O$-N emissions. To further confirm this assumption, in the 11 October date $NH_3$-N emissions dropped sharply, like $N_2O$-N emissions; between 8-14 DFA and 15-21 DFA when air and soil temperatures sharply decrease as described in Table 2.1.

**Table 2.5: $NH_3$-N mean emissions for the three fall fertilizer application dates along with mean $NH_3$-N emissions for each seven day interval.**

| 20 September, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $NH_3$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 8.94 | 0.28 | 0.07 | 3.45a |
| Urea | 6.45 | 0.11 | 0.02 | 3.03a |
| Water | 0.21 | 0.27 | 0.07 | 0.17b |
| Control | 0.03 | 0.01 | 0.02 | 0.02b |
| p-value | 0.061 | 0.538 | 0.183 | 0.002 |

| 11 October, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $NH_3$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 3.57a† | 0.97 | 0.16 | 1.88a |
| Urea | 0.25b | 0.47 | 0.10 | 0.19c |
| Water | 4.35a | 0.66 | 0.07 | 1.08b |
| Control | 0.55b | 0.24 | 0.07 | 0.22bc |
| p-value | <0.001 | 0.506 | 0.485 | <0.001 |

| 1 November, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $NH_3$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 0.26 | 0.15b | - | 0.22b |
| Urea | 0.26 | 1.36a | - | 0.73a |
| Control | 0.16 | 0.05b | - | 0.13b |
| p-value | 0.558 | <0.001 | - | <0.001 |

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

In the 1 May fertilizer application date, Urea & Water had the highest mean $NH_3$-N emissions of 6.11 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, which was followed by Urea, Water, and the Control treatments with mean $NH_3$-N emissions of 2.00, 1.40, and 0.23 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.6). In the 22 May date, Urea & Water once again had the highest mean $NH_3$-N emissions of 7.09 g $NH_3$-N $ha^{-1}$ $hr^{-1}$ which was followed by the Control, Urea, and Water treatments with mean $NH_3$-N emissions of 1.97, 0.56, and 0.21 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.6). In the 12 June date, Urea had the highest mean $NH_3$-N emissions of 1.13 g $NH_3$-N $ha^{-1}$ $hr^{-1}$ which was followed by the Control with mean $NH_3$-N emissions of 0.40 g $NH_3$-N $ha^{-1}$ $hr^{-1}$ (Table 2.6). $NH_3$-N mean emissions were also highest during the first seven days following fertilizer application (Table 2.6).

**Table 2.6: $NH_3$-N mean emissions for the three spring fertilizer application dates along with mean $NH_3$-N emissions for each seven day interval.**

| 1 May, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $NH_3$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 14.2a† | 0.10b | 0.07 | 6.11a |
| Urea | 5.07b | 0.70a | 0.36 | 2.00b |
| Water | 4.17b | 0.01b | 0.03 | 1.40b |
| Control | 0.87b | 0.01b | 0.05 | 0.23b |
| p-value | <0.001 | 0.045 | 0.563 | <0.001 |

| 22 May, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $NH_3$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 13.1a | 1.28a | 0.10b | 7.09a |
| Urea | 1.36b | 0.45b | 0.07b | 0.56b |
| Water | 0.22b | 0.18b | 0.30a | 0.21b |
| Control | 7.33ab | 0.32b | 0.27ab | 1.97ab |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

| 12 June, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $NH_3$-N $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea | 2.54 | 0.39 | 0.08 | 1.13 |
| Control | 0.42 | 0.60 | 0.09 | 0.40 |
| p-value | 0.462 | 0.667 | 0.992 | 0.267 |

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

In most cases the 2018 spring fertilizer application dates had higher $NH_3$-N emissions than the 2017 fall dates. This a direct result of the 2018 spring dates having higher soil and air temperatures than the fall 2017 dates as described in Table 2.1. Within each treatment fertilizer application date, $NH_3$-N emissions generally were highest during the first seven days following fertilizer application; with the exception of 1 November 2017 fertilizer application date. This data suggests that the peak $NH_3$-N emissions occur within the first seven days following fertilizer application, unlike $N_2O$-N in which the 21 day length of study did not incorporate peak $N_2O$-N emissions. The supplemental irrigation increased mean $NH_3$-N emissions in every fertilizer application date except during the 1 November 2017, when the Urea treatment had highest mean $NH_3$-N emissions, and the 22 May 2018 date when the Control treatment had higher mean $NH_3$-N emissions than the Water treatment.

**Carbon Dioxide Emissions**

During the three 2017 fall fertilizer application dates, the 20 September date had the highest $CO_2$-C emissions. During the 20 September date the Control treatment had the highest mean $CO_2$-C emissions of 3080 g $CO_2$-C $ha^{-1}$ $hr^{-1}$ which was followed by Urea, Water, and Urea & Water treatments with mean $CO_2$-C emissions of 2850, 2790, and 2420 g $CO_2$-C $ha^{-1}$ $hr^{-1}$, respectively (Table 2.7). During the 11 October date, Urea & Water had the highest mean emissions of 614 g $CO_2$-C $ha^{-1}$ $hr^{-1}$ which was followed by Urea, Control, and the Water treatments with mean emissions of 511, 494, and 470 g $CO_2$-C $ha^{-1}$ $hr^{-1}$, respectively (Table 2.7). In the 1 November date, Urea had the highest mean emissions of 429 g $CO_2$-C $ha^{-1}$ $hr^{-1}$ which was followed by the Urea & Water and

Control treatments with mean emissions of 360 and 215 g $CO_2$-C $ha^{-1}$ $hr^{-1}$, respectively (Table 2.7).

When comparing soil and air temperatures to $CO_2$-C emissions, the $CO_2$-C emissions did not closely coincide. For example, in the 20 September fertilizer application period, air and soil temperatures decrease across the 21 day course of study (Table 2.1), however, for most treatments, emissions were lowest at 8-14 DFA then they increased at 15-21 DFA. In the 11 October date, $CO_2$-C means emissions did not drop as sharply at 15-21 DFA as mean $CO_2$-C emissions noticed in both $N_2O$-N and $NH_3$-N. In the 1 November date, $CO_2$-C mean emissions are still relatively high when compared to $N_2O$-N and $NH_3$-N

**Table 2.7: $CO_2$-C mean emissions for the three fall fertilizer application dates along with mean $CO_2$-C emissions for each seven day interval.**

| 20 September, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $CO_2$-C $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 3050b† | 1920b | 2290c | 2420b |
| Urea | 4500a | 1820b | 2210c | 2850ab |
| Water | 3030b | 1970b | 3470a | 2790ab |
| Control | 3260b | 3070a | 2900b | 3080a |
| p-value | 0.035 | <0.001 | <0.001 | 0.036 |

| 11 October, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $CO_2$-C $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 884a | 617a | 251b | 614a |
| Urea | 680b | 421c | 381a | 511b |
| Water | 673b | 474bc | 217b | 470b |
| Control | 512c | 513b | 438a | 494b |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

| 1 November, 2017 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $CO_2$-C $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 440a | 239b | - | 360b |
| Urea | 450a | 396a | - | 429a |
| Control | 223b | 203b | - | 215c |
| p-value | <0.001 | <0.001 | - | <0.001 |

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

In the 1 May fertilizer application date, the Urea treatment had the highest $CO_2$-C mean emissions of 1330 g $CO_2$-C $ha^{-1}$ $hr^{-1}$ which was followed by Urea & Water, Control, and the Water treatments with mean $CO_2$-C emissions of 1210, 1090 and 843 g $CO_2$-C $ha^{-1}$ $hr^{-1}$, respectively (Table 2.8). In the 22 May date, the Water treatment had the highest mean $CO_2$-C emissions of 1360 g $CO_2$-C $ha^{-1}$ $hr^{-1}$ which was followed by the Control, Urea & Water, and Urea treatments with mean $CO_2$-C emissions of 1230, 1130, and 975 g $CO_2$-C $ha^{-1}$ $hr^{-1}$, respectively (Table 2.8). In the 12 June date the Control treatment had the highest mean $CO_2$-C emissions of 1320 g $CO_2$-C $ha^{-1}$ $hr^{-1}$ which was followed by the Urea treatment with mean $CO_2$-C emissions of 1010 g $CO_2$-C $ha^{-1}$ $hr^{-1}$ (Table 2.8).

Overall, $CO_2$-C emissions during the three 2018 spring fertilizer application periods were similar with a range of only 520 g $CO_2$-C $ha^{-1}$ $hr^{-1}$. Carbon dioxide emissions also did not trend closely with soil or air temperatures. An example of this is in the 22 May fertilizer application date. Mean soil and air temperatures across the course of the study decreased (Table 2.1), however, $CO_2$-C emissions were generally lowest in the 8-14 DFA interval which did not correspond with the lowest soil or air temperatures. A similar pattern can be noticed in both the 1 May and 12 June fertilizer application dates.

**Table 2.8: $CO_2$-C mean emissions for the three spring fertilizer application dates along with mean $CO_2$-C emissions for each seven day interval.**

| 1 May, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $CO_2$-C $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 1250a† | 900bc | 1720a | 1210b |
| Urea | 1390a | 1160a | 1550ab | 1330a |
| Water | 843b | 795c | 926c | 843c |
| Control | 984b | 1000b | 1410ab | 1090b |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

| 22 May, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $CO_2$-C $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea & Water | 1450a | 847b | 1020b | 1130b |
| Urea | 1010b | 991ab | 914b | 975c |
| Water | 1450a | 1140a | 1510a | 1360a |
| Control | 1160b | 1150a | 1420a | 1230b |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 |

| 12 June, 2018 | Mean Emissions | | | |
|---|---|---|---|---|
| | 0-7 DFA | 8-14 DFA | 15-21 DFA | All |
| Treatment | ----------g $CO_2$-C $ha^{-1}$ $hr^{-1}$---------- | | | |
| Urea | 1230 | 903b | 873b | 1010b |
| Control | 1240 | 1330a | 1470a | 1320a |
| p-value | 0.918 | <0.001 | <0.001 | <0.001 |

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

Across all six different fertilizer application dates, treatments did play an effect in each individual fertilizer application period, however, when comparing across the different dates, no treatment resulted in higher $CO_2$-C emissions. The addition of nitrogen based fertilizer did not increase $CO_2$-C emissions. Air and soil temperatures did not have as large on an impact on $CO_2$-C emissions as expected.

**Treatment Effects across Fertilizer Application Dates**

When looking at the Urea & Water treatment, $N_2O$-N emissions and $CO_2$-C emissions were highest during the 20 September 2017 fertilizer application date with mean emissions of 2.01 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ and 2420 g $CO_2$-C $ha^{-1}$ $hr^{-1}$, respectively (Table 2.9). Ammonia-nitrogen emissions were highest during the 22 May 2018 and 1 May 2018 dates with mean $NH_3$-N emissions of 7.09 and 6.11 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, respectively (Table 2.9). The 11 October and 1 November dates only emitted trace amounts of the measured GHG's.

In the 20 September 2017 fertilizer application date, $N_2O$-N, $NH_3$-N, and $CO_2$-C emissions were highest with mean emissions of 2.21 g $N_2O$-N $ha^{-1}$ $hr^{-1}$, 3.04 g $NH_3$-N $ha^{-1}$ $hr^{-1}$, and 2850 g $CO_2$-C $ha^{-1}$ $hr^{-1}$, respectively (Table 2.9). Like the Urea & Water treatment, all GHG emissions were relatively low in the 11 October 2017 and 1 November 2017 fertilizer application dates. The three 2018 spring dates had similar GHG emissions.

The Water treatment had little effect on $N_2O$-N emissions except in the 20 September 2017 fertilizer application date when mean $N_2O$-N emissions were 1.76 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ (Table 2.9); however supplemental irrigation was only added once.

Supplemental irrigation did increase emissions in the 11 October 2017 and 1 May 2018 dates. However, these increases also correspond to the coolest soil and air temperatures (Table 2.1) when a Water treatment was present, so no definite outcome could be determined. It likely is a result of cooler soil temperatures which slowed the chemical conversion of ammonia to nitrate thus allowing more $NH_3$-N to be emitted.

Nitrous oxide-nitrogen emissions varied greatly in the Control treatment when compared to other treatments. Mean $N_2O$-N emissions were highest in the 20 September 2017 fertilizer application date with mean $N_2O$-N emissions of 1.89 g $N_2O$-N $ha^{-1}$ $hr^{-1}$ which was followed by the 1 May 2018 and 12 June 2018 dates with mean emissions of 0.81 g $N_2O$-N $ha^{-1}$ $hr^{-1}$, for both dates (Table 2.9). Mean $NH_3$-N emissions were relatively low except during the 22 May 2018 date when mean $NH_3$-N emissions were 1.98 g $NH_3$-N $ha^{-1}$ $hr^{-1}$ (Table 2.9). Mean $CO_2$-C emissions were as expected when compared to soil and air temperatures described in Table 2.1.

**Table 2.9: Mean $N_2O$-N, $NH_3$-N, and $CO_2$-C emissions over the study period for all treatments and all fertilizer application dates.**

| Urea & Water Treatment Mean Emissions | | | |
|---|---|---|---|
| Experiment | $N_2O$-N | $NH_3$-N | $CO_2$-C |
| | ----------g ha$^{-1}$ hr$^{-1}$---------- | | |
| 20 September, 2017 | 2.01a† | 3.45bc | 2418.90a |
| 11 October, 2017 | 0.22c | 1.88c | 614.00c |
| 1 November, 2017 | 0.02d | 0.22c | 360.48d |
| 1 May, 2018 | 0.63b | 6.11ab | 1210.66b |
| 22 May, 2018 | 0.34c | 7.09a | 1128.25b |
| p-value | <0.001 | <0.001 | <0.001 |

| Urea Treatment Mean Emissions | | | |
|---|---|---|---|
| Experiment | $N_2O$-N | $NH_3$-N | $CO_2$-C |
| | ----------g ha$^{-1}$ hr$^{-1}$---------- | | |
| 20 September, 2017 | 2.21a | 3.04a | 2853.23a |
| 11 October, 2017 | 0.13d | 0.19d | 511.07d |
| 1 November, 2017 | 0.02d | 0.73cd | 429.63d |
| 1 May, 2018 | 0.60b | 2.00b | 1329.69b |
| 22 May, 2018 | 0.09d | 0.56cd | 975.57c |
| 12 June, 2018 | 0.35c | 1.13c | 1009.69c |
| p-value | <0.001 | <0.001 | <0.001 |

| Water Treatment Mean Emissions | | | |
|---|---|---|---|
| Experiment | $N_2O$-N | $NH_3$-N | $CO_2$-C |
| | ----------g ha$^{-1}$ hr$^{-1}$---------- | | |
| 20 September, 2017 | 1.76a | 0.17b | 2787.15a |
| 11 October, 2017 | 0.20b | 1.08a | 470.47d |
| 1 May, 2018 | 0.18b | 1.40a | 843.01c |
| 22 May, 2018 | 0.10b | 0.21b | 1363.53b |
| p-value | <0.001 | 0.006 | <0.001 |

| Control Treatment Mean Emissions | | | |
|---|---|---|---|
| Experiment | $N_2O$-N | $NH_3$-N | $CO_2$-C |
| | ----------g ha$^{-1}$ hr$^{-1}$---------- | | |
| 20 September, 2017 | 1.89a | 0.02b | 3084.92a |
| 11 October, 2017 | 0.06c | 0.22b | 493.88d |
| 1 November, 2017 | 0.02c | 0.13b | 215.15e |
| 1 May, 2018 | 0.81b | 0.23b | 1093.91c |
| 22 May, 2018 | 0.09c | 1.97a | 1231.77bc |
| 12 June, 2018 | 0.81b | 0.40b | 1317.50b |
| p-value | <0.001 | 0.020 | <0.001 |

Urea & Water = 224 kg N ha$^{-1}$ with supplemental irrigation, Urea = 224 kg N ha$^{-1}$, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a treatment that have the same letter are not significantly different at $\alpha = 0.05$

**Seasonal Differences**

To compare seasonal differences between fertilizer application dates, PLFA samples were analyzed from the 11 October, 2017 and 22 May, 2018 fertilizer application dates. The total biomass was highly variable in the fall and spring and was not significantly different (p-value of 0.149) (Table 2.10). However, seasonal differences in percent bacteria, actinomycetes, arbusular mycorrhizal, and undifferentiated soil organisms were observed (Table 2.10). These finding indicate that from the fall to spring, the relative importance of bacteria decreased as there were more bacteria present in the fall when compared to the spring. This decrease also corresponds to CO2-C emissions as described above (Table 2.7, Table 2.8).

**Table 2.10: Phospholipid Fatty Acid (PLFA) results for the 11 October, 2017 and 12 June, 2018 fertilizer application dates.**

| Fertilizer Application Date | Total Biomass | Bacteria | Fungi | Actino-mycetes | Arbusular Mycorrhizal | Undiffer-entiated | Fungi/ Bacteria |
|---|---|---|---|---|---|---|---|
| | ng $g^{-1}$ | ----------%---------- | | | | | Ratio |
| 11 October, 2017 | 2360 | 54.61 | 10.07 | 11.75 | 3.39 | 34.52 | 0.18 |
| 12 June, 2018 | 3510 | 40.78 | 12.53 | 7.32 | 1.28 | 46.06 | 0.32 |
| p-value | 0.149 | 0.003 | 0.481 | 0.006 | 0.016 | 0.025 | 0.217 |

In the fall of 2017, $CO_2$-C and $N_2O$-N emissions decreased with decreasing soil temperature (Figure 2.1, Figure 2.2). However, different results were observed in the spring of 2018 and soil temperature and emissions were not related. In addition, in the fall there was a strong relationship between $N_2O$-N and $CO_2$-C. These findings indicate that the importance of temperature on GHG activity changed from fall to spring. The data suggests that the population change between the fall of 2017 and spring of 2018 played a

major factor in the GHG emissions regardless of treatment or weather characteristics. Water filled pore space had an important impact on $N_2O$-N emissions. At higher water filled pore space, $N_2O$-N emissions increased regardless of season (Figure 2.2). However, no statistical comparison was performed as water filled pore space and air temperatures both decreased in the fall and the results were confounding. When further comparing seasonal differences, it is important to notice that there was a high nitrate baseline in the spring (Table 2.2). This resulted in the unfertilized treatments having higher $N_2O$-N emissions than the fertilized treatments (Figure 2.2).

**Figure 2.1: Differences in $CO_2$-C and $N_2O$-N emissions verses temperature along with the relationship between $CO_2$-C and $N_2O$-N for the Fall 2017 and Spring 2018 dates.**

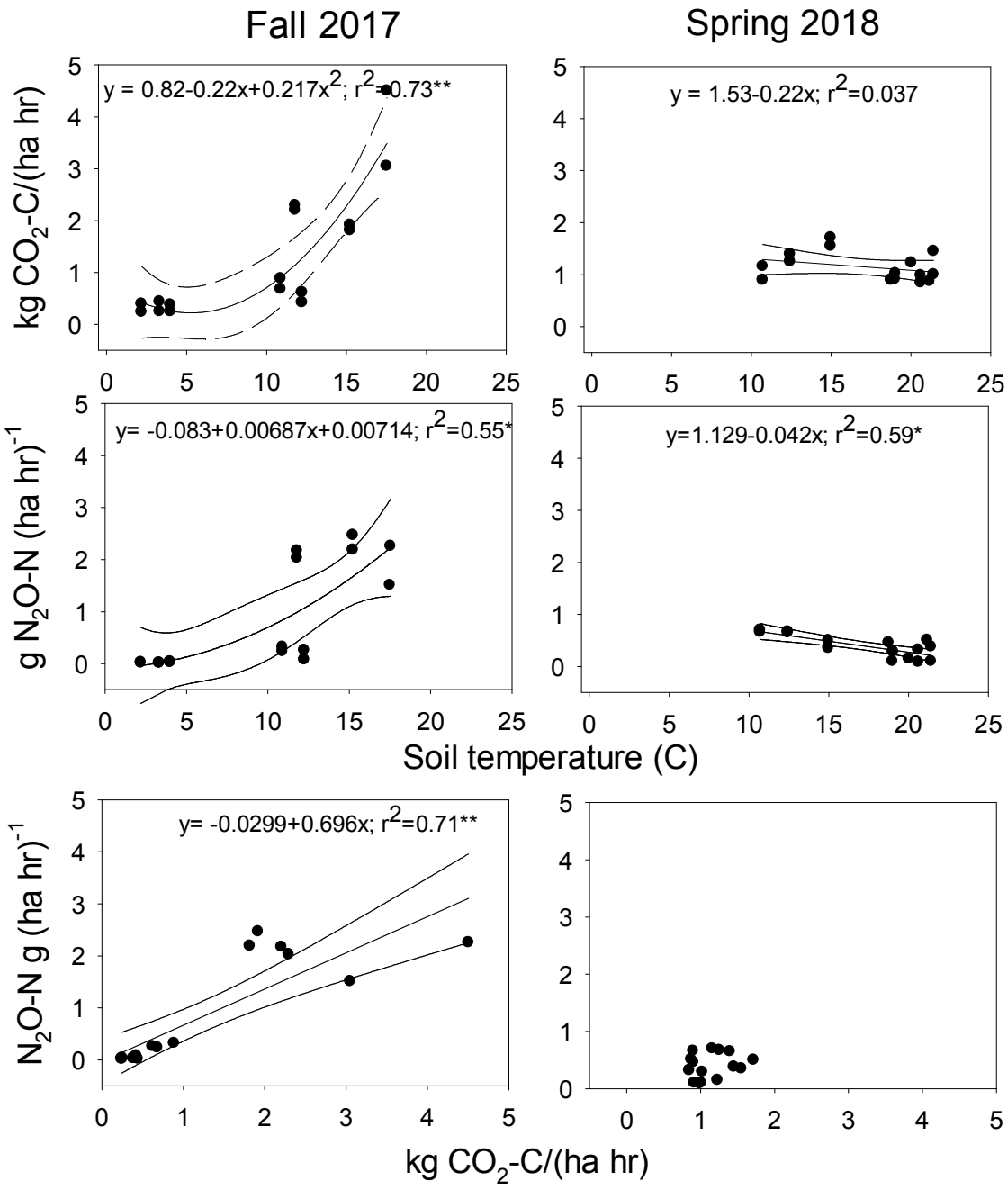
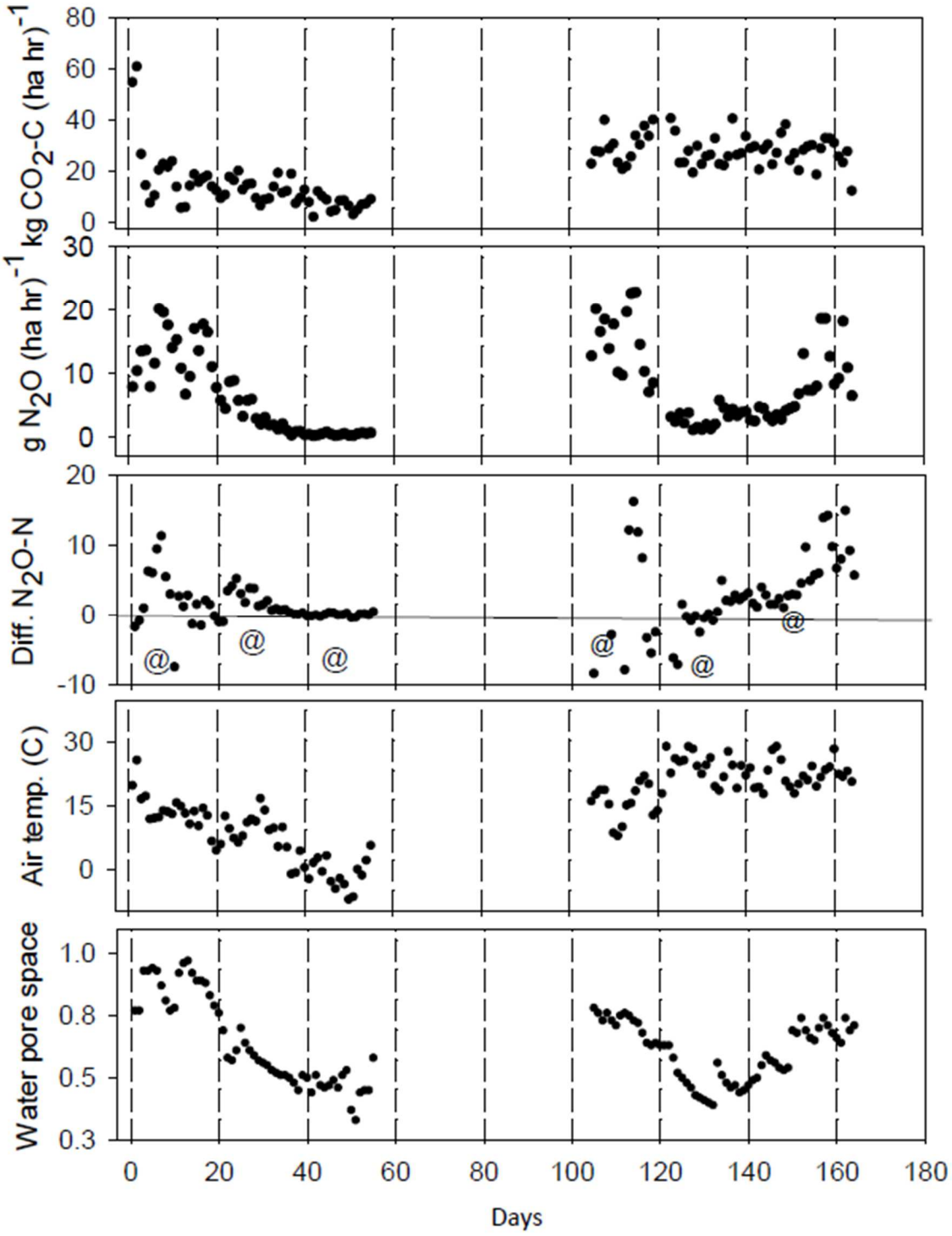


**Figure 2.2: Daily mean $CO_2$-C emissions, $N_2O$-N emissions, air temperature, and water filled pore space for the fall 2017 and spring 2018 fertilizer application dates. The Fall 2017 fertilizer dates started on 20 September at day 1 and Spring 2018 dates started on 1 May at day 100.**




@ = fertilizer application date, Diff. $N_2O$-N = difference in $N_2O$-N emissions from fertilized and unfertilized treatments.

## 2.5 DISCUSSION

Our study found mixed results with increasing soil moisture contents. This is inconsistent with previous studies were $N_2O$ emissions were responsive to high soil water filled pore space (WFPS) (Dusenbury et al., 2008; Sanju et al., 2010; Sainju et al., 2012). These results may be attributed to $N_2O$ being produced when the soil is aerobic through nitrification and when it is anaerobic through denitrification. The research was not able to identify a definitive WFPS point where $N_2O$ emissions increased, unlike Linn and Duran (1984). It was noticed that the treatments that received nitrogen fertilizer had higher $N_2O$-N emissions. This is from an increase in substrate which increases nitrification which is the dominant process for $N_2O$ emissions (Mosier et al., 2006; Dusenbury et al., 2008). Our increase in $N_2O$ emissions from fertilizer application was similar to other studies (Sainju et al., 2012; Dusenbury et al., 2008).

In the fall, soil and air temperatures played an important role in $N_2O$ emissions. This is noted during the 11 October 2017 fertilizer application date where $N_2O$-N emissions decrease drastically between 8-14 DFA and 15-21 DFA. This decrease was aligned with a rapid decrease in soil and air temperatures. The threshold where this sudden drop in $N_2O$-N emissions occurred was between a five cm soil temperature of 12.2 and 3.99 °C. This is contrary to Holtan-Hartwig et al. (2002) where it was noted that $N_2O$ emissions were elevated near freezing from an inhibition of nitrous oxide reductase. During the 21-day study period for fertilizer applied on 11 October, a peak in $N_2O$-N emission from the fertilizer application was not observed. Dusenbury et al. (2008) noted that following fertilizer application $N_2O$ emissions peak approximately two to four weeks thereafter. Sainju et al. (2012) reported that nitrogen fertilization increased $N_2O$

emissions by 43%. Different relationships between the physical measurements of $N_2O$ emissions were observed in the spring. Differences between spring and fall were related to change in the microbial community structure.

Of the six fertilizer application dates, the highest emissions were observed for the 11 September 2017 fertilizer application date. This is consistent with other studies that report that $N_2O$ emissions are greater in fall than in the spring (Drury et al., 2012). However, Dusendury et al. (2008) stated that $N_2O$-N emissions remain elevated during spring thaw cycles, which could have been a factor in our study. The later spring fertilizer application dates did not result in a decrease in $N_2O$-N emissions; this would suggest that delaying nitrogen fertilizer application would not decrease $N_2O$-N emissions. This is similar to results posted by Venterea and Coulter (2015).

Carbon dioxide emissions were not influenced by the application of nitrogen fertilizers. This is consistent with others studies as $CO_2$ emissions from nitrogen fertilizer application are variable (Al-Kaisi et al., 2008). Sainju et al. (2012) also reported similar results in their multiple year study where $CO_2$ emissions were higher in the fertilized treatments in 2009 but $CO_2$ emissions were lower in 2008 and 2011. The application of supplemental irrigation also did not have an effect on $CO_2$ emissions. This is inconsistent with other studies whereas others have reported that irrigation increased $CO_2$ emissions as soil water content increased (Sainju et al., 2012). The biggest factor in $CO_2$-C emissions in this study was soil and air temperatures along with the amount of bacteria in the PLFA soil tests. This is consistent with other studies where $CO_2$ emissions increased with temperature (Alluvione et al., 2009). Carbon dioxide-carbon emissions were higher in the fall of 2017 when compared to the spring of 2018. This is a result of higher SOC

and bacteria in the fall when compared to the spring samples which had lower SOC and undifferentiated PLFA results.

With these results in mind, we are proposing three conceptual models, based on Drake et al. (2013) to explain seasonal differences. The first model is that a season independent model can be used across seasons. A characteristic of this model is that a common model can be used to define the relationship between temperature or soil moisture in the spring and fall. A good example of this conceptual model is Linn and Doran (1984). The second model that the physical properties do not affect activity and the third model is seasonal differences impact the relationship between soil temperature or moisture and microbial activity. This third model is called seasonal plasticity.

These models were tested by comparing the microbial community structure and GHG emissions of fall and spring samples. Understanding these changes are important because different soil organisms have different processes. Bacteria and fungi have different roles in nutrient cycling in soils. Bacteria fix N, release organic acids to solubilize nutrients, produce siderophores that can chelate iron, and have the capacity to convert ammonium to nitrate, and use nitrate as the final electron acceptor in respiration. Fungi, do not fix N, increase uptake of nutrients through their hyphal network, and produce glomalin that builds soil structure, and have the ability to produce $N_2O$ through denitrification. In addition, fungal and bacterial populations have different impacts on the C and N cycles. For example, fungal biomass may immobilize more N into the microbial biomass than bacterial biomass (de Vries, 2009). Understanding the N immobilization kinetics is important because they have the potential to influences $N_2O$ losses. Following the application of urea, Clay et al. (1990) showed that approximately

one third of the applied N was immobilized directly into the microbial biomass, and that the immobilized N was mineralized faster than the organic N. In the second example, bacterial and fungal populations have different denitrification kinetics. Choel and Delaune (2010) reported that fungi are the dominant organisms producing $N_2O$ in soil with a redox potential of 250 mv, and that bacteria are the dominant organisms in anaerobic systems having redox potential of -200 mv. Bacteria and fungi may also be impacted differently by soil temperature. Pietikalainen et al. (2005) reported that both bacteria and fungi had optimum temperatures between 25 and 30$^{o}$ C. However, bacteria were favored with increasing temperatures and fungi were favored with decreasing temperatures. In our experiment, actinomycetes were higher in the fall than the spring. This change may be important because these organisms are aerobic gram + bacteria that form spores. They produce thread-like filaments and they produce the earthy smell. As aerobic organisms, their capacity to produce $N_2O$ through denitrification is limited. This change in composition suggests that seasonal differences in GHG emissions resulted from changes in the microbial community structure (Rashid et al., 2016). These finding suggest that the seasonal plasticity model may be appropriate for South Dakota.

## 2.6 CONCLUSION

Nitrous oxide-nitrogen emissions were highest in the 11 September 2017 when soil temperatures were warmest. Nitrogen fertilization did increase $N_2O$-N and $NH_3$-N gas emissions during the majority of fertilization application dates, however, $CO_2$-C emissions were not impacted by nitrogen fertilization. Supplemental irrigation increased $N_2O$-N and $NH_3$-N gas emissions but no differences were noticed in $CO_2$-C emissions. As soil temperatures decreased $CO_2$-C, $N_2O$-N and $NH_3$-N emissions decreased as well.

There was a microbial community change between the fall and spring fertilizer application dates. This change may have attributed differences in the spring and fall $N_2O$ signatures. With this in mind, it is suggested that there a common model between fall and spring GHG emission cannot be used and instead we are proposing a GHG model that changes with the season.

## 2.7 ACKNOWLEDGEMENTS

Support was provided by USDA-AFRI (2017-05485), USDA-NRCS (69-3A75-285), and the South Dakota Corn Utilization Council.

## 2.8 LITERATURE CITED

Al-Kaisi, M.M., M.L. Kruse, and J.E. Sawyer. 2008. Effect of nitrogen fertilizer application on growing season carbon dioxide emission in a corn-soybean rotation. J. Environ. Qual. 37:325–332.

Alluvione F., A. D. Halvorson, and S. J. Del Grosso. 2009. Nitrogen, tillage, and crop rotation on carbon dioxide and methane fluxes from irrigated cropping systems. J. Environ. Qual. 38:2023–2033.

Choel, D., and R.D. DeLaune. 2010. Fungal and bacteria mediated denitrification in wetlands, influence of sediment redox conditions. Water Res. 44:2441-2450.

Clay, D.E., G.L. Malzer, and J.L. Anderson. 1990. Tillage and dicyandiamide influence on nitrogen fertilizer immobilization, remineralization, and utilization by maize. Biol and Fertil Soil 9: 220-225.

Clay, D.E., S.A. Clay, K. Brix-Davis, and K.A. Scholes. 1994. Nitrate movement after anhydrous ammonia application in a ridge tillage system. J. Environ. Qual. 23:9-13.

Clay, D.E., S.A. Clay, Z. Liu, and S.S. Harper. 1995. Leaching of dissolved organic C in soil following anhydrous ammonia application. Biol. Fert. Soil. 19:10-14.

Clay, D.E., S.A. Clay, T. B. Moorman, K. Brix-Davis, K.A. Scholes, and A.R. Bender. 1996. Temporal variability of organic C and nitrate in a shallow aquifer. Water Res. 30:559-568.

Clay, D. E., S. A. Clay, D. J. Lyon, and J. M. Blumenthal. 2005. $^{13}C$ discrimination in corn grain can be used to separate and quantify yield losses due to water and nitrogen stresses. Weed Sci. 53:23-29.

Clay, D.E., J. Chang, S.A. Clay, J.J. Stone, R.H. Gelderman, C.G. Carlson, K. Reitsma, M. Jones, L. Janssen, and T. Schumacher. 2012. Corn yields and no-tillage affects carbon sequestration and carbon footprint. Agron. J. 104:763-770.

Clay, D.E., G. Reicks, C.G. Carlson, J. Moriles-Miller, J.J. Stone, and S.A. Clay. 2015. Residue harvesting and yield zone impact C storage in a continuous corn rotation. J. Environ. Qual. 44:803-809.

de Mendiburu, F. 2009. Agricolae: Statistical Procedures for Agricultural Research, R package version, 1.0-7.

de Vries, F.T. 2009. Soil fungi and nitrogen cycling. Causes and consequence of changing fungal biomass in grassland. PhD these Wageningen University. ISBN 978-90-8585-325-1, available at http://library.wur.nl/WebQuery/wurpubs/fulltext/1757.

Drake, J.E., M.A. Giasson, K.J. Spiller, and A.CX. Finze. 2013. Seasonal plasticity in the temperature sensitivity of microbial activity in three temperate zone forest soils. Ecosphere 4:77,1-21.

Drury, C.F., W.D. Reynolds, C.S. Tan, T.W. Welacky, W. Calder, and N.B. McLaughlin. 2006. Emissions of nitrous oxide and carbon dioxide: Influence of tillage type and nitrogen placement depth. Soil Sci. Soc. Am. J. 70:570–581.

Drury, C.F., W.D. Reynolds, X.M. Yang, N.B. McLaughlin, T.W. Welacky, W. Calder, and C.A. Grant. 2012. Nitrogen source, application time, and tillage effects on soil nitrous oxide emissions and corn grain yields. Soil Sci. Soc. Am. J. 76:1268–1279.

Dusenbury, M.P., R.E. Engel, P.R. Miller, R.L. Lemke, and R. Wallander. 2008. Nitrous oxide emissions from a northern Great Plains soil as influenced by nitrogen management and cropping systems. J. Environ. Qual. 37:542–550.

Holtan-Hartwig, L., P. Dorsch, and L.R. Bakken. 2002. Low temperature control of soil denitrifying communities: Kinetics of N2O production and reduction. Soil Biol. Biochem. 34:1797–1806.

Kim, K.-I., D.E. Clay, C.G. Carlson, S.A. Clay, and T. Trooien. 2008. Do synergistic relationships between nitrogen and water influence the ability of corn to use nitrogen derived from fertilizer and soil? Agron. J. 100:551–556.

Linn, D.M. and J. W. Doran. 1984. Effect of water-filled pore space on carbon dioxide and nitrous oxide production in tilled and non-tilled soils. Soil Sci. Soc. Am. J. 45:1267-1272.

Lupo, C., D.E. Clay, J. Benning, and J. Stone. 2013. Life Cycle assessment of the beef cattle production system for the northern Great Plains, US. J. Environ. Qual. 42:1386-1394.

Mosier, A.R., A.D. Halvorson, C.A. Reule, and X.J. Liu. 2006. Net global warming potential and greenhouse gas intensity in irrigated cropping systems in northeastern Colorado. J. Environ. Qual. 35:1584–1598.

Pietikalainen, J., M. Patterson, and W. Bååth. 2005. Comparison of temperature effects on soil respiration and bacteria and fungal growth rates. FEMS Micro. Ecol. 52:49-58.

R Core Team. 2017. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/.

Rashid, M.I., L.H. Mujawar, T. Shahazad, T. Almeelbi, I.M. Ismail, and M. Oves. 2016. Bacteria and fungi can contribute to nutrients bioavailability and aggregate formation in degraded soils. Microbiol Res. 2016 Feb; 183:26-41.

Reese, C., D.E. Clay, S.A. Clay, A. Bich, A. Kennedy, S. Hansen, and J. Miller. 2014. Winter cover crops impact on corn production in semi-arid regions. Agron. J. 106:1479-1488.

Roberts, W.P., and K.Y. Chan. 1990. Tillage-induced increases in carbon dioxide loss from soil. Soil Tillage Res. 17:143–151.

Sainju, U.M., W.B. Stevens, T. Caesar-TonThat, and J.D. Jabro. 2010. Land use and management practices impact on plant biomass carbon and soil carbon dioxide emission. Soil Sci. Soc. Am. J. 74:1613–1622.

Sainju, U.M., W.B. Stevens, T. Caesar-TonThat, and M. A. Liebig. 2012. Soil greenhouse gas emissions affected by irrigation, tillage, crop rotation, and nitrogen fertilization. J. Environ. Qual. 41:1774-1786.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2018. Web Soil Survey. Available online at the following link: https://websoilsurvey.sc.egov.usda.gov/.

Stone, J.J., C.R. Dollarhide, J.L. Benning, C.G. Carlson, and D.E. Clay. 2012. The life cycle impacts of feed for modern northern Great Plains U.S. swine production. Agricultural Systems 106:1-10.

Venterea, R. T., and J. A. Coulter. 2015. Split application of urea does not decrease and may increase nitrous oxide emissions in rainfed corn. Agron. J. 107:337–348.

# Chapter 3: Nitrous Oxide Emissions Sampling Point Sampling May Not Accurately Predict Emissions Following Fertilizer Application

## 3.1 ABSTRACT

In crop production, one of the most important greenhouse gases (GHG) is nitrous oxide ($N_2O$), which is increased by the application of nitrogen (N) fertilizer. However, accurate $N_2O$ emissions measurements are confounded by spatial and temporal variability. This study determined the precision and accuracy of $N_2O$ point measurements following the application of fall and spring applied urea fertilizer. Nitrous oxide emissions, air and soil temperatures, and soil moisture contents were determined for 21 days following the application of 224 kg urea-N $ha^{-1}$ on 20 September 2017, 11 October 2017, and 1 May 2018, at six time intervals daily (1.5-2.5, 5.5-6.5, 9.5-10.5, 13.5-14.5, 17.5-18.5, and 21.5-22.5 hours). Point samples collected at the average daytime temperature ($T_{ave, heat}$), between 9.5 and 10.5 hours were inconsistent in their ability to predict $N_2O$ emissions. However, samples collected at the nighttime average temperature ($T_{ave,cool}$) between 21.5 and 22.5 hours were similar to average emissions. The number of randomly collected point samples to be within 20% of the mean, 80% of the time over the 21 day period ranged from 13 for fertilizer applied on 20 September 2017 to 48 samples for fertilizer applied on 11 October 2017. This research indicates that management and climatic variability affects $N_2O$ emissions, and that accurate sampling protocols vary across management and climates. To reduce uncertainty, point sampling protocols should be tested under the range of conditions likely to be experienced in the field and where possible near-continuous measurement systems should be adopted.

Core comments

1. Measuring $N_2O$ flux at the average daytime temperature did not consistently produce flux estimates that were similar to the near continually measured values for spring and fall applied urea.
2. Locally tested $N_2O$ sampling protocols must account for temporal changes in management, and climatic conditions.
3. Non-alignment in the soil temperature and $N_2O$ emissions patterns is consistent with Fick's Law and can result from delayed $N_2O$ diffusion resulting from the clogging of the soil pores with water.
4. The accuracy of $N_2O$ emissions estimates can be improved by using a near continuous automated measurement systems.

## 3.2 INTRODUCTION

The carbon footprint provides a single value that represents the consequences from an activity on greenhouse gas emissions (Stone et al., 2012; Lupo et al., 2013; Clay et al., 2012; Butterbach-Bahl et al., 2013). In crop production, two important greenhouse gases are $CO_2$ and $N_2O$. Carbon dioxide is released as soil organic matter is mineralized (Clay et al., 2012) and $N_2O$ is released during nitrification, denitrification, and co-denitrification (Chang et al., 2016; Selbie et al., 2015). The carbon footprint is calculated by converting each of these gases to the equivalent amount of carbon dioxide, and based on IPCC (2007); 1 kg of $N_2O$ is equivalent to releasing 298 kg of $CO_2$. Carbon footprints are used to document the impacts of human activities on global warming and determine if individual products achieve regulatory requirements (California Environmental Agency,

2009). However, the ability to measure greenhouse gas emissions from individual decisions has not kept pace with the need for accurate information.

In annual crop production, carbon footprints generally increase with the amount of N fertilizer applied (Clay and Shanahan, 2011) and decrease with sequestered carbon (Clay et al., 2012). The large carbon footprint associated with N fertilizer results from the large amount of energy used to produce N fertilizer and the impact of $N_2O$ on the ability of the atmosphere to store energy (Klein et al., 2006; Butterbach-Bahl et al., 2013). Nitrous oxide emissions can be separated into at least three processes that include: 1) the production of $N_2O$ by soil organisms, 2) equilibrium relationships between $N_2O$ solubility in water and the amount of $N_2O$ in the air filled pore space, and 3) ultimately $N_2O$ emissions from the soil.

Nitrous oxide is produced during nitrification, denitrification, and co-denitrification (Chang et al., 2016). In aerobic soils, selected soil organisms have the capacity to obtain energy from conversion of ammonia to nitrate. This process, called nitrification is not 100% efficient and small portions of the N are released as $N_2O$. In anaerobic soils, some soil organisms have the capacity to use nitrate as the terminal electron acceptor in respiration. One of the end products of this process is $N_2$; however a small amount of nitrous oxide is also produced. The conversion of $NO_3$ to $N_2$ is called denitrification. The percentage of N converted to nitrous oxide varies across management and soils (Liu et al., 2016). Both processes are influenced by temperature, which can be defined mathematically (Rodrigo et al., 1997; Sharpali et al., 2016).

Once produced, the gas nitrous oxide is contained within the soil solution or the air-filled pore space. The amount contained within the soil solution has been modeled

using Henry's Law, $p = K_H \times c$, where p is the partial pressure of the solute above the solution, c is the concentration in the solution, and $K_H$ is the Henry's Law gas constant. Because, the $K_H$ value is temperature dependent, the Henrys equation indicates that $N_2O$ solubility will decrease with increasing temperature, which in turn should increase its concentration in the air-filled pore space.

The amount of $N_2O$ that is emitted from soil can be estimated using Fick' s Law, $F \approx D_s \times \frac{dC}{dz}$, where F is the gas flux, $D_s$ is the soil-gas diffusion coefficient, *d*C in the concentration gradient, and *dZ* is the change in distance (DeSutter et al., 2008). Increasing the soil moisture content reduces $D_s$ which slows GHG emissions (Moldrup et al., 2000). In addition, $D_s$ may also be function of management, which influences the pore size distribution, crusting, and the length of time required for water to percolate through the soil (Moldrup et al., 2000). For example, Jung et al. (2007) reported that cumulative average water infiltration after two hours was 15 mm in three annually cropped soils and 45 mm in three grassland soils. The increase in infiltration rate in the grassland soils most likely resulted from an increase in the number of large pores, which has the potential to increase $D_s$ (Eynard et al., 2004).

These findings suggest that interactions between microbes, temperature, and water have the potential to influence $D_s$ and GHG emissions. Based on the above discussion, higher temperatures will stimulate microbial respiration and simultaneously reduce $N_2O$ solubility in water. If $D_s$ is large, then it is likely that temperature and GHG emissions will be aligned. Under these conditions, sampling at the average soil temperature may produce accurate GHG emission estimates (Denmead et al., 1979; van der Weerden et al., 2013). Soil with rapid water flow and large soil pores, such as

permeant grasslands are likely to fit this category. The temperature based point sampling approach was adopted by many projects (Williams et al., 1999; Smith and Dobbie, 2001; Parkin and Venterea, 2010; de Klein and Harvey., 2015; Alves et al., 2012; and van de Weerden et al., 2013). However if $D_s$ is small, then emissions and temperature may not be aligned. If temperature and emissions are not aligned, we hypothesize that a GHG sampling protocol based on the average soil temperature will not accurately estimate GHG emissions. Soils containing a large number of small pores and relatively slow saturated hydraulic conductivities may fit this category.

As suggested above, a one-size fits all sampling protocol for GHG may not exist for all soils and management systems. This problem was noted by Parkin and Venterea (2010), where they stated that, "Because of our inability, at this time, to precisely assess the extent of bias associated with a given chamber design and sampling protocol under the range of conditions which might exist, we have adopted our 'best guess' protocol." The hypothesis of this study was that weekly point measurements of $N_2O$ flux collected at the average air temperature provide the accuracy and precision needed to determine fluxes following fertilizer applications. The objective of this research was to determine the precision and accuracy of point measurements on estimated $N_2O$ emissions following the application of N fertilizer at different seasonal timings.

## 3.3 MATERIALS AND METHODS

A field study was conducted at the Aurora Research Farm near Aurora, South Dakota (44º 18' 20.57" N, 96º 40' 14.04" W). The soil type was a Brandt silty clay loam (Fine-silty, mixed, superactive, frigid Calcic Hapludolls) (Soil Survey Staff, 2018), with percentage of clay, silt, and sand at 28%, 65%, and 7%, respectively. The initial soil

organic C (SOC) for the surface 15 cm was 36 Mg $ha^{-1}$, and the carbon mineralization kinetics was previously discussed in Clay et al. (2015). The soil parent materials were loess (0- to 60- cm) over glacial outwash. The surface soil hydraulic conductivity (ksp = 0.72 m $d^{-1}$) for this site was previously measured and reported (Clay et al., 1994). The water contents at field capacity and the wilting points were 0.315 and 0.177 g $g^{-1}$, and soil bulk density (0- to 15- cm soil depth) at the beginning of the study was 1.29 g $cm^{-3}$. A more complete description of these soils are available in Kim et al. (2008) and Clay et al. (1995, 1996, 2015).

Two long-term opaque chambers (8100-104, LI-COR, Lincoln, NE), that were designed to measure GHG emissions were installed according to LI-COR protocol. Each chamber consisted of a base and cover that pivots to cover the base during sample collection. The bases were only covered when the samples were collected. All chambers were within a ten $m^2$ area. During sample collection, the air temperatures within the chambers were measured with a thermistor when the gas samples were collected, a vent was used to equalize the chamber and atmospheric pressures, and the gas within the chamber was mixed. The chambers were sampled sequentially in a designated sequence, and corrections were applied individually to account for the air volume enclosed between the soil surface and the chamber cover. Gas samples were collected from each chamber at a one-second interval for 15 minutes from a 317 $cm^2$ area. A total of 900 samples were collected and analyzed for $N_2O$ by a Picarro Cavity Ringdown Spectrometer (model G2508; Picarro Inc., Santa Clara, CA). The soil was covered for 15 minutes every four hours. Nitrous oxide flux was calculated from 45 to 900 seconds following chamber closing using the LI-COR SoilFluxPro™ software (ver 4.0.1) (LI-COR, Lincoln, NE).

Soil moisture and temperature for the surface 5 cm were measured using soil moisture (LI-COR 8100-204) and temperature (LI-COR 8150-203) probes.

The Picarro Cavity Ringdown Spectrometer factory calibration was checked with standards at the beginning and end of the experiment. The standards were purchased from Airgas Specialty Gases (Airgas, USA, LLC Cinnaminson NJ), and they had concentrations of 0.378 and 149 ppm. The equation between the standard and the factory calibrations, conducted pre and post experiment was, $y=0.02+1.013\times(\text{standard})$, $r^2=0.99^{**}$.

In this experiment, urea (224 kg N $ha^{-1}$) was dissolved in ten mL water and was applied to the soil surface within the long-term chambers. Nitrous oxide-N emissions following the application of urea were measured 6-times daily (1.5-2.5, 5.5-6.5, 9.5-10.5, 13.5-14.5, 17.5-18.5, and 21.5-22.5 hours) for 21 days. These times were selected to match the average, minimum, and maximum soil and air temperatures. This experiment was based on prior research that showed that $N_2O$ emission increase for a relatively short period followed fertilizer applications (Clay et al., 1990b; Omonode et al., 2015; Fujinuma et al., 2011; Fernandez et al., 2016; Thomas and Hao, 2017). The N treatments were applied on 20 September 2017, 11 October 2017, and 1 May 2018. Within a fertilizer application date, each treatment was applied to two chambers. In this experiment, plants were excluded from the study area. For the fertilizer applied on 20 September 2017, emissions were measured from September 22 to October 11. For the fertilizer applied on 11 October 2017, emissions were measured from October 11 to November 1. For the fertilizer applied on 1 May 2018, emissions were measured from May 5 to May 22, 2018. Prior to the experiments, soil samples from two soil increments

(0- to 15- and 15- to 30- cm) were collected from non-treated areas located adjacent to the chambers. At the completion of the study, soil samples were collected from within the study area. Soil samples were dried, ground, sieved and analyzed for inorganic N (Kim et al., 2008). Bulk densities of the sampling depths were determined. A comparison between the $N_2O$ measurements for two chambers were conducted for the three fertilizer application dates. This comparison showed that for the 20 September, 11 October, and 1 May experiments, measurements in the two chambers were highly correlated ($p<0.01$) to each other and the correlation coefficients between the columns were 0.44, 0.73, and 0.59, respectively.

**Data analysis**

A fast Fourier transform (FFT) was conducted to identify the magnitudes associated with the dominant frequencies (cycles per day) in the soil surface air temperature and $N_2O$-N emission measurements (Chang et al., 2017). This analysis used the method summarized by Klingenberg (2005). The $N_2O$ emissions for each time period for the two columns was assumed to represent a four hour time block, which were then summed to determine total emissions or average emissions over the six sampling intervals. Means, variance, confidence intervals, and the sampling requirements for each of the six sampling intervals for the two columns were determined. The average emissions for the six time periods were compared to the average emission across time periods over the 21 days of the experiment.

Within a fertilizer application date, a t- test assuming a common variance was used to compare the average $N_2O$ emissions at each time-period with average emissions over the study period. An F- statistic was used to compare the variances of the different

sampling periods with the variance across all sampling intervals. The estimated random sampling requirements were determined with the Stein equation (Stein, 1945), $n = \frac{t_p^2 \times s^2}{d^2}$ where $t_p^2$ was the student t- value associated with a specific probability level and degrees of freedom, $s^2$ was the variance, and d was ½ the total desired range of the mean. Using this equation, the sampling requirement for producing $N_2O$ measurements ± 20% and ±30% of the mean 80% of the time (α=0.2) were calculated. This equation was previously used to estimate soil sampling requirements (Black, 1992; Skopp et al., 1995; Clay et al., 1997, 2002; Nolan et al., 2006).

The average air chamber temperature during gas sample collection was used to determine the average air temperature during the heating and cooling periods. Soil temperatures generally increased from 600 to 1600 hours and decreased from 1600 to 600 hours. The average temperature of when the soil was warming was identified as $T_{ave, heat}$ and the average temperature when the soil was cooling was identified as $T_{ave, cool}$.

## 3.4 RESULTS AND DISCUSSION

### Soil Inorganic N

For the 20 September 2017 fertilizer application date, the initial amount of inorganic N in the soil prior to applying the fertilizer for the 0-to 30- cm was 48.9 kg $ha^{-1}$. At the completion of the study, the amount of inorganic N in the surface 30- cm was 123 kg N $ha^{-1}$. For the 20 October 2017 experiment, prior to applying the fertilizer the 0- to 30- cm soil depth contained 65 kg $ha^{-1}$ of inorganic N and at the completion of this experiment, these plots contained 156 kg N $ha^{-1}$. For the May 1 2018 experiment, the inorganic N in the surface 30 cm prior to the experiment was 39 kg N $ha^{-1}$. When the

experiment was completed, the soil contained 107 kg N $ha^{-1}$. The difference between the initial plus the applied N (224 kg N $ha^{-1}$) and the amount of N remaining in the soil at the completion of the experiment suggests that a large portion of the inorganic N was lost through ammonia volatilization, $N_2O$ emissions, nitrate leaching, microbial immobilization, and fixation (Clay et al., 1990a, 1990b). Immobilization into microbial biomass was identified as the primary loss mechanism because following the application or urea, a large percentage of the applied N is rapidly immobilized into the soil biomass or soil organic matter (Clay et al., 1990b), and measured $NH_3$-N volatilization was very low (< 3 g $NH_3$-N $ha^{-1}$).

**Rainfall and Soil Moisture**

Rainfall between September 20 and October 11 was 14.3 cm and rainfall between October 11 and November 1 was 0.51 cm. Rainfall between May 5 and May 20 was 1.63 cm. Between September 20 and October 11, the volumetric water content for the surface five cm depth ranged from 0.35 (68.2 % water filled pore space) to 0.50 g $cm^{-3}$ (98% water filled pore space). Between October 11 and November 1, the volumetric water content for the surface five cm depth ranged from 0.18 (35% water-filled pore space) to 0.42 g $cm^{-3}$ (82% water-filled pore space), and from May 5 to May 22, soil moisture ranged from 0.28 (55% water filled pore space) to 0.37 g $cm^{-3}$ (72% water-filled pore space).

**Chamber temperature**

Average air temperature within the chamber and soil temperatures (0- to 5- cm) between September 20 and October 11 were 13.5 and 15.2$^{o}$ C, respectively. As expected, the chamber temperatures decreased during the fall and between October 11 and

November 1 the average chamber air and soil temperatures were 7.3 and 9.3 $^{o}$C, respectively. In the following spring, temperatures increased as the season progressed and the average chamber air and soil temperatures from May 5 to May 22 were 15.6 and 15.6$^{o}$C, respectively.

The $T_{ave,heat}$ value represents the half-way point between the minimum and maximum temperatures, during a portion of the day when air temperatures were increasing. From 20 September to 11 November 2017, $T_{ave,heat}$ occurred at approximately 10.5 hours (Table 3.1), which was similar to Chang et al. (2016). For the October 2017 and May 2018 experiments, the $T_{ave,heat}$ values were 9.4 and 10.2 hours, respectively.

The $T_{ave,cool}$ values represents the half-way point between the maximum and minimum values during the time of day when air temperatures were decreasing. For the September, October, and May experiments, $T_{ave,cool}$ occurred at 22.3, 22.0, and 22.2 hours, respectively (Table 3.1). In the USDA-ARS GRACnet protocols (Parkin and Venterea, 2010) the $T_{ave,\ heat}$ and $T_{ave,cool}$ values should correspond to the values reported as mid-morning and early evening, respectively. The $T_{ave,\ heat}$ occurred at approximately mid-morning, however $T_{ave,cool}$ was much later than early evening.

**Table 3.1: The mean, median, standard deviation, and confidence interval for air temperatures for each fertilizer application period. Times are reported in a decimal form.**

| 9/20/2017 to 10/11/2017 | Air Temperature | | |
|---|---|---|---|
| | $T_{ave,heat}$ | $T_{ave,cool}$ | Daily |
| | hours | hours | °C |
| Mean | 10.54 | 22.34 | 13.45 |
| Median | 9.63 | 21.63 | 12.21 |
| St dev | 2.043 | 1.86 | 6.98 |
| 95% CI | 1.06 | 0.82 | 1.38 |

| 10/11/2017 to 11/1/2017 | Air Temperature | | |
|---|---|---|---|
| | $T_{ave,heat}$ | $T_{ave,cool}$ | Daily |
| | hours | hours | °C |
| Mean | 9.35 | 22 | 7.27 |
| Median | 9.7 | 21.7 | 5.71 |
| St dev | 1.79 | 1.97 | 8.22 |
| 95% CI | 0.786 | 0.86 | 1.47 |

| 5/1/2018 to 5/22/2018 | Air Temperature | | |
|---|---|---|---|
| | $T_{ave,heat}$ | $T_{ave,cool}$ | Daily |
| | hours | hours | °C |
| Mean | 10.18 | 22.18 | 15.6 |
| Median | 10.18 | 22.18 | 13.37 |
| St dev | 1.51 | 1.51 | 7.65 |
| 95% CI | 0.765 | 0.765 | 1.56 |

**Diurnal and season pattern**

For the three fertilizer application dates, air temperatures and $N_2O$ emission's followed diurnal cycles. Air temperature and $N_2O$ emissions data and the resulting fast Fourier Transformation (FTT) were shown in Figures 3.1 and 3.2. The frequency is the number of cycles per day, and the magnitude represents the dominance of that frequency. The FFT is an analytical approach for inspecting data for repeating cycles. Frequencies with large magnitudes indicate that frequency has a large impact on measured data. For example in Figures 3.1 and 3.2, large magnitude associated with the one cycle per day

frequency indicated that the chamber air temperature and $N_2O$-N emissions measurements were influenced by a diurnal cycles. However, data sets can also contain low and high frequency cycles. The low frequency temperature and $N_2O$ emissions FFT's were attributed to gradual temperature and emissions decreases as the season progressed.

**Figure 3.1: An example of the mathematical conversion of air temperature (top) to the frequency domain (bottom) using a fast Fourier Transformation. The data used in this example was collected between September 20 and October 11. The FFT shows that the data set contains both long (small frequency) and diurnal cycles (frequency 1). The long cycle was attributed to the gradual cooling of the soil. The magnitude in the FFT represents the importance of that frequency. The average volumetric soil moisture contents for September 20 to October 11 time period was 0.42 $cm^3$ $cm^{-3}$.**

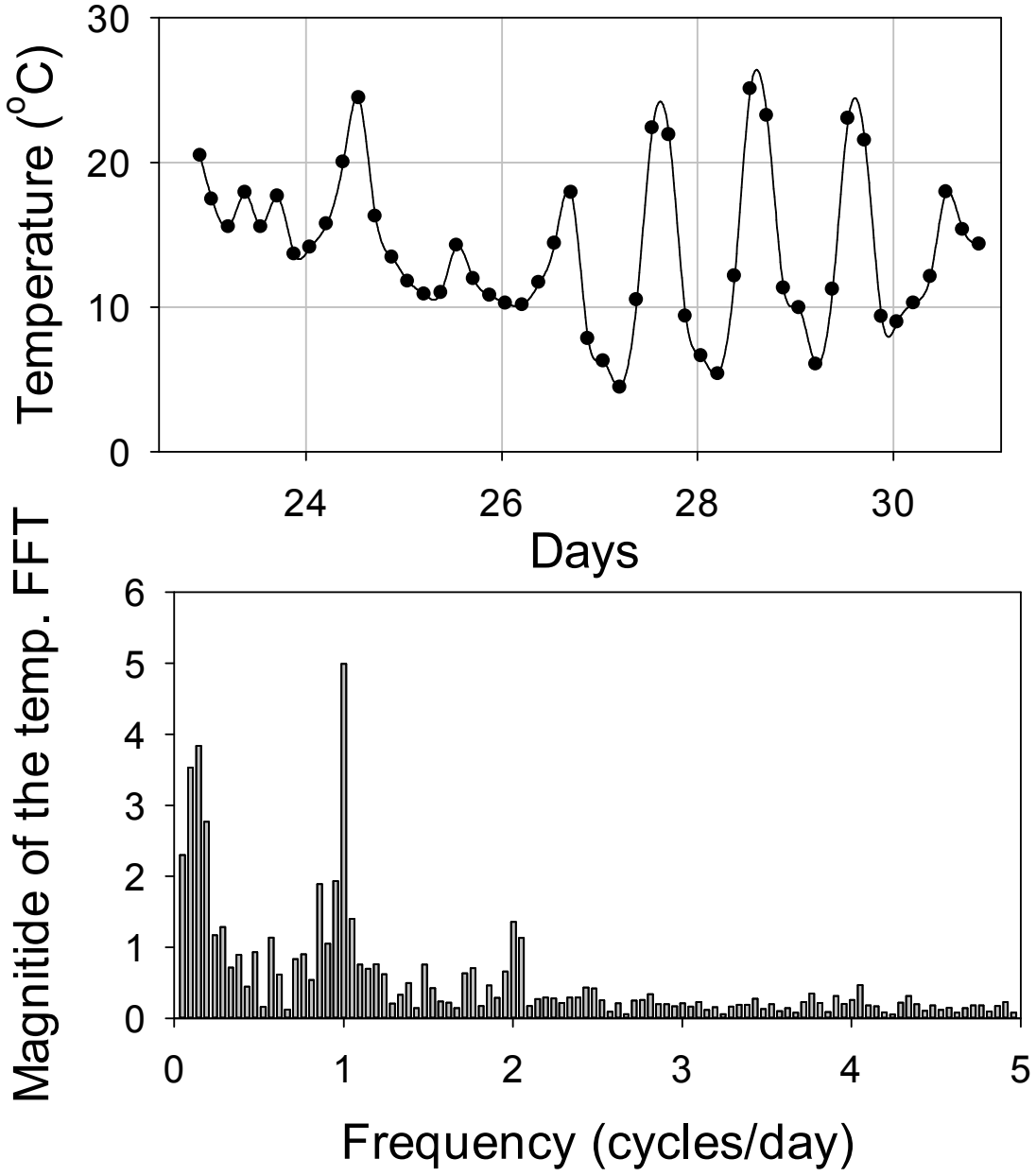
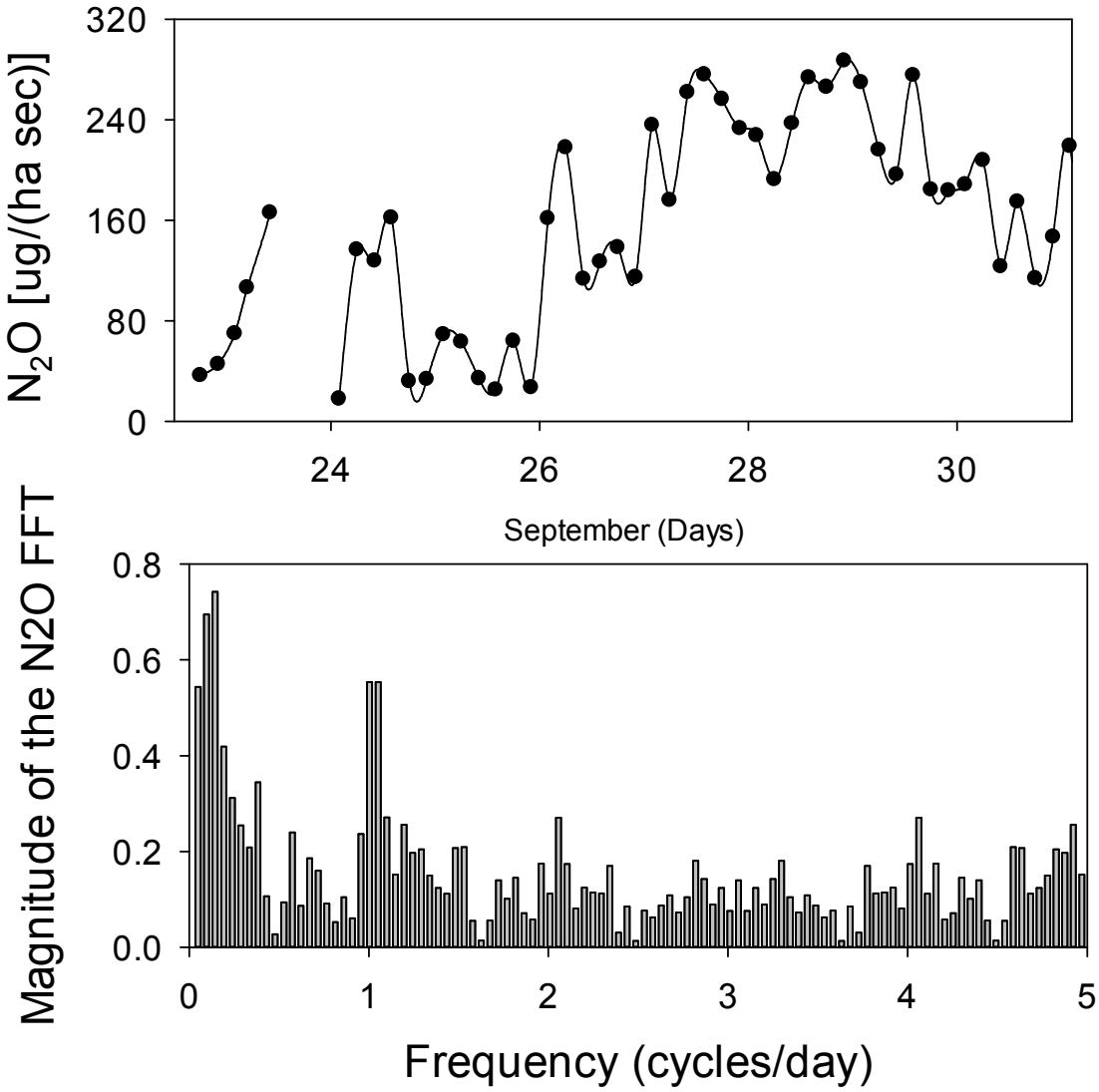


**Figure 3.2: An example of the mathematical conversion of $N_2O$ emissions (top) to the frequency domain (bottom) using a fast Fourier Transformation. The data used in this example was collected between September 20 and October 11. During this period, $N_2O$ was measured every four hours. The FFT frequency (bottom) shows that there were important patterns in the data set. The high magnitudes for small frequencies indicate long-term trends in the emissions pattern. The large magnitude for the frequency of one indicates that a strong diurnal pattern existed in the collected data.**



**Emission signatures**

For the fertilizer applied on 20 September 2017, the maximum $N_2O$-N emissions and air temperatures generally occurred between 13.5 and 14.5 hours (Table 3.2). However, there were important exceptions when temperature and $N_2O$ emissions were not aligned (Figures 3.3 and 3.4). In the first example, during the time-period between September 28 and September 30, $N_2O$ peaks were delayed relative to the temperature peak (Figure 3.3). The shift in the $N_2O$ emission peak results in a similar shift in the optimum sampling time. As predicted by Fick's Law, this delay could result from a reduced soil-gas diffusion coefficient resulting from increasing soil moisture contents or crusting (Clay et al., 1990a; DeSutter et al., 2008; Balaine et al., 2013). The non-alignment between temperature and emissions peaks was not permanent and by 2 October 2017, temperatures and emissions were closely aligned.

It is likely that the length time where temperatures and emissions are not aligned will depend on the soils water flow characteristics. In well drained soils with high water infiltration rates this shift may be very short. For example, in research reported by van de Weerden (2013) on well drained perennial grassland that had a low bulk density (0.96 g $cm^{-3}$), they recommended that sampling at the average temperature between 10.0 and 12.0 hours had zero bias. The comparison of findings from studies with different physical characteristics is important because they suggest that the length of the $N_2O$ phase shift will depend on the soils physical and biological characteristics.

For the 20 September 2017 fertilizer application date, the median $T_{ave,heat}$ value was at 9.6 hours (Table 3.1), and if samples were collected between 9.5 and 10.5 hours

total emissions would have been underestimated by 18% (Table 3.2). For the 11 October 2017 fertilizer application date, the $N_2O$ emission peak occurred between 17.5 and 18.5 hours, and the minimum value occurred between 9.5 and 10.5 hours. Point sampling at $T_{ave,heat}$ would have underestimated total $N_2O$ emissions by 31%.

In the second example, the impact of soil moisture on $N_2O$ emissions for spring applied N was explored (Fig. 3.4). This relationship showed that emissions decreased rapidly with an increase in soil water content from 0.32 to 0.36 $cm^3$ $cm^{-3}$ on 11 May 2018. This decrease could be attributed to several factors including a decrease in diffusivity resulting from an increase in the water-filled pore space or decreased nitrification. Emissions remained relatively low until 13 May, and from 13 May to 16 May, water contents gradually decreased to 0.32 $cm^3$ $cm^{-3}$ and diurnal $N_2O$ emission cycles were again evident in the data set. These results are contrary to the perception that denitrification increases with increasing water saturation, and it highlights the importance of considering that emissions, diffusivity, and microbial activity represent different components of a complex system. For the 1 May 2018 fertilizer application date, maximum emissions occurred between 13.5 and 14.5 hours, and samples collected between 13.5 and 14.5 hours over-estimated emissions by 26% (Table 3.2). Minimum emissions occurred between 1.5 and 2.5 hours and underestimated emissions by 22% (Table 3.2). It is important to point out that for this fertilizer application date, gas samples collected between 9.5 and 10.5 hours, which included $T_{ave,heat}$ were similar to total emissions. Temperature dependence in $N_2O$ emission patterns is not new and has been reported by others (Burzaco et al., 2013; Chang et al., 2016).

**Figure 3.3: Nitrous oxide emissions, air temperatures, and soil moisture for urea applied on 20 September 2017. Values in the top chart are from September 28 to 30. Data in the bottom chart are from October 2 to October 7. In the top chart, the $N_2O$ peak was delayed relative to chamber air temperatures. In the bottom chart, the air temperature and $N_2O$ peaks were becoming more aligned. The average soil moisture content from September 27 to October 3 was 0.45 $cm^3$ $cm^{-3}$. The average soil moisture content from October 3 to October 10 was 0.42 $cm^3$ $cm^{-3}$.**

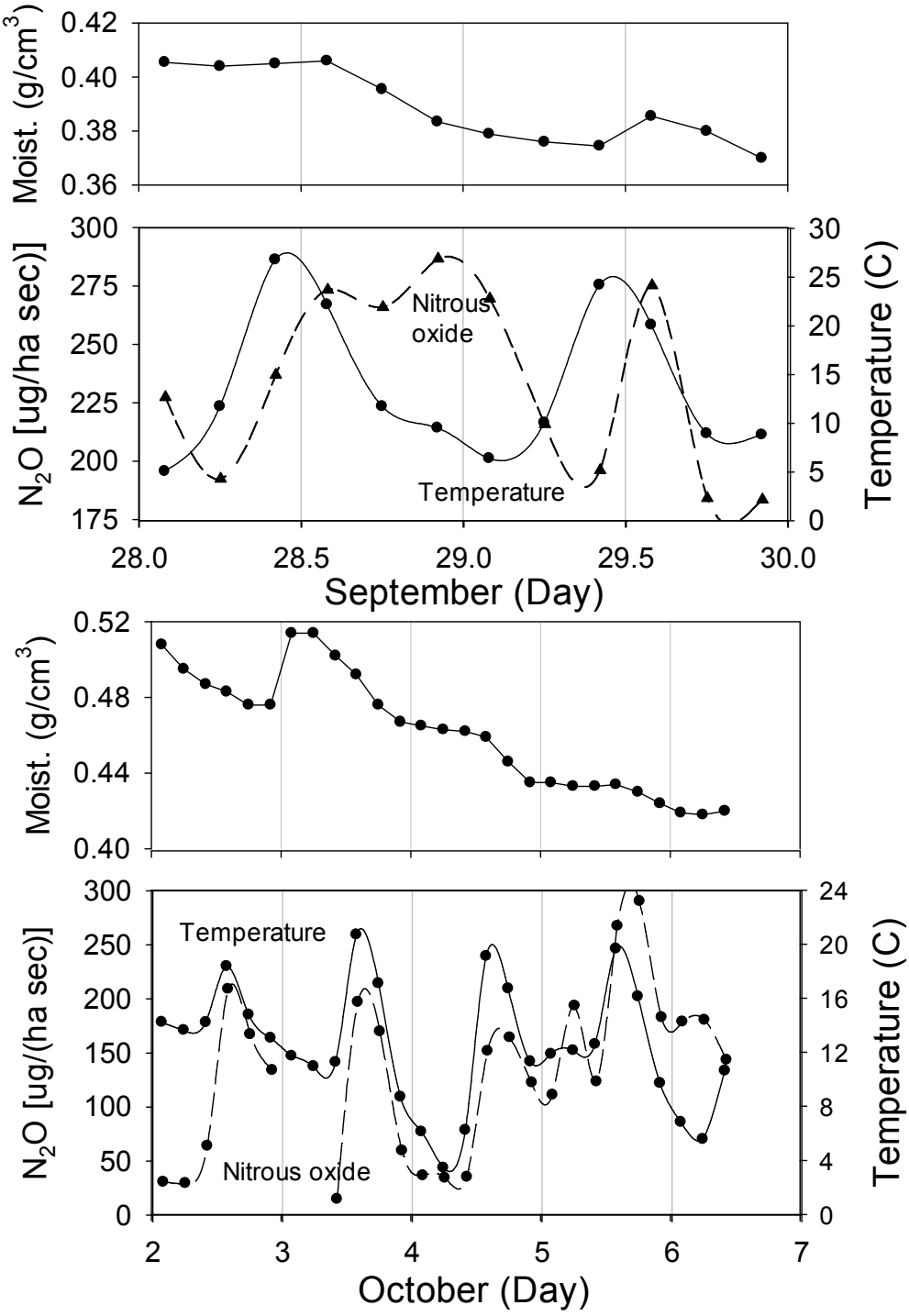


**Figure 3.4: Nitrous oxide emissions and volumetric soil moisture contents from 9 May to 18 May. Soil water increased from 0.32 to 0.36 g $cm^{-3}$ from a rainfall event. Associated with the soil water increases was a decrease in $N_2O$ emissions.**

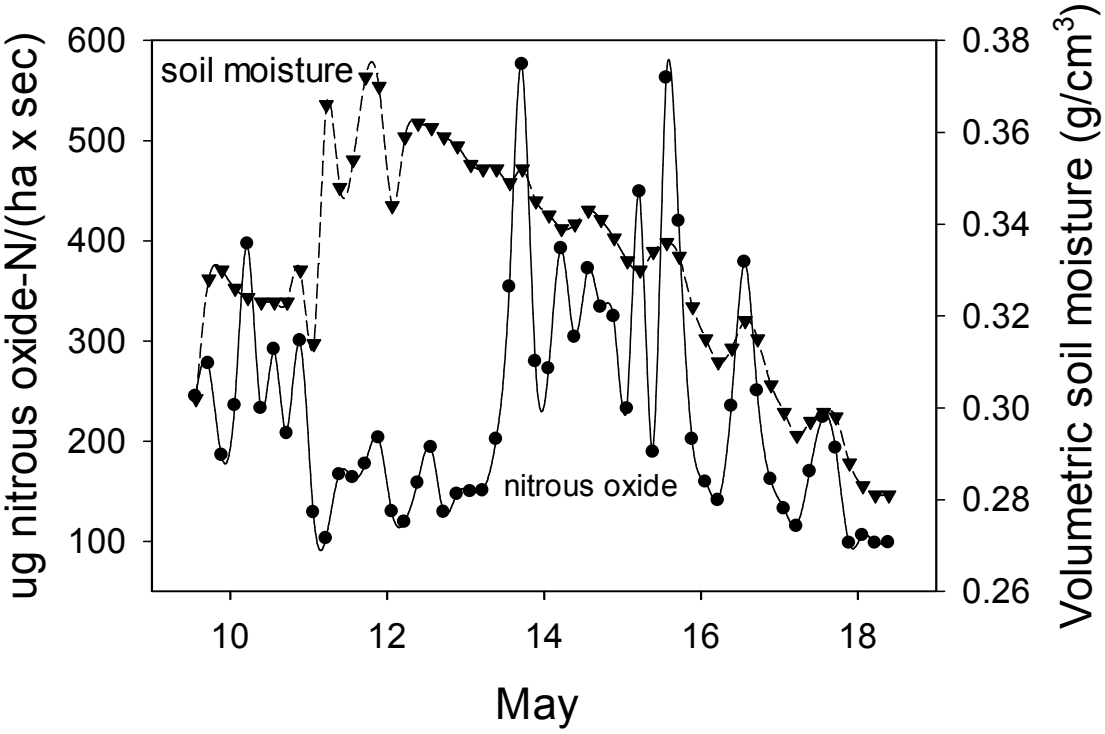


**Table 3.2: The influence of sampling time on the mean and variance of the measured $N_2O$-N emissions. The sampling requirements for the estimated values to be within 20 or 30% of the mean 80% of the time were calculated using the Stein (1945) equation.**

| 9/20/2017 | | ----------$N_2O$-N---------- | | | | Estimated Sampling Requirement (α=0.2) | |
|---|---|---|---|---|---|---|---|
| Hours | Temp. | Mean | 90% CL | Variance | n | | |
| | °C | ug(ha sec)$^{-1}$ | | | | 20% mean | 30% mean |
| 1.5-2.5 | 9.8 | 135.6 | 21.2 | 6,672 | 40 | 16 | 9 |
| 5.5-6.5 | 8.8 | 126.9ţ | 18.5 | 4,694ţ | 37 | 13 | 6 |
| 9.5-10.5 | 11.8 | 120.6* | 17.5 | 4,290ţ | 38 | 13 | 6 |
| 13.5-14.5 | 19.2 | 186.9* | 22.4 | 7,033 | 38 | 9 | 4 |
| 17.5-18.5 | 17.5 | 176.2* | 21.2 | 5,791 | 35 | 8 | 4 |
| 21.5-22.5 | 11.1 | 148.8 | 23.3 | 7,807 | 39 | 15 | 7 |
| All | 13.2 | 149 | 8.8 | 6,557 | 227 | 13 | 6 |

| 10/11/2017 | | ----------$N_2O$-N---------- | | | | Estimated Sampling Requirement (α=0.2) | |
|---|---|---|---|---|---|---|---|
| Hours | Temp. | Mean | 90% CL | Variance | n | | |
| | °C | ug(ha sec)$^{-1}$ | | | | 20% mean | 30% mean |
| 1.5-2.5 | 3.4 | 36.5 | 11.1 | 1,768 | 39 | 57 | 25 |
| 5.5-6.5 | 2.3 | 26.1ţ | 4.61 | 291** | 37 | 19 | 9 |
| 9.5-10.5 | 7.6 | 25.1ţ | 6.29 | 556** | 38 | 38 | 17 |
| 13.5-14.5 | 14.2 | 41.1 | 11.78 | 2,155ţ | 42 | 35 | 16 |
| 17.5-18.5 | 11.8 | 52.4* | 12.68 | 2,260ţ | 38 | 35 | 16 |
| 21.5-22.5 | 5.1 | 37.5 | 9.99 | 1,511 | 41 | 46 | 21 |
| All | 7.5 | 36.67 | 4.15 | 1,497 | 235 | 48 | 21 |

| 5/1/2018 | | ----------$N_2O$-N---------- | | | | Estimated Sampling Requirement (α=0.2) | |
|---|---|---|---|---|---|---|---|
| Hours | Temp. | Mean | 90% CL | Variance | n | | |
| | °C | ug(ha sec)$^{-1}$ | | | | 20% mean | 30% mean |
| 1.5-2.5 | 10.3 | 129.5ţ | 18.8 | 4,170** | 32 | 11 | 5 |
| 5.5-6.5 | 9.2 | 146.3 | 30.2 | 10,480 | 31 | 21 | 10 |
| 9.5-10.5 | 16.1 | 149.5 | 23.7 | 6,667** | 32 | 13 | 6 |
| 13.5-14.5 | 22.5 | 225.0* | 40.8 | 18,483ţ | 30 | 16 | 7 |
| 17.5-18.5 | 22.6 | 202.4ţ | 43.8 | 22,703* | 32 | 24 | 11 |
| 21.5-22.5 | 14 | 134.9 | 22.1 | 5,783** | 32 | 14 | 6 |
| All | 15.8 | 166.4 | 13.8 | 13,336 | 190 | 21 | 2 |

ţ, *,** the reported value for a sampling time interval is different from the average emissions across all sampling times at the 0.1, 0.05, and 0.01% level, respectively.

**Sampling requirement**

For fertilizer applied on 20 September 2017, samples collected between 9.5 and 10.5 hours had variances that were similar or lower than samples collected across all sampling times (Table 3.2). For this fertilizer application date, the Stein (1945) equations predicted that 13 randomly collected samples over 21 days were required to estimate $N_2O$ emissions to within 20% of the mean, 80% of the time. For fertilizer applied on 11 October, 48 and 21 samples, were required to be within 20 and 30% of the mean 80% of the time, respectively (Table 3.2). For fertilizer applied on 1 May, 21 and two samples were required to within 20 and 30% of the mean 80% of the time, respectively (Table 3.2).

These results differ from Parkin (2008), where sampling every three days resulted in flux measurements that were within 10% of expected value. Differences between our results and Parkin (2008) were attributed to the data processing method. Parkin (2008) determined daily emissions by averaging the four values measured within a 24 hour period. These samples were collected at 6.0, 12.0, 18.0, and 24.0 hours. It is important to note that if this sampling protocol missed peak emissions (14 to 16 hours), then total daily emissions were underestimated. Parkin (2008) then resampled this constructed data set to estimate the seasonal sampling requirement. The Parkin (2008) analysis approach was tested using data provided in this paper. As expected, this analysis showed that by averaging the six values collected daily reduced calculated sampling requirement by 38%.

These findings must be considered based on several findings from other studies. First, $N_2O$ emissions are highest following fertilizer application which is followed by

rapid declines (Thomas and Hao, 2017). Samples collected at different times may have difference variances associated with them. For example, samples collected for the 21 days after the 20 September 2017, 11 October 2017, and 1 May 2018 fertilizer application dates had a variances of 6,557, 1,497, and 13,336, respectively (Table 3.2). All of these variances were significantly different. It is likely that similar temporal differences in the variance structure occur in point samples collected at regular intervals across multiple seasons. Second, total annual emissions over a season are estimated using the equation, $\int_0^{365} f_{(N2O,t)}$, which can be solved using a number of approaches. One approach is solve the equation, $\sum_1^{26} N2O_t$, where $N_2O_t$ are the individual emission values the individual time periods when the samples are collected. A second approach is to use a linear model to estimate losses between two sampling points. Regardless of the approach used to aggregate temporal data, it is important to be aware of underlying assumptions. Many statistical methods assume homogeneity of variance and there are consequences (Ott and Longnecker, 2016) of having inconstant variance. These include inaccurate parameter estimates, invalid statistical tests, and interval estimates that are either too wide or narrow depending on an experimental region with low or high variance.

## 3.5 CONCLUSION

The hypothesis for this paper was that weekly point measurements of $N_2O$ flux collected at the average air temperature, as suggested by several papers provides the accuracy and precision needed to determine fluxes following fertilizer applications. In this study, sampling between 9.5 and 10.5 hours, which contained the median $T_{ave,\ heat}$ value for the three fertilizer application dates, underestimated $N_2O$-N emissions for two

of the three application dates. These results were attributed to reduced diffusivity resulting from increased soil moisture or that the surface soil was dispersed. For example, an increase in the volumetric soil water content from 0.32 to 0.36 $cm^3$ $cm^{-3}$ on 11 May (Figure 3.4) resulted in rapid decline in $N_2O$-N emissions. When the soil dried, a large increase in emissions was observed. These results are contrary to the perception that denitrification increases with increasing water saturation, and it highlights the importance of considering that $N_2O$ emissions can be separated into at least three components; production, solubility, and emissions. Each of these components can be described mathematically and are impacted by temporal changes in temperature and moisture. The research findings indicate that in cropped systems, point sampling at $T_{ave,heat}$ can lead to uncertainty in calculated emissions. However, different results were observed for $T_{ave.cool}$.

This study also considered how often samples need to be collected. Protocols suggested by Parkin and Venterea (2010), Alves et al. (2012), van de Weerden et al. (2013), and de Klein et al. (2015) suggest that sample timing could range from daily to several times a week. Based on the Stein (1945) equation, GHG sampling twice a week would have resulted in six samples collected over the 21 time period. Based on data provided in Table 3.2, collecting six samples was less than the sampling requirement for the estimated values to be within 20% of mean 80% of the time for all three fertilizer application dates. Additional characteristics that should be considered when assessing reliability of the calculated measurement are provided by Rochette and Eriksen-Hamel (2008). These considerations include the absence of absolute reference gas, the lack of

consistent chamber deployment time, variation in the number of air samples collected, and variation in the type of mathematical model to estimate emissions.

Alternative sampling approaches to improve reliability might include the adoption of near continuous measurements of temporal and spatial changes in GHG, temperature, water filled pore space, and GHG diffusivity (Balaine et al., 2013). Advantages of continuous sampling of a mixed system are that complex relationships among soils, climate, management, GHG emissions, and plants can be defined (Sharpali et al., 2016). Chamber induced impacts on GHG emission estimates can be minimized (Venterea et al., 2009), and that temporal changes in GHG fluxes are resolved.

If continuous measurement systems are not adopted, locally based protocols need to be tested for precision and accuracy. If all studies use unique sampling protocols and do not provide detailed information on temporal changes in soil moisture and temperature a meaningful meta-analysis of the published findings would be difficult to conduct (Balaine et al., 2013). For example, in South Dakota, Lehman and Osborne (2016) collected gas samples at approximately 10.00 h, whereas in Indiana, Owens et al. (2017) collected samples between 10.00 and 12.00 h. In Colorado, Halvorson and Del Grosso (2012) collected samples in midmorning, and in Minnesota, Venterea and Coulter (2015) collected samples between 10.00 and 13.00 hours.

In conclusion, $N_2O$-N emissions and air chamber temperatures generally followed diurnal cycles. However, this was not the case following climatic perturbations. These results were important because they suggest that during a time-period of high $N_2O$ emissions, temperature-based sampling protocols may or may not produce accurate estimates of total emissions. Accurate $N_2O$ estimates require a sampling system that

accounts for temperature induced diurnal cycles, as well as changes in GHG fluxes following climate and management perturbations. To interpret emission signatures, detailed information on temporal changes in soil moisture, bulk density, and temperature are needed. Many studies do not provide this information. This lack of information when combined with flux differences between point and continuous measurement systems results in uncertainty in the published findings (Weitz et al., 1999; Smith and Dobbie, 2001). These findings are conceptually in agreement with Barton et al. (2015).

## 3.6 ACKNOWLEDGEMENTS

Support was provided by USDA-AFRI (2017-05485), USDA-NRCS (69-3A75-285), and the South Dakota Corn Utilization Council.

## 3.7 LITERATURE CITED

Alves, B.J.R, Smith, K.A., R.A. Flores, A.S. Cardoso, W.R.D. Oliveira, C.P. Jantalia, S. Urquiaga, and R.M. Doddy. 2012. Selection of the most suitable sampling time for static chambers for the estimation of daily mean $N_2O$ flux from soils. Soil Biol. Biochem. 46:129-135.

Balaine, N., T.J. Clough, M.H. Beare, S.M. Thomas, E.D. Meenken, and J.G. Ross. 2013. Changes in gas diffusivity explains soil nitrous oxide flux dynamics. Soil Sci. Soc. Am. J. 77:1496-1505.

Barton, L., B, Wolf, D. Rowlings, C. Scheer, R. Kiese, P. Grace, K. Stefanova, and K. Butterbach-Bahl. 2015. Sampling frequency affects estimates of annual nitrous oxide flux. Sci. Reports 51:15912

Black, C.A. 1992. Soil testing and fertilizer requirements, in Soil Fertilizer Evaluation and Control. CRC Press, New YorkAnn Arbor. MI, pp 271-452.

Burzaco, J.P., D.R. Smith, and T.J. Vyn. 2013. Nitrous oxide emissions in Midwest US maize production vary widely with band-injected N fertilizer rates, timing, with nitrapyrin presence. Environ. Res. Letters 8:035031.

Butterbach-Bahl, K., E.M. Baggs, M. Dannenmann, R. Kiese, S. Zechgmeister-Boltensterm 2013. Nitrous oxide emission from soils. How well do we understand the process and their control? Phil. Tans. Royal Society B 368:20130122.

California Environmental Protection Agency. 2009. Detailed California-modified Greet Pathway for corn ethanol. Available at: https://www.arb.ca.gov/fuels/lcfs/012009lcfs_cornetoh.pdf.

Chang, J., D.E. Clay, S.A. Clay, R. Chintala, J.M. Miller, and T. Schumacher. 2016. Biochar reduced nitrous oxide and carbon dioxide emissions from soils with different temperature and water cycles. Agron J. 108:2214-2221.

Chang, J., D.E. Clay, S.A. Clay, A. J. Smart, and M.K. Ohrtman. 2017. A rapid method for measuring feces ammonia-nitrogen and carbon dioxide-carbon emissions and decomposition rate constants**.** Agron J. 109:1-9.

Clay, D.E., C.G. Carlson, K. Brix-Davis, J. Oolman, and B. Berg. 1997. Soil sampling strategies for estimating residual nitrogen. J. Production Agri. 10:446-451.

Clay, D.E., J. Chang, S.A. Clay, J.J. Stone, R.H. Gelderman, C.G. Carlson, K. Reitsma, M. Jones, L. Janssen, and T. Schumacher. 2012. Corn yields and no-tillage affects carbon sequestration and carbon footprint. Agron. J. 104:763-770.

Clay, D.E., S.A. Clay, Z. Liu, and S.S. Harper. 1995. Leaching of dissolved organic C in soil following anhydrous ammonia application. Biol. Fert. Soil. 19:10-14.

Clay, D.E., S.A. Clay, T.B. Moorman, K. Brix-Davis, K.A. Scholes, and A.R. Bender. 1996. Temporal variability of organic C and nitrate in a shallow aquifer. Water Res. 30:559-568.

Clay, D.E., S.A. Clay, K. Brix-Davis, and K.A. Scholes. 1994. Nitrate movement after anhydrous ammonia application in a ridge tillage system. J. Environ. Qual. 23:9-13.

Clay, D.E., N. Kitchen, C.G. Carlson, J.L. Kleinjan, and W.A. Tjentland. 2002. Collecting representative soil samples for N and P fertilizer recommendations. Online. Crop Management

Clay, D.E., G.L. Malzer, and J.L. Anderson. 1990a. Ammonia volatilization from urea as influenced by soil temperature, soil water content, and nitrification and hydrolysis inhibitors. Soil Sci. Soc. Am. J. 54:263-266.

Clay, D.E., G.L. Malzer, and J.L. Anderson. 1990b. Tillage and dicyandiamide influence on nitrogen fertilizer immobilization, remineralization, and utilization by maize. Biol and Fertil Soil 9: 220-225.

Clay, D.E., G. Reicks, C.G. Carlson, J. Moriles-Miller, J.J. Stone, and S.A. Clay. 2015. Residue harvesting and yield zone impact C storage in a continuous corn rotation. J. Environ. Qual. 44:803-809.

Clay, D.E., and J. Shanahan. 2011. GIS Applications in Agriculture: Volume two, Nutrient Management for Improved Energy Efficiency. Baca Raton, CRC Press.

de Klein, C.A., and M.J. Harvey. 2015. Nitrous oxide chamber methodology and guidelines. Ministry for Primary Industry, Wellington, New Zealand. Available at https://globalresearchalliance.org/wp-content/uploads/2018/06/Nitrous-Oxide-Chamber-Methodology-Guidelines-July-2015.pdf, accessed 7/20/2018.

Denmead, O.T., J.R. Freney, and J.R. Simpson. 1979. Studies of nitrous oxide emission from a grass sward. Soil Sci. Soc. Am. J. 43:726-728.

DeSutter, T.M., T.J. Sauer, T.B. Parkin, and J.L. Heitman. 2008. A subsurface, closed-loop system for soil carbon dioxide and its application to the gradient efflux approach. Soil Sci. Soc. Am. J. 72:126–134.

Eynard, A., T.E. Schumacher, M.J. Lindstrom, and D.D. Malo. 2004. Porosity and pore-size distribution in cultivated ustolls and usterts. Soil Sci. Soc. Am. J. 68:1927-1934.

Fernandez F.G., R.T Venterea, and K.P. Fabrizzi. 2016. Corn nitrogen management influences nitrous oxide emissions in drained and undrained soils. J. Environ. Qual. 45:1847-1855.

Fujinuma R., R.T. Venterea, and C. Rosen. 2011. Broadcast urea reduces $N_2O$ but increases NO emissions compared with conventional and shallow-applied anhydrous ammonia in coarse-textured soils. J. Environ. Qual. 40:1806-1815.

Halvorson A.D, and S.J. Del Grosso. 2012. Nitrogen and source placement effects on soil nitrous oxide emissions from no-till corn. J. Environ. Qual. 41:1349-1360.

IPCC. 2007. Summary for Policymakers. In: Climate Change 2007: Mitigation. Contribution of 542 Working Group III to the Fourth assessment report of the Intergovernmental Panel on Climate Change Cambridge University Press, Cambridge, United Kingdom and New York, NY, http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spm.html (18 January, 2011).

Jung, W.K., N.R. Kitchen, S.H. Anderson, and E.J. Sadler. 2007. Crop management effects on water infiltration for clay pan soils. J. Soul Water Con. 62:55-63.

Kim, Ki-In., D.E. Clay, C.G. Carlson, S.A. Clay, and T. Trooien. 2008. Do synergistic relationships between nitrogen and water influence the ability of corn to use nitrogen derived from fertilizer and soil? Agron. J. 100:551-556.

Klein, C.D., R.A. Novoa, S. Ogle, K.A. Smith, P. Rochette, T.C. Wirth, B.G. McConkey, A. Mosier, K. Rypdal, M. Walsh, and S.A. Williams. 2006. $N_2O$ emissions from managed soils and $CO_2$ emissions from lime and urea application. In Eggleston, S., L. Buendia, K. Miwa, T. Ngara, and K. Tanabe (eds) 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry, and Other Land use. IGES, Japan. ISBN 4-88788-032-4.

Klingenberg, L. 2005. Frequency domain using Excel. San Francisco State Univ., School of Engineering. http://www.stem2.org/je/Excel_FFT_Instructions.pdf(accessed June 2018).

Lehman, M.R., and S.L. Osborne. 2016. Soil greenhouse gas emissions and carbon dynamics of a no-tillage, corn-based cellulostic ethanol production system. Bioenergy, Res. 9:1101-1108.

Liu, R., H. Hu, K.L. Hayden, J. He, P. Mele, and D. Chen. 2016. Nitrification is the primary diver of nitrous oxide production in laboratory mirocosms from different land-use soils. Front Microbiol. 7: 1373.

Lupo, C., D.E. Clay, J. Benning, and J. Stone. 2013. Life cycle assessment of the beef cattle production system for the northern Great Plains, US. J. Eviron. Qual. 42:1386-1394

Moldrup, P., T. Olesen, P. Schjønning, J. Yama, and D.E. Rolston. 2000. Predicting the gas diffusion coefficient in undisturbed soil columns from soil water characteristics. Soil Sci. Soc. Am. J. 64:94-100.

Nolan, S.C., B.M. Olson, and F.J. Hecker. 2006. A comparison of sampling methods for soil-test phosphorus. *In* Alberta Soil Phosphorus Limits Project. Volume 3: Soil sampling, manure application, and sorption characteristics. Alberta Agriculture, Food and Rural Development, Lethbridge, Alberta, Canada.

Omonode, R.A., P. Kovacs, and T.J. Vyn. 2015. Tillage and nitrogen rate effect on area and yield-scaled nitrous oxide emissions from pre-plant anhydrous ammonia. Agron. J. 107:605-614.

Ott, R.L. and M. Longnecker. 2016. An Introduction to Statistical Methods and Data Analysis, 7th Edition. Boston, Massachusetts, Cengage Learning.

Owens, J., T.J. Clough, J. Laubach. J.E. Hunt. R.T. Venerea. 2017. Nitrous oxide and soil oxygen dynamics of soil treated with cow urine. Soil Sci. Soc. Am. J. 81:289-298.

Parkin, T.B. 2008. Effect of sampling frequency on estimates of cumulative nitrous oxide emissions. J. Envir. Qual. 37:1390-1395.

Parkin T.B. and R.T. Venterea. 2010. USDA-USRS GRACEnet project protocols Chapter 3. Chamber-based trace gas flux measurements. In: Sampling Protocols. Follett RF (ed) pp 3–1 to 3–39. http://www.ars.usda.gov/research/GRACEnet

Rochette, P., and N.S. Eriksen-Hamel. 2008. Chamber measurements of nitrous oxide flux: Are absolute values reliable? Soil Sci. Soc. Am. J. 72:331-342.

Rodrigo, A., S. Recous, C. Neal, and B. Mary. 1997. Modeling temperature and moisture effects on C-N transformation in soils: comparison of nine models. Ecol. Mod. 102:325-339.

Selbie, D.R., G.L. Lanigan, R.J. Laughlin, H.J. Di, L. Moir, K.C. Cameron, T.J. Clough, C.J. Watson, J. Grant, C. Somers, and K.G. Richards. 2015. Confirmation of co-denitrification in grazed grasslands. Sci. Rep. 5:17361.

Sharpali, N.J., U. Rannik, S. Jokinen, S. Lind, C. Biasi, I. Mammarella, O. Peltola. M. Pihlatie, N. Hyvonen. M. Raty, S. Haapanala, M. Zahniser. P. Virkajarvi. T. Vesala, and P.J. Martikainen. 2016. Neglecting diurnal variation leads to uncertainties in terrestrial nitrous oxide emissions. Sci. Rep. 6:25739.

Skopp, J., S.D. Kachman, and G.W. Hergert. 1995. Comparison for estimating sampling numbers. Comm. Soil Sci Plant Anal. 25:2559-2568.

Smith, K.A., and K.E. Dobbie. 2001. The impact of sampling frequency and sampling times on chamber-based measurements of $N_2O$ emissions from fertilized soils. Global Change Biology 7: 933–945.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2018. Web Soil Survey. Available online at the following link: https://websoilsurvey.sc.egov.usda.gov/.

Stein, C. 1945. A two sample test for a linear hypothesis whose power is independent of the variance. Ann Math Stat. 16:243-258.

Stone, J.J., C.R. Dollarhide, J.L. Benning, C.G. Carlson, and D.E. Clay. 2012. The life cycle impacts of feed for modern northern Great Plains U.S. swine production. Agricultural Systems. 106:1-10.

Thomas, B.W., and X. Hao. 2017. Nitrous oxide from soil receiving anaerobically digested solid cattle manure. J. Environ. Qual. 46:741-750.

van der Weerden, T.J., T.J. Clough, and T.M. Styles. 2013. Using near-continuous measurements of N2O emission from urine-affected soil to guide manual gas sampling regimes. N. Z. J. Agric. Res. 56:60–76.

Venterea R.T., and J.A. Coulter. 2015. Split application of urea does not decrease and may increase nitrous oxide in rainfed corn. Agron. J.107:337-341

Venterea, R.T., K.A. Spokas, and J.M. Baker. 2009. Accuracy and precision analysis of chamber-based nitrous oxide gas flux estimates. Soil Sci. Soc. Am. J. 73:1087–1093.

Weitz, A.M., M. Keller, E. Linder, and P.M. Crill. 1999. Spatial and temporal variability of nitrogen oxide and methane fluxes from a fertilized tree plantation in Costa Rica. J. Geophysical Res. 104:30097–30107.

Williams, D.L., P. Ineson, and P.A. Coward. 1999. Temporal variations in nitrous oxide fluxes from urine-affected grassland. Soil Biology Biochem. 31:779-788.

Woodley, A.L., C.F. Drury, X.M. Yang, W.D. Reynolds, W. Calder, and T.O. Oloya. 2018. Streaming urea ammonium nitrate with and without enhanced efficiency products impact on corn yields, ammonia, and nitrous oxide emissions. Agron. J. 110:444-454.

# Chapter 4: Future Research

## 4.1 GENERAL

This thesis looked at using enhanced efficiency fertilizers (EEF), different application timings, different moisture regimes, and applying nitrogen fertilizers during different seasons of the year. The cost associated with analyzing greenhouse gas (GHG) emissions, specifically nitrous oxide, is relatively expensive and this results in smaller experiments and less replications. An automated system provides more measurements but the cost is high, however, a manual system has low cost but measurements are typically limited to only a few due to available labor and sample analysis cost. These studies used an automated sampling system with almost exclusively two replications due to the cost of the equipment. This limited the treatments to four because only eight chambers were available. While GHG could be monitored six times a day, the limited number of treatments resulted in a huge knowledge gap and researchers should collaborate to reduce the knowledge gap on GHG emissions.

## 4.2 NITROGEN STABILIZERS

It was determined that Environmentally Smart Nitrogen (ESN) and urease coated urea (NBPT) were effective in reducing $N_2O$ emissions in controlled laboratory conditions. This study should be replicated in field conditions to see if the results are consistent. The study could also include different fertilizer sources such as, but not limited to; anhydrous ammonia, urea ammonia nitrate (UAN), and manure. Also, different nitrogen stabilizers could be applied such as nitrapyrin or dicyandiamide (DCD). The use of polymer coated nitrogen fertilizers to reduce GHG gas emissions also

requires more data observations. Enhanced efficiency fertilizers could provide a management strategy for reducing $N_2O$ emissions in different soils and different climates without compromising yield.

## 4.3 CONVENTIONAL FERTILIZER APPLICATION

Conventional nitrogen fertilizers (example: Urea, UAN, Anhydrous Ammonia) will continue to be used as a major source of nitrogen based fertilizers. However, different management strategies should be implemented to reduce GHG emissions. This study looked at the effects of soil moisture, soil temperature, and different application timings. It was determined that soil moisture had some impact on $N_2O$-N and $CO_2$-C emissions. Also, the same was noticed for soil temperature. The biggest factor that was researched in this study in reducing GHG emissions was the different fertilizer application dates, specifically the impacts of spring vs. fall fertilizer applications. This was a result of a microbial community change. To further this research, nitrogen based fertilizers should be applied as frequent intervals (example: every week) throughout the growing season and Phospholipid Fatty Acid (PLFA) samples should be collected to determine and monitor if a microbial community change occurs throughout the growing season. Altogether, the impact of microbial communities on GHG emissions requires advanced technologies to fully understand the complex nature of GHG's.

Another management option to reduce nitrogen loss in agriculture is the use of cover crops, also known as catch crops and green manure. These crops, if managed properly, could scavenge up excess nitrogen from previous nitrogen applications and convert the nitrogen into an organic form. This will likely reduce potential leaching and volatilization losses. The cover crops can also be used to decrease erosion potential,

suppress undesirable plants, and decrease soil bulk density all of which are favorable for plant development.

# APPENDIX A

**Supplemental Table 1: Phospholipid Fatty Acid (PLFA) results for the 11 October, 2017 and 12 June, 2018 fertilizer application dates.**

| Fertilizer Application Date | Treatment | Biomass ng $g^{-1}$ | Bacteria % | Fungi % | Protozoan % | Undifferentiated % |
|---|---|---|---|---|---|---|
| 11 October, 2017 | Urea | 2500 | 54.70a† | 10.95 | 0.82 | 33.54 |
| | Control | 2230 | 54.54a | 9.20 | 0.77 | 35.51 |
| 12 June, 2018 | Urea | 2750 | 39.71b | 11.14 | 0.62 | 58.54 |
| | Control | 4260 | 41.85b | 13.92 | 0.65 | 43.58 |
| | p-value | 0.223 | 0.019 | 0.829 | 0.967 | 0.076 |

Urea = 224 kg N $ha^{-1}$, Control = no treatment added.
† values within a column that have the same letter are not significantly different at $\alpha = 0.05$

**Supplemental Table 2: Average soil $NO_3$-N and $NH_4$-N test values for all six fertilizer application dates, treatments, and sample depths.**

| Fertilizer Application Date | Treatment | $NO_3$-N | | | | $NH_4$-N | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0-15 cm | 15-30 cm | 30-45 cm | 45-60 cm | 0-15 cm | 15-30 cm | 30-45 cm | 45-60 cm |
| | | ----------kg $NO_3$-N/ha---------- | | | | ----------kg $NH_4$-N/ha---------- | | | |
| 20 September, 2017 | Start | 20.5 | 13.9 | - | - | 10.2 | 4.41 | - | - |
| | Urea & Water | 122 | 34.9 | 18.1 | 10.3 | 24.7 | 15.0 | 22.0 | 12.9 |
| | Urea | 63.3 | 21.6 | 13.2 | 20.1 | 22.1 | 15.1 | 12.08 | 9.2 |
| | Water | 10.2 | 5.52 | 2.61 | 7.22 | 17.6 | 15.5 | 11.09 | 13.1 |
| | Control | 14.5 | 3.25 | 3.69 | 7.18 | 18.7 | 12.8 | 13.06 | 12.4 |
| 11 October, 2017 | Start | 32.2 | 7.05 | 4.81 | 3.04 | 6.19 | 1.98 | 12.35 | 10.0 |
| | Urea & Water | 34.0 | 10.3 | 26.2 | 7.31 | 9.57 | 4.32 | 61.30 | 5.45 |
| | Urea | 24.6 | 20.0 | 6.70 | 4.20 | 190 | 13.3 | 1.78b | 3.50 |
| | Water | 9.22 | 13.7 | 6.90 | 13.6 | 22.2 | 61.8 | 3.25b | 6.62 |
| | Control | 9.11 | 10.8 | 3.37 | 13.6 | 3.67 | 22.5 | 4.42 | 2.43 |
| 1 November, 2017 | Start | 18.7 | 7.08 | 5.11 | 4.83 | 14.9 | 20.3 | 6.17 | 6.64 |
| | Urea & Water | 42.8 | 11.3 | 5.98 | 2.30 | 154 | 8.54 | 4.16 | 0.00 |
| | Urea | 36.4 | 11.2 | 5.79 | 2.51 | 128 | 6.06 | 6.46 | 0.00 |
| | Control | 17.8 | 8.77 | 5.82 | 5.34 | 11.6 | 1.48 | 3.09 | 3.82 |
| 1 May, 2018 | Start | 18.1 | 8.02 | 3.64 | 3.50 | 4.72 | 4.98 | 3.74 | 2.07 |
| | Urea & Water | 69.3 | 8.56 | 2.86 | 1.73 | 18.3 | 10.8 | 8.07 | 7.92 |
| | Urea | 70.0 | 6.08 | 2.32 | 3.45 | 26.1 | 9.97 | 9.43 | 8.35 |
| | Water | 7.59 | 1.67 | 1.70 | 2.14 | 12.1 | 9.09 | 12.56 | 9.44 |
| | Control | 9.37 | 5.20 | 2.44 | 1.94 | 12.7 | 13.7 | 14.90 | 12.3 |
| 22 May, 2018 | Start | 1.95 | 1.67 | 1.33 | 1.41 | 15.2 | 14.7 | 9.85 | 9.43 |
| | Urea & Water | 96.6 | 20.1 | 8.27 | 3.80 | 13.6 | 10.7 | 9.91 | 11.4 |
| | Urea | 83.3 | 15.2 | 5.83 | 4.15 | 49.6 | 12.2 | 8.90 | 9.27 |
| | Water | 21.4 | 11.1 | 3.92 | 2.37 | 9.93 | 13.5 | 12.56 | 12.1 |
| | Control | 10.5 | 5.24 | 2.19 | 1.45 | 8.48 | 10.4 | 9.19 | 9.09 |
| 12 June, 2018 | Start | 30.7 | 11.8 | 5.07 | 2.95 | 7.64 | 10.5 | 9.29 | 12.2 |
| | Urea | 90.1 | 25.4 | 11.9 | 5.25 | 25.3 | 14.3 | 14.98 | 14.6 |
| | Control | 13.5 | 9.07 | 6.16 | 2.85 | 19.7 | 13.4 | 14.6 | 12.5 |

Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.

**Supplemental Table 3: Percent $NO_3$-N and Total available inorganic N for each fertilizer application date and treatment for the 60 cm soil depth.**

| 20 September, 2017 | 0 to 60 cm | |
|---|---|---|
| | $NO_3$-N | Total N |
| Treatment | % | kg ha$^{-1}$ |
| Start | - | - |
| Urea & Water | 71.06a | 259.82a |
| Urea | 66.83a | 176.60b |
| Water | 30.03b | 82.86c |
| Control | 33.55b | 82.51c |
| p-value | 0.004 | 0.002 |

| 1 May, 2018 | 0 to 60 cm | |
|---|---|---|
| | $NO_3$-N | Total N |
| Treatment | % | kg ha$^{-1}$ |
| Start | 68.22a | 48.81b |
| Urea & Water | 64.66a | 127.56a |
| Urea | 60.23a | 135.65a |
| Water | 24.29b | 53.80b |
| Control | 23.11b | 72.65b |
| p-value | 0.026 | 0.018 |

| 11 October, 2017 | 0 to 60 cm | |
|---|---|---|
| | $NO_3$-N | Total N |
| Treatment | % | kg ha$^{-1}$ |
| Start | 60.65 | 77.65 |
| Urea & Water | 53.42 | 158.45 |
| Urea | 21.63 | 264.39 |
| Water | 38.61 | 137.26 |
| Control | 57.24 | 69.95 |
| p-value | 0.454 | 0.181 |

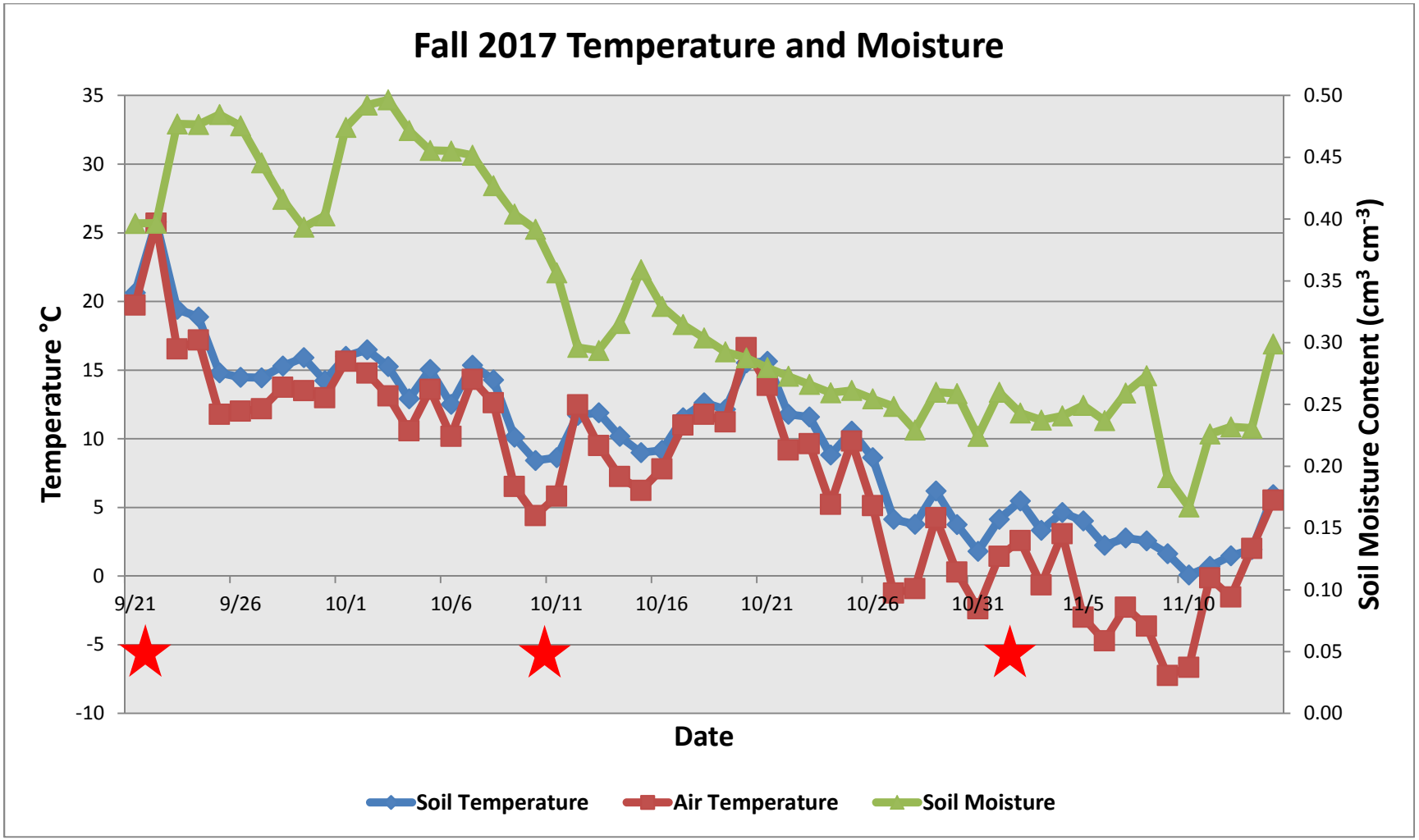
| 22 May, 2018 | 0 to 60 cm | |
|---|---|---|
| | $NO_3$-N | Total N |
| Treatment | % | kg ha$^{-1}$ |
| Start | 11.47 | 55.46b |
| Urea & Water | 72.92 | 174.35a |
| Urea | 57.51 | 188.43a |
| Water | 43.62 | 86.90b |
| Control | 30.20 | 56.52b |
| p-value | 0.106 | 0.020 |

| 1 November, 2017 | 0 to 60 cm | |
|---|---|---|
| | $NO_3$-N | Total N |
| Treatment | % | kg ha$^{-1}$ |
| Start | 42.66b | 83.76bc |
| Urea & Water | 27.56c | 226.52a |
| Urea | 28.69c | 194.37ab |
| Water | - | - |
| Control | 65.32a | 57.73c |
| p-value | 0.009 | 0.047 |

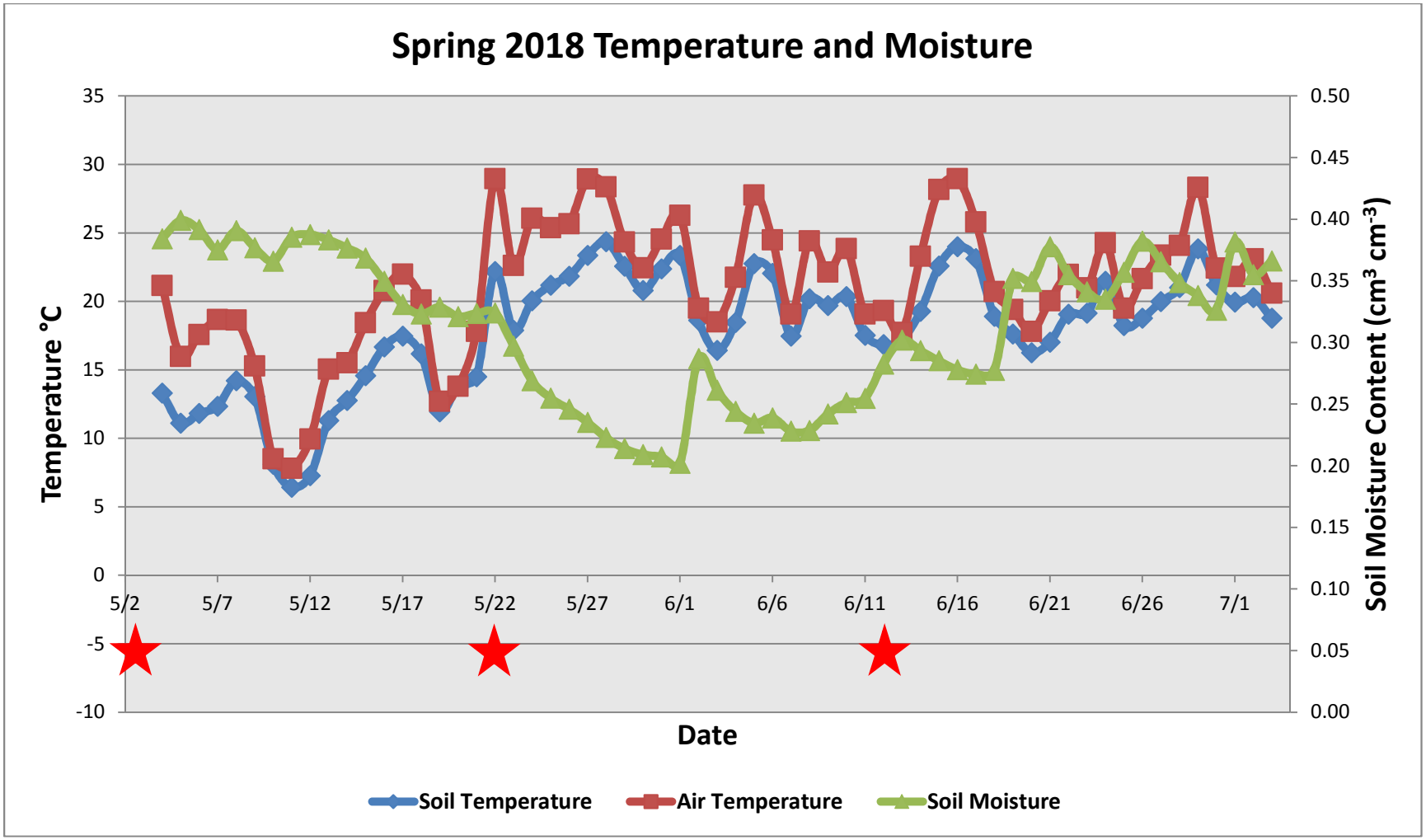
| 12 June, 2018 | 0 to 60 cm | |
|---|---|---|
| | $NO_3$-N | Total N |
| Treatment | % | kg ha$^{-1}$ |
| Start | 55.98ab | 90.12b |
| Urea & Water | - | - |
| Urea | 65.10a | 201.81a |
| Water | - | - |
| Control | 23.97b | 91.87b |
| p-value | 0.044 | 0.025 |

Urea & Water = 224 kg N ha$^{-1}$ with supplemental irrigation, Urea = 224 kg N ha$^{-1}$, Water = supplemental irrigation, Control = no treatment added.

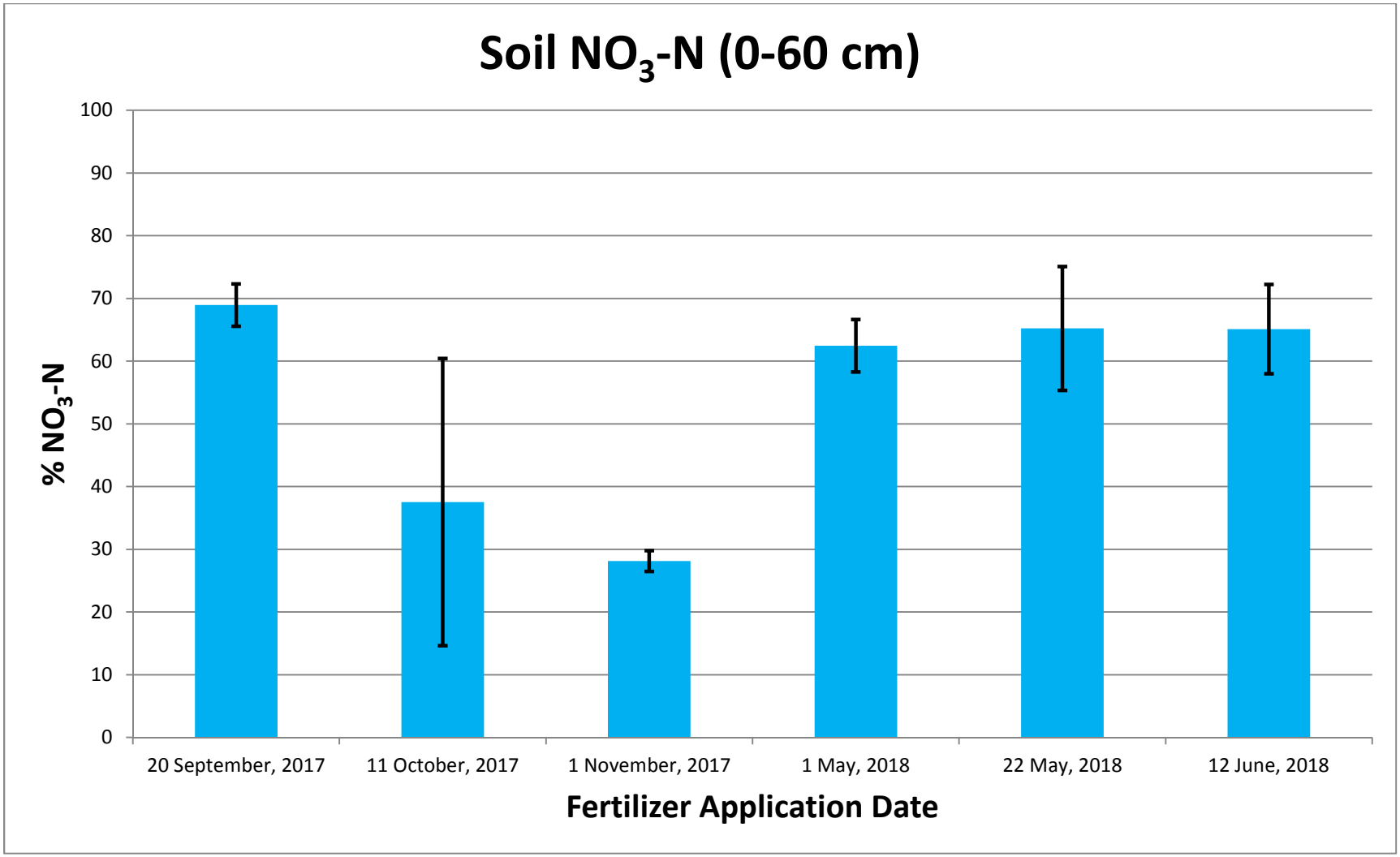
**Supplemental Figure 1: Fall 2017 soil and air temperatures along with natural soil moisture content. The red stars coincide with each fertilizer application date.**



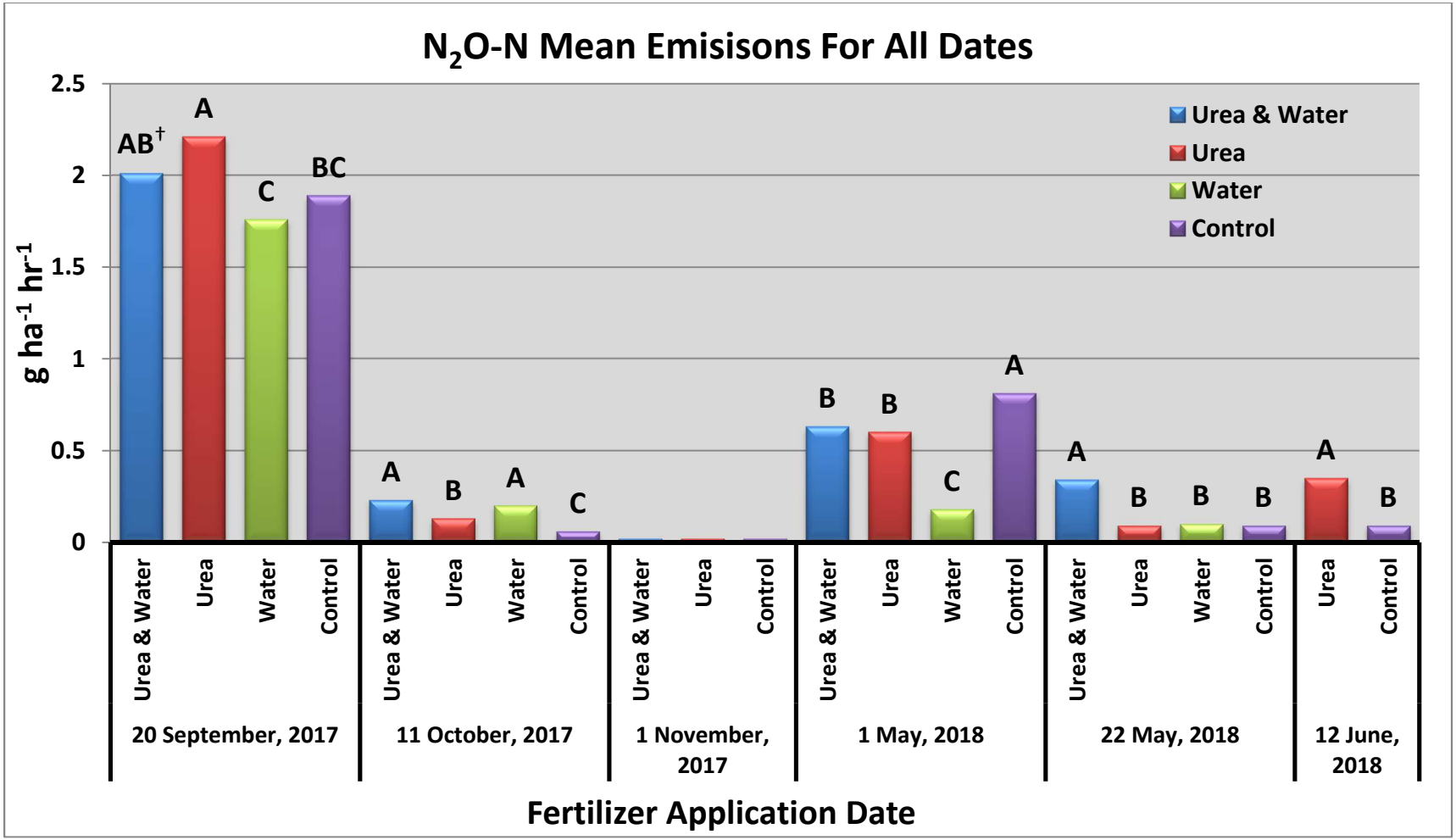
**Supplemental Figure 2: Spring 2018 soil and air temperatures along with natural soil moisture content. The red stars coincide with each fertilizer application date.**



**Supplemental Figure 3: Soil percent nitrate in the 0- to 60- cm soil depth for the Urea and Urea & Water treatments for all fertilizer application dates. The error bars are the 95% confidence interval.**

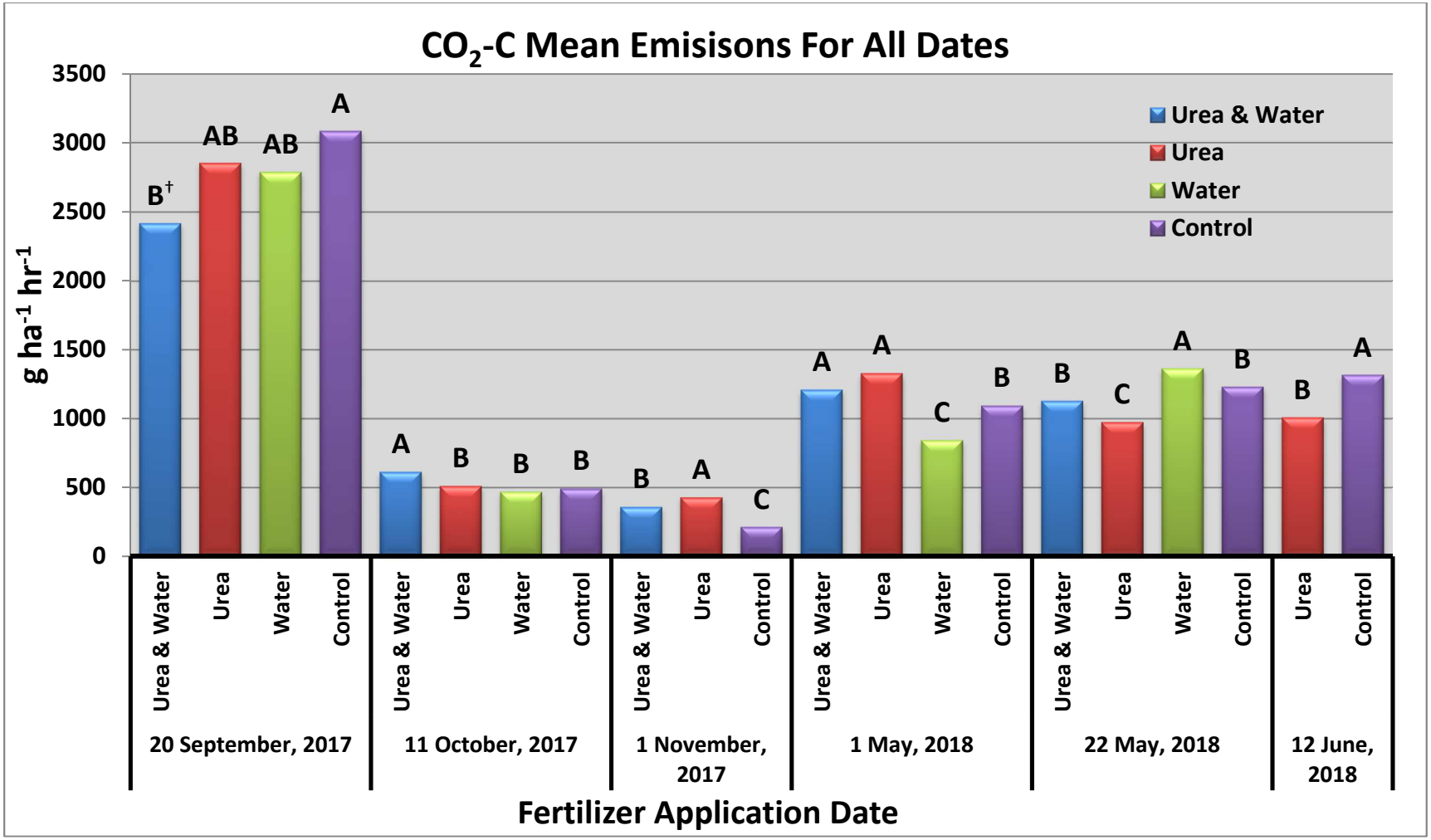


**Supplemental Figure 4: Mean nitrous oxide ($N_2O$-N) emissions for all treatments and all fertilizer application dates.**



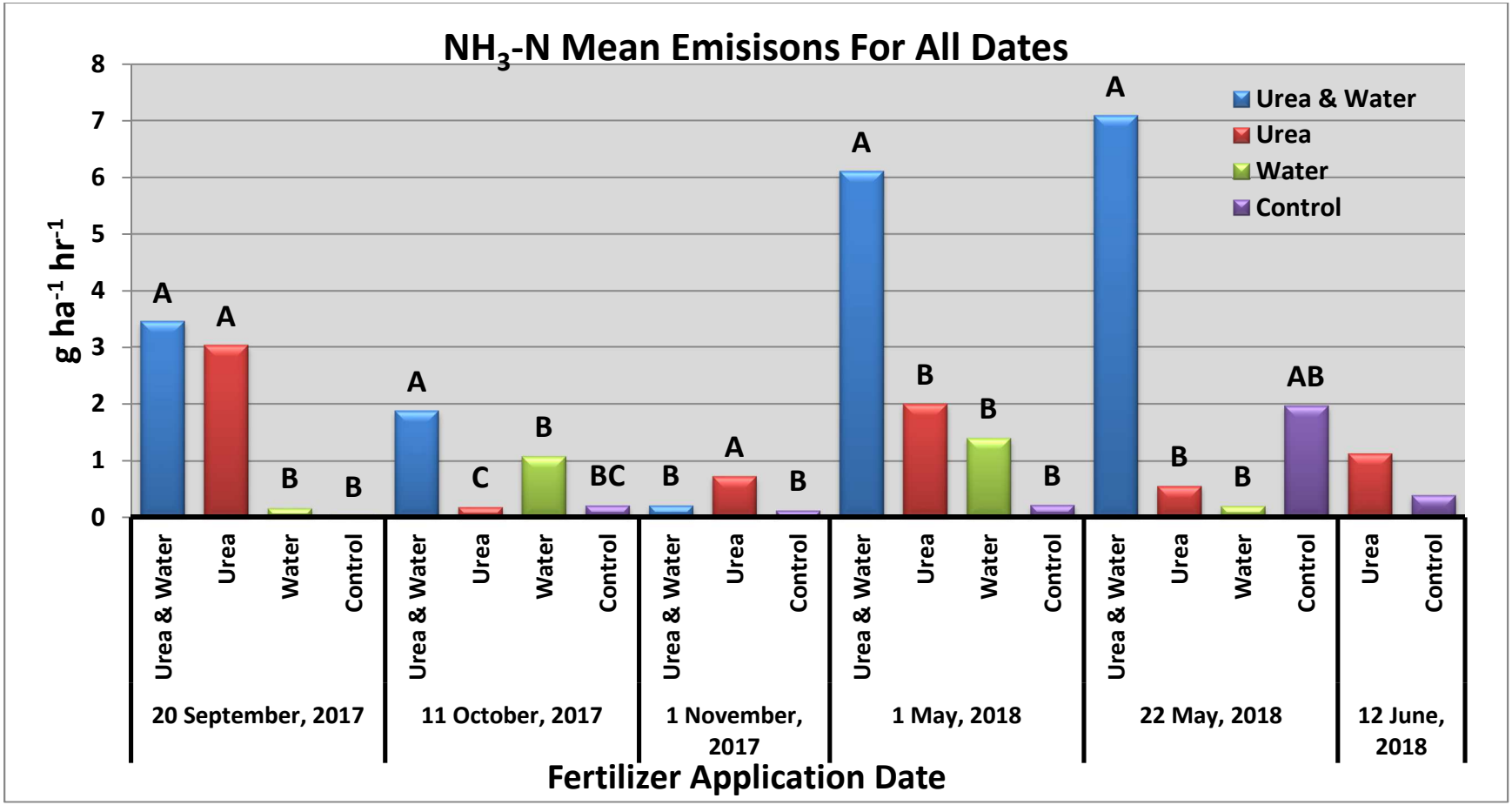

Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.
† values within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

**Supplemental Figure 5: Mean carbon dioxide ($CO_2$-C) emissions for all treatments and all fertilizer application dates.**




Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.
† values within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

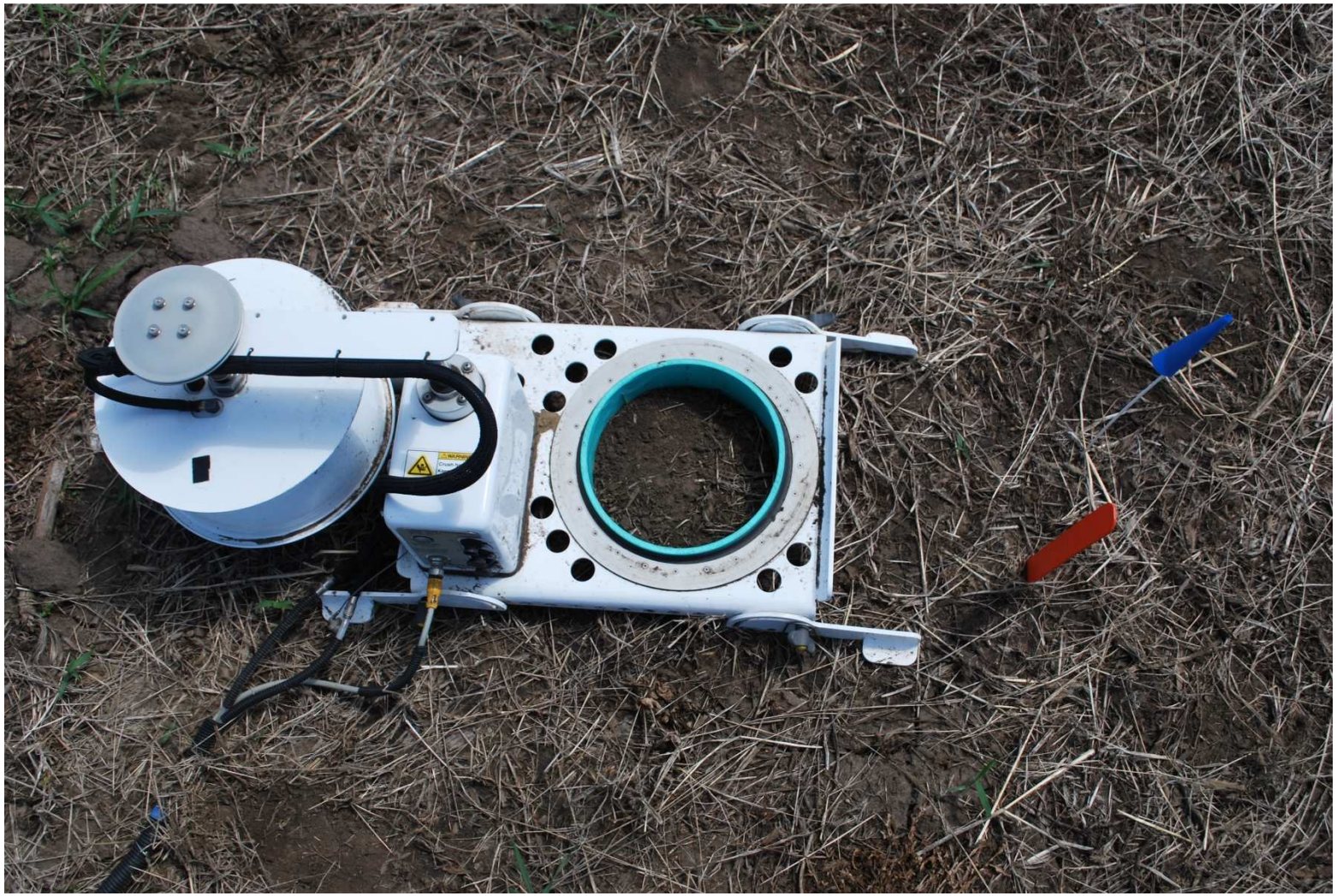
**Supplemental Figure 6: Mean ammonia ($NH_3$-N) emissions for all treatments and all fertilizer application dates.**




Urea & Water = 224 kg N $ha^{-1}$ with supplemental irrigation, Urea = 224 kg N $ha^{-1}$, Water = supplemental irrigation, Control = no treatment added.
† values within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

**Supplemental Picture 1: Pictured below is the LI-COR LI-8100-104 long term chambers in the field. The meter PVC square was used for soil sampling during the experiment without disturbing the soil in the chambers.**

**Supplemental Picture 2: A LI-COR LI-8100-104 long term chamber from an aerial view. The blue PVC ring inside of the chamber was inserted into the soil five cm.**



**Supplemental Picture 3: The LI-COR LI-8150 16 port multiplexer. This multiplexer switched gas samples automatically.**

**Supplemental Picture 4: This picture shows the inside of the weatherproof trailer. The LI-COR LI-8150 multiplexer is located in the lower right side, the Picarro Cavity Ringdown Spectrometer is located center, and a backup battery and surge protector are located underneath the table.**

**Supplemental Picture 5: This picture shows the application of the urea fertilizer in the field to the LI-COR LI-8100-104 long term chambers. The urea fertilizer was dissolved in water before application.**

# APPENDIX B

Appendix B contains the raw calculated flux and soil parameters. These values were used in Chapters 2 and 3. A complete description of how these values were collected and calculated can be found in the materials and methods section of Chapter 2.

**List of Variables in APPENDIX B:**

| | |
|---|---|
| ID #: | Identification number |
| Date & Time: | Date and time at start of sampling |
| Run: | Fertilizer application date; 1 = 20 September 2017, 2 = 11 October 2017, 3 = 1 November 2017, 4 = 1 May 2018, 5 = 22 May 2018, 6 = 1 June 2018 |
| A Tmp: | Air temperature (°C) |
| S Tmp: | Five cm soil temperature (°C) |
| N Mst: | Natural rainfall soil moisture five cm depth ($cm^3$ $cm^{-3}$) |
| NS Mst: | Natural rainfall plus supplemental irrigation soil moisture five cm depth ($cm^3$ $cm^{-3}$) |
| Trt: | Treatment applied; U = Urea, UW= Urea & Water, W= Water, C= Control |
| $N_2O$-N: | $N_2O$-N emissions in g $N_2O$-N $ha^{-1}$ $hr^{-1}$ |
| $CO_2$-C: | $CO_2$-C emissions in g $CO_2$-C $ha^{-1}$ $hr^{-1}$ |
| $NH_3$-N: | $NH_3$-N emissions in g $NH_3$-N $ha^{-1}$ $hr^{-1}$ |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9/22/2017 0:26 | 1 | 21.97 | | | | W | 2.30 | 9042.2 | |
| 2 | 9/22/2017 0:43 | 1 | 21.80 | | 0.38 | | C | 1.44 | 7763.8 | |
| 3 | 9/22/2017 1:00 | 1 | 21.86 | | | | C | 1.98 | 8373.1 | |
| 4 | 9/22/2017 1:17 | 1 | 21.71 | 22.05 | 0.42 | | W | 0.57 | 10120.2 | |
| 5 | 9/22/2017 1:33 | 1 | 21.76 | | | | UW | 0.64 | 12535.9 | 25.76 |
| 6 | 9/22/2017 1:50 | 1 | 22.80 | | | | U | 1.56 | 10024.4 | 22.76 |
| 7 | 9/22/2017 2:07 | 1 | 21.88 | | | | UW | 0.78 | 8617.1 | |
| 8 | 9/22/2017 2:24 | 1 | 21.98 | | 0.36 | | U | 0.59 | 12833.7 | 15.39 |
| 9 | 9/22/2017 4:25 | 1 | 21.63 | | | | W | 2.52 | 9252.0 | |
| 10 | 9/22/2017 4:42 | 1 | 21.52 | | 0.38 | | C | 1.56 | 8396.6 | |
| 11 | 9/22/2017 4:59 | 1 | 21.66 | | | | C | 2.29 | 8925.0 | |
| 12 | 9/22/2017 5:16 | 1 | 21.49 | 21.77 | 0.41 | | W | 0.62 | 9770.8 | |
| 13 | 9/22/2017 5:32 | 1 | 21.50 | | | | UW | 0.59 | 11807.8 | 30.14 |
| 14 | 9/22/2017 5:49 | 1 | 22.25 | | | | U | 1.69 | 9911.6 | 29.96 |
| 15 | 9/22/2017 6:06 | 1 | 21.56 | | | | UW | 1.67 | 8217.6 | |
| 16 | 9/22/2017 6:23 | 1 | 21.62 | | 0.36 | | U | 1.88 | 11836.7 | 23.15 |
| 17 | 9/22/2017 8:25 | 1 | 22.42 | | | | W | 1.01 | 10035.9 | |
| 18 | 9/22/2017 8:42 | 1 | 22.61 | | 0.38 | | C | 0.83 | 8129.1 | |
| 19 | 9/22/2017 8:59 | 1 | 22.72 | | | | C | 1.45 | 9738.3 | |
| 20 | 9/22/2017 9:16 | 1 | 23.50 | 23.06 | 0.41 | | W | 0.75 | 12316.2 | |
| 21 | 9/22/2017 9:32 | 1 | 24.78 | | | | UW | 2.39 | 15523.5 | 59.27 |
| 22 | 9/22/2017 9:49 | 1 | 25.97 | | | | U | 2.77 | 11901.7 | 48.92 |
| 23 | 9/22/2017 10:06 | 1 | 25.77 | | | | UW | 2.11 | 10027.4 | |
| 24 | 9/22/2017 10:23 | 1 | 25.38 | | 0.36 | | U | 1.79 | 15935.1 | 38.54 |
| 25 | 9/22/2017 10:50 | 1 | 27.07 | | | | UW | 2.54 | 16455.8 | 45.75 |
| 26 | 9/22/2017 11:06 | 1 | 27.84 | | | | U | 2.74 | 11737.5 | 60.61 |
| 27 | 9/22/2017 11:23 | 1 | 29.46 | | | | W | 1.24 | 9481.1 | |
| 28 | 9/22/2017 11:39 | 1 | 30.71 | | 0.38 | | C | 1.53 | 8604.2 | |
| 29 | 9/22/2017 12:45 | 1 | 32.79 | | | | W | 2.18 | 10213.6 | 0.74 |
| 30 | 9/22/2017 13:02 | 1 | 33.63 | | 0.38 | | C | 1.60 | 8743.0 | |
| 31 | 9/22/2017 13:18 | 1 | 33.37 | | | | C | 2.28 | 10222.7 | |
| 32 | 9/22/2017 13:35 | 1 | 34.29 | 32.08 | 0.42 | | W | 0.92 | 17183.1 | |
| 33 | 9/22/2017 13:51 | 1 | 34.24 | | | | UW | 0.76 | 15278.0 | 62.39 |
| 34 | 9/22/2017 14:08 | 1 | 32.60 | | | | U | 2.58 | 8701.0 | 22.12 |
| 35 | 9/22/2017 14:24 | 1 | 34.48 | | | | UW | 2.32 | 9649.2 | |
| 36 | 9/22/2017 14:41 | 1 | 35.15 | | 0.36 | | U | 1.25 | 16657.2 | 19.44 |
| 37 | 9/22/2017 16:45 | 1 | 33.26 | | | | W | 2.38 | 12022.1 | |
| 38 | 9/22/2017 17:02 | 1 | 33.12 | | 0.37 | | C | 2.41 | 9112.5 | |
| 39 | 9/22/2017 17:18 | 1 | 33.20 | | | | C | 2.36 | 11106.4 | |
| 40 | 9/22/2017 17:35 | 1 | 31.11 | 31.65 | 0.41 | | W | 1.57 | 18258.9 | |
| 41 | 9/22/2017 17:51 | 1 | 29.30 | | | | UW | 0.65 | 12055.1 | 15.06 |
| 42 | 9/22/2017 18:08 | 1 | 29.24 | | | | U | 2.62 | 7430.1 | 11.40 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 9/22/2017 18:24 | 1 | 27.91 | | | | UW | 2.30 | 8258.0 | |
| 44 | 9/22/2017 18:41 | 1 | 23.39 | | 0.36 | | U | 0.53 | 17556.5 | 7.70 |
| 45 | 9/22/2017 20:45 | 1 | 22.83 | | | | W | 0.57 | 4297.2 | |
| 46 | 9/22/2017 21:02 | 1 | 22.65 | | 0.47 | | C | 2.15 | 7160.1 | |
| 47 | 9/22/2017 21:18 | 1 | 21.55 | | | | C | 2.60 | 3919.0 | |
| 48 | 9/22/2017 21:35 | 1 | 21.08 | 24.18 | 0.49 | | W | 0.69 | 2479.7 | |
| 49 | 9/22/2017 21:51 | 1 | 20.73 | | | | UW | 0.39 | 5355.5 | 0.16 |
| 50 | 9/22/2017 22:08 | 1 | 20.52 | | | | U | 2.78 | 7794.9 | 8.60 |
| 51 | 9/22/2017 22:24 | 1 | 20.16 | | | | UW | 0.59 | 2042.9 | |
| 52 | 9/22/2017 22:41 | 1 | 19.79 | | 0.47 | | U | 0.66 | 5212.8 | 3.87 |
| 53 | 9/23/2017 0:15 | 1 | 19.28 | | | | W | 2.01 | 2396.9 | |
| 54 | 9/23/2017 0:32 | 1 | 18.44 | | 0.47 | | C | 3.09 | 6400.4 | |
| 55 | 9/23/2017 0:48 | 1 | 18.26 | | | | C | 3.13 | 3297.6 | |
| 56 | 9/23/2017 1:05 | 1 | 18.07 | 21.36 | 0.49 | | W | 1.78 | 4638.4 | |
| 57 | 9/23/2017 1:21 | 1 | 17.71 | | | | UW | 2.47 | 6780.6 | 2.79 |
| 58 | 9/23/2017 1:38 | 1 | 16.92 | | | | U | 5.21 | 10256.4 | 12.66 |
| 59 | 9/23/2017 1:54 | 1 | 17.15 | | | | UW | 1.31 | 2457.7 | |
| 60 | 9/23/2017 2:11 | 1 | 16.87 | | 0.46 | | U | 1.01 | 5780.6 | 3.99 |
| 61 | 9/23/2017 4:15 | 1 | 16.66 | | | | W | 1.74 | 2005.2 | |
| 62 | 9/23/2017 4:32 | 1 | 16.51 | | 0.46 | | C | 2.77 | 6288.1 | |
| 63 | 9/23/2017 4:48 | 1 | 16.69 | | | | C | 3.03 | 2980.3 | |
| 64 | 9/23/2017 5:05 | 1 | 16.70 | 19.45 | 0.48 | | W | 2.24 | 3051.9 | |
| 65 | 9/23/2017 5:21 | 1 | 15.91 | | | | UW | 2.36 | 5543.3 | 6.81 |
| 66 | 9/23/2017 5:38 | 1 | 14.73 | | | | U | 3.21 | 6964.7 | 6.52 |
| 67 | 9/23/2017 5:54 | 1 | 15.11 | | | | UW | 1.11 | 2614.0 | |
| 68 | 9/23/2017 6:11 | 1 | 14.95 | | 0.45 | | U | 1.53 | 6247.0 | 3.98 |
| 69 | 9/23/2017 8:15 | 1 | 15.47 | | | | W | 0.93 | 3202.2 | |
| 70 | 9/23/2017 8:32 | 1 | 15.66 | | 0.46 | | C | 3.24 | 6383.7 | |
| 71 | 9/23/2017 8:48 | 1 | 16.13 | | | | C | 3.30 | 3137.6 | |
| 72 | 9/23/2017 9:05 | 1 | 17.06 | 18.98 | 0.48 | | W | 1.63 | 4644.9 | |
| 73 | 9/23/2017 9:21 | 1 | 17.44 | | | | UW | 2.69 | 7626.9 | 11.76 |
| 74 | 9/23/2017 9:38 | 1 | 17.34 | | | | U | 3.52 | 9813.2 | 13.73 |
| 75 | 9/23/2017 9:54 | 1 | 18.34 | | | | UW | 2.34 | 4125.8 | |
| 76 | 9/23/2017 10:11 | 1 | 17.92 | | 0.45 | | U | 2.39 | 8264.2 | 9.89 |
| 77 | 9/23/2017 12:15 | 1 | 20.41 | | | | W | 2.16 | 2960.4 | |
| 78 | 9/23/2017 12:32 | 1 | 19.05 | | 0.45 | | C | 2.36 | 5163.5 | |
| 79 | 9/23/2017 12:48 | 1 | 17.92 | | | | C | 3.19 | 3855.3 | |
| 80 | 9/23/2017 13:05 | 1 | 16.80 | 20.59 | 0.48 | | W | 2.64 | 3817.9 | |
| 81 | 9/23/2017 13:21 | 1 | 15.96 | | | | UW | 2.43 | 3815.7 | 8.44 |
| 82 | 9/23/2017 13:38 | 1 | 14.68 | | | | U | 4.79 | 9517.4 | 3.65 |
| 83 | 9/23/2017 13:55 | 1 | 15.07 | | | | UW | 0.08 | | |
| 84 | 9/23/2017 14:11 | 1 | 15.27 | | 0.49 | | U | 0.12 | 747.8 | 0.77 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 85 | 9/23/2017 16:15 | 1 | 17.28 | | | | W | | 987.3 | |
| 86 | 9/23/2017 16:32 | 1 | 17.35 | | 0.52 | | C | | 124.8 | |
| 87 | 9/23/2017 16:48 | 1 | 17.53 | | | | C | 0.04 | 145.7 | |
| 88 | 9/23/2017 17:05 | 1 | 17.71 | 19.12 | 0.50 | | W | | 112.0 | |
| 89 | 9/23/2017 17:21 | 1 | 17.63 | | | | UW | 0.15 | 17.8 | 1.20 |
| 90 | 9/23/2017 17:38 | 1 | 17.48 | | | | U | 2.68 | 2136.0 | 0.92 |
| 91 | 9/23/2017 17:54 | 1 | 17.67 | | | | UW | 0.03 | 87.9 | |
| 92 | 9/23/2017 18:11 | 1 | 17.59 | | 0.49 | | U | | 393.3 | |
| 93 | 9/23/2017 20:15 | 1 | 14.18 | | | | W | 0.11 | 429.5 | |
| 94 | 9/23/2017 20:32 | 1 | 14.00 | | 0.49 | | C | 0.54 | 1020.7 | |
| 95 | 9/23/2017 20:48 | 1 | 13.82 | | | | C | 0.07 | 116.9 | |
| 96 | 9/23/2017 21:05 | 1 | 13.81 | 17.09 | 0.50 | | W | 0.15 | 254.6 | |
| 97 | 9/23/2017 21:21 | 1 | 13.76 | | | | UW | 0.89 | 3556.2 | 0.09 |
| 98 | 9/23/2017 21:38 | 1 | 13.37 | | | | U | 2.24 | 6153.3 | 0.73 |
| 99 | 9/23/2017 21:54 | 1 | 13.52 | | | | UW | | 61.7 | |
| 100 | 9/23/2017 22:11 | 1 | 13.63 | | 0.47 | | U | 0.06 | 357.2 | |
| 101 | 9/24/2017 0:15 | 1 | 13.84 | | | | W | 0.46 | 688.2 | |
| 102 | 9/24/2017 0:32 | 1 | 13.67 | | 0.48 | | C | 1.21 | 1930.1 | |
| 103 | 9/24/2017 0:48 | 1 | 13.67 | | | | C | 0.41 | 685.1 | |
| 104 | 9/24/2017 1:05 | 1 | 13.88 | 16.26 | 0.49 | | W | 0.38 | 521.0 | |
| 105 | 9/24/2017 1:21 | 1 | 13.87 | | | | UW | 1.98 | 1935.4 | |
| 106 | 9/24/2017 1:38 | 1 | 14.31 | | | | U | 3.50 | 4752.2 | 0.81 |
| 107 | 9/24/2017 1:54 | 1 | 14.37 | | | | UW | | 225.5 | 59.68 |
| 108 | 9/24/2017 2:11 | 1 | 14.39 | | 0.46 | | U | 0.26 | 963.3 | |
| 109 | 9/24/2017 4:15 | 1 | 15.16 | | | | W | 0.44 | 923.8 | 0.23 |
| 110 | 9/24/2017 4:32 | 1 | 15.17 | | 0.48 | | C | 2.40 | 2513.9 | |
| 111 | 9/24/2017 4:48 | 1 | 15.16 | | | | C | 0.77 | 961.3 | |
| 112 | 9/24/2017 5:05 | 1 | 15.30 | 16.71 | 0.49 | | W | 0.32 | 606.4 | |
| 113 | 9/24/2017 5:21 | 1 | 15.32 | | | | UW | 2.03 | 2354.2 | 0.01 |
| 114 | 9/24/2017 5:38 | 1 | 16.20 | | | | U | 3.64 | 4079.1 | 1.65 |
| 115 | 9/24/2017 5:54 | 1 | 16.14 | | | | UW | 0.41 | 474.9 | |
| 116 | 9/24/2017 6:11 | 1 | 16.47 | | 0.46 | | U | 1.97 | 3038.9 | |
| 117 | 9/24/2017 8:15 | 1 | 18.03 | | | | W | 0.39 | 1040.1 | 0.77 |
| 118 | 9/24/2017 8:32 | 1 | 18.06 | | 0.48 | | C | 2.57 | 2767.0 | |
| 119 | 9/24/2017 8:48 | 1 | 18.40 | | | | C | 0.87 | 1279.2 | |
| 120 | 9/24/2017 9:05 | 1 | 18.86 | 18.99 | 0.49 | | W | 1.31 | 922.5 | |
| 121 | 9/24/2017 9:21 | 1 | 19.42 | | | | UW | 2.26 | 2674.6 | 0.83 |
| 122 | 9/24/2017 9:38 | 1 | 20.73 | | | | U | 2.47 | 3362.9 | 2.38 |
| 123 | 9/24/2017 9:54 | 1 | 20.57 | | | | UW | 1.35 | 1025.1 | |
| 124 | 9/24/2017 10:11 | 1 | 20.40 | | 0.46 | | U | 1.84 | 2429.5 | 0.52 |
| 125 | 9/24/2017 12:15 | 1 | 22.37 | | | | W | 0.77 | 1394.4 | |
| 126 | 9/24/2017 12:32 | 1 | 22.83 | | 0.47 | | C | 2.83 | 4365.0 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 127 | 9/24/2017 12:48 | 1 | 23.89 | | | | C | 1.64 | 1776.7 | |
| 128 | 9/24/2017 13:05 | 1 | 24.68 | 23.38 | 0.49 | | W | 2.50 | 1190.7 | |
| 129 | 9/24/2017 13:21 | 1 | 25.19 | | | | UW | 2.44 | 2893.0 | 11.02 |
| 130 | 9/24/2017 13:38 | 1 | 23.84 | | | | U | 4.08 | 5321.2 | 3.50 |
| 131 | 9/24/2017 13:54 | 1 | 23.69 | | | | UW | 2.90 | 1559.3 | |
| 132 | 9/24/2017 14:11 | 1 | 22.20 | | 0.45 | | U | 2.33 | 2377.9 | 1.16 |
| 133 | 9/24/2017 16:15 | 1 | 18.90 | | | | W | 0.13 | 834.6 | |
| 134 | 9/24/2017 16:32 | 1 | 18.27 | | 0.49 | | C | 0.76 | 1419.4 | |
| 135 | 9/24/2017 16:48 | 1 | 18.09 | | | | C | 0.28 | 828.7 | |
| 136 | 9/24/2017 17:05 | 1 | 16.79 | 20.96 | 0.50 | | W | 0.13 | 498.7 | |
| 137 | 9/24/2017 17:21 | 1 | 16.30 | | | | UW | 2.47 | 1513.3 | 0.01 |
| 138 | 9/24/2017 17:38 | 1 | 16.04 | | | | U | 2.63 | 3336.0 | 1.01 |
| 139 | 9/24/2017 17:54 | 1 | 16.20 | | | | UW | 0.83 | 627.5 | |
| 140 | 9/24/2017 18:11 | 1 | 15.80 | | 0.47 | | U | 0.46 | 834.9 | 0.08 |
| 141 | 9/24/2017 20:15 | 1 | 14.12 | | | | W | 0.23 | 781.2 | |
| 142 | 9/24/2017 20:32 | 1 | 13.87 | | 0.48 | | C | 0.61 | 1742.4 | |
| 143 | 9/24/2017 20:48 | 1 | 13.73 | | | | C | 0.28 | 856.1 | |
| 144 | 9/24/2017 21:05 | 1 | 13.71 | 16.99 | 0.49 | | W | 0.34 | 505.2 | |
| 145 | 9/24/2017 21:21 | 1 | 13.48 | | | | UW | 2.37 | 1362.8 | |
| 146 | 9/24/2017 21:38 | 1 | 13.01 | | | | U | 3.44 | 3286.5 | 0.24 |
| 147 | 9/24/2017 21:54 | 1 | 13.38 | | | | UW | 1.57 | 816.6 | 7.37 |
| 148 | 9/24/2017 22:11 | 1 | 13.27 | | 0.46 | | U | 0.48 | 1546.0 | |
| 149 | 9/25/2017 0:15 | 1 | 12.48 | | | | W | 0.28 | 862.4 | 0.40 |
| 150 | 9/25/2017 0:32 | 1 | 12.22 | | 0.47 | | C | 0.61 | 1384.0 | |
| 151 | 9/25/2017 0:48 | 1 | 12.07 | | | | C | 0.25 | 911.2 | |
| 152 | 9/25/2017 1:05 | 1 | 11.96 | 15.31 | 0.49 | | W | 0.31 | 695.0 | |
| 153 | 9/25/2017 1:21 | 1 | 11.73 | | | | UW | 4.25 | 1700.1 | |
| 154 | 9/25/2017 1:38 | 1 | 11.38 | | | | U | 2.16 | 2629.0 | 0.40 |
| 155 | 9/25/2017 1:54 | 1 | 11.77 | | | | UW | 1.75 | 753.0 | 3.75 |
| 156 | 9/25/2017 2:11 | 1 | 11.71 | | 0.46 | | U | 0.99 | 1972.9 | |
| 157 | 9/25/2017 4:15 | 1 | 11.10 | | | | W | 0.19 | 411.7 | 0.37 |
| 158 | 9/25/2017 4:32 | 1 | 10.98 | | 0.49 | | C | 0.32 | 694.7 | |
| 159 | 9/25/2017 4:48 | 1 | 11.00 | | | | C | | 321.7 | |
| 160 | 9/25/2017 5:05 | 1 | 11.13 | 14.23 | 0.50 | | W | 0.12 | 296.2 | |
| 161 | 9/25/2017 5:21 | 1 | 10.87 | | | | UW | 0.41 | 449.8 | |
| 162 | 9/25/2017 5:38 | 1 | 10.43 | | | | U | 3.61 | 3302.4 | 0.20 |
| 163 | 9/25/2017 5:54 | 1 | 10.87 | | | | UW | 0.33 | 242.4 | 0.28 |
| 164 | 9/25/2017 6:11 | 1 | 10.76 | | 0.49 | | U | 0.91 | 263.8 | |
| 165 | 9/25/2017 8:15 | 1 | 10.52 | | | | W | 0.25 | 456.2 | 0.11 |
| 166 | 9/25/2017 8:32 | 1 | 10.33 | | 0.50 | | C | 0.21 | 834.8 | |
| 167 | 9/25/2017 8:48 | 1 | 10.56 | | | | C | 0.17 | 503.8 | |
| 168 | 9/25/2017 9:05 | 1 | 10.91 | 13.76 | 0.50 | | W | 0.03 | 370.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 169 | 9/25/2017 9:21 | 1 | 10.77 | | | | UW | 0.36 | 581.0 | |
| 170 | 9/25/2017 9:38 | 1 | 10.56 | | | | U | 0.81 | 1661.7 | 0.12 |
| 171 | 9/25/2017 9:54 | 1 | 11.19 | | | | UW | 0.33 | 425.0 | 0.30 |
| 172 | 9/25/2017 10:11 | 1 | 11.17 | | 0.47 | | U | 0.49 | 929.6 | |
| 173 | 9/25/2017 12:15 | 1 | 13.40 | | | | W | 0.30 | 804.2 | 0.13 |
| 174 | 9/25/2017 12:32 | 1 | 13.90 | | 0.48 | | C | 0.47 | 877.3 | |
| 175 | 9/25/2017 12:48 | 1 | 13.81 | | | | C | 0.25 | 881.4 | |
| 176 | 9/25/2017 13:05 | 1 | 13.55 | 16.29 | 0.50 | | W | 0.30 | 547.3 | |
| 177 | 9/25/2017 13:21 | 1 | 13.53 | | | | UW | 1.21 | 949.3 | |
| 178 | 9/25/2017 13:38 | 1 | 13.48 | | | | U | 2.00 | 2330.9 | 0.22 |
| 179 | 9/25/2017 13:54 | 1 | 14.97 | | | | UW | 0.84 | 825.0 | 1.24 |
| 180 | 9/25/2017 14:11 | 1 | 14.89 | | 0.46 | | U | 0.36 | 787.4 | |
| 181 | 9/25/2017 16:15 | 1 | 12.77 | | | | W | 0.29 | 819.5 | 0.58 |
| 182 | 9/25/2017 16:32 | 1 | 12.29 | | 0.47 | | C | 0.76 | 2941.6 | |
| 183 | 9/25/2017 16:48 | 1 | 12.16 | | | | C | 0.23 | 846.6 | |
| 184 | 9/25/2017 17:05 | 1 | 12.35 | 15.40 | 0.50 | | W | 0.30 | 421.4 | |
| 185 | 9/25/2017 17:21 | 1 | 12.02 | | | | UW | 1.40 | 484.3 | |
| 186 | 9/25/2017 17:38 | 1 | 11.60 | | | | U | 1.97 | 1616.9 | 0.12 |
| 187 | 9/25/2017 17:54 | 1 | 11.86 | | | | UW | 0.46 | 365.2 | 0.38 |
| 188 | 9/25/2017 18:11 | 1 | 11.69 | | 0.47 | | U | 0.92 | 936.9 | |
| 189 | 9/25/2017 20:15 | 1 | 10.88 | | | | W | 0.07 | 371.9 | 0.10 |
| 190 | 9/25/2017 20:32 | 1 | 10.77 | | 0.49 | | C | 0.22 | 809.7 | |
| 191 | 9/25/2017 20:48 | 1 | 10.75 | | | | C | 0.15 | 644.0 | |
| 192 | 9/25/2017 21:05 | 1 | 10.97 | 13.77 | 0.50 | | W | 0.24 | 493.6 | |
| 193 | 9/25/2017 21:22 | 1 | 10.75 | | | | UW | 0.81 | 558.5 | |
| 194 | 9/25/2017 21:38 | 1 | 10.57 | | | | U | 1.07 | 1074.3 | 0.06 |
| 195 | 9/25/2017 21:55 | 1 | 10.87 | | | | UW | 0.31 | 72.8 | 0.11 |
| 196 | 9/25/2017 22:11 | 1 | 10.84 | | 0.49 | | U | 0.39 | | |
| 197 | 9/26/2017 0:15 | 1 | 10.58 | | | | W | 0.13 | 327.2 | 0.04 |
| 198 | 9/26/2017 0:32 | 1 | 10.37 | | 0.50 | | C | 0.39 | 898.7 | |
| 199 | 9/26/2017 0:48 | 1 | 10.35 | | | | C | | 395.7 | |
| 200 | 9/26/2017 1:05 | 1 | 10.44 | 13.10 | 0.50 | | W | 0.24 | 440.5 | |
| 201 | 9/26/2017 1:21 | 1 | 10.26 | | | | UW | 0.13 | 175.7 | |
| 202 | 9/26/2017 1:38 | 1 | 9.91 | | | | U | 1.35 | 1515.4 | 0.03 |
| 203 | 9/26/2017 1:55 | 1 | 10.23 | | | | UW | 0.18 | 264.9 | 0.05 |
| 204 | 9/26/2017 2:11 | 1 | 10.17 | | 0.48 | | U | 2.32 | 2619.8 | |
| 205 | 9/26/2017 4:15 | 1 | 10.11 | | | | W | 0.17 | 403.3 | 0.03 |
| 206 | 9/26/2017 4:32 | 1 | 9.98 | | 0.49 | | C | 0.52 | 906.4 | |
| 207 | 9/26/2017 4:48 | 1 | 9.93 | | | | C | 0.15 | 431.9 | |
| 208 | 9/26/2017 5:05 | 1 | 10.12 | 12.62 | 0.50 | | W | 0.25 | 423.7 | |
| 209 | 9/26/2017 5:21 | 1 | 10.09 | | | | UW | 0.55 | 708.9 | |
| 210 | 9/26/2017 5:38 | 1 | 9.85 | | | | U | 1.77 | 1801.8 | 0.03 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 211 | 9/26/2017 5:55 | 1 | 10.19 | | | | UW | 0.42 | 400.4 | 0.04 |
| 212 | 9/26/2017 6:11 | 1 | 10.16 | | 0.47 | | U | 3.13 | 3082.6 | |
| 213 | 9/26/2017 8:15 | 1 | 10.23 | | | | W | 0.17 | 517.0 | 0.03 |
| 214 | 9/26/2017 8:32 | 1 | 10.30 | | 0.48 | | C | 0.35 | 1007.4 | |
| 215 | 9/26/2017 8:48 | 1 | 10.69 | | | | C | 0.17 | 625.4 | |
| 216 | 9/26/2017 9:05 | 1 | 11.39 | 13.25 | 0.50 | | W | 0.33 | 481.2 | |
| 217 | 9/26/2017 9:21 | 1 | 11.57 | | | | UW | 0.50 | 852.3 | |
| 218 | 9/26/2017 9:38 | 1 | 11.14 | | | | U | 1.76 | 1896.3 | 0.07 |
| 219 | 9/26/2017 9:54 | 1 | 11.76 | | | | UW | 0.55 | 512.6 | 0.19 |
| 220 | 9/26/2017 10:11 | 1 | 11.69 | | 0.47 | | U | 1.63 | 2446.7 | 0.01 |
| 221 | 9/26/2017 12:15 | 1 | 13.38 | | | | W | 0.13 | 638.5 | 0.12 |
| 222 | 9/26/2017 12:32 | 1 | 13.46 | | 0.48 | | C | 0.50 | 1402.8 | |
| 223 | 9/26/2017 12:48 | 1 | 13.70 | | | | C | 0.23 | 900.5 | |
| 224 | 9/26/2017 13:05 | 1 | 14.15 | 16.15 | 0.50 | | W | 0.16 | 701.5 | |
| 225 | 9/26/2017 13:21 | 1 | 14.49 | | | | UW | 1.51 | 1157.6 | |
| 226 | 9/26/2017 13:38 | 1 | 13.24 | | | | U | 1.50 | 2084.1 | 0.27 |
| 227 | 9/26/2017 13:54 | 1 | 14.28 | | | | UW | 1.41 | 702.6 | 0.76 |
| 228 | 9/26/2017 14:11 | 1 | 14.61 | | 0.46 | | U | 1.83 | 4174.4 | |
| 229 | 9/26/2017 16:15 | 1 | 19.24 | | | | W | | 587.5 | 0.39 |
| 230 | 9/26/2017 16:32 | 1 | 19.41 | | 0.46 | | C | 0.61 | 2056.1 | |
| 231 | 9/26/2017 16:48 | 1 | 19.06 | | | | C | 0.23 | 1256.6 | |
| 232 | 9/26/2017 17:05 | 1 | 17.89 | 18.54 | 0.49 | | W | 0.20 | 725.0 | |
| 233 | 9/26/2017 17:21 | 1 | 18.61 | | | | UW | 2.70 | 2204.0 | 0.56 |
| 234 | 9/26/2017 17:38 | 1 | 16.13 | | | | U | 1.99 | 2100.6 | 0.14 |
| 235 | 9/26/2017 17:54 | 1 | 17.20 | | | | UW | 2.52 | 988.5 | |
| 236 | 9/26/2017 18:11 | 1 | 17.05 | | 0.44 | | U | 1.99 | 2937.1 | 0.05 |
| 237 | 9/26/2017 20:15 | 1 | 9.00 | | | | W | 0.03 | 538.5 | |
| 238 | 9/26/2017 20:32 | 1 | 8.34 | | 0.45 | | C | 0.71 | 1686.0 | |
| 239 | 9/26/2017 20:48 | 1 | 8.43 | | | | C | 0.30 | 1168.5 | |
| 240 | 9/26/2017 21:05 | 1 | 8.19 | 13.15 | 0.47 | | W | 0.21 | 512.1 | |
| 241 | 9/26/2017 21:21 | 1 | 7.91 | | | | UW | 0.82 | 924.5 | 0.14 |
| 242 | 9/26/2017 21:38 | 1 | 7.19 | | | | U | 2.08 | 1646.0 | 0.11 |
| 243 | 9/26/2017 21:54 | 1 | 7.69 | | | | UW | 0.65 | 703.1 | |
| 244 | 9/26/2017 22:11 | 1 | 7.28 | | 0.43 | | U | 1.65 | 1527.2 | |
| 245 | 9/27/2017 0:15 | 1 | 6.13 | | | | W | 0.11 | 524.6 | 0.01 |
| 246 | 9/27/2017 0:32 | 1 | 5.84 | | 0.45 | | C | 0.94 | 2083.5 | |
| 247 | 9/27/2017 0:48 | 1 | 5.77 | | | | C | 0.17 | 1149.7 | |
| 248 | 9/27/2017 1:08 | 1 | 6.23 | 10.40 | 0.48 | | W | 0.28 | 529.4 | |
| 249 | 9/27/2017 1:24 | 1 | 5.85 | | | | UW | 0.92 | 775.4 | |
| 250 | 9/27/2017 1:41 | 1 | 5.97 | | | | U | 3.60 | 1839.5 | 0.02 |
| 251 | 9/27/2017 1:57 | 1 | 6.69 | | | | UW | 0.51 | 503.9 | 0.20 |
| 252 | 9/27/2017 2:14 | 1 | 6.45 | | 0.43 | | U | 3.39 | 2683.9 | 0.01 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 253 | 9/27/2017 4:15 | 1 | 5.45 | | | | W | 0.29 | 1156.7 | 0.04 |
| 254 | 9/27/2017 4:32 | 1 | 4.96 | | 0.45 | | C | 1.87 | 2187.9 | |
| 255 | 9/27/2017 4:48 | 1 | 4.82 | | | | C | 0.30 | 850.9 | |
| 256 | 9/27/2017 5:08 | 1 | 5.10 | 9.16 | 0.48 | | W | 0.32 | 614.9 | |
| 257 | 9/27/2017 5:24 | 1 | 4.49 | | | | UW | 1.56 | 778.8 | |
| 258 | 9/27/2017 5:41 | 1 | 3.16 | | | | U | 2.18 | 1914.7 | 0.02 |
| 259 | 9/27/2017 5:57 | 1 | 4.41 | | | | UW | 0.54 | 504.1 | 0.30 |
| 260 | 9/27/2017 6:14 | 1 | 4.08 | | 0.43 | | U | 2.53 | 2782.0 | |
| 261 | 9/27/2017 8:15 | 1 | 6.44 | | | | W | 0.29 | 585.7 | 0.07 |
| 262 | 9/27/2017 8:32 | 1 | 6.98 | | 0.45 | | C | 0.80 | 1996.1 | 0.05 |
| 263 | 9/27/2017 8:48 | 1 | 6.40 | | | | C | 0.33 | 721.9 | 0.03 |
| 264 | 9/27/2017 9:05 | 1 | 8.98 | 10.18 | 0.48 | | W | 0.34 | 510.4 | 0.04 |
| 265 | 9/27/2017 9:21 | 1 | 9.57 | | | | UW | 1.15 | 946.3 | 0.04 |
| 266 | 9/27/2017 9:38 | 1 | 11.26 | | | | U | 1.80 | 2145.1 | 0.90 |
| 267 | 9/27/2017 9:54 | 1 | 11.40 | | | | UW | 0.39 | 546.4 | 0.08 |
| 268 | 9/27/2017 10:11 | 1 | 9.62 | | 0.43 | | U | 3.77 | 5308.6 | |
| 269 | 9/27/2017 12:15 | 1 | 19.81 | | | | W | 0.48 | 1170.4 | |
| 270 | 9/27/2017 12:32 | 1 | 20.55 | | 0.45 | | C | 2.44 | 5358.5 | |
| 271 | 9/27/2017 12:48 | 1 | 22.34 | | | | C | 0.38 | 1850.1 | |
| 272 | 9/27/2017 13:05 | 1 | 22.46 | 21.45 | 0.47 | | W | 0.48 | 926.1 | |
| 273 | 9/27/2017 13:21 | 1 | 22.56 | | | | UW | 2.11 | 2337.5 | 3.44 |
| 274 | 9/27/2017 13:38 | 1 | 19.25 | | | | U | 4.00 | 4882.3 | 0.84 |
| 275 | 9/27/2017 13:54 | 1 | 22.14 | | | | UW | 1.73 | 1103.4 | |
| 276 | 9/27/2017 14:11 | 1 | 22.06 | | 0.43 | | U | 3.97 | 4387.1 | 0.54 |
| 277 | 9/27/2017 16:15 | 1 | 23.68 | | | | W | 2.99 | 7640.2 | |
| 278 | 9/27/2017 16:32 | 1 | 22.38 | | 0.43 | | C | 2.39 | 4490.5 | |
| 279 | 9/27/2017 16:48 | 1 | 23.05 | | | | C | 3.91 | 8939.5 | |
| 280 | 9/27/2017 17:05 | 1 | 21.77 | 20.82 | 0.46 | | W | 5.12 | 7182.2 | |
| 281 | 9/27/2017 17:21 | 1 | 22.55 | | | | UW | 4.42 | 4662.2 | 1.32 |
| 282 | 9/27/2017 17:38 | 1 | 20.60 | | | | U | 4.40 | 4814.5 | |
| 283 | 9/27/2017 17:54 | 1 | 21.22 | | | | UW | 2.93 | 2766.5 | |
| 284 | 9/27/2017 18:11 | 1 | 20.87 | | 0.41 | | U | 3.69 | 4524.6 | 0.29 |
| 285 | 9/27/2017 20:15 | 1 | 10.50 | | | | W | 3.24 | 4712.1 | |
| 286 | 9/27/2017 20:32 | 1 | 10.05 | | 0.42 | | C | 1.89 | 3654.8 | |
| 287 | 9/27/2017 20:48 | 1 | 9.99 | | | | C | 2.10 | 5099.1 | |
| 288 | 9/27/2017 21:05 | 1 | 9.61 | 14.67 | 0.46 | | W | 2.75 | 3760.5 | |
| 289 | 9/27/2017 21:21 | 1 | 9.42 | | | | UW | 3.04 | 3027.5 | 0.07 |
| 290 | 9/27/2017 21:38 | 1 | 9.12 | | | | U | 3.33 | 3031.7 | 0.36 |
| 291 | 9/27/2017 21:54 | 1 | 9.31 | | | | UW | 1.51 | 1803.5 | |
| 292 | 9/27/2017 22:11 | 1 | 8.44 | | 0.40 | | U | 3.36 | 3835.0 | |
| 293 | 9/28/2017 0:15 | 1 | 7.08 | | | | W | 2.94 | 4182.0 | 0.17 |
| 294 | 9/28/2017 0:32 | 1 | 6.84 | | 0.41 | | C | 2.50 | 3525.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 295 | 9/28/2017 0:48 | 1 | 6.59 | | | | C | 2.14 | 3778.4 | |
| 296 | 9/28/2017 1:05 | 1 | 6.99 | 11.52 | 0.45 | | W | 2.97 | 3093.9 | |
| 297 | 9/28/2017 1:21 | 1 | 6.58 | | | | UW | 3.52 | 2380.9 | |
| 298 | 9/28/2017 1:38 | 1 | 5.76 | | | | U | 3.17 | 2856.2 | 0.28 |
| 299 | 9/28/2017 1:54 | 1 | 6.66 | | | | UW | 1.56 | 1425.8 | |
| 300 | 9/28/2017 2:11 | 1 | 6.08 | | 0.40 | | U | 3.28 | 3236.3 | |
| 301 | 9/28/2017 4:15 | 1 | 5.55 | | | | W | 2.36 | 3863.5 | 0.11 |
| 302 | 9/28/2017 4:32 | 1 | 5.40 | | 0.41 | | C | 1.45 | 3075.8 | |
| 303 | 9/28/2017 4:48 | 1 | 5.35 | | | | C | 1.85 | 3353.7 | |
| 304 | 9/28/2017 5:05 | 1 | 5.65 | 9.77 | 0.45 | | W | 2.95 | 2522.3 | |
| 305 | 9/28/2017 5:21 | 1 | 5.21 | | | | UW | 2.49 | 2071.4 | |
| 306 | 9/28/2017 5:38 | 1 | 4.54 | | | | U | 2.64 | 2644.2 | 0.18 |
| 307 | 9/28/2017 5:54 | 1 | 5.52 | | | | UW | 1.43 | 1281.3 | 0.97 |
| 308 | 9/28/2017 6:11 | 1 | 5.09 | | 0.40 | | U | 2.77 | 3153.3 | |
| 309 | 9/28/2017 8:15 | 1 | 7.16 | | | | W | 2.73 | 4352.0 | 0.14 |
| 310 | 9/28/2017 8:32 | 1 | 8.09 | | 0.41 | | C | 2.35 | 3091.7 | 0.02 |
| 311 | 9/28/2017 8:48 | 1 | 7.89 | | | | C | 1.85 | 3202.1 | 0.04 |
| 312 | 9/28/2017 9:05 | 1 | 10.32 | 11.16 | 0.46 | | W | 3.31 | 2604.9 | 0.06 |
| 313 | 9/28/2017 9:21 | 1 | 11.27 | | | | UW | 1.72 | 2318.2 | 0.45 |
| 314 | 9/28/2017 9:38 | 1 | 13.33 | | | | U | 2.72 | 2849.6 | 0.23 |
| 315 | 9/28/2017 9:54 | 1 | 13.01 | | | | UW | 1.91 | 1417.9 | |
| 316 | 9/28/2017 10:11 | 1 | 11.75 | | 0.40 | | U | 3.41 | 3565.4 | 0.01 |
| 317 | 9/28/2017 12:15 | 1 | 22.98 | | | | W | 3.10 | 4166.4 | |
| 318 | 9/28/2017 12:32 | 1 | 24.23 | | 0.41 | | C | 2.14 | 5192.0 | |
| 319 | 9/28/2017 12:48 | 1 | 24.92 | | | | C | 2.69 | 5804.3 | |
| 320 | 9/28/2017 13:05 | 1 | 24.59 | 21.68 | 0.45 | | W | 3.57 | 5458.4 | |
| 321 | 9/28/2017 13:21 | 1 | 24.64 | | | | UW | 3.01 | 4976.9 | 3.14 |
| 322 | 9/28/2017 13:38 | 1 | 24.26 | | | | U | 3.03 | 4469.8 | |
| 323 | 9/28/2017 13:54 | 1 | 25.46 | | | | UW | 4.60 | 4376.7 | |
| 324 | 9/28/2017 14:11 | 1 | 26.82 | | 0.40 | | U | 3.94 | 5005.4 | 0.98 |
| 325 | 9/28/2017 16:15 | 1 | 25.71 | | | | W | 3.59 | 6103.2 | |
| 326 | 9/28/2017 16:32 | 1 | 24.36 | | 0.40 | | C | 3.37 | 4525.5 | |
| 327 | 9/28/2017 16:48 | 1 | 24.74 | | | | C | 2.59 | 4588.5 | |
| 328 | 9/28/2017 17:05 | 1 | 23.76 | 21.70 | 0.44 | | W | 2.65 | 4804.2 | |
| 329 | 9/28/2017 17:21 | 1 | 24.04 | | | | UW | 4.32 | 4943.0 | 3.28 |
| 330 | 9/28/2017 17:38 | 1 | 23.11 | | | | U | 3.29 | 3568.7 | |
| 331 | 9/28/2017 17:54 | 1 | 22.38 | | | | UW | 3.04 | 4846.3 | |
| 332 | 9/28/2017 18:11 | 1 | 22.21 | | 0.39 | | U | 3.83 | 3477.3 | 0.83 |
| 333 | 9/28/2017 20:15 | 1 | 11.62 | | | | W | 3.45 | 4390.1 | |
| 334 | 9/28/2017 20:32 | 1 | 11.43 | | 0.39 | | C | 3.04 | 4139.9 | |
| 335 | 9/28/2017 20:48 | 1 | 11.79 | | | | C | 2.03 | 4599.8 | |
| 336 | 9/28/2017 21:05 | 1 | 12.42 | 15.98 | 0.43 | | W | 3.39 | 3341.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 337 | 9/28/2017 21:21 | 1 | 11.49 | | | | UW | 3.08 | 3350.8 | |
| 338 | 9/28/2017 21:38 | 1 | 11.48 | | | | U | 2.73 | 2899.3 | 0.19 |
| 339 | 9/28/2017 21:54 | 1 | 11.10 | | | | UW | 2.76 | 3024.8 | |
| 340 | 9/28/2017 22:11 | 1 | 11.75 | | 0.38 | | U | 4.13 | 3827.1 | |
| 341 | 9/29/2017 0:15 | 1 | 11.51 | | | | W | 2.68 | 5084.5 | 0.07 |
| 342 | 9/29/2017 0:32 | 1 | 11.13 | | 0.39 | | C | 2.34 | 3201.3 | |
| 343 | 9/29/2017 0:48 | 1 | 10.81 | | | | C | 2.24 | 4298.7 | |
| 344 | 9/29/2017 1:05 | 1 | 10.61 | 13.24 | 0.43 | | W | 3.63 | 4382.6 | |
| 345 | 9/29/2017 1:22 | 1 | 10.03 | | | | UW | 2.98 | 3059.1 | |
| 346 | 9/29/2017 1:38 | 1 | 10.37 | | | | U | 2.32 | 2825.7 | 0.03 |
| 347 | 9/29/2017 1:55 | 1 | 9.87 | | | | UW | 3.56 | 2826.0 | 0.14 |
| 348 | 9/29/2017 2:11 | 1 | 9.54 | | 0.37 | | U | 3.88 | 3609.0 | |
| 349 | 9/29/2017 4:15 | 1 | 7.60 | | | | W | 2.45 | 4561.1 | 0.02 |
| 350 | 9/29/2017 4:32 | 1 | 7.59 | | 0.38 | | C | 2.28 | 3191.4 | |
| 351 | 9/29/2017 4:48 | 1 | 7.22 | | | | C | 2.66 | 3747.2 | |
| 352 | 9/29/2017 5:05 | 1 | 6.58 | 10.99 | 0.43 | | W | 3.11 | 2667.6 | |
| 353 | 9/29/2017 5:21 | 1 | 5.95 | | | | UW | 2.27 | 2409.1 | |
| 354 | 9/29/2017 5:38 | 1 | 5.95 | | | | U | 2.13 | 2306.1 | 0.05 |
| 355 | 9/29/2017 5:55 | 1 | 6.12 | | | | UW | 2.63 | 2227.2 | 0.05 |
| 356 | 9/29/2017 6:11 | 1 | 6.40 | | 0.37 | | U | 3.11 | 3151.6 | |
| 357 | 9/29/2017 8:15 | 1 | 7.32 | | | | W | 3.16 | 3968.0 | 0.04 |
| 358 | 9/29/2017 8:32 | 1 | 7.95 | | 0.38 | | C | 1.40 | 3108.8 | 0.03 |
| 359 | 9/29/2017 8:48 | 1 | 7.58 | | | | C | 1.73 | 3353.8 | 0.03 |
| 360 | 9/29/2017 9:05 | 1 | 9.77 | 11.29 | 0.43 | | W | 2.85 | 2782.6 | 0.03 |
| 361 | 9/29/2017 9:21 | 1 | 10.31 | | | | UW | 2.66 | 2525.5 | 0.08 |
| 362 | 9/29/2017 9:38 | 1 | 12.33 | | | | U | 1.98 | 2812.3 | 0.60 |
| 363 | 9/29/2017 9:54 | 1 | 12.10 | | | | UW | 2.16 | 2574.6 | 0.25 |
| 364 | 9/29/2017 10:11 | 1 | 10.07 | | 0.37 | | U | 2.82 | 3077.3 | |
| 365 | 9/29/2017 12:15 | 1 | 20.43 | | | | W | 3.14 | 5526.8 | 8.43 |
| 366 | 9/29/2017 12:32 | 1 | 21.70 | | 0.39 | | C | 2.24 | 4748.5 | |
| 367 | 9/29/2017 12:48 | 1 | 22.75 | | | | C | 3.03 | 5268.0 | |
| 368 | 9/29/2017 13:05 | 1 | 22.87 | 21.76 | 0.43 | | W | 3.76 | 5678.6 | |
| 369 | 9/29/2017 13:21 | 1 | 22.78 | | | | UW | 3.24 | 4909.9 | 1.21 |
| 370 | 9/29/2017 13:38 | 1 | 21.01 | | | | U | 2.71 | 3805.8 | |
| 371 | 9/29/2017 13:54 | 1 | 23.23 | | | | UW | 3.05 | 4074.0 | |
| 372 | 9/29/2017 14:11 | 1 | 24.23 | | 0.39 | | U | 3.97 | 4947.5 | 0.23 |
| 373 | 9/29/2017 16:15 | 1 | 23.82 | | | | W | 0.32 | 1243.0 | |
| 374 | 9/29/2017 16:32 | 1 | 23.65 | | 0.38 | | C | 3.23 | 4942.3 | |
| 375 | 9/29/2017 16:48 | 1 | 24.08 | | | | C | 3.15 | 5508.2 | |
| 376 | 9/29/2017 17:05 | 1 | 22.01 | 23.22 | 0.43 | | W | 0.26 | 939.0 | |
| 377 | 9/29/2017 17:21 | 1 | 22.42 | | | | UW | 2.49 | 1745.3 | 1.20 |
| 378 | 9/29/2017 17:38 | 1 | 19.80 | | | | U | 3.88 | 3756.2 | 0.06 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 379 | 9/29/2017 17:54 | 1 | 20.55 | | | | UW | 2.79 | 3965.0 | |
| 380 | 9/29/2017 18:11 | 1 | 20.12 | | 0.38 | | U | 2.65 | 1572.1 | 0.28 |
| 381 | 9/29/2017 20:15 | 1 | 10.23 | | | | W | 0.66 | 1332.6 | |
| 382 | 9/29/2017 20:32 | 1 | 9.46 | | 0.37 | | C | 2.52 | 4156.3 | |
| 383 | 9/29/2017 20:48 | 1 | 9.25 | | | | C | 2.20 | 3941.0 | |
| 384 | 9/29/2017 21:05 | 1 | 9.80 | 15.00 | 0.42 | | W | 0.28 | 688.0 | |
| 385 | 9/29/2017 21:21 | 1 | 9.39 | | | | UW | 2.41 | 1378.5 | |
| 386 | 9/29/2017 21:38 | 1 | 10.00 | | | | U | 2.90 | 2799.8 | 0.08 |
| 387 | 9/29/2017 21:54 | 1 | 9.28 | | | | UW | 2.49 | 2891.6 | 1.61 |
| 388 | 9/29/2017 22:11 | 1 | 8.97 | | 0.37 | | U | 2.64 | 1296.9 | |
| 389 | 9/30/2017 0:15 | 1 | 9.15 | | | | W | 0.69 | 1963.4 | 0.04 |
| 390 | 9/30/2017 0:32 | 1 | 9.18 | | 0.36 | | C | 2.36 | 4184.3 | |
| 391 | 9/30/2017 0:48 | 1 | 9.29 | | | | C | 2.73 | 4378.1 | |
| 392 | 9/30/2017 1:05 | 1 | 9.17 | 12.28 | 0.41 | | W | 0.78 | 893.6 | |
| 393 | 9/30/2017 1:21 | 1 | 9.00 | | | | UW | 2.25 | 1328.4 | |
| 394 | 9/30/2017 1:38 | 1 | 9.23 | | | | U | 1.86 | 2424.2 | 0.02 |
| 395 | 9/30/2017 1:55 | 1 | 8.91 | | | | UW | 2.88 | 3592.0 | 0.06 |
| 396 | 9/30/2017 2:11 | 1 | 8.83 | | 0.37 | | U | 2.71 | 1564.9 | |
| 397 | 9/30/2017 4:15 | 1 | 9.39 | | | | W | 0.82 | 1860.7 | 0.04 |
| 398 | 9/30/2017 4:32 | 1 | 9.78 | | 0.36 | | C | 2.47 | 4684.6 | 0.02 |
| 399 | 9/30/2017 4:48 | 1 | 9.99 | | | | C | 3.67 | 5695.6 | |
| 400 | 9/30/2017 5:05 | 1 | 10.04 | 11.92 | 0.41 | | W | 2.21 | 1394.0 | |
| 401 | 9/30/2017 5:21 | 1 | 10.07 | | | | UW | 0.71 | 1331.4 | |
| 402 | 9/30/2017 5:38 | 1 | 10.74 | | | | U | 2.54 | 2281.0 | 0.05 |
| 403 | 9/30/2017 5:54 | 1 | 10.45 | | | | UW | 2.75 | 3730.8 | 0.09 |
| 404 | 9/30/2017 6:11 | 1 | 10.53 | | 0.37 | | U | 2.99 | 2033.2 | 0.01 |
| 405 | 9/30/2017 8:15 | 1 | 9.81 | | | | W | 0.88 | 1714.8 | 0.11 |
| 406 | 9/30/2017 8:32 | 1 | 10.04 | | 0.36 | | C | 3.17 | 4556.9 | |
| 407 | 9/30/2017 8:48 | 1 | 10.35 | | | | C | 5.76 | 7756.4 | |
| 408 | 9/30/2017 9:05 | 1 | 10.76 | 12.61 | 0.41 | | W | 1.30 | 823.4 | |
| 409 | 9/30/2017 9:21 | 1 | 11.29 | | | | UW | 0.69 | 1398.2 | 0.01 |
| 410 | 9/30/2017 9:38 | 1 | 12.91 | | | | U | 2.48 | 2475.9 | 0.14 |
| 411 | 9/30/2017 9:54 | 1 | 12.91 | | | | UW | 3.70 | 3609.0 | 0.17 |
| 412 | 9/30/2017 10:11 | 1 | 12.93 | | 0.37 | | U | 1.77 | 1813.1 | 0.03 |
| 413 | 9/30/2017 12:15 | 1 | 15.34 | | | | W | 1.70 | 3438.4 | 0.12 |
| 414 | 9/30/2017 12:32 | 1 | 16.04 | | 0.37 | | C | 3.50 | 5982.9 | |
| 415 | 9/30/2017 12:48 | 1 | 16.48 | | | | C | 4.98 | 8401.9 | |
| 416 | 9/30/2017 13:05 | 1 | 16.86 | 16.25 | 0.42 | | W | 2.25 | 2320.5 | |
| 417 | 9/30/2017 13:21 | 1 | 17.91 | | | | UW | 1.78 | 2057.5 | 0.45 |
| 418 | 9/30/2017 13:38 | 1 | 18.30 | | | | U | 2.42 | 2771.2 | |
| 419 | 9/30/2017 13:54 | 1 | 17.95 | | | | UW | 4.62 | 6478.9 | |
| 420 | 9/30/2017 14:11 | 1 | 17.15 | | 0.47 | | U | 2.51 | 3344.3 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 421 | 9/30/2017 16:15 | 1 | 17.60 | | | | W | 3.29 | 3816.5 | 0.20 |
| 422 | 9/30/2017 16:32 | 1 | 17.15 | | 0.37 | | C | 3.41 | 5637.5 | |
| 423 | 9/30/2017 16:48 | 1 | 17.12 | | | | C | 3.73 | 6131.3 | |
| 424 | 9/30/2017 17:05 | 1 | 17.02 | 17.10 | 0.42 | | W | 5.25 | 3363.1 | |
| 425 | 9/30/2017 17:21 | 1 | 15.74 | | | | UW | 3.19 | 2318.4 | 0.01 |
| 426 | 9/30/2017 17:38 | 1 | 15.95 | | | | U | 2.46 | 2585.1 | 0.04 |
| 427 | 9/30/2017 17:54 | 1 | 14.93 | | | | UW | 3.81 | 5245.6 | |
| 428 | 9/30/2017 18:11 | 1 | 14.58 | | 0.48 | | U | 1.64 | 1289.7 | |
| 429 | 9/30/2017 20:15 | 1 | 14.29 | | | | W | 0.90 | 2080.4 | 0.03 |
| 430 | 9/30/2017 20:32 | 1 | 14.38 | | 0.38 | | C | 3.49 | 5469.5 | |
| 431 | 9/30/2017 20:48 | 1 | 14.59 | | | | C | 3.56 | 5790.5 | |
| 432 | 9/30/2017 21:05 | 1 | 14.47 | 15.26 | 0.42 | | W | 0.76 | 881.0 | |
| 433 | 9/30/2017 21:21 | 1 | 14.31 | | | | UW | 0.38 | 646.5 | |
| 434 | 9/30/2017 21:38 | 1 | 15.28 | | | | U | 2.39 | 2024.4 | 0.07 |
| 435 | 9/30/2017 21:55 | 1 | 14.36 | | | | UW | 3.32 | 4637.1 | 0.02 |
| 436 | 9/30/2017 22:11 | 1 | 14.37 | | 0.48 | | U | 2.11 | 1119.6 | |
| 437 | 10/1/2017 0:15 | 1 | 14.30 | | | | W | 0.77 | 1686.7 | 0.03 |
| 438 | 10/1/2017 0:32 | 1 | 14.30 | | 0.38 | | C | 3.64 | 6554.0 | |
| 439 | 10/1/2017 0:49 | 1 | 14.54 | | | | C | 4.04 | 7632.1 | |
| 440 | 10/1/2017 1:05 | 1 | 14.47 | 14.43 | 0.42 | | W | 2.38 | 1915.2 | |
| 441 | 10/1/2017 1:22 | 1 | 14.51 | | | | UW | 1.32 | 1684.7 | 0.01 |
| 442 | 10/1/2017 1:38 | 1 | 15.59 | | | | U | 1.47 | 2119.0 | 0.19 |
| 443 | 10/1/2017 1:55 | 1 | 14.19 | | | | UW | 4.82 | 6165.7 | |
| 444 | 10/1/2017 2:11 | 1 | 14.07 | | 0.48 | | U | 3.16 | 2918.4 | |
| 445 | 10/1/2017 4:15 | 1 | 12.55 | | | | W | | 312.7 | 0.04 |
| 446 | 10/1/2017 4:32 | 1 | 12.31 | | 0.48 | | C | 0.39 | 591.9 | |
| 447 | 10/1/2017 4:48 | 1 | 12.30 | | | | C | 0.02 | 304.8 | |
| 448 | 10/1/2017 5:05 | 1 | 12.25 | 14.17 | 0.49 | | W | | 347.8 | |
| 449 | 10/1/2017 5:22 | 1 | 12.21 | | | | UW | 0.28 | 226.1 | |
| 450 | 10/1/2017 5:38 | 1 | 12.46 | | | | U | 0.16 | 93.4 | |
| 451 | 10/1/2017 5:55 | 1 | 12.34 | | | | UW | 0.05 | 86.5 | |
| 452 | 10/1/2017 6:11 | 1 | 12.38 | | 0.50 | | U | 0.47 | 159.4 | |
| 453 | 10/1/2017 8:15 | 1 | 12.74 | | | | W | | 185.4 | 0.03 |
| 454 | 10/1/2017 8:32 | 1 | 12.54 | | 0.49 | | C | 0.28 | 547.2 | |
| 455 | 10/1/2017 8:48 | 1 | 12.40 | | | | C | 0.20 | 468.7 | |
| 456 | 10/1/2017 9:05 | 1 | 12.34 | 14.15 | 0.49 | | W | 0.04 | 144.0 | |
| 457 | 10/1/2017 9:21 | 1 | 12.56 | | | | UW | 0.33 | 655.0 | |
| 458 | 10/1/2017 9:38 | 1 | 12.63 | | | | U | 0.27 | 406.5 | |
| 459 | 10/1/2017 9:54 | 1 | 12.80 | | | | UW | 0.11 | 219.4 | |
| 460 | 10/1/2017 10:11 | 1 | 13.14 | | 0.50 | | U | 0.65 | 628.2 | |
| 461 | 10/1/2017 12:15 | 1 | 16.24 | | | | W | 0.68 | 1480.9 | 0.02 |
| 462 | 10/1/2017 12:32 | 1 | 15.56 | | 0.47 | | C | 2.85 | 1767.5 | 0.01 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 463 | 10/1/2017 12:48 | 1 | 15.96 | | | | C | 3.16 | 2868.6 | |
| 464 | 10/1/2017 13:05 | 1 | 17.55 | 16.97 | 0.49 | | W | 0.07 | 474.8 | 0.04 |
| 465 | 10/1/2017 13:21 | 1 | 18.16 | | | | UW | 2.21 | 919.6 | 0.01 |
| 466 | 10/1/2017 13:38 | 1 | 19.04 | | | | U | 1.35 | 1122.1 | 0.14 |
| 467 | 10/1/2017 13:54 | 1 | 20.02 | | | | UW | 0.03 | 386.4 | 0.10 |
| 468 | 10/1/2017 14:11 | 1 | 19.89 | | 0.49 | | U | 5.03 | 3022.8 | |
| 469 | 10/1/2017 16:15 | 1 | 22.72 | | | | W | 1.38 | 1889.0 | 0.08 |
| 470 | 10/1/2017 16:32 | 1 | 21.34 | | 0.46 | | C | 2.51 | 2983.6 | |
| 471 | 10/1/2017 16:48 | 1 | 22.12 | | | | C | 2.86 | 3721.7 | |
| 472 | 10/1/2017 17:05 | 1 | 21.86 | 20.08 | 0.48 | | W | 0.40 | 715.4 | |
| 473 | 10/1/2017 17:21 | 1 | 20.10 | | | | UW | 2.06 | 1285.1 | 0.02 |
| 474 | 10/1/2017 17:38 | 1 | 21.29 | | | | U | 3.23 | 1881.6 | 0.09 |
| 475 | 10/1/2017 17:54 | 1 | 20.98 | | | | UW | 0.86 | 529.6 | |
| 476 | 10/1/2017 18:11 | 1 | 20.33 | | 0.49 | | U | 4.89 | 1842.6 | |
| 477 | 10/1/2017 20:15 | 1 | 15.79 | | | | W | 0.86 | 1662.4 | |
| 478 | 10/1/2017 20:32 | 1 | 15.50 | | 0.45 | | C | 2.22 | 1842.2 | |
| 479 | 10/1/2017 20:48 | 1 | 15.46 | | | | C | 2.83 | 3939.5 | |
| 480 | 10/1/2017 21:05 | 1 | 15.28 | 16.30 | 0.48 | | W | 0.30 | 586.6 | |
| 481 | 10/1/2017 21:21 | 1 | 15.38 | | | | UW | 3.17 | 1146.9 | |
| 482 | 10/1/2017 21:38 | 1 | 16.69 | | | | U | 2.50 | 1103.0 | 0.02 |
| 483 | 10/1/2017 21:54 | 1 | 15.64 | | | | UW | 0.69 | 450.2 | 0.10 |
| 484 | 10/1/2017 22:11 | 1 | 15.70 | | 0.49 | | U | 7.18 | 5502.3 | |
| 485 | 10/2/2017 0:15 | 1 | 14.53 | | | | W | 0.11 | 139.9 | 0.01 |
| 486 | 10/2/2017 0:32 | 1 | 14.38 | | 0.51 | | C | 0.74 | 493.2 | |
| 487 | 10/2/2017 0:49 | 1 | 14.36 | | | | C | | 87.6 | |
| 488 | 10/2/2017 1:05 | 1 | 14.34 | 15.91 | 0.50 | | W | | 142.1 | |
| 489 | 10/2/2017 1:22 | 1 | 14.24 | | | | UW | 0.82 | 596.2 | |
| 490 | 10/2/2017 1:38 | 1 | 14.21 | | | | U | 0.03 | 2.7 | |
| 491 | 10/2/2017 1:55 | 1 | 14.28 | | | | UW | 0.10 | 160.5 | |
| 492 | 10/2/2017 2:11 | 1 | 14.23 | | 0.50 | | U | 0.44 | | |
| 493 | 10/2/2017 4:15 | 1 | 14.15 | | | | W | 0.22 | 458.9 | |
| 494 | 10/2/2017 4:32 | 1 | 13.71 | | 0.50 | | C | 0.85 | 967.9 | |
| 495 | 10/2/2017 4:48 | 1 | 13.55 | | | | C | 0.01 | 400.1 | |
| 496 | 10/2/2017 5:05 | 1 | 13.65 | 15.31 | 0.49 | | W | 0.05 | 291.7 | |
| 497 | 10/2/2017 5:22 | 1 | 13.59 | | | | UW | 2.60 | 801.8 | |
| 498 | 10/2/2017 5:38 | 1 | 13.72 | | | | U | 1.26 | 612.4 | |
| 499 | 10/2/2017 5:55 | 1 | 13.70 | | | | UW | 0.07 | 209.6 | |
| 500 | 10/2/2017 6:11 | 1 | 13.64 | | 0.51 | | U | 0.43 | 513.6 | |
| 501 | 10/2/2017 8:15 | 1 | 13.57 | | | | W | 0.04 | 627.2 | |
| 502 | 10/2/2017 8:32 | 1 | 13.46 | | 0.49 | | C | 1.00 | 1104.4 | |
| 503 | 10/2/2017 8:48 | 1 | 13.44 | | | | C | 1.29 | 799.1 | |
| 504 | 10/2/2017 9:05 | 1 | 13.52 | 15.35 | 0.49 | | W | 0.05 | 373.9 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 505 | 10/2/2017 9:21 | 1 | 13.60 | | | | UW | 9.37 | 1324.4 | |
| 506 | 10/2/2017 9:38 | 1 | 13.60 | | | | U | 2.31 | 808.7 | |
| 507 | 10/2/2017 9:54 | 1 | 13.88 | | | | UW | 0.53 | 356.1 | 0.02 |
| 508 | 10/2/2017 10:11 | 1 | 14.22 | | 0.50 | | U | 0.92 | 434.3 | |
| 509 | 10/2/2017 12:15 | 1 | 16.38 | | | | W | 0.45 | 960.6 | 0.01 |
| 510 | 10/2/2017 12:32 | 1 | 16.21 | | 0.48 | | C | 2.58 | 1298.9 | 0.01 |
| 511 | 10/2/2017 12:48 | 1 | 17.06 | | | | C | 0.73 | 759.9 | |
| 512 | 10/2/2017 13:05 | 1 | 17.93 | 18.78 | 0.49 | | W | 0.48 | 629.2 | |
| 513 | 10/2/2017 13:21 | 1 | 19.46 | | | | UW | 9.48 | 2085.7 | 0.01 |
| 514 | 10/2/2017 13:38 | 1 | 17.55 | | | | U | 3.27 | 1487.4 | 0.12 |
| 515 | 10/2/2017 13:54 | 1 | 18.87 | | | | UW | 1.88 | 566.3 | 0.43 |
| 516 | 10/2/2017 14:11 | 1 | 18.37 | | 0.50 | | U | 3.01 | 692.7 | |
| 517 | 10/2/2017 16:15 | 1 | 16.74 | | | | W | 0.94 | 1091.0 | 0.01 |
| 518 | 10/2/2017 16:32 | 1 | 16.40 | | 0.48 | | C | 7.93 | 3861.9 | |
| 519 | 10/2/2017 16:48 | 1 | 16.25 | | | | C | 0.66 | 858.2 | |
| 520 | 10/2/2017 17:05 | 1 | 16.03 | 17.87 | 0.49 | | W | 0.36 | 655.0 | |
| 521 | 10/2/2017 17:21 | 1 | 15.38 | | | | UW | 5.43 | 2056.0 | |
| 522 | 10/2/2017 17:38 | 1 | 14.97 | | | | U | 3.21 | 931.1 | 0.03 |
| 523 | 10/2/2017 17:54 | 1 | 14.82 | | | | UW | 1.94 | 472.7 | 0.04 |
| 524 | 10/2/2017 18:11 | 1 | 14.78 | | 0.49 | | U | 2.41 | 586.7 | |
| 525 | 10/2/2017 20:15 | 1 | 13.79 | | | | W | 3.23 | 1791.5 | 0.01 |
| 526 | 10/2/2017 20:32 | 1 | 13.66 | | 0.48 | | C | 2.19 | 1775.7 | |
| 527 | 10/2/2017 20:48 | 1 | 13.58 | | | | C | 0.97 | 868.4 | |
| 528 | 10/2/2017 21:05 | 1 | 13.55 | 15.68 | 0.49 | | W | 0.61 | 680.6 | |
| 529 | 10/2/2017 21:21 | 1 | 13.33 | | | | UW | 8.33 | 3959.1 | |
| 530 | 10/2/2017 21:38 | 1 | 13.15 | | | | U | 2.18 | 1221.6 | |
| 531 | 10/2/2017 21:54 | 1 | 13.10 | | | | UW | 0.74 | 502.2 | 0.06 |
| 532 | 10/2/2017 22:11 | 1 | 13.06 | | 0.49 | | U | 1.93 | 516.3 | |
| 533 | 10/3/2017 0:15 | 1 | 12.14 | | | | W | 0.08 | 226.7 | 0.02 |
| 534 | 10/3/2017 0:32 | 1 | 11.90 | | 0.51 | | C | 0.03 | 173.5 | |
| 535 | 10/3/2017 0:48 | 1 | 11.90 | | | | C | | 245.0 | |
| 536 | 10/3/2017 1:05 | 1 | 12.09 | 14.34 | 0.50 | | W | 0.04 | 1166.4 | |
| 537 | 10/3/2017 1:22 | 1 | 11.91 | | | | UW | 0.13 | 57.9 | |
| 538 | 10/3/2017 1:38 | 1 | 11.72 | | | | U | 0.26 | 1117.9 | |
| 539 | 10/3/2017 1:55 | 1 | 11.84 | | | | UW | | 55.8 | |
| 540 | 10/3/2017 2:11 | 1 | 11.73 | | 0.50 | | U | 0.05 | 147.1 | |
| 541 | 10/3/2017 4:15 | 1 | 11.34 | | | | W | | 301.1 | |
| 542 | 10/3/2017 4:32 | 1 | 11.04 | | 0.51 | | C | 0.39 | 374.3 | |
| 543 | 10/3/2017 4:48 | 1 | 10.95 | | | | C | | 134.0 | |
| 544 | 10/3/2017 5:05 | 1 | 11.11 | 13.52 | 0.50 | | W | 0.08 | 135.7 | |
| 545 | 10/3/2017 5:21 | 1 | 10.98 | | | | UW | 0.17 | 293.3 | |
| 546 | 10/3/2017 5:38 | 1 | 10.66 | | | | U | 0.25 | 514.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 547 | 10/3/2017 5:54 | 1 | 10.96 | | | | UW | 0.05 | 413.1 | |
| 548 | 10/3/2017 6:11 | 1 | 10.96 | | 0.51 | | U | | 525.8 | |
| 549 | 10/3/2017 8:15 | 1 | 10.35 | | | | W | 0.77 | 1982.4 | |
| 550 | 10/3/2017 8:32 | 1 | 10.41 | | 0.50 | | C | 0.52 | 744.8 | |
| 551 | 10/3/2017 8:48 | 1 | 10.68 | | | | C | 0.19 | 402.4 | |
| 552 | 10/3/2017 9:05 | 1 | 10.84 | 13.15 | 0.50 | | W | 0.23 | 336.5 | |
| 553 | 10/3/2017 9:21 | 1 | 10.63 | | | | UW | 6.96 | 1280.1 | |
| 554 | 10/3/2017 9:38 | 1 | 10.51 | | | | U | 0.89 | 733.3 | |
| 555 | 10/3/2017 9:54 | 1 | 10.93 | | | | UW | 0.10 | 70.7 | |
| 556 | 10/3/2017 10:11 | 1 | 11.28 | | 0.51 | | U | 0.22 | 226.3 | |
| 557 | 10/3/2017 12:15 | 1 | 17.01 | | | | W | 1.43 | 1395.7 | 0.03 |
| 558 | 10/3/2017 12:32 | 1 | 16.68 | | 0.49 | | C | 0.73 | 1891.5 | 0.02 |
| 559 | 10/3/2017 12:48 | 1 | 17.78 | | | | C | 0.05 | 711.0 | |
| 560 | 10/3/2017 13:05 | 1 | 16.76 | 18.17 | 0.49 | | W | 0.15 | 452.1 | |
| 561 | 10/3/2017 13:21 | 1 | 16.98 | | | | UW | 6.43 | 2207.0 | |
| 562 | 10/3/2017 13:38 | 1 | 17.27 | | | | U | 1.81 | 1838.7 | 0.03 |
| 563 | 10/3/2017 13:54 | 1 | 19.38 | | | | UW | 2.55 | 403.9 | 0.13 |
| 564 | 10/3/2017 14:11 | 1 | 20.70 | | 0.51 | | U | 2.84 | 589.6 | 0.02 |
| 565 | 10/3/2017 16:15 | 1 | 19.91 | | | | W | 2.08 | 2493.3 | 0.06 |
| 566 | 10/3/2017 16:32 | 1 | 17.31 | | 0.48 | | C | 1.76 | 3107.5 | |
| 567 | 10/3/2017 16:48 | 1 | 20.01 | | | | C | 2.89 | 2439.5 | |
| 568 | 10/3/2017 17:05 | 1 | 18.41 | 19.33 | 0.48 | | W | 0.58 | 809.8 | |
| 569 | 10/3/2017 17:21 | 1 | 18.85 | | | | UW | 5.94 | 1811.5 | |
| 570 | 10/3/2017 17:38 | 1 | 16.24 | | | | U | 2.21 | 2043.9 | 0.17 |
| 571 | 10/3/2017 17:54 | 1 | 17.19 | | | | UW | 1.59 | 468.1 | 0.40 |
| 572 | 10/3/2017 18:11 | 1 | 17.10 | | 0.50 | | U | 2.45 | 677.0 | |
| 573 | 10/3/2017 20:15 | 1 | 9.40 | | | | W | 0.42 | 742.7 | |
| 574 | 10/3/2017 20:32 | 1 | 8.36 | | 0.47 | | C | 0.57 | 1065.6 | |
| 575 | 10/3/2017 20:48 | 1 | 8.15 | | | | C | 0.54 | 955.6 | |
| 576 | 10/3/2017 21:05 | 1 | 9.02 | 13.08 | 0.48 | | W | 0.36 | 637.7 | |
| 577 | 10/3/2017 21:21 | 1 | 8.85 | | | | UW | 2.67 | 1086.7 | |
| 578 | 10/3/2017 21:38 | 1 | 9.08 | | | | U | 1.46 | 1157.4 | |
| 579 | 10/3/2017 21:54 | 1 | 8.69 | | | | UW | 0.51 | 501.8 | 0.03 |
| 580 | 10/3/2017 22:11 | 1 | 8.71 | | 0.50 | | U | 0.86 | 460.9 | |
| 581 | 10/4/2017 0:15 | 1 | 7.31 | | | | W | 0.78 | 967.3 | 0.03 |
| 582 | 10/4/2017 0:32 | 1 | 7.15 | | 0.47 | | C | 1.33 | 1604.6 | |
| 583 | 10/4/2017 0:49 | 1 | 7.24 | | | | C | 0.49 | 1187.7 | |
| 584 | 10/4/2017 1:05 | 1 | 7.46 | 10.48 | 0.48 | | W | 1.81 | 849.1 | |
| 585 | 10/4/2017 1:22 | 1 | 7.12 | | | | UW | 3.03 | 1626.5 | |
| 586 | 10/4/2017 1:38 | 1 | 6.78 | | | | U | 1.40 | 1187.7 | |
| 587 | 10/4/2017 1:54 | 1 | 6.49 | | | | UW | 0.41 | 409.9 | |
| 588 | 10/4/2017 2:11 | 1 | 6.13 | | 0.49 | | U | 0.53 | 531.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 589 | 10/4/2017 4:15 | 1 | 4.73 | | | | W | 0.87 | 973.9 | 0.01 |
| 590 | 10/4/2017 4:32 | 1 | 4.40 | | 0.46 | | C | 0.92 | 2034.0 | |
| 591 | 10/4/2017 4:48 | 1 | 4.08 | | | | C | 0.61 | 895.4 | |
| 592 | 10/4/2017 5:05 | 1 | 4.17 | 8.13 | 0.48 | | W | 0.61 | 633.2 | |
| 593 | 10/4/2017 5:21 | 1 | 3.83 | | | | UW | 2.47 | 1037.7 | |
| 594 | 10/4/2017 5:38 | 1 | 3.56 | | | | U | 0.81 | 1010.7 | |
| 595 | 10/4/2017 5:54 | 1 | 3.68 | | | | UW | 0.39 | 313.6 | |
| 596 | 10/4/2017 6:11 | 1 | 3.46 | | 0.49 | | U | 0.50 | 497.4 | |
| 597 | 10/4/2017 8:15 | 1 | 4.53 | | | | W | 1.78 | 1827.1 | 0.01 |
| 598 | 10/4/2017 8:32 | 1 | 4.89 | | 0.46 | | C | 1.65 | 2616.3 | 0.01 |
| 599 | 10/4/2017 8:48 | 1 | 4.12 | | | | C | 0.51 | 856.8 | 0.01 |
| 600 | 10/4/2017 9:05 | 1 | 6.15 | 8.33 | 0.48 | | W | 0.70 | 1319.4 | |
| 601 | 10/4/2017 9:21 | 1 | 6.52 | | | | UW | 3.24 | 1791.7 | 0.01 |
| 602 | 10/4/2017 9:38 | 1 | 8.27 | | | | U | 0.76 | 1063.2 | 0.01 |
| 603 | 10/4/2017 9:55 | 1 | 8.08 | | | | UW | 0.31 | 321.7 | 0.01 |
| 604 | 10/4/2017 10:11 | 1 | 6.24 | | 0.49 | | U | 0.51 | 513.7 | 0.02 |
| 605 | 10/4/2017 12:15 | 1 | 15.75 | | | | W | 2.50 | 1472.5 | 0.05 |
| 606 | 10/4/2017 12:32 | 1 | 17.02 | | 0.46 | | C | 2.83 | 5229.9 | 0.01 |
| 607 | 10/4/2017 12:48 | 1 | 17.58 | | | | C | 2.05 | 2463.9 | |
| 608 | 10/4/2017 13:05 | 1 | 17.34 | 18.42 | 0.47 | | W | 2.97 | 2132.7 | |
| 609 | 10/4/2017 13:21 | 1 | 17.52 | | | | UW | 2.61 | 1753.4 | |
| 610 | 10/4/2017 13:38 | 1 | 15.57 | | | | U | 3.48 | 3400.9 | 0.13 |
| 611 | 10/4/2017 13:54 | 1 | 18.36 | | | | UW | 1.93 | 1025.6 | 0.34 |
| 612 | 10/4/2017 14:11 | 1 | 19.11 | | 0.49 | | U | 2.19 | 1279.5 | |
| 613 | 10/4/2017 16:15 | 1 | 19.71 | | | | W | 3.22 | 4035.2 | 0.17 |
| 614 | 10/4/2017 16:32 | 1 | 19.23 | | 0.45 | | C | 3.68 | 6504.7 | |
| 615 | 10/4/2017 16:48 | 1 | 19.27 | | | | C | 2.73 | 6314.2 | |
| 616 | 10/4/2017 17:05 | 1 | 17.99 | 18.57 | 0.46 | | W | 3.24 | 4177.3 | |
| 617 | 10/4/2017 17:21 | 1 | 18.34 | | | | UW | 3.45 | 4193.2 | |
| 618 | 10/4/2017 17:38 | 1 | 16.90 | | | | U | 2.54 | 3579.2 | 0.14 |
| 619 | 10/4/2017 17:54 | 1 | 17.38 | | | | UW | 3.27 | 3024.6 | 0.20 |
| 620 | 10/4/2017 18:11 | 1 | 16.72 | | 0.49 | | U | 2.37 | 1984.0 | |
| 621 | 10/4/2017 20:15 | 1 | 9.37 | | | | W | 2.38 | 3157.0 | 0.02 |
| 622 | 10/4/2017 20:32 | 1 | 9.92 | | 0.44 | | C | 2.53 | 2904.1 | |
| 623 | 10/4/2017 20:48 | 1 | 10.37 | | | | C | 2.16 | 3511.7 | |
| 624 | 10/4/2017 21:05 | 1 | 10.64 | 13.54 | 0.46 | | W | 3.62 | 3409.8 | |
| 625 | 10/4/2017 21:21 | 1 | 10.86 | | | | UW | 2.10 | 2303.6 | |
| 626 | 10/4/2017 21:38 | 1 | 11.44 | | | | U | 1.98 | 2625.0 | |
| 627 | 10/4/2017 21:54 | 1 | 11.29 | | | | UW | 1.79 | 2285.1 | 0.03 |
| 628 | 10/4/2017 22:11 | 1 | 11.32 | | 0.49 | | U | 1.76 | 2037.4 | |
| 629 | 10/5/2017 0:15 | 1 | 11.81 | | | | W | 2.62 | 3709.8 | 0.05 |
| 630 | 10/5/2017 0:32 | 1 | 11.73 | | 0.44 | | C | 1.80 | 3051.1 | 0.02 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 631 | 10/5/2017 0:48 | 1 | 11.85 | | | | C | 2.95 | 3411.1 | |
| 632 | 10/5/2017 1:05 | 1 | 11.85 | 13.47 | 0.46 | | W | 3.88 | 3091.7 | |
| 633 | 10/5/2017 1:22 | 1 | 11.86 | | | | UW | 1.63 | 2205.2 | |
| 634 | 10/5/2017 1:38 | 1 | 11.85 | | | | U | 2.95 | 2663.4 | |
| 635 | 10/5/2017 1:55 | 1 | 11.89 | | | | UW | 2.28 | 2098.7 | 0.05 |
| 636 | 10/5/2017 2:11 | 1 | 11.88 | | 0.48 | | U | 1.60 | 1773.7 | |
| 637 | 10/5/2017 4:15 | 1 | 11.99 | | | | W | 2.83 | 3742.8 | 0.07 |
| 638 | 10/5/2017 4:32 | 1 | 11.92 | | 0.43 | | C | 1.90 | 3128.5 | 0.02 |
| 639 | 10/5/2017 4:48 | 1 | 11.95 | | | | C | 1.75 | 3260.5 | |
| 640 | 10/5/2017 5:05 | 1 | 12.03 | 13.40 | 0.45 | | W | 2.35 | 2701.8 | |
| 641 | 10/5/2017 5:21 | 1 | 12.02 | | | | UW | 2.17 | 2253.2 | |
| 642 | 10/5/2017 5:38 | 1 | 12.17 | | | | U | 2.53 | 2494.7 | 0.02 |
| 643 | 10/5/2017 5:54 | 1 | 12.04 | | | | UW | 2.51 | 1975.2 | 0.07 |
| 644 | 10/5/2017 6:11 | 1 | 12.14 | | 0.48 | | U | 2.79 | 1677.8 | |
| 645 | 10/5/2017 8:15 | 1 | 12.15 | | | | W | 3.71 | 4622.8 | 0.04 |
| 646 | 10/5/2017 8:32 | 1 | 12.21 | | 0.43 | | C | 3.40 | 4007.2 | 0.01 |
| 647 | 10/5/2017 8:48 | 1 | 12.41 | | | | C | 2.50 | 3398.7 | |
| 648 | 10/5/2017 9:05 | 1 | 12.61 | 13.49 | 0.45 | | W | 2.30 | 3040.8 | |
| 649 | 10/5/2017 9:21 | 1 | 12.77 | | | | UW | 2.20 | 2784.2 | |
| 650 | 10/5/2017 9:38 | 1 | 13.04 | | | | U | 2.88 | 2593.1 | 0.05 |
| 651 | 10/5/2017 9:54 | 1 | 13.01 | | | | UW | 2.64 | 2086.4 | 0.07 |
| 652 | 10/5/2017 10:11 | 1 | 12.60 | | 0.48 | | U | 1.78 | 2040.4 | |
| 653 | 10/5/2017 12:15 | 1 | 14.86 | | | | W | 2.70 | 4236.9 | 0.06 |
| 654 | 10/5/2017 12:32 | 1 | 14.59 | | 0.43 | | C | 3.04 | 3454.5 | 0.01 |
| 655 | 10/5/2017 12:48 | 1 | 14.96 | | | | C | 2.29 | 3529.6 | |
| 656 | 10/5/2017 13:05 | 1 | 14.77 | 16.14 | 0.46 | | W | 2.71 | 3086.2 | |
| 657 | 10/5/2017 13:21 | 1 | 15.18 | | | | UW | 3.92 | 2781.2 | |
| 658 | 10/5/2017 13:38 | 1 | 15.63 | | | | U | 2.77 | 3204.2 | 0.12 |
| 659 | 10/5/2017 13:54 | 1 | 17.69 | | | | UW | 1.92 | 2180.4 | 0.13 |
| 660 | 10/5/2017 14:11 | 1 | 19.66 | | 0.49 | | U | 3.85 | 2277.2 | 0.03 |
| 661 | 10/5/2017 16:15 | 1 | 19.01 | | | | W | 3.81 | 5942.7 | 0.04 |
| 662 | 10/5/2017 16:32 | 1 | 18.49 | | 0.43 | | C | 3.35 | 3770.7 | |
| 663 | 10/5/2017 16:48 | 1 | 18.42 | | | | C | 2.65 | 4472.5 | |
| 664 | 10/5/2017 17:05 | 1 | 18.10 | 18.88 | 0.45 | | W | 3.78 | 4525.0 | |
| 665 | 10/5/2017 17:21 | 1 | 17.60 | | | | UW | 3.92 | 3752.3 | 0.01 |
| 666 | 10/5/2017 17:38 | 1 | 16.43 | | | | U | 3.47 | 3765.5 | 0.07 |
| 667 | 10/5/2017 17:54 | 1 | 16.42 | | | | UW | 2.35 | 2775.5 | |
| 668 | 10/5/2017 18:11 | 1 | 16.13 | | 0.48 | | U | 4.18 | 2777.2 | |
| 669 | 10/5/2017 20:15 | 1 | 13.94 | | | | W | 3.23 | 4672.6 | 0.01 |
| 670 | 10/5/2017 20:32 | 1 | 13.57 | | 0.42 | | C | 2.10 | 3700.3 | |
| 671 | 10/5/2017 20:48 | 1 | 12.17 | | | | C | 3.04 | 3873.7 | |
| 672 | 10/5/2017 21:05 | 1 | 11.51 | 14.95 | 0.45 | | W | 3.06 | 3175.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 673 | 10/5/2017 21:21 | 1 | 10.68 | | | | UW | 2.78 | 2744.8 | |
| 674 | 10/5/2017 21:38 | 1 | 10.09 | | | | U | 2.40 | 2708.3 | |
| 675 | 10/5/2017 21:54 | 1 | 10.10 | | | | UW | 2.44 | 2161.5 | |
| 676 | 10/5/2017 22:11 | 1 | 9.72 | | 0.48 | | U | 2.64 | 2680.0 | |
| 677 | 10/6/2017 0:15 | 1 | 8.12 | | | | W | 2.62 | 4349.1 | |
| 678 | 10/6/2017 0:32 | 1 | 7.88 | | 0.42 | | C | 2.93 | 3248.2 | |
| 679 | 10/6/2017 0:48 | 1 | 7.52 | | | | C | 1.90 | 3404.9 | |
| 680 | 10/6/2017 1:05 | 1 | 7.54 | 11.50 | 0.44 | | W | 3.13 | 2675.4 | |
| 681 | 10/6/2017 1:21 | 1 | 7.00 | | | | UW | 2.55 | 2257.1 | |
| 682 | 10/6/2017 1:38 | 1 | 6.50 | | | | U | 1.95 | 2178.0 | |
| 683 | 10/6/2017 1:54 | 1 | 7.13 | | | | UW | 2.26 | 1945.1 | |
| 684 | 10/6/2017 2:11 | 1 | 6.84 | | 0.48 | | U | 2.58 | 2101.9 | |
| 685 | 10/6/2017 4:15 | 1 | 7.22 | | | | W | 2.54 | 3985.6 | |
| 686 | 10/6/2017 4:32 | 1 | 7.22 | | 0.42 | | C | 2.45 | 3409.1 | 0.02 |
| 687 | 10/6/2017 4:48 | 1 | 6.60 | | | | C | 1.72 | 3358.3 | |
| 688 | 10/6/2017 5:05 | 1 | 6.58 | 10.00 | 0.44 | | W | 2.44 | 2764.7 | |
| 689 | 10/6/2017 5:21 | 1 | 6.10 | | | | UW | 1.94 | 2361.5 | |
| 690 | 10/6/2017 5:38 | 1 | 4.92 | | | | U | 1.70 | 2157.8 | |
| 691 | 10/6/2017 5:54 | 1 | 5.49 | | | | UW | 2.23 | 1826.9 | |
| 692 | 10/6/2017 6:11 | 1 | 5.58 | | 0.48 | | U | 2.60 | 1978.7 | |
| 693 | 10/6/2017 8:15 | 1 | 9.18 | | | | W | 3.39 | 4480.9 | 0.02 |
| 694 | 10/6/2017 8:32 | 1 | 9.01 | | 0.42 | | C | 3.40 | 4784.2 | 0.01 |
| 695 | 10/6/2017 8:48 | 1 | 9.09 | | | | C | 3.01 | 3282.1 | 0.05 |
| 696 | 10/6/2017 9:05 | 1 | 9.44 | 11.09 | 0.45 | | W | 2.57 | 2604.6 | |
| 697 | 10/6/2017 9:21 | 1 | 9.66 | | | | UW | 1.30 | 1442.8 | |
| 698 | 10/6/2017 9:38 | 1 | 10.16 | | | | U | 1.02 | 1154.4 | |
| 699 | 10/6/2017 9:54 | 1 | 10.46 | | | | UW | 1.46 | 1019.5 | |
| 700 | 10/6/2017 10:11 | 1 | 10.64 | | 0.49 | | U | 2.07 | 994.3 | |
| 701 | 10/6/2017 12:15 | 1 | 12.64 | | | | W | 3.33 | 4533.0 | 0.01 |
| 702 | 10/6/2017 12:32 | 1 | 13.98 | | 0.45 | | C | 2.82 | 1996.5 | |
| 703 | 10/6/2017 12:48 | 1 | 13.97 | | | | C | 1.52 | 2197.3 | 0.16 |
| 704 | 10/6/2017 13:05 | 1 | 14.12 | 15.03 | 0.47 | | W | 5.30 | 4314.6 | 0.01 |
| 705 | 10/6/2017 13:21 | 1 | 14.48 | | | | UW | 2.44 | 2504.6 | |
| 706 | 10/6/2017 13:38 | 1 | 14.36 | | | | U | 3.50 | 2650.1 | |
| 707 | 10/6/2017 13:54 | 1 | 15.57 | | | | UW | 2.81 | 1936.2 | 0.05 |
| 708 | 10/6/2017 14:11 | 1 | 15.90 | | 0.49 | | U | 2.12 | 1279.2 | 0.05 |
| 709 | 10/6/2017 16:15 | 1 | 12.52 | | | | W | 4.60 | 4919.1 | 0.03 |
| 710 | 10/6/2017 16:32 | 1 | 12.14 | | 0.44 | | C | 2.15 | 2477.3 | |
| 711 | 10/6/2017 16:48 | 1 | 12.01 | | | | C | 2.73 | 3588.4 | |
| 712 | 10/6/2017 17:05 | 1 | 11.98 | 14.26 | 0.46 | | W | 3.22 | 4102.8 | |
| 713 | 10/6/2017 17:21 | 1 | 11.82 | | | | UW | 3.02 | 2620.5 | |
| 714 | 10/6/2017 17:38 | 1 | 11.58 | | | | U | 2.47 | 2603.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 715 | 10/6/2017 17:54 | 1 | 11.76 | | | | UW | 2.19 | 1970.1 | 0.01 |
| 716 | 10/6/2017 18:11 | 1 | 11.77 | | 0.48 | | U | 2.64 | 1444.3 | |
| 717 | 10/6/2017 20:15 | 1 | 11.34 | | | | W | 3.41 | 4458.8 | 0.02 |
| 718 | 10/6/2017 20:32 | 1 | 11.20 | | 0.44 | | C | 2.98 | 3687.5 | |
| 719 | 10/6/2017 20:48 | 1 | 11.21 | | | | C | 2.40 | 3377.4 | |
| 720 | 10/6/2017 21:05 | 1 | 11.25 | 13.20 | 0.46 | | W | 3.93 | 3291.4 | |
| 721 | 10/6/2017 21:21 | 1 | 11.14 | | | | UW | 2.22 | 3051.0 | |
| 722 | 10/6/2017 21:38 | 1 | 10.88 | | | | U | 2.58 | 2652.0 | |
| 723 | 10/6/2017 21:54 | 1 | 11.01 | | | | UW | 1.85 | 2101.8 | |
| 724 | 10/6/2017 22:11 | 1 | 11.15 | | 0.48 | | U | 1.73 | 1575.3 | |
| 725 | 10/7/2017 0:15 | 1 | 11.17 | | | | W | 3.35 | 4494.8 | 0.01 |
| 726 | 10/7/2017 0:32 | 1 | 11.00 | | 0.44 | | C | 2.22 | 2662.6 | |
| 727 | 10/7/2017 0:48 | 1 | 10.98 | | | | C | 2.55 | 3255.9 | |
| 728 | 10/7/2017 1:05 | 1 | 11.06 | 12.85 | 0.46 | | W | 2.97 | 3450.6 | |
| 729 | 10/7/2017 1:21 | 1 | 10.99 | | | | UW | 2.84 | 2491.8 | |
| 730 | 10/7/2017 1:38 | 1 | 10.88 | | | | U | 2.74 | 2633.4 | |
| 731 | 10/7/2017 1:55 | 1 | 11.03 | | | | UW | 2.25 | 2085.1 | |
| 732 | 10/7/2017 2:11 | 1 | 11.03 | | 0.48 | | U | 2.33 | 2056.0 | |
| 733 | 10/7/2017 4:15 | 1 | 10.72 | | | | W | 3.67 | 3999.6 | 0.01 |
| 734 | 10/7/2017 4:32 | 1 | 10.61 | | 0.43 | | C | 2.96 | 3004.7 | 0.01 |
| 735 | 10/7/2017 4:48 | 1 | 10.61 | | | | C | 2.81 | 3162.4 | |
| 736 | 10/7/2017 5:05 | 1 | 10.69 | 12.52 | 0.46 | | W | 2.78 | 2977.2 | |
| 737 | 10/7/2017 5:21 | 1 | 10.58 | | | | UW | 2.00 | 2605.2 | |
| 738 | 10/7/2017 5:38 | 1 | 10.03 | | | | U | 2.00 | 2592.0 | |
| 739 | 10/7/2017 5:54 | 1 | 10.08 | | | | UW | 2.04 | 2188.1 | |
| 740 | 10/7/2017 6:11 | 1 | 9.97 | | 0.48 | | U | 2.39 | 1461.2 | |
| 741 | 10/7/2017 8:15 | 1 | 9.31 | | | | W | 2.96 | 3400.4 | 0.01 |
| 742 | 10/7/2017 8:32 | 1 | 9.26 | | 0.43 | | C | 2.79 | 2525.8 | |
| 743 | 10/7/2017 8:48 | 1 | 9.49 | | | | C | 2.97 | 2909.9 | |
| 744 | 10/7/2017 9:05 | 1 | 9.57 | 12.00 | 0.46 | | W | 2.70 | 2631.7 | |
| 745 | 10/7/2017 9:21 | 1 | 10.15 | | | | UW | 1.71 | 1807.4 | |
| 746 | 10/7/2017 9:38 | 1 | 12.06 | | | | U | 2.70 | 2222.0 | 0.01 |
| 747 | 10/7/2017 9:54 | 1 | 11.94 | | | | UW | 2.64 | 1743.4 | 0.03 |
| 748 | 10/7/2017 10:11 | 1 | 10.36 | | 0.48 | | U | 1.61 | 1386.9 | 0.03 |
| 749 | 10/7/2017 12:15 | 1 | 19.82 | | | | W | 1.79 | 2800.1 | 0.18 |
| 750 | 10/7/2017 12:32 | 1 | 21.54 | | 0.43 | | C | 3.19 | 4154.8 | |
| 751 | 10/7/2017 12:48 | 1 | 22.65 | | | | C | 2.74 | 5372.8 | |
| 752 | 10/7/2017 13:05 | 1 | 22.65 | 20.75 | 0.45 | | W | 2.94 | 3669.5 | |
| 753 | 10/7/2017 13:21 | 1 | 22.11 | | | | UW | 3.91 | 3183.8 | 0.35 |
| 754 | 10/7/2017 13:38 | 1 | 22.02 | | | | U | 2.99 | 2868.5 | 0.05 |
| 755 | 10/7/2017 13:54 | 1 | 23.07 | | | | UW | 2.94 | 3052.6 | |
| 756 | 10/7/2017 14:11 | 1 | 23.73 | | 0.48 | | U | 5.88 | 2587.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 757 | 10/7/2017 16:15 | 1 | 23.20 | | | | W | 1.74 | 2583.2 | 0.77 |
| 758 | 10/7/2017 16:32 | 1 | 22.90 | | 0.42 | | C | 1.74 | 3281.6 | |
| 759 | 10/7/2017 16:48 | 1 | 23.06 | | | | C | 2.11 | 3410.2 | |
| 760 | 10/7/2017 17:05 | 1 | 22.08 | 19.99 | 0.44 | | W | 2.68 | 3283.8 | |
| 761 | 10/7/2017 17:21 | 1 | 22.46 | | | | UW | 3.48 | 2867.5 | 0.13 |
| 762 | 10/7/2017 17:38 | 1 | 22.50 | | | | U | 2.92 | 2213.2 | |
| 763 | 10/7/2017 17:54 | 1 | 21.51 | | | | UW | 3.28 | 2553.8 | |
| 764 | 10/7/2017 18:11 | 1 | 20.55 | | 0.47 | | U | 4.21 | 2493.1 | |
| 765 | 10/7/2017 20:15 | 1 | 10.09 | | | | W | 2.41 | 3529.6 | |
| 766 | 10/7/2017 20:32 | 1 | 9.79 | | 0.41 | | C | 2.05 | 3016.6 | |
| 767 | 10/7/2017 20:48 | 1 | 9.72 | | | | C | 2.90 | 3521.0 | |
| 768 | 10/7/2017 21:05 | 1 | 9.40 | 14.06 | 0.43 | | W | 2.16 | 2976.5 | |
| 769 | 10/7/2017 21:21 | 1 | 9.62 | | | | UW | 2.69 | 2776.7 | |
| 770 | 10/7/2017 21:38 | 1 | 10.23 | | | | U | 2.32 | 2390.8 | |
| 771 | 10/7/2017 21:54 | 1 | 9.84 | | | | UW | 2.76 | 2226.9 | |
| 772 | 10/7/2017 22:11 | 1 | 10.50 | | 0.47 | | U | 3.14 | 2625.6 | |
| 773 | 10/8/2017 0:15 | 1 | 7.78 | | | | W | 2.89 | 3888.3 | |
| 774 | 10/8/2017 0:32 | 1 | 7.40 | | 0.40 | | C | 2.20 | 2837.2 | |
| 775 | 10/8/2017 0:49 | 1 | 7.07 | | | | C | 2.35 | 3159.4 | |
| 776 | 10/8/2017 1:05 | 1 | 7.23 | 11.53 | 0.43 | | W | 1.80 | 2688.6 | |
| 777 | 10/8/2017 1:22 | 1 | 8.47 | | | | UW | 1.86 | 2832.1 | |
| 778 | 10/8/2017 1:38 | 1 | 10.08 | | | | U | 2.53 | 2470.7 | |
| 779 | 10/8/2017 1:55 | 1 | 9.47 | | | | UW | 2.63 | 2517.4 | |
| 780 | 10/8/2017 2:11 | 1 | 9.45 | | 0.47 | | U | 3.22 | 2735.9 | |
| 781 | 10/8/2017 4:15 | 1 | 9.40 | | | | W | 4.02 | 4524.0 | |
| 782 | 10/8/2017 4:32 | 1 | 8.75 | | 0.40 | | C | 2.70 | 3296.9 | |
| 783 | 10/8/2017 4:48 | 1 | 8.12 | | | | C | 2.05 | 3640.1 | |
| 784 | 10/8/2017 5:05 | 1 | 7.60 | 10.79 | 0.43 | | W | 2.31 | 2931.8 | |
| 785 | 10/8/2017 5:21 | 1 | 8.11 | | | | UW | 1.77 | 2764.4 | |
| 786 | 10/8/2017 5:38 | 1 | 9.61 | | | | U | 1.88 | 2323.4 | |
| 787 | 10/8/2017 5:55 | 1 | 8.73 | | | | UW | 2.72 | 2259.8 | |
| 788 | 10/8/2017 6:11 | 1 | 8.81 | | 0.47 | | U | 3.32 | 2065.1 | |
| 789 | 10/8/2017 8:15 | 1 | 8.42 | | | | W | 2.89 | 3887.6 | |
| 790 | 10/8/2017 8:32 | 1 | 9.03 | | 0.40 | | C | 1.84 | 3041.6 | |
| 791 | 10/8/2017 8:48 | 1 | 8.52 | | | | C | 2.68 | 3049.8 | 0.01 |
| 792 | 10/8/2017 9:05 | 1 | 11.09 | 11.24 | 0.43 | | W | 2.43 | 2546.5 | 0.01 |
| 793 | 10/8/2017 9:21 | 1 | 12.22 | | | | UW | 1.55 | 2264.1 | 0.01 |
| 794 | 10/8/2017 9:38 | 1 | 15.29 | | | | U | 2.33 | 2362.8 | 0.01 |
| 795 | 10/8/2017 9:54 | 1 | 13.86 | | | | UW | 1.99 | 2224.6 | 0.03 |
| 796 | 10/8/2017 10:11 | 1 | 12.76 | | 0.47 | | U | 2.31 | 1903.9 | 0.03 |
| 797 | 10/8/2017 12:15 | 1 | 18.15 | | | | W | 4.01 | 4734.3 | 0.06 |
| 798 | 10/8/2017 12:32 | 1 | 18.83 | | 0.40 | | C | 2.54 | 3514.2 | 0.02 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 799 | 10/8/2017 12:48 | 1 | 19.63 | | | | C | 2.54 | 3526.8 | |
| 800 | 10/8/2017 13:05 | 1 | 19.39 | 18.92 | 0.43 | | W | 4.94 | 6577.4 | |
| 801 | 10/8/2017 13:21 | 1 | 19.95 | | | | UW | 3.35 | 3023.0 | 0.08 |
| 802 | 10/8/2017 13:38 | 1 | 19.21 | | | | U | 2.43 | 3169.8 | 0.14 |
| 803 | 10/8/2017 13:54 | 1 | 19.92 | | | | UW | 2.39 | 3503.2 | 0.20 |
| 804 | 10/8/2017 14:11 | 1 | 20.70 | | 0.46 | | U | 4.00 | 3020.1 | |
| 805 | 10/8/2017 16:15 | 1 | 20.48 | | | | W | 4.04 | 4893.5 | 0.03 |
| 806 | 10/8/2017 16:32 | 1 | 19.74 | | 0.39 | | C | 3.28 | 3460.9 | |
| 807 | 10/8/2017 16:48 | 1 | 20.09 | | | | C | 2.97 | 3453.7 | |
| 808 | 10/8/2017 17:05 | 1 | 18.68 | 19.80 | 0.43 | | W | 3.42 | 6070.6 | |
| 809 | 10/8/2017 17:21 | 1 | 18.44 | | | | UW | 2.52 | 2717.8 | 0.03 |
| 810 | 10/8/2017 17:38 | 1 | 17.60 | | | | U | 3.04 | 3714.6 | 0.05 |
| 811 | 10/8/2017 17:54 | 1 | 17.23 | | | | UW | 2.85 | 3559.5 | |
| 812 | 10/8/2017 18:11 | 1 | 16.00 | | 0.45 | | U | 3.43 | 3070.3 | |
| 813 | 10/8/2017 20:15 | 1 | 9.98 | | | | W | 2.74 | 4054.9 | |
| 814 | 10/8/2017 20:32 | 1 | 10.15 | | 0.38 | | C | 2.77 | 3213.2 | |
| 815 | 10/8/2017 20:48 | 1 | 9.91 | | | | C | 1.83 | 2840.9 | |
| 816 | 10/8/2017 21:05 | 1 | 9.95 | 13.41 | 0.42 | | W | 1.97 | 3151.6 | |
| 817 | 10/8/2017 21:21 | 1 | 9.53 | | | | UW | 2.57 | 2647.6 | |
| 818 | 10/8/2017 21:38 | 1 | 10.29 | | | | U | 2.01 | 3175.8 | |
| 819 | 10/8/2017 21:54 | 1 | 9.56 | | | | UW | 1.95 | 2810.9 | |
| 820 | 10/8/2017 22:11 | 1 | 9.22 | | 0.44 | | U | 2.25 | 2477.1 | |
| 821 | 10/9/2017 0:15 | 1 | 7.04 | | | | W | 2.63 | 3881.1 | 0.03 |
| 822 | 10/9/2017 0:32 | 1 | 6.55 | | 0.38 | | C | 2.12 | 2786.1 | |
| 823 | 10/9/2017 0:49 | 1 | 6.18 | | | | C | 1.48 | 2948.7 | |
| 824 | 10/9/2017 1:05 | 1 | 6.50 | 10.42 | 0.41 | | W | 1.63 | 2607.1 | |
| 825 | 10/9/2017 1:22 | 1 | 6.49 | | | | UW | 2.07 | 2153.9 | |
| 826 | 10/9/2017 1:38 | 1 | 7.53 | | | | U | 1.81 | 2229.4 | |
| 827 | 10/9/2017 1:55 | 1 | 7.53 | | | | UW | 1.84 | 2150.8 | |
| 828 | 10/9/2017 2:11 | 1 | 7.75 | | 0.44 | | U | 2.74 | 2044.9 | |
| 829 | 10/9/2017 4:15 | 1 | 9.05 | | | | W | 2.94 | 3545.8 | 0.04 |
| 830 | 10/9/2017 4:32 | 1 | 8.95 | | 0.38 | | C | 1.81 | 2791.2 | 0.01 |
| 831 | 10/9/2017 4:48 | 1 | 8.90 | | | | C | 2.05 | 2381.0 | 0.01 |
| 832 | 10/9/2017 5:05 | 1 | 9.00 | 10.82 | 0.41 | | W | 2.63 | 2912.5 | |
| 833 | 10/9/2017 5:21 | 1 | 8.61 | | | | UW | 1.63 | 2064.0 | |
| 834 | 10/9/2017 5:38 | 1 | 8.65 | | | | U | 1.34 | 2326.9 | |
| 835 | 10/9/2017 5:55 | 1 | 8.46 | | | | UW | 1.75 | 2323.6 | |
| 836 | 10/9/2017 6:11 | 1 | 8.26 | | 0.44 | | U | 1.58 | 2122.2 | |
| 837 | 10/9/2017 8:15 | 1 | 7.32 | | | | W | 3.35 | 3638.1 | 0.02 |
| 838 | 10/9/2017 8:32 | 1 | 7.08 | | 0.38 | | C | 2.28 | 2281.3 | |
| 839 | 10/9/2017 8:48 | 1 | 7.00 | | | | C | 1.96 | 2389.7 | |
| 840 | 10/9/2017 9:05 | 1 | 7.08 | 9.88 | 0.41 | | W | 2.35 | 3356.9 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 841 | 10/9/2017 9:21 | 1 | 6.75 | | | | UW | 2.42 | 2165.8 | |
| 842 | 10/9/2017 9:38 | 1 | 6.61 | | | | U | 1.87 | 2324.8 | |
| 843 | 10/9/2017 9:54 | 1 | 6.64 | | | | UW | 2.52 | 2877.7 | |
| 844 | 10/9/2017 10:11 | 1 | 6.66 | | 0.43 | | U | 2.04 | 1991.8 | |
| 845 | 10/9/2017 12:15 | 1 | 6.84 | | | | W | 2.85 | 3814.4 | 0.03 |
| 846 | 10/9/2017 12:32 | 1 | 6.04 | | 0.37 | | C | 3.40 | 2338.5 | |
| 847 | 10/9/2017 12:48 | 1 | 6.02 | | | | C | 1.77 | 2601.1 | |
| 848 | 10/9/2017 13:05 | 1 | 6.23 | 9.62 | 0.41 | | W | 2.19 | 3839.7 | |
| 849 | 10/9/2017 13:21 | 1 | 6.03 | | | | UW | 1.89 | 1856.7 | |
| 850 | 10/9/2017 13:38 | 1 | 6.09 | | | | U | 1.26 | 2437.6 | |
| 851 | 10/9/2017 13:54 | 1 | 6.43 | | | | UW | 1.96 | 2339.5 | |
| 852 | 10/9/2017 14:11 | 1 | 6.46 | | 0.43 | | U | 2.56 | 1970.9 | |
| 853 | 10/9/2017 16:15 | 1 | 13.03 | | | | W | 2.67 | 3183.0 | 0.04 |
| 854 | 10/9/2017 16:32 | 1 | 9.98 | | 0.37 | | C | 0.99 | 2093.8 | 0.39 |
| 855 | 10/9/2017 16:48 | 1 | 11.10 | | | | C | 0.96 | 2197.5 | |
| 856 | 10/9/2017 17:05 | 1 | 9.21 | 12.73 | 0.41 | | W | 2.25 | 4014.3 | 0.44 |
| 857 | 10/9/2017 17:21 | 1 | 10.79 | | | | UW | 1.83 | 1505.5 | |
| 858 | 10/9/2017 17:38 | 1 | 8.56 | | | | U | 1.98 | 2265.2 | 0.02 |
| 859 | 10/9/2017 17:54 | 1 | 9.19 | | | | UW | 2.34 | 2439.1 | 0.87 |
| 860 | 10/9/2017 18:11 | 1 | 8.11 | | 0.43 | | U | 2.26 | 1715.3 | |
| 861 | 10/9/2017 20:15 | 1 | 0.84 | | | | W | 1.56 | 2479.3 | 0.13 |
| 862 | 10/9/2017 20:32 | 1 | 0.40 | | 0.36 | | C | 1.13 | 2142.9 | |
| 863 | 10/9/2017 20:48 | 1 | 0.07 | | | | C | 2.25 | 2411.0 | |
| 864 | 10/9/2017 21:05 | 1 | 0.17 | 7.19 | 0.40 | | W | 1.22 | 2166.9 | |
| 865 | 10/9/2017 21:21 | 1 | 0.06 | | | | UW | 0.72 | 1580.5 | |
| 866 | 10/9/2017 21:38 | 1 | 0.42 | | | | U | 0.77 | 1646.2 | |
| 867 | 10/9/2017 21:55 | 1 | 0.41 | | | | UW | 1.12 | 1956.5 | |
| 868 | 10/9/2017 22:11 | 1 | -0.26 | | 0.42 | | U | 1.68 | 2210.4 | |
| 869 | 10/10/2017 0:15 | 1 | -1.67 | | | | W | 1.33 | 2504.3 | 0.05 |
| 870 | 10/10/2017 0:32 | 1 | -1.77 | | 0.36 | | C | 1.56 | 1930.3 | |
| 871 | 10/10/2017 0:49 | 1 | -2.12 | | | | C | 1.04 | 2046.5 | |
| 872 | 10/10/2017 1:05 | 1 | -1.83 | 4.54 | 0.40 | | W | 1.59 | 1953.4 | |
| 873 | 10/10/2017 1:22 | 1 | -2.07 | | | | UW | 0.68 | 1832.1 | |
| 874 | 10/10/2017 1:38 | 1 | -3.52 | | | | U | 0.64 | 1345.6 | |
| 875 | 10/10/2017 1:55 | 1 | -2.57 | | | | UW | 0.94 | 1708.2 | |
| 876 | 10/10/2017 2:11 | 1 | -2.67 | | 0.42 | | U | 1.60 | 1708.1 | |
| 877 | 10/10/2017 4:15 | 1 | -3.40 | | | | W | 1.47 | 2283.9 | 0.01 |
| 878 | 10/10/2017 4:32 | 1 | -3.58 | | 0.36 | | C | 1.74 | 1892.7 | |
| 879 | 10/10/2017 4:48 | 1 | -4.03 | | | | C | 0.94 | 1888.3 | |
| 880 | 10/10/2017 5:05 | 1 | -3.85 | 2.94 | 0.40 | | W | 1.27 | 1856.3 | |
| 881 | 10/10/2017 5:21 | 1 | -3.96 | | | | UW | 0.64 | 1553.9 | |
| 882 | 10/10/2017 5:38 | 1 | -5.25 | | | | U | 0.56 | 1517.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 883 | 10/10/2017 5:55 | 1 | -4.02 | | | | UW | 0.90 | 1599.0 | |
| 884 | 10/10/2017 6:11 | 1 | -3.77 | | 0.42 | | U | 1.49 | 1775.2 | |
| 885 | 10/10/2017 8:15 | 1 | -3.30 | | | | W | 2.42 | 2613.7 | 0.01 |
| 886 | 10/10/2017 8:32 | 1 | -2.27 | | 0.35 | | C | 1.06 | 1680.4 | |
| 887 | 10/10/2017 8:48 | 1 | -2.43 | | | | C | 0.90 | 1750.7 | 0.01 |
| 888 | 10/10/2017 9:05 | 1 | 0.68 | 2.68 | 0.40 | | W | 0.91 | 1710.7 | 0.01 |
| 889 | 10/10/2017 9:21 | 1 | 1.35 | | | | UW | 0.54 | 1563.6 | 0.01 |
| 890 | 10/10/2017 9:38 | 1 | 4.53 | | | | U | 0.57 | 1432.1 | 0.01 |
| 891 | 10/10/2017 9:55 | 1 | 3.96 | | | | UW | 0.84 | 1516.8 | 0.01 |
| 892 | 10/10/2017 10:11 | 1 | 0.55 | | 0.42 | | U | 0.88 | 1637.4 | 0.02 |
| 893 | 10/10/2017 12:18 | 1 | 13.45 | | | | W | 1.60 | 3006.3 | 0.24 |
| 894 | 10/10/2017 12:35 | 1 | 15.08 | | 0.36 | | C | 1.25 | 2532.6 | 0.01 |
| 895 | 10/10/2017 12:51 | 1 | 16.26 | | | | C | 1.81 | 2506.4 | 0.01 |
| 896 | 10/10/2017 13:08 | 1 | 16.11 | 15.45 | 0.40 | | W | 2.26 | 2716.0 | |
| 897 | 10/10/2017 13:24 | 1 | 14.95 | | | | UW | 1.77 | 2479.3 | |
| 898 | 10/10/2017 13:41 | 1 | 13.30 | | | | U | 1.14 | 2119.4 | 0.01 |
| 899 | 10/10/2017 13:57 | 1 | 16.26 | | | | UW | 1.89 | 2233.3 | 0.05 |
| 900 | 10/10/2017 14:14 | 1 | 16.80 | | 0.43 | | U | 2.47 | 2369.0 | 0.01 |
| 901 | 10/10/2017 16:15 | 1 | 18.21 | | | | W | 2.86 | 3980.6 | 0.18 |
| 902 | 10/10/2017 16:32 | 1 | 17.27 | | 0.36 | | C | 1.85 | 2686.9 | |
| 903 | 10/10/2017 16:48 | 1 | 17.17 | | | | C | 1.54 | 2857.2 | |
| 904 | 10/10/2017 17:05 | 1 | 16.09 | 16.62 | 0.40 | | W | 2.81 | 3262.9 | |
| 905 | 10/10/2017 17:21 | 1 | 16.07 | | | | UW | 1.31 | 2391.3 | 0.06 |
| 906 | 10/10/2017 17:38 | 1 | 12.83 | | | | U | 1.41 | 2310.9 | 0.11 |
| 907 | 10/10/2017 17:54 | 1 | 14.25 | | | | UW | 2.32 | 2167.4 | |
| 908 | 10/10/2017 18:11 | 1 | 12.64 | | 0.42 | | U | 2.44 | 2276.2 | |
| 909 | 10/10/2017 20:15 | 1 | 2.42 | | | | W | 1.54 | 3115.0 | 0.02 |
| 910 | 10/10/2017 20:32 | 1 | 2.25 | | 0.35 | | C | 2.30 | 2333.6 | |
| 911 | 10/10/2017 20:48 | 1 | 0.81 | | | | C | 1.49 | 2233.8 | |
| 912 | 10/10/2017 21:05 | 1 | 0.80 | 8.28 | 0.40 | | W | 1.71 | 2389.7 | |
| 913 | 10/10/2017 21:21 | 1 | 0.22 | | | | UW | 0.73 | 1824.9 | |
| 914 | 10/10/2017 21:38 | 1 | -0.09 | | | | U | 0.75 | 1749.3 | |
| 915 | 10/10/2017 21:55 | 1 | 0.00 | | | | UW | 1.88 | 1766.0 | |
| 916 | 10/10/2017 22:11 | 1 | -0.24 | | 0.42 | | U | 1.46 | 1740.9 | |
| 917 | 10/11/2017 0:15 | 1 | -0.94 | | | | W | 1.53 | 2816.8 | 0.03 |
| 918 | 10/11/2017 0:32 | 1 | -1.57 | | 0.35 | | C | 1.10 | 1817.3 | |
| 919 | 10/11/2017 0:49 | 1 | -0.89 | | | | C | 0.94 | 2327.4 | |
| 920 | 10/11/2017 1:05 | 1 | -0.07 | 5.08 | 0.39 | | W | 2.03 | 2162.2 | |
| 921 | 10/11/2017 1:22 | 1 | -0.25 | | | | UW | 0.68 | 1889.8 | |
| 922 | 10/11/2017 1:38 | 1 | -0.97 | | | | U | 0.71 | 1542.7 | |
| 923 | 10/11/2017 1:55 | 1 | -0.63 | | | | UW | 1.90 | 1870.1 | |
| 924 | 10/11/2017 2:11 | 1 | -1.24 | | 0.41 | | U | 1.70 | 1648.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 925 | 10/11/2017 4:15 | 1 | -3.05 | | | | W | 1.34 | 2544.1 | 0.01 |
| 926 | 10/11/2017 4:32 | 1 | -3.23 | | 0.35 | | C | 0.91 | 1691.3 | |
| 927 | 10/11/2017 4:48 | 1 | -3.83 | | | | C | 1.58 | 1967.5 | |
| 928 | 10/11/2017 5:05 | 1 | -3.40 | 3.11 | 0.39 | | W | 1.02 | 2043.2 | |
| 929 | 10/11/2017 5:21 | 1 | -3.66 | | | | UW | 0.64 | 1590.9 | |
| 930 | 10/11/2017 5:38 | 1 | -4.31 | | | | U | 0.64 | 1427.0 | |
| 931 | 10/11/2017 5:55 | 1 | -3.68 | | | | UW | 1.25 | 1739.8 | |
| 932 | 10/11/2017 6:11 | 1 | -3.85 | | 0.41 | | U | 1.62 | 1730.4 | |
| 933 | 10/11/2017 8:15 | 1 | -1.17 | | | | W | 1.78 | 2640.6 | 0.01 |
| 934 | 10/11/2017 8:32 | 1 | -0.56 | | 0.34 | | C | 1.00 | 1983.3 | 0.01 |
| 935 | 10/11/2017 8:48 | 1 | -1.07 | | | | C | 0.94 | 1946.3 | 0.01 |
| 936 | 10/11/2017 9:05 | 1 | 1.28 | 3.06 | 0.39 | | W | 1.20 | 2295.7 | 0.01 |
| 937 | 10/11/2017 9:21 | 1 | 1.89 | | | | UW | 0.59 | 1625.4 | 0.01 |
| 938 | 10/11/2017 9:38 | 1 | 4.65 | | | | U | 0.59 | 1591.4 | 0.01 |
| 939 | 10/11/2017 9:55 | 1 | 4.21 | | | | UW | 1.14 | 2183.2 | 0.01 |
| 940 | 10/11/2017 10:11 | 1 | 3.19 | | 0.42 | | U | 2.14 | 2378.6 | 0.02 |
| 941 | 10/11/2017 12:15 | 1 | 13.40 | | | | W | 2.47 | 4485.3 | 0.27 |
| 942 | 10/11/2017 12:32 | 1 | 14.80 | | 0.36 | | C | 3.44 | 3516.4 | 0.03 |
| 943 | 10/11/2017 12:48 | 1 | 15.32 | | | | C | 3.56 | 4111.7 | 0.01 |
| 944 | 10/11/2017 13:05 | 1 | 16.07 | 15.41 | 0.40 | | W | 3.73 | 5755.2 | |
| 945 | 10/11/2017 13:21 | 1 | 15.42 | | | | UW | 2.59 | 3137.7 | |
| 946 | 10/11/2017 13:38 | 1 | 15.14 | | | | U | 1.57 | 2284.6 | 0.05 |
| 947 | 10/11/2017 13:54 | 1 | 17.18 | | | | UW | 2.05 | 3963.0 | 0.03 |
| 948 | 10/11/2017 14:11 | 1 | 17.77 | | 0.42 | | U | 2.45 | 4330.6 | 0.04 |
| 949 | 10/11/2017 16:25 | 2 | 16.25 | | | 0.31 | UW | 0.48 | 814.8 | 0.03 |
| 950 | 10/11/2017 16:42 | 2 | 17.80 | | 0.30 | | U | 0.45 | 882.3 | 0.01 |
| 951 | 10/11/2017 16:58 | 2 | 16.63 | 14.58 | 0.30 | | UW | 0.22 | 1369.0 | 0.38 |
| 952 | 10/11/2017 17:15 | 2 | 16.49 | | | | U | 0.17 | 634.1 | |
| 953 | 10/11/2017 17:31 | 2 | 16.27 | | | | C | 0.01 | 179.8 | |
| 954 | 10/11/2017 17:48 | 2 | 14.54 | | | | W | 0.83 | 1103.5 | |
| 955 | 10/11/2017 18:04 | 2 | 14.35 | | | | C | 0.04 | 361.9 | |
| 956 | 10/11/2017 18:21 | 2 | 13.47 | | | | W | 0.62 | 616.5 | |
| 957 | 10/11/2017 20:24 | 2 | 7.93 | | | 0.31 | UW | 0.51 | 1090.5 | |
| 958 | 10/11/2017 20:41 | 2 | 8.02 | | 0.29 | | U | 0.22 | 660.4 | |
| 959 | 10/11/2017 20:57 | 2 | 7.55 | 10.56 | 0.29 | | UW | 0.19 | 983.8 | |
| 960 | 10/11/2017 21:14 | 2 | 6.92 | | | | U | 0.13 | 560.8 | |
| 961 | 10/11/2017 21:30 | 2 | 6.61 | | | | C | 0.05 | 425.8 | 0.01 |
| 962 | 10/11/2017 21:47 | 2 | 5.86 | | | | W | 0.49 | 781.8 | |
| 963 | 10/11/2017 22:03 | 2 | 4.66 | | | | C | 0.12 | 439.1 | |
| 964 | 10/11/2017 22:20 | 2 | 4.97 | | | | W | 0.39 | 520.7 | |
| 965 | 10/12/2017 0:15 | 2 | 5.58 | | | 0.31 | UW | 0.39 | 976.3 | 0.01 |
| 966 | 10/12/2017 0:32 | 2 | 5.37 | | 0.29 | | U | 0.64 | 635.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 967 | 10/12/2017 0:48 | 2 | 5.44 | 8.68 | 0.28 | | UW | 0.20 | 962.1 | |
| 968 | 10/12/2017 1:05 | 2 | 5.92 | | | | U | 0.14 | 502.6 | 0.01 |
| 969 | 10/12/2017 1:22 | 2 | 6.39 | | | | C | 0.01 | 170.0 | 0.02 |
| 970 | 10/12/2017 1:38 | 2 | 6.18 | | | | W | 0.61 | 834.0 | |
| 971 | 10/12/2017 1:55 | 2 | 5.81 | | | | C | 0.06 | 357.7 | |
| 972 | 10/12/2017 2:11 | 2 | 6.53 | | | | W | 0.29 | 483.2 | |
| 973 | 10/12/2017 4:15 | 2 | 5.48 | | | 0.31 | UW | 0.46 | 929.1 | 0.03 |
| 974 | 10/12/2017 4:32 | 2 | 5.63 | | 0.28 | | U | 0.14 | 560.6 | 0.01 |
| 975 | 10/12/2017 4:48 | 2 | 5.57 | 8.07 | 0.28 | | UW | 0.15 | 843.2 | 0.01 |
| 976 | 10/12/2017 5:05 | 2 | 5.59 | | | | U | 0.08 | 475.7 | 0.05 |
| 977 | 10/12/2017 5:21 | 2 | 5.63 | | | | C | 0.02 | 200.2 | 0.06 |
| 978 | 10/12/2017 5:38 | 2 | 5.76 | | | | W | 0.55 | 918.5 | |
| 979 | 10/12/2017 5:54 | 2 | 5.72 | | | | C | 0.07 | 295.2 | |
| 980 | 10/12/2017 6:11 | 2 | 6.66 | | | | W | 0.18 | 362.0 | |
| 981 | 10/12/2017 8:15 | 2 | 6.87 | | | 0.31 | UW | 0.33 | 808.9 | 0.06 |
| 982 | 10/12/2017 8:32 | 2 | 7.17 | | 0.29 | | U | 0.10 | 532.9 | 0.01 |
| 983 | 10/12/2017 8:48 | 2 | 8.15 | 8.33 | 0.28 | | UW | 0.20 | 1018.4 | 0.02 |
| 984 | 10/12/2017 9:05 | 2 | 9.65 | | | | U | 0.04 | 514.6 | 0.19 |
| 985 | 10/12/2017 9:21 | 2 | 10.97 | | | | C | 0.02 | 185.4 | 0.27 |
| 986 | 10/12/2017 9:38 | 2 | 11.86 | | | | W | 0.68 | 1022.2 | |
| 987 | 10/12/2017 9:54 | 2 | 12.98 | | | | C | 0.05 | 249.1 | |
| 988 | 10/12/2017 10:11 | 2 | 12.34 | | | | W | 0.13 | 329.0 | |
| 989 | 10/12/2017 12:15 | 2 | 19.28 | | | 0.31 | UW | 0.45 | 1023.4 | 0.06 |
| 990 | 10/12/2017 12:32 | 2 | 19.52 | | 0.30 | | U | 0.09 | 626.1 | 0.34 |
| 991 | 10/12/2017 12:48 | 2 | 18.35 | 14.11 | 0.30 | | UW | 0.18 | 1220.5 | 0.31 |
| 992 | 10/12/2017 13:05 | 2 | 20.45 | | | | U | 0.05 | 627.7 | |
| 993 | 10/12/2017 13:21 | 2 | 20.91 | | | | C | | 233.1 | |
| 994 | 10/12/2017 13:38 | 2 | 19.92 | | | | W | 1.17 | 2171.2 | |
| 995 | 10/12/2017 13:54 | 2 | 21.91 | | | | C | 0.04 | 287.2 | |
| 996 | 10/12/2017 14:11 | 2 | 20.58 | | | | W | 0.23 | 354.8 | |
| 997 | 10/12/2017 15:48 | 2 | 22.78 | | | | C | 0.01 | 306.5 | |
| 998 | 10/12/2017 16:05 | 2 | 20.87 | | | | W | 1.39 | 1869.0 | |
| 999 | 10/12/2017 16:23 | 2 | 22.58 | | | | C | 0.04 | 364.7 | |
| 1000 | 10/12/2017 16:40 | 2 | 20.48 | | | | W | 0.62 | 478.8 | |
| 1001 | 10/12/2017 16:57 | 2 | 19.31 | | | 0.32 | UW | 0.57 | 797.6 | 0.02 |
| 1002 | 10/12/2017 17:15 | 2 | 19.64 | | 0.30 | | U | 0.27 | 480.0 | 0.13 |
| 1003 | 10/12/2017 17:32 | 2 | 20.57 | 17.18 | 0.30 | | UW | 0.54 | 1202.9 | 0.40 |
| 1004 | 10/12/2017 17:49 | 2 | 19.04 | | | | U | 0.12 | 586.9 | |
| 1005 | 10/12/2017 19:47 | 2 | 13.18 | | | | C | 0.06 | 426.1 | |
| 1006 | 10/12/2017 20:05 | 2 | 12.67 | | | | W | 0.51 | 826.3 | |
| 1007 | 10/12/2017 20:22 | 2 | 12.71 | | | | C | 0.19 | 531.0 | |
| 1008 | 10/12/2017 20:39 | 2 | 12.79 | | | | W | 0.62 | 539.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1009 | 10/12/2017 20:56 | 2 | 12.51 | | | 0.31 | UW | 0.58 | 829.4 | |
| 1010 | 10/12/2017 21:14 | 2 | 12.69 | | 0.29 | | U | 0.41 | 760.5 | 0.02 |
| 1011 | 10/12/2017 21:31 | 2 | 11.78 | 13.91 | 0.29 | | UW | 0.19 | 755.7 | 0.31 |
| 1012 | 10/12/2017 21:48 | 2 | 10.94 | | | | U | 0.51 | 864.8 | |
| 1013 | 10/12/2017 23:47 | 2 | 8.00 | | | | C | 0.08 | 597.5 | 0.25 |
| 1014 | 10/13/2017 0:05 | 2 | 7.86 | | | | W | 0.12 | 239.0 | |
| 1015 | 10/13/2017 0:20 | 2 | 6.75 | | | | C | 0.07 | 450.5 | |
| 1016 | 10/13/2017 0:38 | 2 | 6.93 | | | | W | 0.12 | 271.6 | |
| 1017 | 10/13/2017 0:55 | 2 | 5.66 | | | | C | 0.17 | 703.0 | |
| 1018 | 10/13/2017 1:12 | 2 | 6.23 | | | | W | 0.51 | 709.4 | |
| 1019 | 10/13/2017 1:30 | 2 | 5.75 | | | 0.31 | UW | 0.56 | 934.5 | |
| 1020 | 10/13/2017 1:47 | 2 | 5.69 | | 0.28 | | U | 0.36 | 720.5 | 0.02 |
| 1021 | 10/13/2017 2:04 | 2 | 5.53 | 10.53 | 0.28 | | UW | 0.10 | 496.9 | 0.16 |
| 1022 | 10/13/2017 2:21 | 2 | 4.95 | | | | U | 0.39 | 829.2 | |
| 1023 | 10/13/2017 4:20 | 2 | 5.87 | | | | C | 0.06 | 442.1 | 0.01 |
| 1024 | 10/13/2017 4:38 | 2 | 5.65 | | | | W | 0.22 | 429.3 | |
| 1025 | 10/13/2017 4:55 | 2 | 5.49 | | | | C | 0.14 | 631.7 | |
| 1026 | 10/13/2017 5:12 | 2 | 5.19 | | | | W | 0.37 | 538.1 | |
| 1027 | 10/13/2017 5:29 | 2 | 6.16 | | | 0.31 | UW | 0.47 | 901.6 | |
| 1028 | 10/13/2017 5:47 | 2 | 6.48 | | 0.28 | | U | 0.26 | 682.1 | 0.08 |
| 1029 | 10/13/2017 6:04 | 2 | 6.08 | 9.73 | 0.28 | | UW | 0.12 | 787.9 | 0.38 |
| 1030 | 10/13/2017 6:21 | 2 | 6.04 | | | | U | 0.19 | 700.9 | |
| 1031 | 10/13/2017 8:20 | 2 | 5.54 | | | | C | 0.10 | 408.8 | 0.36 |
| 1032 | 10/13/2017 8:38 | 2 | 5.81 | | | | W | 0.22 | 530.0 | |
| 1033 | 10/13/2017 8:55 | 2 | 5.92 | | | | C | 0.17 | 668.5 | |
| 1034 | 10/13/2017 9:12 | 2 | 6.23 | | | | W | 0.29 | 664.2 | |
| 1035 | 10/13/2017 9:29 | 2 | 7.18 | | | 0.31 | UW | 0.48 | 974.0 | |
| 1036 | 10/13/2017 9:47 | 2 | 7.58 | | 0.28 | | U | 0.19 | 819.2 | 0.06 |
| 1037 | 10/13/2017 10:04 | 2 | 8.44 | 9.85 | 0.28 | | UW | 0.09 | 765.9 | 0.67 |
| 1038 | 10/13/2017 10:21 | 2 | 10.12 | | | | U | 0.19 | 959.4 | |
| 1039 | 10/13/2017 12:20 | 2 | 14.91 | | | | C | 0.11 | 622.7 | |
| 1040 | 10/13/2017 12:38 | 2 | 14.00 | | | | W | 0.11 | 439.0 | |
| 1041 | 10/13/2017 12:55 | 2 | 15.13 | | | | C | 0.73 | 1029.6 | 0.01 |
| 1042 | 10/13/2017 13:12 | 2 | 12.06 | | | | W | 0.50 | 835.6 | |
| 1043 | 10/13/2017 13:29 | 2 | 20.02 | | | 0.32 | UW | 0.91 | 1289.4 | 0.35 |
| 1044 | 10/13/2017 13:47 | 2 | 18.84 | | 0.30 | | U | 0.32 | 855.0 | 0.23 |
| 1045 | 10/13/2017 14:04 | 2 | 16.26 | 14.95 | 0.29 | | UW | 0.11 | 683.8 | 0.78 |
| 1046 | 10/13/2017 14:21 | 2 | 18.76 | | | | U | 0.65 | 1016.3 | 0.12 |
| 1047 | 10/13/2017 16:20 | 2 | 19.49 | | | | C | 0.18 | 738.6 | |
| 1048 | 10/13/2017 16:37 | 2 | 16.22 | | | | W | 0.15 | 377.2 | |
| 1049 | 10/13/2017 16:55 | 2 | 18.77 | | | | C | 0.23 | 1088.5 | 0.38 |
| 1050 | 10/13/2017 17:12 | 2 | 15.12 | | | | W | 0.69 | 936.0 | 0.74 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1051 | 10/13/2017 17:29 | 2 | 13.01 | | | 0.31 | UW | 0.77 | 1157.4 | 0.19 |
| 1052 | 10/13/2017 17:47 | 2 | 13.89 | | 0.29 | | U | 0.46 | 665.0 | 0.15 |
| 1053 | 10/13/2017 18:04 | 2 | 14.13 | 15.12 | 0.29 | | UW | 0.30 | 599.1 | 0.73 |
| 1054 | 10/13/2017 18:21 | 2 | 13.12 | | | | U | 0.54 | 776.3 | 0.06 |
| 1055 | 10/13/2017 20:20 | 2 | 5.01 | | | | C | 0.06 | 494.9 | |
| 1056 | 10/13/2017 20:38 | 2 | 5.80 | | | | W | 0.41 | 546.4 | |
| 1057 | 10/13/2017 20:55 | 2 | 5.59 | | | | C | 0.57 | 709.8 | |
| 1058 | 10/13/2017 21:12 | 2 | 5.76 | | | | W | 0.63 | 572.6 | |
| 1059 | 10/13/2017 21:29 | 2 | 5.86 | | | 0.31 | UW | 0.64 | 890.7 | 0.05 |
| 1060 | 10/13/2017 21:47 | 2 | 6.11 | | 0.28 | | U | 0.24 | 607.3 | |
| 1061 | 10/13/2017 22:04 | 2 | 5.36 | 11.15 | 0.28 | | UW | 0.12 | 526.0 | 0.42 |
| 1062 | 10/13/2017 22:21 | 2 | 5.41 | | | | U | 0.21 | 622.6 | |
| 1063 | 10/14/2017 0:15 | 2 | 4.15 | | | | C | 0.07 | 389.9 | |
| 1064 | 10/14/2017 0:33 | 2 | 3.90 | | | | W | 0.22 | 572.1 | |
| 1065 | 10/14/2017 0:50 | 2 | 3.97 | | | | C | 0.19 | 760.2 | |
| 1066 | 10/14/2017 1:07 | 2 | 4.83 | | | | W | 0.58 | 684.6 | |
| 1067 | 10/14/2017 1:25 | 2 | 4.33 | | | 0.31 | UW | 0.50 | 842.9 | 0.02 |
| 1068 | 10/14/2017 1:42 | 2 | 4.54 | | 0.28 | | U | 0.67 | 546.5 | 0.02 |
| 1069 | 10/14/2017 1:59 | 2 | 4.16 | 9.34 | 0.28 | | UW | 0.13 | 499.6 | 0.38 |
| 1070 | 10/14/2017 2:16 | 2 | 4.44 | | | | U | 0.38 | 603.4 | |
| 1071 | 10/14/2017 4:15 | 2 | 4.60 | | | | C | 0.05 | 419.0 | 0.83 |
| 1072 | 10/14/2017 4:33 | 2 | 5.06 | | | | W | 0.53 | 532.9 | |
| 1073 | 10/14/2017 4:50 | 2 | 5.04 | | | | C | 0.11 | 561.2 | |
| 1074 | 10/14/2017 5:07 | 2 | 5.34 | | | | W | 0.20 | 597.5 | |
| 1075 | 10/14/2017 5:24 | 2 | 5.49 | | | 0.31 | UW | 0.65 | 750.1 | 0.02 |
| 1076 | 10/14/2017 5:42 | 2 | 5.30 | | 0.28 | | U | 0.20 | 660.3 | 0.02 |
| 1077 | 10/14/2017 5:59 | 2 | 5.03 | 9.01 | 0.28 | | UW | 0.12 | 590.9 | 0.60 |
| 1078 | 10/14/2017 6:16 | 2 | 5.61 | | | | U | 0.18 | 684.8 | |
| 1079 | 10/14/2017 8:15 | 2 | 7.85 | | | | C | 0.09 | 431.6 | |
| 1080 | 10/14/2017 8:33 | 2 | 8.15 | | | | W | 0.29 | 380.3 | |
| 1081 | 10/14/2017 8:50 | 2 | 8.41 | | | | C | 0.14 | 744.4 | |
| 1082 | 10/14/2017 9:07 | 2 | 8.78 | | | | W | 0.28 | 686.7 | |
| 1083 | 10/14/2017 9:24 | 2 | 9.05 | | | 0.31 | UW | 0.60 | 951.1 | 0.08 |
| 1084 | 10/14/2017 9:42 | 2 | 9.54 | | 0.28 | | U | 0.38 | 583.6 | 0.33 |
| 1085 | 10/14/2017 9:59 | 2 | 9.99 | 9.92 | 0.28 | | UW | 0.14 | 446.3 | 0.74 |
| 1086 | 10/14/2017 10:16 | 2 | 13.19 | | | | U | 0.32 | 730.5 | |
| 1087 | 10/14/2017 12:15 | 2 | 16.16 | | | | C | 0.09 | 517.3 | |
| 1088 | 10/14/2017 12:32 | 2 | 13.33 | | | | W | 0.08 | 256.7 | |
| 1089 | 10/14/2017 12:50 | 2 | 12.41 | | | | C | 0.13 | 982.2 | |
| 1090 | 10/14/2017 13:07 | 2 | 11.41 | | | | W | 0.45 | 734.5 | |
| 1091 | 10/14/2017 13:24 | 2 | 10.73 | | | 0.31 | UW | 0.71 | 1059.8 | 0.12 |
| 1092 | 10/14/2017 13:42 | 2 | 9.74 | | 0.29 | | U | 0.46 | 568.6 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1093 | 10/14/2017 13:59 | 2 | 9.39 | 12.62 | 0.28 | | UW | 0.13 | 375.0 | 0.68 |
| 1094 | 10/14/2017 14:16 | 2 | 9.12 | | | | U | 0.25 | 798.6 | |
| 1095 | 10/14/2017 16:15 | 2 | 7.27 | | | | C | 0.12 | 757.8 | |
| 1096 | 10/14/2017 16:32 | 2 | 7.28 | | | | W | | 185.1 | |
| 1097 | 10/14/2017 16:50 | 2 | 7.44 | | | | C | 0.18 | 1061.9 | |
| 1098 | 10/14/2017 17:07 | 2 | 6.96 | | | | W | 0.51 | 773.5 | |
| 1099 | 10/14/2017 17:24 | 2 | 7.44 | | | 0.35 | UW | 0.55 | 1061.8 | |
| 1100 | 10/14/2017 17:42 | 2 | 7.28 | | 0.36 | | U | 0.48 | 887.1 | 0.10 |
| 1101 | 10/14/2017 17:59 | 2 | 7.07 | 10.71 | 0.36 | | UW | 0.05 | 302.6 | 0.11 |
| 1102 | 10/14/2017 18:16 | 2 | 7.16 | | | | U | 0.16 | 718.9 | |
| 1103 | 10/14/2017 20:15 | 2 | 6.29 | | | | C | 0.15 | 662.4 | 0.31 |
| 1104 | 10/14/2017 20:35 | 2 | 6.09 | | | | W | 0.02 | 92.5 | |
| 1105 | 10/14/2017 20:53 | 2 | 5.98 | | | | C | 0.14 | 988.0 | |
| 1106 | 10/14/2017 21:10 | 2 | 5.82 | | | | W | 0.24 | 860.2 | |
| 1107 | 10/14/2017 21:27 | 2 | 5.97 | | | 0.37 | UW | 0.51 | 933.4 | |
| 1108 | 10/14/2017 21:44 | 2 | 5.78 | | 0.39 | | U | 0.69 | 832.3 | 0.10 |
| 1109 | 10/14/2017 22:02 | 2 | 5.53 | 9.42 | 0.37 | | UW | 0.05 | 247.3 | 0.08 |
| 1110 | 10/14/2017 22:19 | 2 | 5.43 | | | | U | 0.15 | 888.2 | 0.63 |
| 1111 | 10/15/2017 0:15 | 2 | 4.64 | | | | C | 0.16 | 732.9 | 0.10 |
| 1112 | 10/15/2017 0:33 | 2 | 4.79 | | | | W | 0.07 | 235.8 | |
| 1113 | 10/15/2017 0:50 | 2 | 4.88 | | | | C | 0.15 | 947.5 | |
| 1114 | 10/15/2017 1:07 | 2 | 4.49 | | | | W | 0.42 | 845.2 | |
| 1115 | 10/15/2017 1:25 | 2 | 5.24 | | | 0.38 | UW | 0.51 | 1118.2 | |
| 1116 | 10/15/2017 1:42 | 2 | 5.20 | | 0.39 | | U | 0.22 | 928.4 | 0.15 |
| 1117 | 10/15/2017 1:59 | 2 | 5.39 | 8.61 | 0.37 | | UW | 0.05 | 481.4 | 0.15 |
| 1118 | 10/15/2017 2:16 | 2 | 5.32 | | | | U | 0.11 | 1196.3 | |
| 1119 | 10/15/2017 4:15 | 2 | 2.30 | | | | C | 0.10 | 676.4 | 1.59 |
| 1120 | 10/15/2017 4:33 | 2 | 2.08 | | | | W | 0.06 | 208.8 | |
| 1121 | 10/15/2017 4:50 | 2 | 1.56 | | | | C | 0.17 | 873.3 | |
| 1122 | 10/15/2017 5:07 | 2 | 1.79 | | | | W | 0.21 | 812.0 | |
| 1123 | 10/15/2017 5:24 | 2 | 1.43 | | | 0.37 | UW | 0.30 | 911.1 | |
| 1124 | 10/15/2017 5:42 | 2 | 1.06 | | 0.38 | | U | 0.19 | 849.9 | 0.13 |
| 1125 | 10/15/2017 5:59 | 2 | 0.96 | 6.60 | 0.36 | | UW | 0.08 | 415.4 | 0.13 |
| 1126 | 10/15/2017 6:16 | 2 | 0.55 | | | | U | 0.16 | 661.8 | |
| 1127 | 10/15/2017 8:15 | 2 | -0.18 | | | | C | 0.08 | 424.8 | 0.09 |
| 1128 | 10/15/2017 8:33 | 2 | 0.80 | | | | W | 0.13 | 333.7 | |
| 1129 | 10/15/2017 8:50 | 2 | 1.43 | | | | C | 0.11 | 557.9 | |
| 1130 | 10/15/2017 9:07 | 2 | 1.77 | | | | W | 0.21 | 758.7 | |
| 1131 | 10/15/2017 9:24 | 2 | 4.98 | | | 0.37 | UW | 0.23 | 892.8 | 0.02 |
| 1132 | 10/15/2017 9:42 | 2 | 5.66 | | 0.38 | | U | 0.20 | 1002.0 | 0.23 |
| 1133 | 10/15/2017 9:59 | 2 | 5.31 | 6.41 | 0.36 | | UW | 0.09 | 671.8 | 0.54 |
| 1134 | 10/15/2017 10:16 | 2 | 8.14 | | | | U | 0.13 | 839.8 | 0.02 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1135 | 10/15/2017 12:15 | 2 | 12.04 | | | | C | 0.07 | 445.8 | |
| 1136 | 10/15/2017 12:32 | 2 | 11.11 | | | | W | 0.67 | 1157.4 | |
| 1137 | 10/15/2017 12:50 | 2 | 12.68 | | | | C | 0.05 | 706.8 | |
| 1138 | 10/15/2017 13:07 | 2 | 11.07 | | | | W | 0.19 | 734.0 | |
| 1139 | 10/15/2017 13:24 | 2 | 14.97 | | | 0.36 | UW | 0.66 | 1449.0 | 0.64 |
| 1140 | 10/15/2017 13:42 | 2 | 13.41 | | 0.36 | | U | 0.57 | 1156.0 | 0.60 |
| 1141 | 10/15/2017 13:59 | 2 | 11.87 | 12.18 | 0.35 | | UW | 0.12 | 948.7 | 1.08 |
| 1142 | 10/15/2017 14:16 | 2 | 14.02 | | | | U | 0.17 | 1331.3 | |
| 1143 | 10/15/2017 16:15 | 2 | 16.22 | | | | C | 0.07 | 431.2 | |
| 1144 | 10/15/2017 16:33 | 2 | 13.60 | | | | W | 0.59 | 858.5 | |
| 1145 | 10/15/2017 16:50 | 2 | 14.80 | | | | C | 0.08 | 778.4 | |
| 1146 | 10/15/2017 17:07 | 2 | 12.55 | | | | W | 0.20 | 680.8 | |
| 1147 | 10/15/2017 17:24 | 2 | 11.19 | | | 0.35 | UW | 0.61 | 1040.5 | 0.60 |
| 1148 | 10/15/2017 17:42 | 2 | 13.42 | | 0.35 | | U | 0.46 | 925.4 | 0.74 |
| 1149 | 10/15/2017 17:59 | 2 | 12.05 | 12.02 | 0.34 | | UW | 0.09 | 738.3 | 1.51 |
| 1150 | 10/15/2017 18:16 | 2 | 12.23 | | | | U | 0.32 | 991.4 | 0.37 |
| 1151 | 10/15/2017 20:15 | 2 | 1.95 | | | | C | 0.06 | 363.6 | |
| 1152 | 10/15/2017 20:33 | 2 | 1.49 | | | | W | 0.17 | 553.7 | |
| 1153 | 10/15/2017 20:50 | 2 | 0.71 | | | | C | 0.12 | 549.8 | |
| 1154 | 10/15/2017 21:07 | 2 | -0.02 | | | | W | 0.22 | 558.8 | |
| 1155 | 10/15/2017 21:24 | 2 | 0.91 | | | 0.34 | UW | 0.52 | 819.6 | 0.40 |
| 1156 | 10/15/2017 21:42 | 2 | 1.07 | | 0.33 | | U | 0.15 | 776.5 | |
| 1157 | 10/15/2017 21:59 | 2 | 0.48 | 8.11 | 0.33 | | UW | 0.11 | 598.1 | 1.43 |
| 1158 | 10/15/2017 22:16 | 2 | 0.11 | | | | U | 0.15 | 517.8 | 0.17 |
| 1159 | 10/16/2017 0:15 | 2 | -1.31 | | | | C | 0.04 | 403.4 | |
| 1160 | 10/16/2017 0:33 | 2 | -1.25 | | | | W | 0.15 | 514.9 | |
| 1161 | 10/16/2017 0:50 | 2 | -2.14 | | | | C | 0.08 | 493.1 | |
| 1162 | 10/16/2017 1:07 | 2 | -2.40 | | | | W | 0.15 | 415.9 | |
| 1163 | 10/16/2017 1:25 | 2 | -1.65 | | | 0.33 | UW | 0.27 | 736.1 | 0.52 |
| 1164 | 10/16/2017 1:42 | 2 | -1.90 | | 0.33 | | U | 0.13 | 666.7 | 0.34 |
| 1165 | 10/16/2017 2:02 | 2 | -1.69 | 5.88 | 0.33 | | UW | 0.08 | 439.3 | 1.88 |
| 1166 | 10/16/2017 2:19 | 2 | -2.06 | | | | U | 0.13 | 495.7 | 0.23 |
| 1167 | 10/16/2017 4:15 | 2 | -2.47 | | | | C | 0.05 | 295.6 | |
| 1168 | 10/16/2017 4:33 | 2 | -2.63 | | | | W | 0.13 | 421.2 | |
| 1169 | 10/16/2017 4:50 | 2 | -3.37 | | | | C | 0.09 | 450.7 | |
| 1170 | 10/16/2017 5:07 | 2 | -3.31 | | | | W | 0.12 | 485.0 | |
| 1171 | 10/16/2017 5:24 | 2 | -2.86 | | | 0.33 | UW | 0.35 | 753.0 | 0.82 |
| 1172 | 10/16/2017 5:42 | 2 | -3.16 | | 0.32 | | U | 0.11 | 599.8 | 0.25 |
| 1173 | 10/16/2017 6:02 | 2 | -2.29 | 4.59 | 0.32 | | UW | 0.08 | 494.3 | 1.82 |
| 1174 | 10/16/2017 6:19 | 2 | -2.64 | | | | U | 0.11 | 561.5 | 0.15 |
| 1175 | 10/16/2017 8:15 | 2 | -1.56 | | | | C | 0.05 | 356.1 | |
| 1176 | 10/16/2017 8:33 | 2 | 0.11 | | | | W | 0.11 | 468.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1177 | 10/16/2017 8:50 | 2 | 0.88 | | | | C | 0.07 | 394.6 | |
| 1178 | 10/16/2017 9:07 | 2 | 2.01 | | | | W | 0.11 | 467.0 | 0.01 |
| 1179 | 10/16/2017 9:24 | 2 | 5.99 | | | 0.34 | UW | 0.39 | 1161.2 | 0.12 |
| 1180 | 10/16/2017 9:42 | 2 | 7.38 | | 0.33 | | U | 0.09 | 790.9 | 0.59 |
| 1181 | 10/16/2017 10:02 | 2 | 8.07 | 5.45 | 0.33 | | UW | 0.08 | 842.4 | 2.20 |
| 1182 | 10/16/2017 10:19 | 2 | 10.60 | | | | U | 0.06 | 797.1 | |
| 1183 | 10/16/2017 12:15 | 2 | 18.46 | | | | C | 0.04 | 291.7 | |
| 1184 | 10/16/2017 12:33 | 2 | 17.71 | | | | W | 0.77 | 1271.0 | |
| 1185 | 10/16/2017 12:50 | 2 | 20.59 | | | | C | | 323.6 | |
| 1186 | 10/16/2017 13:07 | 2 | 19.84 | | | | W | 0.12 | 312.2 | |
| 1187 | 10/16/2017 13:24 | 2 | 21.52 | | | 0.34 | UW | 0.48 | 1335.9 | 3.53 |
| 1188 | 10/16/2017 13:42 | 2 | 21.85 | | 0.34 | | U | 0.08 | 819.2 | 1.97 |
| 1189 | 10/16/2017 13:59 | 2 | 18.18 | 13.46 | 0.33 | | UW | 0.01 | 686.4 | 23.65 |
| 1190 | 10/16/2017 14:16 | 2 | 21.96 | | | | U | 0.12 | 881.5 | |
| 1191 | 10/16/2017 16:15 | 2 | 23.24 | | | | C | 0.04 | 277.9 | |
| 1192 | 10/16/2017 16:33 | 2 | 21.13 | | | | W | 0.91 | 1637.8 | |
| 1193 | 10/16/2017 16:50 | 2 | 22.85 | | | | C | 0.06 | 400.6 | 3.88 |
| 1194 | 10/16/2017 17:07 | 2 | 21.27 | | | | W | 0.63 | 475.7 | 0.52 |
| 1195 | 10/16/2017 17:24 | 2 | 18.90 | | | 0.34 | UW | 0.59 | 955.8 | 1.67 |
| 1196 | 10/16/2017 17:42 | 2 | 19.09 | | 0.33 | | U | 0.19 | 400.9 | 0.87 |
| 1197 | 10/16/2017 17:59 | 2 | 18.58 | 15.03 | 0.33 | | UW | 0.14 | 951.4 | 12.03 |
| 1198 | 10/16/2017 18:16 | 2 | 17.58 | | | | U | 0.25 | 835.1 | |
| 1199 | 10/16/2017 20:15 | 2 | 10.55 | | | | C | 0.05 | 441.8 | |
| 1200 | 10/16/2017 20:33 | 2 | 10.28 | | | | W | 0.22 | 626.0 | |
| 1201 | 10/16/2017 20:50 | 2 | 7.93 | | | | C | 0.08 | 545.9 | |
| 1202 | 10/16/2017 21:07 | 2 | 7.92 | | | | W | 0.47 | 493.5 | |
| 1203 | 10/16/2017 21:24 | 2 | 4.99 | | | 0.33 | UW | 0.57 | 665.9 | 1.08 |
| 1204 | 10/16/2017 21:42 | 2 | 4.31 | | 0.32 | | U | 0.19 | 457.0 | |
| 1205 | 10/16/2017 22:02 | 2 | 4.07 | 10.60 | 0.32 | | UW | 0.11 | 442.9 | 4.22 |
| 1206 | 10/16/2017 22:19 | 2 | 3.69 | | | | U | 0.23 | 520.2 | |
| 1207 | 10/17/2017 0:15 | 2 | 1.76 | | | | C | 0.07 | 329.9 | |
| 1208 | 10/17/2017 0:33 | 2 | 2.45 | | | | W | 0.15 | 522.1 | |
| 1209 | 10/17/2017 0:50 | 2 | 1.36 | | | | C | 0.09 | 485.4 | |
| 1210 | 10/17/2017 1:07 | 2 | 1.01 | | | | W | 0.15 | 469.1 | |
| 1211 | 10/17/2017 1:25 | 2 | 1.61 | | | 0.33 | UW | 0.40 | 711.7 | 0.81 |
| 1212 | 10/17/2017 1:42 | 2 | 1.41 | | 0.32 | | U | 0.12 | 591.9 | |
| 1213 | 10/17/2017 1:59 | 2 | 2.31 | 8.18 | 0.31 | | UW | 0.04 | 277.7 | 8.79 |
| 1214 | 10/17/2017 2:16 | 2 | 1.23 | | | | U | 0.18 | 560.1 | |
| 1215 | 10/17/2017 4:15 | 2 | 0.54 | | | | C | 0.07 | 396.2 | |
| 1216 | 10/17/2017 4:33 | 2 | 0.45 | | | | W | 0.17 | 454.1 | |
| 1217 | 10/17/2017 4:50 | 2 | -0.05 | | | | C | 0.09 | 521.4 | |
| 1218 | 10/17/2017 5:07 | 2 | 0.23 | | | | W | 0.11 | 441.6 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1219 | 10/17/2017 5:24 | 2 | -0.01 | | | 0.32 | UW | 0.23 | 745.5 | 0.64 |
| 1220 | 10/17/2017 5:42 | 2 | -0.17 | | 0.31 | | U | 0.12 | 501.0 | 0.04 |
| 1221 | 10/17/2017 5:59 | 2 | 0.15 | 6.61 | 0.31 | | UW | 0.08 | 625.1 | 5.19 |
| 1222 | 10/17/2017 6:16 | 2 | 0.07 | | | | U | 0.16 | 599.1 | |
| 1223 | 10/17/2017 8:15 | 2 | -0.08 | | | | C | 0.05 | 379.2 | |
| 1224 | 10/17/2017 8:33 | 2 | 2.23 | | | | W | 0.15 | 512.9 | |
| 1225 | 10/17/2017 8:50 | 2 | 4.11 | | | | C | 0.07 | 457.8 | |
| 1226 | 10/17/2017 9:07 | 2 | 5.01 | | | | W | 0.11 | 449.0 | 0.16 |
| 1227 | 10/17/2017 9:24 | 2 | 9.73 | | | 0.33 | UW | 0.27 | 1166.5 | 0.40 |
| 1228 | 10/17/2017 9:42 | 2 | 10.43 | | 0.32 | | U | 0.09 | 814.1 | 0.86 |
| 1229 | 10/17/2017 9:59 | 2 | 10.77 | 7.49 | 0.31 | | UW | 0.09 | 1103.4 | 6.53 |
| 1230 | 10/17/2017 10:16 | 2 | 13.92 | | | | U | 0.14 | 862.3 | |
| 1231 | 10/17/2017 12:15 | 2 | 22.83 | | | | C | 0.09 | 409.9 | |
| 1232 | 10/17/2017 12:33 | 2 | 21.68 | | | | W | 0.21 | 703.2 | |
| 1233 | 10/17/2017 12:50 | 2 | 26.01 | | | | C | 0.07 | 652.7 | |
| 1234 | 10/17/2017 13:07 | 2 | 24.31 | | | | W | 0.57 | 803.4 | |
| 1235 | 10/17/2017 13:24 | 2 | 27.44 | | | 0.34 | UW | 0.78 | 1583.4 | 5.77 |
| 1236 | 10/17/2017 13:42 | 2 | 27.21 | | 0.33 | | U | 0.34 | 1307.1 | 0.13 |
| 1237 | 10/17/2017 13:59 | 2 | 22.60 | 16.67 | 0.32 | | UW | 0.16 | 1061.1 | 16.62 |
| 1238 | 10/17/2017 14:16 | 2 | 27.03 | | | | U | 0.37 | 1275.1 | 0.66 |
| 1239 | 10/17/2017 16:15 | 2 | 26.65 | | | | C | 0.10 | 583.4 | |
| 1240 | 10/17/2017 16:32 | 2 | 22.83 | | | | W | 0.92 | 5617.4 | 23.89 |
| 1241 | 10/17/2017 16:50 | 2 | 25.76 | | | | C | 0.09 | 546.7 | |
| 1242 | 10/17/2017 17:07 | 2 | 23.80 | | | | W | 0.46 | 1085.2 | 0.07 |
| 1243 | 10/17/2017 17:24 | 2 | 19.68 | | | 0.47 | UW | 0.80 | 2233.9 | 4.54 |
| 1244 | 10/17/2017 17:42 | 2 | 23.54 | | 0.33 | | U | 0.43 | 566.7 | 0.58 |
| 1245 | 10/17/2017 17:59 | 2 | 20.01 | 17.66 | 0.31 | | UW | 0.13 | 1632.8 | 13.09 |
| 1246 | 10/17/2017 18:16 | 2 | 19.93 | | | | U | 0.41 | 630.9 | 0.14 |
| 1247 | 10/17/2017 20:15 | 2 | 10.21 | | | | C | 0.09 | 458.2 | |
| 1248 | 10/17/2017 20:33 | 2 | 9.23 | | | | W | 0.56 | 1206.4 | |
| 1249 | 10/17/2017 20:50 | 2 | 8.78 | | | | C | 0.17 | 604.4 | |
| 1250 | 10/17/2017 21:07 | 2 | 9.26 | | | | W | 0.59 | 498.0 | |
| 1251 | 10/17/2017 21:24 | 2 | 8.41 | | | 0.45 | UW | 0.67 | 1100.3 | 3.17 |
| 1252 | 10/17/2017 21:42 | 2 | 9.21 | | 0.31 | | U | 0.24 | 489.8 | |
| 1253 | 10/17/2017 21:59 | 2 | 9.03 | 12.58 | 0.30 | | UW | 0.12 | 1090.7 | 7.86 |
| 1254 | 10/17/2017 22:16 | 2 | 9.41 | | | | U | 0.25 | 549.9 | |
| 1255 | 10/18/2017 0:15 | 2 | 9.07 | | | | C | 0.07 | 381.9 | |
| 1256 | 10/18/2017 0:33 | 2 | 8.43 | | | | W | 0.45 | 764.6 | |
| 1257 | 10/18/2017 0:50 | 2 | 8.93 | | | | C | 0.06 | 555.1 | |
| 1258 | 10/18/2017 1:07 | 2 | 9.52 | | | | W | 0.15 | 316.7 | |
| 1259 | 10/18/2017 1:25 | 2 | 8.69 | | | 0.45 | UW | 0.66 | 847.1 | 1.42 |
| 1260 | 10/18/2017 1:42 | 2 | 8.82 | | 0.31 | | U | 0.14 | 372.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1261 | 10/18/2017 1:59 | 2 | 8.53 | 11.04 | 0.30 | | UW | 0.04 | 941.6 | 4.76 |
| 1262 | 10/18/2017 2:17 | 2 | 8.74 | | | | U | 0.13 | 368.4 | |
| 1263 | 10/18/2017 4:15 | 2 | 8.90 | | | | C | 0.02 | 426.6 | |
| 1264 | 10/18/2017 4:33 | 2 | 8.58 | | | | W | 0.50 | 780.5 | |
| 1265 | 10/18/2017 4:50 | 2 | 8.78 | | | | C | 0.04 | 339.1 | |
| 1266 | 10/18/2017 5:07 | 2 | 9.49 | | | | W | 0.08 | 302.2 | |
| 1267 | 10/18/2017 5:24 | 2 | 8.05 | | | 0.44 | UW | 0.65 | 720.2 | 1.16 |
| 1268 | 10/18/2017 5:42 | 2 | 8.25 | | 0.31 | | U | 0.09 | 341.9 | |
| 1269 | 10/18/2017 5:59 | 2 | 7.49 | 10.22 | 0.30 | | UW | 0.12 | 838.6 | 4.06 |
| 1270 | 10/18/2017 6:16 | 2 | 7.03 | | | | U | 0.14 | 356.1 | |
| 1271 | 10/18/2017 8:15 | 2 | 6.85 | | | | C | 0.05 | 340.7 | |
| 1272 | 10/18/2017 8:33 | 2 | 8.22 | | | | W | 0.15 | 612.8 | |
| 1273 | 10/18/2017 8:50 | 2 | 7.50 | | | | C | 0.04 | 487.5 | |
| 1274 | 10/18/2017 9:07 | 2 | 9.02 | | | | W | 0.46 | 408.0 | |
| 1275 | 10/18/2017 9:24 | 2 | 8.62 | | | 0.44 | UW | 0.33 | 587.9 | 1.21 |
| 1276 | 10/18/2017 9:42 | 2 | 10.52 | | 0.31 | | U | 0.13 | 565.4 | |
| 1277 | 10/18/2017 9:59 | 2 | 10.54 | 10.13 | 0.30 | | UW | 0.13 | 984.6 | 9.88 |
| 1278 | 10/18/2017 10:16 | 2 | 12.91 | | | | U | 0.18 | 686.7 | |
| 1279 | 10/18/2017 12:15 | 2 | 22.05 | | | | C | 0.07 | 661.1 | |
| 1280 | 10/18/2017 12:33 | 2 | 19.43 | | | | W | 0.01 | 198.3 | 17.07 |
| 1281 | 10/18/2017 12:50 | 2 | 23.93 | | | | C | 0.13 | 931.4 | |
| 1282 | 10/18/2017 13:07 | 2 | 21.85 | | | | W | 0.58 | 524.3 | 2.86 |
| 1283 | 10/18/2017 13:24 | 2 | 21.86 | | | 0.43 | UW | 0.61 | 1875.5 | 8.53 |
| 1284 | 10/18/2017 13:42 | 2 | 24.49 | | 0.32 | | U | 0.33 | 1149.2 | |
| 1285 | 10/18/2017 13:59 | 2 | 19.97 | 16.68 | 0.31 | | UW | 0.06 | 1219.0 | 11.29 |
| 1286 | 10/18/2017 14:16 | 2 | 23.94 | | | | U | 0.33 | 1179.2 | |
| 1287 | 10/18/2017 16:15 | 2 | 21.34 | | | | C | 0.12 | 813.1 | |
| 1288 | 10/18/2017 16:33 | 2 | 18.18 | | | | W | 0.08 | 217.1 | 8.92 |
| 1289 | 10/18/2017 16:50 | 2 | 21.27 | | | | C | 0.19 | 1216.2 | |
| 1290 | 10/18/2017 17:07 | 2 | 18.07 | | | | W | 0.61 | 838.9 | 0.16 |
| 1291 | 10/18/2017 17:24 | 2 | 14.88 | | | 0.40 | UW | 0.84 | 1400.0 | 8.95 |
| 1292 | 10/18/2017 17:42 | 2 | 18.64 | | 0.31 | | U | 0.57 | 879.7 | |
| 1293 | 10/18/2017 17:59 | 2 | 15.83 | 16.42 | 0.30 | | UW | 0.11 | 911.8 | 18.43 |
| 1294 | 10/18/2017 18:16 | 2 | 15.72 | | | | U | 0.45 | 789.5 | |
| 1295 | 10/18/2017 20:15 | 2 | 5.94 | | | | C | 0.09 | 520.2 | |
| 1296 | 10/18/2017 20:33 | 2 | 6.40 | | | | W | 0.19 | 386.8 | |
| 1297 | 10/18/2017 20:50 | 2 | 5.14 | | | | C | 0.16 | 689.5 | |
| 1298 | 10/18/2017 21:07 | 2 | 5.44 | | | | W | 0.41 | 505.5 | |
| 1299 | 10/18/2017 21:24 | 2 | 3.38 | | | 0.39 | UW | 0.69 | 773.5 | 7.87 |
| 1300 | 10/18/2017 21:45 | 2 | 3.09 | | 0.30 | | U | 0.20 | 320.6 | |
| 1301 | 10/18/2017 22:02 | 2 | 3.23 | 11.28 | 0.29 | | UW | 0.13 | 532.0 | 16.27 |
| 1302 | 10/18/2017 22:19 | 2 | 2.75 | | | | U | 0.20 | 363.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1303 | 10/19/2017 0:15 | 2 | 1.55 | | | | C | 0.06 | 382.7 | |
| 1304 | 10/19/2017 0:33 | 2 | 1.99 | | | | W | 0.17 | 392.6 | |
| 1305 | 10/19/2017 0:50 | 2 | 1.16 | | | | C | 0.11 | 496.6 | |
| 1306 | 10/19/2017 1:07 | 2 | 1.01 | | | | W | 0.22 | 432.6 | |
| 1307 | 10/19/2017 1:25 | 2 | 1.32 | | | 0.39 | UW | 0.73 | 624.6 | 5.77 |
| 1308 | 10/19/2017 1:42 | 2 | 1.07 | | 0.29 | | U | 0.16 | 443.2 | |
| 1309 | 10/19/2017 1:59 | 2 | 1.81 | 8.96 | 0.29 | | UW | 0.08 | 542.0 | 13.15 |
| 1310 | 10/19/2017 2:16 | 2 | 1.74 | | | | U | 0.17 | 585.4 | |
| 1311 | 10/19/2017 4:15 | 2 | 1.00 | | | | C | 0.05 | 378.8 | |
| 1312 | 10/19/2017 4:33 | 2 | 1.36 | | | | W | 0.15 | 391.7 | |
| 1313 | 10/19/2017 4:50 | 2 | 0.56 | | | | C | 0.08 | 484.9 | |
| 1314 | 10/19/2017 5:07 | 2 | 1.07 | | | | W | 0.16 | 384.8 | |
| 1315 | 10/19/2017 5:24 | 2 | 0.72 | | | 0.39 | UW | 0.26 | 687.6 | 5.18 |
| 1316 | 10/19/2017 5:42 | 2 | 0.08 | | 0.29 | | U | 0.12 | 426.6 | |
| 1317 | 10/19/2017 5:59 | 2 | 0.67 | 7.54 | 0.29 | | UW | 0.06 | 417.1 | 12.04 |
| 1318 | 10/19/2017 6:16 | 2 | -0.02 | | | | U | 0.13 | 442.4 | |
| 1319 | 10/19/2017 8:15 | 2 | 2.16 | | | | C | 0.06 | 396.7 | |
| 1320 | 10/19/2017 8:33 | 2 | 2.93 | | | | W | 0.12 | 438.2 | |
| 1321 | 10/19/2017 8:50 | 2 | 3.78 | | | | C | 0.07 | 421.6 | |
| 1322 | 10/19/2017 9:07 | 2 | 5.14 | | | | W | 0.05 | 387.6 | 0.05 |
| 1323 | 10/19/2017 9:24 | 2 | 7.47 | | | 0.39 | UW | 0.23 | 960.8 | 2.23 |
| 1324 | 10/19/2017 9:42 | 2 | 10.63 | | 0.29 | | U | 0.06 | 464.7 | |
| 1325 | 10/19/2017 9:59 | 2 | 11.10 | 8.23 | 0.29 | | UW | 0.06 | 895.5 | 6.57 |
| 1326 | 10/19/2017 10:16 | 2 | 13.54 | | | | U | 0.06 | 440.5 | |
| 1327 | 10/19/2017 12:15 | 2 | 20.14 | | | | C | 0.04 | 181.1 | |
| 1328 | 10/19/2017 12:32 | 2 | 18.73 | | | | W | 0.16 | 1334.7 | |
| 1329 | 10/19/2017 12:50 | 2 | 22.18 | | | | C | 0.01 | 243.8 | |
| 1330 | 10/19/2017 13:07 | 2 | 21.64 | | | | W | 0.07 | 254.5 | |
| 1331 | 10/19/2017 13:24 | 2 | 22.38 | | | 0.38 | UW | 0.25 | 1516.9 | 12.98 |
| 1332 | 10/19/2017 13:42 | 2 | 23.95 | | 0.31 | | U | 0.07 | 342.9 | |
| 1333 | 10/19/2017 13:59 | 2 | 20.56 | 16.14 | 0.30 | | UW | 0.05 | 1237.5 | 14.42 |
| 1334 | 10/19/2017 14:16 | 2 | 24.23 | | | | U | 0.09 | 348.6 | |
| 1335 | 10/19/2017 16:15 | 2 | 24.64 | | | | C | 0.03 | 213.5 | |
| 1336 | 10/19/2017 16:32 | 2 | 22.10 | | | | W | 0.61 | 1770.7 | 6.41 |
| 1337 | 10/19/2017 16:50 | 2 | 23.88 | | | | C | 0.04 | 287.5 | |
| 1338 | 10/19/2017 17:07 | 2 | 22.77 | | | | W | 0.50 | 274.0 | 0.04 |
| 1339 | 10/19/2017 17:24 | 2 | 20.48 | | | 0.37 | UW | 0.52 | 637.8 | 5.46 |
| 1340 | 10/19/2017 17:42 | 2 | 21.75 | | 0.30 | | U | 0.14 | 184.6 | |
| 1341 | 10/19/2017 17:59 | 2 | 19.81 | 17.54 | 0.29 | | UW | 0.10 | 979.7 | 11.90 |
| 1342 | 10/19/2017 18:16 | 2 | 19.25 | | | | U | 0.11 | 203.7 | |
| 1343 | 10/19/2017 20:15 | 2 | 15.00 | | | | C | 0.03 | 282.1 | |
| 1344 | 10/19/2017 20:33 | 2 | 14.73 | | | | W | 0.62 | 951.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1345 | 10/19/2017 20:50 | 2 | 15.18 | | | | C | 0.03 | 271.9 | |
| 1346 | 10/19/2017 21:07 | 2 | 15.84 | | | | W | 0.18 | 259.0 | |
| 1347 | 10/19/2017 21:24 | 2 | 14.60 | | | 0.37 | UW | 0.65 | 652.9 | 2.38 |
| 1348 | 10/19/2017 21:42 | 2 | 14.37 | | 0.30 | | U | 0.13 | 168.7 | |
| 1349 | 10/19/2017 21:59 | 2 | 13.61 | 14.47 | 0.29 | | UW | 0.13 | 852.4 | 4.85 |
| 1350 | 10/19/2017 22:16 | 2 | 13.84 | | | | U | 0.07 | 196.0 | |
| 1351 | 10/20/2017 0:15 | 2 | 13.01 | | | | C | 0.02 | 281.1 | |
| 1352 | 10/20/2017 0:33 | 2 | 12.75 | | | | W | 0.35 | 832.9 | |
| 1353 | 10/20/2017 0:50 | 2 | 12.58 | | | | C | 0.04 | 282.7 | |
| 1354 | 10/20/2017 1:07 | 2 | 13.33 | | | | W | 0.26 | 365.8 | |
| 1355 | 10/20/2017 1:25 | 2 | 11.49 | | | 0.36 | UW | 0.53 | 639.9 | 1.60 |
| 1356 | 10/20/2017 1:42 | 2 | 11.48 | | 0.29 | | U | 0.14 | 368.4 | |
| 1357 | 10/20/2017 1:59 | 2 | 10.77 | 13.09 | 0.28 | | UW | 0.15 | 676.0 | 4.10 |
| 1358 | 10/20/2017 2:16 | 2 | 10.58 | | | | U | 0.11 | 319.2 | |
| 1359 | 10/20/2017 4:15 | 2 | 11.35 | | | | C | | 315.6 | |
| 1360 | 10/20/2017 4:33 | 2 | 11.26 | | | | W | 0.46 | 923.1 | |
| 1361 | 10/20/2017 4:50 | 2 | 11.21 | | | | C | 0.03 | 298.3 | |
| 1362 | 10/20/2017 5:07 | 2 | 11.80 | | | | W | 0.10 | 301.1 | |
| 1363 | 10/20/2017 5:24 | 2 | 10.95 | | | 0.36 | UW | 0.68 | 674.5 | 1.24 |
| 1364 | 10/20/2017 5:42 | 2 | 10.77 | | 0.29 | | U | 0.06 | 269.3 | |
| 1365 | 10/20/2017 5:59 | 2 | 10.46 | 12.24 | 0.28 | | UW | 0.12 | 731.3 | 2.52 |
| 1366 | 10/20/2017 6:16 | 2 | 10.57 | | | | U | 0.07 | 250.4 | |
| 1367 | 10/20/2017 8:15 | 2 | 10.05 | | | | C | | 228.5 | |
| 1368 | 10/20/2017 8:33 | 2 | 10.54 | | | | W | 0.25 | 955.6 | |
| 1369 | 10/20/2017 8:50 | 2 | 11.33 | | | | C | 0.02 | 226.8 | |
| 1370 | 10/20/2017 9:07 | 2 | 12.08 | | | | W | 0.04 | 198.1 | 0.04 |
| 1371 | 10/20/2017 9:24 | 2 | 13.14 | | | 0.36 | UW | 0.24 | 705.0 | 1.04 |
| 1372 | 10/20/2017 9:42 | 2 | 14.55 | | 0.29 | | U | 0.06 | 265.1 | |
| 1373 | 10/20/2017 9:59 | 2 | 14.78 | 12.54 | 0.28 | | UW | 0.06 | 942.6 | 2.59 |
| 1374 | 10/20/2017 10:16 | 2 | 16.42 | | | | U | 0.05 | 286.3 | |
| 1375 | 10/20/2017 12:15 | 2 | 21.44 | | | | C | | 181.7 | |
| 1376 | 10/20/2017 12:32 | 2 | 21.24 | | | | W | 0.15 | 1420.3 | |
| 1377 | 10/20/2017 12:50 | 2 | 23.42 | | | | C | | 246.8 | |
| 1378 | 10/20/2017 13:07 | 2 | 22.88 | | | | W | 0.11 | 198.8 | 0.21 |
| 1379 | 10/20/2017 13:24 | 2 | 23.83 | | | 0.36 | UW | 0.61 | 701.9 | 2.85 |
| 1380 | 10/20/2017 13:42 | 2 | 24.50 | | 0.30 | | U | 0.11 | 285.2 | |
| 1381 | 10/20/2017 13:59 | 2 | 22.33 | 18.46 | 0.29 | | UW | 0.05 | 1156.1 | 3.01 |
| 1382 | 10/20/2017 14:16 | 2 | 25.20 | | | | U | 0.05 | 252.2 | |
| 1383 | 10/20/2017 16:15 | 2 | 24.53 | | | | C | 0.04 | 301.0 | |
| 1384 | 10/20/2017 16:32 | 2 | 22.48 | | | | W | 0.09 | 1377.7 | 7.81 |
| 1385 | 10/20/2017 16:50 | 2 | 24.43 | | | | C | 0.04 | 265.8 | |
| 1386 | 10/20/2017 17:07 | 2 | 23.64 | | | | W | 0.07 | 316.7 | 0.26 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1387 | 10/20/2017 17:24 | 2 | 20.71 | | | 0.45 | UW | 0.47 | 1359.2 | 2.01 |
| 1388 | 10/20/2017 17:42 | 2 | 22.61 | | 0.30 | | U | 0.10 | 129.4 | |
| 1389 | 10/20/2017 17:59 | 2 | 20.65 | 19.32 | 0.28 | | UW | 0.03 | 786.7 | 2.51 |
| 1390 | 10/20/2017 18:16 | 2 | 20.88 | | | | U | 0.06 | 139.9 | |
| 1391 | 10/20/2017 20:15 | 2 | 19.14 | | | | C | | 235.5 | |
| 1392 | 10/20/2017 20:32 | 2 | 18.72 | | | | W | 0.03 | 563.9 | |
| 1393 | 10/20/2017 20:50 | 2 | 19.35 | | | | C | 0.01 | 381.5 | |
| 1394 | 10/20/2017 21:07 | 2 | 19.74 | | | | W | 0.08 | 214.0 | 0.25 |
| 1395 | 10/20/2017 21:24 | 2 | 17.96 | | | 0.45 | UW | 0.67 | 706.3 | 1.49 |
| 1396 | 10/20/2017 21:42 | 2 | 18.25 | | 0.29 | | U | 0.10 | 170.9 | |
| 1397 | 10/20/2017 21:59 | 2 | 17.83 | 17.49 | 0.28 | | UW | 0.03 | 740.9 | 1.97 |
| 1398 | 10/20/2017 22:16 | 2 | 18.52 | | | | U | 0.07 | 182.0 | |
| 1399 | 10/21/2017 0:15 | 2 | 17.79 | | | | C | 0.01 | 220.3 | |
| 1400 | 10/21/2017 0:33 | 2 | 17.36 | | | | W | 0.01 | 275.7 | |
| 1401 | 10/21/2017 0:50 | 2 | 17.76 | | | | C | | 301.4 | |
| 1402 | 10/21/2017 1:07 | 2 | 18.11 | | | | W | 0.06 | 169.2 | |
| 1403 | 10/21/2017 1:24 | 2 | 17.15 | | | 0.44 | UW | 0.64 | 744.2 | 1.04 |
| 1404 | 10/21/2017 1:42 | 2 | 17.42 | | 0.29 | | U | 0.09 | 183.9 | |
| 1405 | 10/21/2017 1:59 | 2 | 16.72 | 16.88 | 0.28 | | UW | 0.09 | 709.0 | 1.34 |
| 1406 | 10/21/2017 2:16 | 2 | 17.08 | | | | U | 0.05 | 162.3 | |
| 1407 | 10/21/2017 4:15 | 2 | 15.90 | | | | C | 0.01 | 256.2 | |
| 1408 | 10/21/2017 4:33 | 2 | 15.61 | | | | W | 0.13 | 539.3 | |
| 1409 | 10/21/2017 4:50 | 2 | 15.68 | | | | C | 0.03 | 275.7 | |
| 1410 | 10/21/2017 5:07 | 2 | 16.17 | | | | W | 0.10 | 201.8 | |
| 1411 | 10/21/2017 5:24 | 2 | 15.63 | | | 0.44 | UW | 0.70 | 694.2 | 1.02 |
| 1412 | 10/21/2017 5:42 | 2 | 15.81 | | 0.29 | | U | 0.09 | 223.2 | |
| 1413 | 10/21/2017 5:59 | 2 | 15.58 | 16.16 | 0.27 | | UW | 0.08 | 680.3 | 1.12 |
| 1414 | 10/21/2017 6:16 | 2 | 16.42 | | | | U | 0.06 | 247.8 | |
| 1415 | 10/21/2017 8:15 | 2 | 16.88 | | | | C | 0.03 | 274.9 | |
| 1416 | 10/21/2017 8:32 | 2 | 16.75 | | | | W | 0.05 | 465.8 | |
| 1417 | 10/21/2017 8:50 | 2 | 17.22 | | | | C | 0.03 | 329.2 | |
| 1418 | 10/21/2017 9:07 | 2 | 17.18 | | | | W | 0.09 | 191.5 | |
| 1419 | 10/21/2017 9:24 | 2 | 17.24 | | | 0.43 | UW | 0.45 | 695.4 | 1.07 |
| 1420 | 10/21/2017 9:42 | 2 | 17.63 | | 0.29 | | U | 0.01 | 260.0 | |
| 1421 | 10/21/2017 9:59 | 2 | 17.56 | 16.75 | 0.28 | | UW | 0.15 | 793.8 | 1.11 |
| 1422 | 10/21/2017 10:16 | 2 | 17.98 | | | | U | 0.06 | 249.0 | |
| 1423 | 10/21/2017 12:15 | 2 | 15.24 | | | | C | 0.03 | 475.9 | |
| 1424 | 10/21/2017 12:32 | 2 | 14.60 | | | | W | 0.43 | 561.9 | |
| 1425 | 10/21/2017 12:50 | 2 | 14.83 | | | | C | 0.17 | 676.1 | |
| 1426 | 10/21/2017 13:07 | 2 | 13.65 | | | | W | 0.27 | 399.6 | |
| 1427 | 10/21/2017 13:24 | 2 | 13.72 | | | 0.43 | UW | 0.88 | 718.4 | 1.00 |
| 1428 | 10/21/2017 13:42 | 2 | 14.27 | | 0.29 | | U | 0.22 | 486.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1429 | 10/21/2017 13:59 | 2 | 14.11 | 16.70 | 0.27 | | UW | 0.69 | 744.5 | 0.79 |
| 1430 | 10/21/2017 14:16 | 2 | 14.52 | | | | U | 0.41 | 394.6 | |
| 1431 | 10/21/2017 16:15 | 2 | 13.14 | | | | C | 0.09 | 698.4 | |
| 1432 | 10/21/2017 16:32 | 2 | 12.31 | | | | W | 0.67 | 628.5 | 0.37 |
| 1433 | 10/21/2017 16:50 | 2 | 12.82 | | | | C | 0.08 | 605.9 | |
| 1434 | 10/21/2017 17:07 | 2 | 11.90 | | | | W | 0.18 | 380.1 | 0.02 |
| 1435 | 10/21/2017 17:24 | 2 | 11.38 | | | 0.42 | UW | 0.77 | 1309.9 | 0.77 |
| 1436 | 10/21/2017 17:42 | 2 | 11.84 | | 0.29 | | U | 0.15 | 624.4 | |
| 1437 | 10/21/2017 17:59 | 2 | 11.95 | 15.21 | 0.27 | | UW | 0.47 | 431.0 | 0.58 |
| 1438 | 10/21/2017 18:16 | 2 | 11.40 | | | | U | 0.20 | 413.1 | |
| 1439 | 10/21/2017 20:15 | 2 | 7.42 | | | | C | 0.03 | 393.7 | |
| 1440 | 10/21/2017 20:33 | 2 | 6.86 | | | | W | 0.55 | 630.7 | |
| 1441 | 10/21/2017 20:50 | 2 | 6.44 | | | | C | 0.12 | 649.7 | |
| 1442 | 10/21/2017 21:07 | 2 | 6.71 | | | | W | 0.22 | 455.2 | |
| 1443 | 10/21/2017 21:24 | 2 | 6.05 | | | 0.41 | UW | 0.34 | 524.2 | 0.79 |
| 1444 | 10/21/2017 21:42 | 2 | 5.88 | | 0.28 | | U | 0.11 | 456.7 | |
| 1445 | 10/21/2017 21:59 | 2 | 5.80 | 12.18 | 0.27 | | UW | 0.20 | 349.3 | 0.23 |
| 1446 | 10/21/2017 22:16 | 2 | 5.61 | | | | U | 0.08 | 433.0 | |
| 1447 | 10/22/2017 0:15 | 2 | 4.67 | | | | C | 0.04 | 340.4 | |
| 1448 | 10/22/2017 0:33 | 2 | 5.00 | | | | W | 0.26 | 586.6 | |
| 1449 | 10/22/2017 0:50 | 2 | 4.49 | | | | C | 0.06 | 556.7 | |
| 1450 | 10/22/2017 1:07 | 2 | 4.59 | | | | W | 0.21 | 427.5 | |
| 1451 | 10/22/2017 1:25 | 2 | 4.39 | | | 0.41 | UW | 0.25 | 439.7 | 0.62 |
| 1452 | 10/22/2017 1:42 | 2 | 3.59 | | 0.28 | | U | 0.09 | 426.1 | |
| 1453 | 10/22/2017 1:59 | 2 | 3.91 | 10.18 | 0.26 | | UW | 0.17 | 299.9 | 0.25 |
| 1454 | 10/22/2017 2:17 | 2 | 3.36 | | | | U | 0.07 | 354.1 | |
| 1455 | 10/22/2017 4:15 | 2 | 1.44 | | | | C | 0.03 | 316.9 | |
| 1456 | 10/22/2017 4:33 | 2 | 1.41 | | | | W | 0.19 | 419.9 | |
| 1457 | 10/22/2017 4:50 | 2 | 0.24 | | | | C | 0.07 | 393.4 | |
| 1458 | 10/22/2017 5:07 | 2 | -0.15 | | | | W | 0.12 | 320.7 | |
| 1459 | 10/22/2017 5:24 | 2 | 0.29 | | | 0.41 | UW | 0.17 | 423.0 | 1.14 |
| 1460 | 10/22/2017 5:42 | 2 | -0.98 | | 0.28 | | U | 0.11 | 316.3 | |
| 1461 | 10/22/2017 5:59 | 2 | -0.28 | 8.24 | 0.26 | | UW | 0.09 | 238.5 | 0.36 |
| 1462 | 10/22/2017 6:16 | 2 | -1.19 | | | | U | 0.07 | 341.9 | |
| 1463 | 10/22/2017 8:15 | 2 | -2.25 | | | | C | 0.04 | 300.8 | |
| 1464 | 10/22/2017 8:33 | 2 | -0.62 | | | | W | 0.14 | 391.6 | |
| 1465 | 10/22/2017 8:50 | 2 | 1.15 | | | | C | 0.05 | 357.7 | |
| 1466 | 10/22/2017 9:07 | 2 | 1.24 | | | | W | 0.10 | 387.4 | 0.03 |
| 1467 | 10/22/2017 9:24 | 2 | 6.05 | | | 0.41 | UW | 0.13 | 620.3 | 0.13 |
| 1468 | 10/22/2017 9:42 | 2 | 7.42 | | 0.28 | | U | 0.08 | 471.0 | |
| 1469 | 10/22/2017 9:59 | 2 | 7.81 | 7.94 | 0.26 | | UW | 0.09 | 415.2 | 0.64 |
| 1470 | 10/22/2017 10:16 | 2 | 10.72 | | | | U | 0.04 | 467.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1471 | 10/22/2017 12:15 | 2 | 17.89 | | | | C | 0.05 | 320.7 | |
| 1472 | 10/22/2017 12:32 | 2 | 16.84 | | | | W | 0.16 | 897.3 | 10.44 |
| 1473 | 10/22/2017 12:50 | 2 | 20.32 | | | | C | 0.05 | 305.8 | |
| 1474 | 10/22/2017 13:07 | 2 | 19.09 | | | | W | 0.15 | 454.3 | 3.52 |
| 1475 | 10/22/2017 13:24 | 2 | 18.95 | | | 0.40 | UW | 0.56 | 1216.6 | 4.16 |
| 1476 | 10/22/2017 13:42 | 2 | 20.54 | | 0.29 | | U | 0.08 | 456.9 | |
| 1477 | 10/22/2017 13:59 | 2 | 16.73 | 15.47 | 0.27 | | UW | 0.10 | 660.8 | 0.24 |
| 1478 | 10/22/2017 14:16 | 2 | 20.99 | | | | U | 0.04 | 504.6 | |
| 1479 | 10/22/2017 16:15 | 2 | 20.45 | | | | C | 0.03 | 333.2 | |
| 1480 | 10/22/2017 16:32 | 2 | 17.85 | | | | W | 0.65 | 1283.4 | 0.01 |
| 1481 | 10/22/2017 16:50 | 2 | 19.80 | | | | C | 0.02 | 246.7 | |
| 1482 | 10/22/2017 17:07 | 2 | 18.22 | | | | W | 0.13 | 319.1 | 0.09 |
| 1483 | 10/22/2017 17:24 | 2 | 15.72 | | | 0.38 | UW | 0.82 | 596.7 | 3.27 |
| 1484 | 10/22/2017 17:42 | 2 | 17.83 | | 0.29 | | U | 0.07 | 178.5 | |
| 1485 | 10/22/2017 17:59 | 2 | 15.62 | 16.08 | 0.27 | | UW | 0.19 | 633.8 | 2.24 |
| 1486 | 10/22/2017 18:16 | 2 | 15.69 | | | | U | 0.10 | 217.9 | |
| 1487 | 10/22/2017 20:15 | 2 | 8.92 | | | | C | 0.04 | 323.6 | |
| 1488 | 10/22/2017 20:33 | 2 | 8.55 | | | | W | 0.36 | 559.5 | 0.01 |
| 1489 | 10/22/2017 20:50 | 2 | 9.99 | | | | C | 0.04 | 430.6 | |
| 1490 | 10/22/2017 21:07 | 2 | 10.18 | | | | W | 0.13 | 293.3 | 0.03 |
| 1491 | 10/22/2017 21:24 | 2 | 9.97 | | | 0.37 | UW | 0.62 | 502.9 | 1.56 |
| 1492 | 10/22/2017 21:42 | 2 | 10.72 | | 0.28 | | U | 0.09 | 293.0 | |
| 1493 | 10/22/2017 21:59 | 2 | 10.56 | 12.79 | 0.26 | | UW | 0.10 | 455.9 | 1.01 |
| 1494 | 10/22/2017 22:16 | 2 | 10.69 | | | | U | 0.07 | 288.3 | |
| 1495 | 10/23/2017 0:15 | 2 | 7.11 | | | | C | 0.01 | 297.0 | |
| 1496 | 10/23/2017 0:33 | 2 | 7.41 | | | | W | 0.19 | 550.3 | 0.03 |
| 1497 | 10/23/2017 0:50 | 2 | 8.78 | | | | C | 0.04 | 386.0 | |
| 1498 | 10/23/2017 1:07 | 2 | 8.94 | | | | W | 0.15 | 370.3 | 0.02 |
| 1499 | 10/23/2017 1:25 | 2 | 8.59 | | | 0.37 | UW | 0.42 | 573.1 | 1.05 |
| 1500 | 10/23/2017 1:42 | 2 | 8.75 | | 0.28 | | U | 0.09 | 287.5 | |
| 1501 | 10/23/2017 1:59 | 2 | 8.64 | 11.54 | 0.26 | | UW | 0.09 | 435.2 | 0.66 |
| 1502 | 10/23/2017 2:16 | 2 | 8.73 | | | | U | 0.08 | 309.4 | |
| 1503 | 10/23/2017 4:15 | 2 | 4.82 | | | | C | 0.05 | 338.2 | |
| 1504 | 10/23/2017 4:33 | 2 | 6.36 | | | | W | 0.18 | 442.2 | |
| 1505 | 10/23/2017 4:50 | 2 | 8.57 | | | | C | 0.11 | 662.6 | |
| 1506 | 10/23/2017 5:07 | 2 | 9.26 | | | | W | 0.08 | 543.3 | 0.05 |
| 1507 | 10/23/2017 5:24 | 2 | 9.54 | | | 0.37 | UW | 0.38 | 801.4 | 0.61 |
| 1508 | 10/23/2017 5:42 | 2 | 9.79 | | 0.28 | | U | 0.10 | 658.5 | |
| 1509 | 10/23/2017 5:59 | 2 | 10.04 | 10.93 | 0.26 | | UW | 0.11 | 301.1 | 0.39 |
| 1510 | 10/23/2017 6:16 | 2 | 10.29 | | | | U | 0.11 | 509.0 | |
| 1511 | 10/23/2017 8:15 | 2 | 7.79 | | | | C | 0.05 | 407.0 | |
| 1512 | 10/23/2017 8:33 | 2 | 7.82 | | | | W | 0.14 | 347.6 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1513 | 10/23/2017 8:50 | 2 | 8.35 | | | | C | 0.07 | 639.5 | |
| 1514 | 10/23/2017 9:07 | 2 | 8.33 | | | | W | 0.10 | 524.6 | 0.07 |
| 1515 | 10/23/2017 9:24 | 2 | 11.38 | | | 0.36 | UW | 0.23 | 923.0 | 0.38 |
| 1516 | 10/23/2017 9:42 | 2 | 12.21 | | 0.28 | | U | 0.10 | 529.8 | |
| 1517 | 10/23/2017 9:59 | 2 | 11.36 | 11.03 | 0.26 | | UW | 0.14 | 329.1 | 0.30 |
| 1518 | 10/23/2017 10:16 | 2 | 13.71 | | | | U | 0.11 | 541.0 | |
| 1519 | 10/23/2017 12:15 | 2 | 12.13 | | | | C | 0.03 | 759.7 | |
| 1520 | 10/23/2017 12:33 | 2 | 10.78 | | | | W | 0.05 | 186.8 | 0.26 |
| 1521 | 10/23/2017 12:50 | 2 | 11.10 | | | | C | | 775.7 | |
| 1522 | 10/23/2017 13:07 | 2 | 10.55 | | | | W | 0.02 | 653.2 | 0.02 |
| 1523 | 10/23/2017 13:24 | 2 | 10.21 | | | 0.36 | UW | 0.20 | 1026.9 | 0.32 |
| 1524 | 10/23/2017 13:42 | 2 | 10.13 | | 0.28 | | U | 0.05 | 683.6 | |
| 1525 | 10/23/2017 13:59 | 2 | 9.90 | 12.31 | 0.26 | | UW | 0.06 | 180.3 | 0.20 |
| 1526 | 10/23/2017 14:16 | 2 | 12.75 | | | | U | 0.03 | 654.0 | |
| 1527 | 10/23/2017 16:15 | 2 | 13.17 | | | | C | | 1125.5 | |
| 1528 | 10/23/2017 16:33 | 2 | 11.30 | | | | W | 0.09 | 110.6 | 0.04 |
| 1529 | 10/23/2017 16:50 | 2 | 11.81 | | | | C | 0.04 | 1063.5 | |
| 1530 | 10/23/2017 17:07 | 2 | 11.24 | | | | W | 0.02 | 360.0 | 0.03 |
| 1531 | 10/23/2017 17:24 | 2 | 11.24 | | | 0.35 | UW | 0.41 | 1558.4 | 0.42 |
| 1532 | 10/23/2017 17:42 | 2 | 10.99 | | 0.28 | | U | 0.07 | 656.3 | |
| 1533 | 10/23/2017 17:59 | 2 | 10.10 | 12.75 | 0.26 | | UW | 0.11 | 153.4 | 0.22 |
| 1534 | 10/23/2017 18:16 | 2 | 10.19 | | | | U | 0.09 | 524.1 | |
| 1535 | 10/23/2017 20:15 | 2 | 8.75 | | | | C | | 930.7 | |
| 1536 | 10/23/2017 20:33 | 2 | 8.71 | | | | W | 0.04 | 83.8 | |
| 1537 | 10/23/2017 20:50 | 2 | 8.21 | | | | C | 0.04 | 797.1 | |
| 1538 | 10/23/2017 21:07 | 2 | 8.33 | | | | W | 0.01 | 690.0 | |
| 1539 | 10/23/2017 21:24 | 2 | 7.98 | | | 0.35 | UW | 0.23 | 834.9 | 0.15 |
| 1540 | 10/23/2017 21:42 | 2 | 8.56 | | 0.27 | | U | 0.04 | 707.6 | |
| 1541 | 10/23/2017 21:59 | 2 | 8.51 | 11.02 | 0.26 | | UW | 0.04 | 115.3 | 0.13 |
| 1542 | 10/23/2017 22:16 | 2 | 8.48 | | | | U | 0.05 | 680.1 | |
| 1543 | 10/24/2017 0:15 | 2 | 4.86 | | | | C | | 1322.1 | |
| 1544 | 10/24/2017 0:33 | 2 | 4.68 | | | | W | 0.03 | 87.1 | |
| 1545 | 10/24/2017 0:50 | 2 | 3.98 | | | | C | 0.06 | 969.9 | |
| 1546 | 10/24/2017 1:07 | 2 | 4.13 | | | | W | 0.02 | 445.1 | |
| 1547 | 10/24/2017 1:25 | 2 | 4.18 | | | 0.35 | UW | 0.17 | 966.1 | 0.04 |
| 1548 | 10/24/2017 1:42 | 2 | 4.03 | | 0.27 | | U | 0.06 | 567.7 | |
| 1549 | 10/24/2017 1:59 | 2 | 3.67 | 8.89 | 0.25 | | UW | 0.03 | 61.4 | 0.03 |
| 1550 | 10/24/2017 2:16 | 2 | 2.59 | | | | U | 0.04 | 669.4 | |
| 1551 | 10/24/2017 4:15 | 2 | 0.53 | | | | C | 0.01 | 1157.3 | |
| 1552 | 10/24/2017 4:33 | 2 | 0.68 | | | | W | 0.02 | 65.3 | |
| 1553 | 10/24/2017 4:50 | 2 | 0.23 | | | | C | 0.03 | 1034.4 | |
| 1554 | 10/24/2017 5:07 | 2 | 0.34 | | | | W | 0.03 | 570.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1555 | 10/24/2017 5:25 | 2 | 0.66 | | | 0.34 | UW | 0.03 | 767.8 | |
| 1556 | 10/24/2017 5:42 | 2 | 0.49 | | 0.26 | | U | 0.05 | 470.2 | 0.13 |
| 1557 | 10/24/2017 5:59 | 2 | 0.51 | 6.58 | 0.25 | | UW | 0.03 | 61.0 | 0.01 |
| 1558 | 10/24/2017 6:16 | 2 | 0.28 | | | | U | 0.05 | 598.3 | 0.09 |
| 1559 | 10/24/2017 8:15 | 2 | -0.39 | | | | C | 0.01 | 995.6 | 0.05 |
| 1560 | 10/24/2017 8:33 | 2 | 0.56 | | | | W | | 70.8 | |
| 1561 | 10/24/2017 8:50 | 2 | 1.56 | | | | C | 0.04 | 667.4 | |
| 1562 | 10/24/2017 9:07 | 2 | 1.19 | | | | W | 0.03 | 317.7 | 0.01 |
| 1563 | 10/24/2017 9:24 | 2 | 3.46 | | | 0.34 | UW | 0.09 | 840.2 | |
| 1564 | 10/24/2017 9:42 | 2 | 4.01 | | 0.27 | | U | | 500.9 | 0.16 |
| 1565 | 10/24/2017 9:59 | 2 | 3.44 | 6.24 | 0.25 | | UW | 0.02 | 124.8 | 0.03 |
| 1566 | 10/24/2017 10:16 | 2 | 5.32 | | | | U | 0.05 | 826.5 | |
| 1567 | 10/24/2017 12:15 | 2 | 9.94 | | | | C | 0.01 | 934.2 | 0.52 |
| 1568 | 10/24/2017 12:33 | 2 | 8.02 | | | | W | | 65.8 | |
| 1569 | 10/24/2017 12:50 | 2 | 11.40 | | | | C | 0.02 | 810.7 | |
| 1570 | 10/24/2017 13:07 | 2 | 8.82 | | | | W | 0.02 | 515.5 | 0.02 |
| 1571 | 10/24/2017 13:24 | 2 | 11.39 | | | 0.35 | UW | 0.10 | 1283.9 | 0.12 |
| 1572 | 10/24/2017 13:42 | 2 | 11.73 | | 0.27 | | U | 0.03 | 708.6 | |
| 1573 | 10/24/2017 13:59 | 2 | 9.28 | 11.25 | 0.26 | | UW | 0.06 | 150.2 | 0.08 |
| 1574 | 10/24/2017 14:16 | 2 | 12.45 | | | | U | 0.05 | 1037.7 | |
| 1575 | 10/24/2017 16:15 | 2 | 12.59 | | | | C | 0.02 | 929.1 | |
| 1576 | 10/24/2017 16:33 | 2 | 10.72 | | | | W | 0.04 | 78.1 | 0.01 |
| 1577 | 10/24/2017 16:50 | 2 | 11.98 | | | | C | 0.04 | 964.3 | |
| 1578 | 10/24/2017 17:07 | 2 | 9.81 | | | | W | 0.05 | 553.5 | 0.01 |
| 1579 | 10/24/2017 17:24 | 2 | 8.80 | | | 0.34 | UW | 0.36 | 1229.4 | 0.16 |
| 1580 | 10/24/2017 17:42 | 2 | 10.45 | | 0.27 | | U | 0.06 | 542.5 | |
| 1581 | 10/24/2017 17:59 | 2 | 9.43 | 11.58 | 0.25 | | UW | 0.08 | 111.3 | 0.08 |
| 1582 | 10/24/2017 18:16 | 2 | 8.79 | | | | U | 0.08 | 402.9 | |
| 1583 | 10/24/2017 20:15 | 2 | 3.73 | | | | C | 0.06 | 437.3 | |
| 1584 | 10/24/2017 20:33 | 2 | 3.95 | | | | W | 0.07 | 230.0 | |
| 1585 | 10/24/2017 20:50 | 2 | 3.03 | | | | C | 0.05 | 553.8 | |
| 1586 | 10/24/2017 21:07 | 2 | 3.80 | | | | W | 0.08 | 602.7 | |
| 1587 | 10/24/2017 21:24 | 2 | 3.06 | | | 0.34 | UW | 0.15 | 489.4 | 0.03 |
| 1588 | 10/24/2017 21:42 | 2 | 3.49 | | 0.26 | | U | 0.09 | 464.5 | |
| 1589 | 10/24/2017 21:59 | 2 | 3.18 | 8.35 | 0.25 | | UW | 0.06 | 113.2 | 0.03 |
| 1590 | 10/24/2017 22:16 | 2 | 2.22 | | | | U | 0.07 | 350.5 | |
| 1591 | 10/25/2017 0:15 | 2 | 2.18 | | | | C | 0.05 | 378.2 | 0.12 |
| 1592 | 10/25/2017 0:33 | 2 | 2.81 | | | | W | 0.08 | 337.0 | |
| 1593 | 10/25/2017 0:50 | 2 | 3.62 | | | | C | 0.05 | 454.4 | |
| 1594 | 10/25/2017 1:07 | 2 | 3.75 | | | | W | 0.07 | 420.7 | |
| 1595 | 10/25/2017 1:25 | 2 | 4.45 | | | 0.34 | UW | 0.14 | 606.4 | 0.02 |
| 1596 | 10/25/2017 1:42 | 2 | 3.63 | | 0.26 | | U | 0.08 | 323.3 | 1.39 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1597 | 10/25/2017 1:59 | 2 | 3.82 | 7.66 | 0.25 | | UW | 0.08 | 237.9 | 0.04 |
| 1598 | 10/25/2017 2:16 | 2 | 4.60 | | | | U | 0.05 | 455.6 | |
| 1599 | 10/25/2017 4:15 | 2 | 6.12 | | | | C | 0.04 | 535.9 | 0.38 |
| 1600 | 10/25/2017 4:32 | 2 | 6.61 | | | | W | 0.06 | 224.5 | |
| 1601 | 10/25/2017 4:50 | 2 | 6.07 | | | | C | 0.05 | 526.4 | |
| 1602 | 10/25/2017 5:07 | 2 | 7.04 | | | | W | 0.03 | 493.4 | |
| 1603 | 10/25/2017 5:24 | 2 | 5.51 | | | 0.34 | UW | 0.14 | 590.3 | 0.07 |
| 1604 | 10/25/2017 5:42 | 2 | 5.09 | | 0.26 | | U | 0.08 | 434.9 | |
| 1605 | 10/25/2017 5:59 | 2 | 5.13 | 7.58 | 0.25 | | UW | 0.07 | 166.3 | 0.07 |
| 1606 | 10/25/2017 6:16 | 2 | 4.40 | | | | U | 0.06 | 470.3 | |
| 1607 | 10/25/2017 8:15 | 2 | 2.11 | | | | C | 0.09 | 340.8 | 0.41 |
| 1608 | 10/25/2017 8:33 | 2 | 3.46 | | | | W | 0.09 | 279.3 | |
| 1609 | 10/25/2017 8:50 | 2 | 5.69 | | | | C | 0.01 | 432.4 | |
| 1610 | 10/25/2017 9:07 | 2 | 5.87 | | | | W | 0.08 | 388.6 | 0.01 |
| 1611 | 10/25/2017 9:24 | 2 | 9.33 | | | 0.34 | UW | 0.12 | 567.0 | 0.03 |
| 1612 | 10/25/2017 9:42 | 2 | 10.71 | | 0.27 | | U | 0.07 | 435.8 | 1.03 |
| 1613 | 10/25/2017 9:59 | 2 | 10.49 | 7.81 | 0.25 | | UW | 0.06 | 389.5 | 0.15 |
| 1614 | 10/25/2017 10:16 | 2 | 13.17 | | | | U | 0.07 | 520.6 | |
| 1615 | 10/25/2017 12:15 | 2 | 19.04 | | | | C | 0.02 | 422.2 | |
| 1616 | 10/25/2017 12:32 | 2 | 16.35 | | | | W | 0.13 | 594.1 | |
| 1617 | 10/25/2017 12:50 | 2 | 19.54 | | | | C | 0.05 | 648.6 | |
| 1618 | 10/25/2017 13:07 | 2 | 16.98 | | | | W | 0.40 | 674.4 | 0.03 |
| 1619 | 10/25/2017 13:24 | 2 | 20.98 | | | 0.35 | UW | 0.59 | 795.9 | 0.61 |
| 1620 | 10/25/2017 13:42 | 2 | 21.27 | | 0.28 | | U | 0.13 | 712.4 | |
| 1621 | 10/25/2017 13:59 | 2 | 16.49 | 14.69 | 0.26 | | UW | 0.08 | 292.4 | 0.22 |
| 1622 | 10/25/2017 14:16 | 2 | 19.61 | | | | U | 0.07 | 634.8 | 0.03 |
| 1623 | 10/25/2017 16:15 | 2 | 21.07 | | | | C | 0.06 | 529.6 | |
| 1624 | 10/25/2017 16:33 | 2 | 18.47 | | | | W | 0.08 | 1212.2 | 0.04 |
| 1625 | 10/25/2017 16:50 | 2 | 19.31 | | | | C | 0.09 | 559.3 | |
| 1626 | 10/25/2017 17:07 | 2 | 17.49 | | | | W | 0.26 | 930.8 | 0.05 |
| 1627 | 10/25/2017 17:24 | 2 | 15.08 | | | 0.45 | UW | 0.57 | 569.6 | 1.26 |
| 1628 | 10/25/2017 17:42 | 2 | 15.71 | | 0.28 | | U | 0.15 | 361.7 | |
| 1629 | 10/25/2017 17:59 | 2 | 13.38 | 15.00 | 0.26 | | UW | 0.12 | 583.2 | 1.00 |
| 1630 | 10/25/2017 18:16 | 2 | 14.32 | | | | U | 0.11 | 350.1 | |
| 1631 | 10/25/2017 20:15 | 2 | 7.12 | | | | C | 0.04 | 420.7 | |
| 1632 | 10/25/2017 20:33 | 2 | 7.03 | | | | W | 0.32 | 723.6 | |
| 1633 | 10/25/2017 20:50 | 2 | 5.18 | | | | C | 0.08 | 457.7 | |
| 1634 | 10/25/2017 21:07 | 2 | 5.88 | | | | W | 0.15 | 338.0 | |
| 1635 | 10/25/2017 21:24 | 2 | 5.51 | | | 0.45 | UW | 0.41 | 280.1 | 0.42 |
| 1636 | 10/25/2017 21:42 | 2 | 5.59 | | 0.27 | | U | 0.07 | 325.4 | |
| 1637 | 10/25/2017 21:59 | 2 | 5.64 | 10.65 | 0.25 | | UW | 0.14 | 493.1 | 0.23 |
| 1638 | 10/25/2017 22:16 | 2 | 6.19 | | | | U | 0.06 | 350.6 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1639 | 10/26/2017 0:15 | 2 | 7.59 | | | | C | 0.01 | 370.0 | |
| 1640 | 10/26/2017 0:33 | 2 | 7.16 | | | | W | 0.13 | 445.9 | |
| 1641 | 10/26/2017 0:50 | 2 | 7.52 | | | | C | 0.03 | 386.7 | |
| 1642 | 10/26/2017 1:07 | 2 | 7.81 | | | | W | 0.05 | 135.9 | 0.06 |
| 1643 | 10/26/2017 1:24 | 2 | 7.61 | | | 0.44 | UW | 0.17 | 340.6 | 0.14 |
| 1644 | 10/26/2017 1:42 | 2 | 7.52 | | 0.26 | | U | 0.04 | 225.1 | |
| 1645 | 10/26/2017 1:59 | 2 | 6.68 | 9.73 | 0.25 | | UW | 0.09 | 457.7 | 0.16 |
| 1646 | 10/26/2017 2:16 | 2 | 6.77 | | | | U | 0.03 | 143.6 | |
| 1647 | 10/26/2017 4:15 | 2 | 5.98 | | | | C | 0.04 | 294.5 | |
| 1648 | 10/26/2017 4:33 | 2 | 6.05 | | | | W | 0.04 | 322.1 | |
| 1649 | 10/26/2017 4:50 | 2 | 5.60 | | | | C | 0.05 | 316.1 | |
| 1650 | 10/26/2017 5:07 | 2 | 5.68 | | | | W | 0.09 | 219.1 | |
| 1651 | 10/26/2017 5:24 | 2 | 6.31 | | | 0.44 | UW | 0.09 | 203.5 | 0.15 |
| 1652 | 10/26/2017 5:42 | 2 | 6.22 | | 0.26 | | U | 0.05 | 296.0 | |
| 1653 | 10/26/2017 5:59 | 2 | 7.38 | 9.23 | 0.25 | | UW | 0.17 | 445.4 | 0.15 |
| 1654 | 10/26/2017 6:16 | 2 | 8.84 | | | | U | 0.09 | 410.7 | |
| 1655 | 10/26/2017 8:15 | 2 | 8.56 | | | | C | 0.02 | 520.1 | |
| 1656 | 10/26/2017 8:32 | 2 | 8.55 | | | | W | 0.07 | 158.4 | |
| 1657 | 10/26/2017 8:50 | 2 | 8.49 | | | | C | 0.03 | 568.8 | |
| 1658 | 10/26/2017 9:07 | 2 | 8.79 | | | | W | 0.04 | 111.3 | 0.07 |
| 1659 | 10/26/2017 9:24 | 2 | 7.84 | | | 0.43 | UW | 0.16 | 745.1 | 0.15 |
| 1660 | 10/26/2017 9:42 | 2 | 8.44 | | 0.26 | | U | 0.05 | 463.1 | |
| 1661 | 10/26/2017 9:59 | 2 | 7.11 | 9.56 | 0.25 | | UW | 0.06 | 363.0 | 0.10 |
| 1662 | 10/26/2017 10:16 | 2 | 7.28 | | | | U | 0.05 | 475.7 | |
| 1663 | 10/26/2017 12:15 | 2 | 7.28 | | | | C | | 1017.4 | |
| 1664 | 10/26/2017 12:33 | 2 | 6.94 | | | | W | 0.04 | 118.1 | 0.11 |
| 1665 | 10/26/2017 12:50 | 2 | 6.94 | | | | C | 0.03 | 729.4 | |
| 1666 | 10/26/2017 13:07 | 2 | 6.03 | | | | W | 0.03 | 256.1 | 0.01 |
| 1667 | 10/26/2017 13:24 | 2 | 5.89 | | | 0.42 | UW | 0.18 | 1503.7 | 0.02 |
| 1668 | 10/26/2017 13:42 | 2 | 5.87 | | 0.26 | | U | 0.03 | 363.5 | |
| 1669 | 10/26/2017 13:59 | 2 | 5.21 | 9.59 | 0.25 | | UW | 0.02 | 228.3 | 0.06 |
| 1670 | 10/26/2017 14:16 | 2 | 5.82 | | | | U | 0.02 | 620.5 | |
| 1671 | 10/26/2017 16:15 | 2 | 3.30 | | | | C | | 630.8 | |
| 1672 | 10/26/2017 16:32 | 2 | 2.69 | | | | W | 0.01 | 73.7 | 0.01 |
| 1673 | 10/26/2017 16:50 | 2 | 2.72 | | | | C | | 919.2 | |
| 1674 | 10/26/2017 17:07 | 2 | 2.02 | | | | W | | 104.3 | |
| 1675 | 10/26/2017 17:24 | 2 | 2.28 | | | 0.41 | UW | 0.10 | 882.9 | |
| 1676 | 10/26/2017 17:42 | 2 | 2.21 | | 0.26 | | U | 0.02 | 624.1 | 0.17 |
| 1677 | 10/26/2017 17:59 | 2 | 1.81 | 7.71 | 0.25 | | UW | 0.03 | 150.0 | 0.02 |
| 1678 | 10/26/2017 18:16 | 2 | 2.00 | | | | U | 0.04 | 804.6 | |
| 1679 | 10/26/2017 20:15 | 2 | 0.82 | | | | C | | 1017.9 | |
| 1680 | 10/26/2017 20:32 | 2 | 0.48 | | | | W | | 33.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1681 | 10/26/2017 20:50 | 2 | 0.40 | | | | C | | 729.2 | |
| 1682 | 10/26/2017 21:07 | 2 | -0.12 | | | | W | | 152.6 | |
| 1683 | 10/26/2017 21:24 | 2 | -0.04 | | | 0.40 | UW | 0.02 | 286.9 | |
| 1684 | 10/26/2017 21:42 | 2 | 0.04 | | 0.26 | | U | 0.02 | 488.9 | 0.11 |
| 1685 | 10/26/2017 21:59 | 2 | -0.28 | 5.92 | 0.24 | | UW | | 88.0 | 0.01 |
| 1686 | 10/26/2017 22:16 | 2 | -0.13 | | | | U | 0.03 | 671.1 | |
| 1687 | 10/27/2017 0:15 | 2 | -0.75 | | | | C | 0.01 | 1023.0 | |
| 1688 | 10/27/2017 0:33 | 2 | -0.84 | | | | W | | 29.7 | |
| 1689 | 10/27/2017 0:50 | 2 | -0.95 | | | | C | 0.01 | 849.6 | |
| 1690 | 10/27/2017 1:07 | 2 | -1.42 | | | | W | 0.01 | 299.1 | |
| 1691 | 10/27/2017 1:25 | 2 | -1.19 | | | 0.38 | UW | | 300.9 | |
| 1692 | 10/27/2017 1:42 | 2 | -1.55 | | 0.26 | | U | 0.01 | 507.6 | 0.02 |
| 1693 | 10/27/2017 1:59 | 2 | -1.64 | 4.63 | 0.24 | | UW | | 87.3 | |
| 1694 | 10/27/2017 2:16 | 2 | -1.61 | | | | U | 0.02 | 494.6 | |
| 1695 | 10/27/2017 4:15 | 2 | -1.67 | | | | C | | 998.2 | 0.02 |
| 1696 | 10/27/2017 4:33 | 2 | -1.60 | | | | W | | 91.9 | |
| 1697 | 10/27/2017 4:50 | 2 | -1.84 | | | | C | | 704.6 | |
| 1698 | 10/27/2017 5:07 | 2 | -2.12 | | | | W | 0.02 | 143.9 | |
| 1699 | 10/27/2017 5:24 | 2 | -1.61 | | | 0.37 | UW | 0.01 | 276.0 | |
| 1700 | 10/27/2017 5:42 | 2 | -1.96 | | 0.25 | | U | 0.02 | 443.5 | 0.01 |
| 1701 | 10/27/2017 5:59 | 2 | -2.04 | 3.78 | 0.24 | | UW | | 53.4 | |
| 1702 | 10/27/2017 6:16 | 2 | -2.04 | | | | U | | 845.7 | |
| 1703 | 10/27/2017 8:15 | 2 | -2.11 | | | | C | | 1209.7 | 0.02 |
| 1704 | 10/27/2017 8:33 | 2 | -1.97 | | | | W | 0.02 | 22.2 | |
| 1705 | 10/27/2017 8:50 | 2 | -2.05 | | | | C | 0.02 | 723.1 | |
| 1706 | 10/27/2017 9:07 | 2 | -2.34 | | | | W | | 149.6 | |
| 1707 | 10/27/2017 9:24 | 2 | -1.65 | | | 0.36 | UW | | 163.7 | |
| 1708 | 10/27/2017 9:42 | 2 | -1.91 | | 0.25 | | U | | 690.6 | 0.01 |
| 1709 | 10/27/2017 9:59 | 2 | -2.08 | 3.46 | 0.24 | | UW | 0.01 | 43.2 | |
| 1710 | 10/27/2017 10:16 | 2 | -1.58 | | | | U | | 1036.9 | |
| 1711 | 10/27/2017 12:15 | 2 | -0.06 | | | | C | | 881.9 | 0.03 |
| 1712 | 10/27/2017 12:33 | 2 | -0.42 | | | | W | | 27.2 | 0.01 |
| 1713 | 10/27/2017 12:50 | 2 | 0.14 | | | | C | 0.01 | 692.9 | |
| 1714 | 10/27/2017 13:07 | 2 | -0.86 | | | | W | | 373.5 | |
| 1715 | 10/27/2017 13:24 | 2 | 0.35 | | | 0.36 | UW | | 315.7 | |
| 1716 | 10/27/2017 13:42 | 2 | 0.40 | | 0.26 | | U | 0.01 | 564.2 | 0.07 |
| 1717 | 10/27/2017 13:59 | 2 | 0.10 | 4.87 | 0.24 | | UW | | 45.0 | |
| 1718 | 10/27/2017 14:16 | 2 | 1.83 | | | | U | | 934.8 | |
| 1719 | 10/27/2017 16:15 | 2 | 2.89 | | | | C | 0.03 | 1339.0 | 0.01 |
| 1720 | 10/27/2017 16:33 | 2 | 1.29 | | | | W | | 50.6 | |
| 1721 | 10/27/2017 16:50 | 2 | 3.48 | | | | C | 0.01 | 695.3 | |
| 1722 | 10/27/2017 17:07 | 2 | 1.10 | | | | W | | 426.2 | 0.01 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1723 | 10/27/2017 17:24 | 2 | 0.35 | | | 0.38 | UW | | 369.3 | |
| 1724 | 10/27/2017 17:42 | 2 | 1.89 | | 0.26 | | U | 0.01 | 489.3 | 0.05 |
| 1725 | 10/27/2017 17:59 | 2 | 0.93 | 5.36 | 0.24 | | UW | | 61.6 | |
| 1726 | 10/27/2017 18:16 | 2 | 0.35 | | | | U | 0.03 | 759.1 | |
| 1727 | 10/27/2017 20:15 | 2 | -5.16 | | | | C | 0.07 | 383.9 | 0.07 |
| 1728 | 10/27/2017 20:33 | 2 | -4.42 | | | | W | 0.03 | 85.2 | |
| 1729 | 10/27/2017 20:50 | 2 | -5.49 | | | | C | 0.03 | 366.8 | |
| 1730 | 10/27/2017 21:07 | 2 | -5.22 | | | | W | 0.01 | 272.1 | |
| 1731 | 10/27/2017 21:24 | 2 | -3.53 | | | 0.36 | UW | 0.06 | 413.4 | |
| 1732 | 10/27/2017 21:42 | 2 | -4.55 | | 0.25 | | U | 0.01 | 299.0 | 0.05 |
| 1733 | 10/27/2017 21:59 | 2 | -3.94 | 2.72 | 0.24 | | UW | 0.02 | 85.6 | |
| 1734 | 10/27/2017 22:16 | 2 | -4.52 | | | | U | 0.01 | 362.0 | |
| 1735 | 10/28/2017 0:15 | 2 | -6.47 | | | | C | 0.03 | 358.4 | 0.02 |
| 1736 | 10/28/2017 0:33 | 2 | -5.83 | | | | W | 0.02 | 101.1 | |
| 1737 | 10/28/2017 0:50 | 2 | -6.91 | | | | C | 0.05 | 302.0 | |
| 1738 | 10/28/2017 1:07 | 2 | -7.11 | | | | W | 0.02 | 393.5 | |
| 1739 | 10/28/2017 1:24 | 2 | -5.87 | | | 0.32 | UW | 0.04 | 271.3 | |
| 1740 | 10/28/2017 1:42 | 2 | -7.16 | | 0.23 | | U | 0.05 | 260.8 | 0.08 |
| 1741 | 10/28/2017 1:59 | 2 | -7.20 | 1.80 | 0.22 | | UW | 0.03 | 60.3 | |
| 1742 | 10/28/2017 2:16 | 2 | -8.16 | | | | U | 0.04 | 289.0 | |
| 1743 | 10/28/2017 4:15 | 2 | -10.71 | | | | C | 0.04 | 232.0 | 0.03 |
| 1744 | 10/28/2017 4:33 | 2 | -9.60 | | | | W | 0.03 | 110.2 | |
| 1745 | 10/28/2017 4:50 | 2 | -11.72 | | | | C | 0.03 | 226.8 | |
| 1746 | 10/28/2017 5:07 | 2 | -12.15 | | | | W | 0.05 | 254.6 | |
| 1747 | 10/28/2017 5:24 | 2 | -10.28 | | | 0.27 | UW | 0.04 | 246.5 | 0.02 |
| 1748 | 10/28/2017 5:42 | 2 | -11.81 | | 0.20 | | U | 0.02 | 186.2 | |
| 1749 | 10/28/2017 5:59 | 2 | -10.72 | 0.93 | 0.20 | | UW | 0.01 | 48.9 | |
| 1750 | 10/28/2017 6:16 | 2 | -11.36 | | | | U | 0.03 | 257.9 | |
| 1751 | 10/28/2017 8:15 | 2 | -9.56 | | | | C | 0.02 | 252.6 | 0.02 |
| 1752 | 10/28/2017 8:33 | 2 | -8.38 | | | | W | 0.02 | 180.9 | 0.01 |
| 1753 | 10/28/2017 8:50 | 2 | -7.61 | | | | C | 0.03 | 213.8 | 0.01 |
| 1754 | 10/28/2017 9:07 | 2 | -8.08 | | | | W | 0.03 | 229.7 | |
| 1755 | 10/28/2017 9:24 | 2 | -2.64 | | | 0.21 | UW | 0.12 | 276.3 | |
| 1756 | 10/28/2017 9:42 | 2 | -2.24 | | 0.19 | | U | 0.04 | 240.5 | 0.02 |
| 1757 | 10/28/2017 9:59 | 2 | -1.56 | 0.98 | 0.20 | | UW | 0.02 | 136.3 | 0.02 |
| 1758 | 10/28/2017 10:16 | 2 | 1.07 | | | | U | 0.05 | 288.0 | 0.02 |
| 1759 | 10/28/2017 12:15 | 2 | 8.35 | | | | C | 0.04 | 258.0 | 0.03 |
| 1760 | 10/28/2017 12:33 | 2 | 5.82 | | | | W | 0.02 | 185.5 | |
| 1761 | 10/28/2017 12:50 | 2 | 9.95 | | | | C | 0.02 | 267.3 | |
| 1762 | 10/28/2017 13:07 | 2 | 8.20 | | | | W | 0.10 | 212.0 | 0.17 |
| 1763 | 10/28/2017 13:24 | 2 | 9.69 | | | 0.31 | UW | 0.18 | 537.1 | 0.17 |
| 1764 | 10/28/2017 13:42 | 2 | 12.05 | | 0.27 | | U | 0.03 | 459.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1765 | 10/28/2017 13:59 | 2 | 6.96 | 6.09 | 0.25 | | UW | 0.02 | 164.8 | 2.80 |
| 1766 | 10/28/2017 14:16 | 2 | 12.00 | | | | U | 0.02 | 446.3 | |
| 1767 | 10/28/2017 16:15 | 2 | 12.38 | | | | C | 0.03 | 296.0 | |
| 1768 | 10/28/2017 16:33 | 2 | 8.83 | | | | W | 0.07 | 418.6 | 0.57 |
| 1769 | 10/28/2017 16:50 | 2 | 11.66 | | | | C | | 431.4 | 0.17 |
| 1770 | 10/28/2017 17:07 | 2 | 9.09 | | | | W | 0.07 | 373.8 | 0.40 |
| 1771 | 10/28/2017 17:24 | 2 | 5.78 | | | 0.35 | UW | 0.12 | 238.2 | 0.31 |
| 1772 | 10/28/2017 17:42 | 2 | 8.42 | | 0.26 | | U | 0.03 | 232.4 | |
| 1773 | 10/28/2017 17:59 | 2 | 5.89 | 8.21 | 0.25 | | UW | 0.02 | 182.0 | 0.30 |
| 1774 | 10/28/2017 18:16 | 2 | 4.09 | | | | U | 0.04 | 307.6 | |
| 1775 | 10/28/2017 20:15 | 2 | -0.32 | | | | C | 0.02 | 240.4 | |
| 1776 | 10/28/2017 20:33 | 2 | -0.14 | | | | W | | 261.4 | 0.07 |
| 1777 | 10/28/2017 20:50 | 2 | 0.12 | | | | C | 0.02 | 258.5 | |
| 1778 | 10/28/2017 21:07 | 2 | 0.10 | | | | W | 0.03 | 300.8 | |
| 1779 | 10/28/2017 21:24 | 2 | -2.62 | | | 0.35 | UW | 0.07 | 256.6 | 0.07 |
| 1780 | 10/28/2017 21:42 | 2 | -2.66 | | 0.25 | | U | 0.03 | 136.0 | |
| 1781 | 10/28/2017 21:59 | 2 | -0.70 | 4.68 | 0.24 | | UW | 0.03 | 242.6 | 0.02 |
| 1782 | 10/28/2017 22:16 | 2 | 0.32 | | | | U | 0.03 | 303.2 | 0.89 |
| 1783 | 10/29/2017 0:15 | 2 | 1.47 | | | | C | 0.01 | 221.1 | 0.12 |
| 1784 | 10/29/2017 0:33 | 2 | 1.19 | | | | W | 0.03 | 216.8 | 0.09 |
| 1785 | 10/29/2017 0:50 | 2 | 1.92 | | | | C | 0.02 | 330.2 | |
| 1786 | 10/29/2017 1:07 | 2 | 1.59 | | | | W | 0.05 | 249.2 | 0.06 |
| 1787 | 10/29/2017 1:25 | 2 | 2.01 | | | 0.35 | UW | 0.10 | 365.2 | 0.03 |
| 1788 | 10/29/2017 1:42 | 2 | 2.14 | | 0.25 | | U | 0.03 | 227.3 | |
| 1789 | 10/29/2017 1:59 | 2 | 2.08 | 4.92 | 0.24 | | UW | 0.02 | 262.4 | 0.05 |
| 1790 | 10/29/2017 2:16 | 2 | 2.46 | | | | U | 0.01 | 248.9 | |
| 1791 | 10/29/2017 4:15 | 2 | -0.02 | | | | C | 0.04 | 245.9 | |
| 1792 | 10/29/2017 4:33 | 2 | -0.44 | | | | W | 0.03 | 218.1 | |
| 1793 | 10/29/2017 4:50 | 2 | -1.12 | | | | C | 0.03 | 248.4 | |
| 1794 | 10/29/2017 5:07 | 2 | -0.46 | | | | W | 0.04 | 262.5 | 0.01 |
| 1795 | 10/29/2017 5:24 | 2 | 1.10 | | | 0.34 | UW | 0.07 | 343.6 | 0.02 |
| 1796 | 10/29/2017 5:42 | 2 | 1.68 | | 0.25 | | U | 0.04 | 203.4 | 1.28 |
| 1797 | 10/29/2017 5:59 | 2 | 1.94 | 4.34 | 0.24 | | UW | 0.02 | 224.8 | 0.02 |
| 1798 | 10/29/2017 6:16 | 2 | 2.76 | | | | U | 0.01 | 250.7 | |
| 1799 | 10/29/2017 8:15 | 2 | 2.31 | | | | C | 0.02 | 309.0 | 0.06 |
| 1800 | 10/29/2017 8:33 | 2 | 2.61 | | | | W | 0.04 | 225.5 | |
| 1801 | 10/29/2017 8:50 | 2 | 2.89 | | | | C | 0.03 | 292.9 | |
| 1802 | 10/29/2017 9:07 | 2 | 3.12 | | | | W | 0.04 | 261.5 | |
| 1803 | 10/29/2017 9:24 | 2 | 3.67 | | | 0.35 | UW | 0.06 | 354.0 | 0.01 |
| 1804 | 10/29/2017 9:42 | 2 | 4.64 | | 0.25 | | U | 0.05 | 407.1 | 0.13 |
| 1805 | 10/29/2017 9:59 | 2 | 4.77 | 5.59 | 0.24 | | UW | 0.05 | 337.7 | 0.03 |
| 1806 | 10/29/2017 10:16 | 2 | 5.05 | | | | U | 0.01 | 423.2 | 0.03 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1807 | 10/29/2017 12:15 | 2 | 6.07 | | | | C | 0.03 | 397.6 | 0.22 |
| 1808 | 10/29/2017 12:33 | 2 | 6.17 | | | | W | 0.02 | 249.7 | |
| 1809 | 10/29/2017 12:50 | 2 | 6.62 | | | | C | | 539.0 | |
| 1810 | 10/29/2017 13:07 | 2 | 6.87 | | | | W | 0.05 | 524.2 | |
| 1811 | 10/29/2017 13:24 | 2 | 7.29 | | | 0.38 | UW | 0.05 | 413.5 | |
| 1812 | 10/29/2017 13:42 | 2 | 7.57 | | 0.29 | | U | 0.06 | 483.3 | 0.17 |
| 1813 | 10/29/2017 13:59 | 2 | 7.45 | 7.80 | 0.27 | | UW | 0.03 | 214.5 | 0.05 |
| 1814 | 10/29/2017 14:16 | 2 | 7.67 | | | | U | 0.05 | 441.0 | 0.01 |
| 1815 | 10/29/2017 16:15 | 2 | 8.51 | | | | C | 0.06 | 618.5 | 0.21 |
| 1816 | 10/29/2017 16:33 | 2 | 8.56 | | | | W | 0.02 | 140.6 | |
| 1817 | 10/29/2017 16:50 | 2 | 9.14 | | | | C | | 566.6 | |
| 1818 | 10/29/2017 17:07 | 2 | 9.08 | | | | W | 0.02 | 463.6 | |
| 1819 | 10/29/2017 17:24 | 2 | 8.48 | | | 0.38 | UW | 0.09 | 502.8 | 0.01 |
| 1820 | 10/29/2017 17:42 | 2 | 8.34 | | 0.29 | | U | 0.08 | 662.0 | 0.14 |
| 1821 | 10/29/2017 17:59 | 2 | 7.91 | 8.65 | 0.27 | | UW | 0.04 | 179.5 | 0.13 |
| 1822 | 10/29/2017 18:16 | 2 | 7.53 | | | | U | | 584.8 | 0.03 |
| 1823 | 10/29/2017 20:15 | 2 | 4.81 | | | | C | 0.01 | 792.5 | |
| 1824 | 10/29/2017 20:33 | 2 | 4.97 | | | | W | 0.02 | 92.0 | |
| 1825 | 10/29/2017 20:50 | 2 | 4.43 | | | | C | 0.03 | 555.5 | |
| 1826 | 10/29/2017 21:07 | 2 | 5.00 | | | | W | | 416.3 | |
| 1827 | 10/29/2017 21:24 | 2 | 3.55 | | | 0.37 | UW | 0.14 | 580.7 | |
| 1828 | 10/29/2017 21:42 | 2 | 3.03 | | 0.28 | | U | 0.05 | 570.3 | 0.07 |
| 1829 | 10/29/2017 21:59 | 2 | 3.24 | 5.95 | 0.26 | | UW | 0.02 | 126.8 | 1.06 |
| 1830 | 10/29/2017 22:16 | 2 | 2.94 | | | | U | 0.03 | 487.0 | 0.05 |
| 1831 | 10/30/2017 0:15 | 2 | 2.10 | | | | C | 0.06 | 309.5 | 0.01 |
| 1832 | 10/30/2017 0:33 | 2 | 2.22 | | | | W | 0.06 | 162.8 | |
| 1833 | 10/30/2017 0:50 | 2 | 1.49 | | | | C | 0.03 | 427.4 | |
| 1834 | 10/30/2017 1:07 | 2 | 2.25 | | | | W | 0.01 | 345.6 | |
| 1835 | 10/30/2017 1:24 | 2 | 2.41 | | | 0.37 | UW | 0.05 | 397.9 | |
| 1836 | 10/30/2017 1:42 | 2 | 2.37 | | 0.27 | | U | 0.03 | 566.0 | 0.05 |
| 1837 | 10/30/2017 1:59 | 2 | 2.14 | 4.73 | 0.26 | | UW | | 124.8 | |
| 1838 | 10/30/2017 2:16 | 2 | 1.40 | | | | U | 0.02 | 424.9 | 0.03 |
| 1839 | 10/30/2017 4:15 | 2 | 0.12 | | | | C | 0.04 | 515.5 | 0.01 |
| 1840 | 10/30/2017 4:33 | 2 | 0.98 | | | | W | 0.04 | 174.7 | |
| 1841 | 10/30/2017 4:50 | 2 | 1.01 | | | | C | 0.02 | 399.6 | |
| 1842 | 10/30/2017 5:07 | 2 | 1.08 | | | | W | 0.03 | 373.4 | |
| 1843 | 10/30/2017 5:24 | 2 | 1.18 | | | 0.36 | UW | 0.03 | 588.6 | |
| 1844 | 10/30/2017 5:42 | 2 | 1.04 | | 0.27 | | U | 0.01 | 430.0 | 0.04 |
| 1845 | 10/30/2017 5:59 | 2 | 0.64 | 3.79 | 0.26 | | UW | 0.04 | 95.2 | 0.08 |
| 1846 | 10/30/2017 6:16 | 2 | -0.28 | | | | U | | 356.3 | 0.02 |
| 1847 | 10/30/2017 8:15 | 2 | -0.26 | | | | C | 0.02 | 664.4 | 0.02 |
| 1848 | 10/30/2017 8:33 | 2 | 0.04 | | | | W | 0.03 | 41.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1849 | 10/30/2017 8:50 | 2 | 0.10 | | | | C | 0.01 | 555.6 | |
| 1850 | 10/30/2017 9:07 | 2 | 0.10 | | | | W | 0.04 | 332.8 | |
| 1851 | 10/30/2017 9:24 | 2 | 0.28 | | | 0.35 | UW | 0.03 | 495.6 | |
| 1852 | 10/30/2017 9:42 | 2 | 0.46 | | 0.27 | | U | | 407.1 | 0.06 |
| 1853 | 10/30/2017 9:59 | 2 | 0.38 | 3.36 | 0.26 | | UW | 0.02 | 56.1 | 0.34 |
| 1854 | 10/30/2017 10:16 | 2 | 0.70 | | | | U | | 507.2 | 0.02 |
| 1855 | 10/30/2017 12:15 | 2 | 1.32 | | | | C | 0.01 | 729.8 | 0.02 |
| 1856 | 10/30/2017 12:33 | 2 | 0.67 | | | | W | 0.01 | 27.8 | |
| 1857 | 10/30/2017 12:50 | 2 | 1.18 | | | | C | 0.03 | 621.3 | |
| 1858 | 10/30/2017 13:07 | 2 | 0.26 | | | | W | | 418.2 | |
| 1859 | 10/30/2017 13:24 | 2 | 1.53 | | | 0.35 | UW | 0.01 | 590.0 | |
| 1860 | 10/30/2017 13:42 | 2 | 1.47 | | 0.27 | | U | | 482.6 | 0.09 |
| 1861 | 10/30/2017 13:59 | 2 | 1.31 | 4.44 | 0.26 | | UW | | 221.0 | |
| 1862 | 10/30/2017 14:16 | 2 | 0.94 | | | | U | 0.02 | 525.0 | 0.04 |
| 1863 | 10/30/2017 16:15 | 2 | 0.65 | | | | C | | 833.4 | |
| 1864 | 10/30/2017 16:33 | 2 | 0.16 | | | | W | | 218.3 | |
| 1865 | 10/30/2017 16:50 | 2 | 0.16 | | | | C | | 545.2 | |
| 1866 | 10/30/2017 17:07 | 2 | -0.34 | | | | W | 0.01 | 366.0 | |
| 1867 | 10/30/2017 17:24 | 2 | -0.37 | | | 0.34 | UW | | 656.4 | |
| 1868 | 10/30/2017 17:42 | 2 | -0.64 | | 0.26 | | U | 0.03 | 363.6 | 0.08 |
| 1869 | 10/30/2017 17:59 | 2 | -0.65 | 3.58 | 0.25 | | UW | | 56.1 | |
| 1870 | 10/30/2017 18:16 | 2 | -0.80 | | | | U | 0.01 | 449.2 | 0.04 |
| 1871 | 10/30/2017 20:15 | 2 | -1.96 | | | | C | 0.02 | 941.3 | 0.01 |
| 1872 | 10/30/2017 20:33 | 2 | -1.96 | | | | W | 0.01 | 52.5 | |
| 1873 | 10/30/2017 20:50 | 2 | -2.32 | | | | C | 0.01 | 566.1 | |
| 1874 | 10/30/2017 21:07 | 2 | -2.79 | | | | W | 0.01 | 289.7 | |
| 1875 | 10/30/2017 21:24 | 2 | -2.05 | | | 0.33 | UW | 0.03 | 519.5 | |
| 1876 | 10/30/2017 21:42 | 2 | -2.67 | | 0.25 | | U | | 454.1 | 0.03 |
| 1877 | 10/30/2017 21:59 | 2 | -2.27 | 2.56 | 0.24 | | UW | 0.01 | 56.4 | 0.48 |
| 1878 | 10/30/2017 22:16 | 2 | -2.34 | | | | U | 0.02 | 470.9 | 0.02 |
| 1879 | 10/31/2017 0:15 | 2 | -5.00 | | | | C | 0.06 | 451.4 | 0.01 |
| 1880 | 10/31/2017 0:33 | 2 | -4.68 | | | | W | 0.01 | 66.6 | |
| 1881 | 10/31/2017 0:50 | 2 | -5.66 | | | | C | 0.01 | 430.5 | |
| 1882 | 10/31/2017 1:07 | 2 | -5.47 | | | | W | 0.01 | 325.4 | |
| 1883 | 10/31/2017 1:25 | 2 | -5.17 | | | 0.29 | UW | 0.05 | 384.1 | |
| 1884 | 10/31/2017 1:42 | 2 | -6.21 | | 0.22 | | U | 0.02 | 421.1 | 0.01 |
| 1885 | 10/31/2017 1:59 | 2 | -6.32 | 1.74 | 0.22 | | UW | | 56.7 | |
| 1886 | 10/31/2017 2:16 | 2 | -6.70 | | | | U | 0.04 | 248.1 | 0.02 |
| 1887 | 10/31/2017 4:15 | 2 | -8.26 | | | | C | 0.03 | 217.8 | 0.06 |
| 1888 | 10/31/2017 4:33 | 2 | -7.35 | | | | W | 0.03 | 158.1 | |
| 1889 | 10/31/2017 4:50 | 2 | -8.11 | | | | C | | 272.0 | |
| 1890 | 10/31/2017 5:07 | 2 | -8.15 | | | | W | 0.03 | 257.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1891 | 10/31/2017 5:24 | 2 | -8.09 | | | 0.24 | UW | 0.03 | 287.7 | |
| 1892 | 10/31/2017 5:42 | 2 | -9.52 | | 0.19 | | U | | 250.7 | 0.02 |
| 1893 | 10/31/2017 5:59 | 2 | -9.21 | 0.84 | 0.19 | | UW | | 62.7 | |
| 1894 | 10/31/2017 6:16 | 2 | -8.90 | | | | U | 0.02 | 210.2 | 0.03 |
| 1895 | 10/31/2017 8:15 | 2 | -9.64 | | | | C | 0.04 | 192.5 | 0.09 |
| 1896 | 10/31/2017 8:33 | 2 | -9.19 | | | | W | 0.02 | 117.4 | |
| 1897 | 10/31/2017 8:50 | 2 | -7.86 | | | | C | 0.01 | 253.9 | |
| 1898 | 10/31/2017 9:07 | 2 | -8.27 | | | | W | 0.04 | 207.7 | 0.01 |
| 1899 | 10/31/2017 9:24 | 2 | -4.63 | | | 0.20 | UW | 0.04 | 321.1 | |
| 1900 | 10/31/2017 9:42 | 2 | -4.05 | | 0.18 | | U | | 291.3 | |
| 1901 | 10/31/2017 9:59 | 2 | -2.82 | 0.63 | 0.19 | | UW | | 145.7 | 0.04 |
| 1902 | 10/31/2017 10:16 | 2 | -2.31 | | | | U | 0.01 | 292.5 | 0.03 |
| 1903 | 10/31/2017 12:15 | 2 | 3.94 | | | | C | 0.05 | 307.2 | 0.46 |
| 1904 | 10/31/2017 12:33 | 2 | 2.81 | | | | W | 0.03 | 265.8 | |
| 1905 | 10/31/2017 12:50 | 2 | 3.98 | | | | C | 0.02 | 252.3 | |
| 1906 | 10/31/2017 13:07 | 2 | 2.90 | | | | W | 0.07 | 274.2 | 0.30 |
| 1907 | 10/31/2017 13:24 | 2 | 4.25 | | | 0.25 | UW | 0.08 | 485.4 | 0.01 |
| 1908 | 10/31/2017 13:42 | 2 | 3.75 | | 0.25 | | U | 0.02 | 396.0 | 0.44 |
| 1909 | 10/31/2017 13:59 | 2 | 2.15 | 1.83 | 0.24 | | UW | 0.03 | 231.9 | |
| 1910 | 10/31/2017 14:16 | 2 | 4.18 | | | | U | 0.01 | 383.9 | 0.06 |
| 1911 | 10/31/2017 16:15 | 2 | 4.16 | | | | C | 0.01 | 136.8 | |
| 1912 | 10/31/2017 16:32 | 2 | 3.69 | | | | W | 0.01 | 267.6 | |
| 1913 | 10/31/2017 16:50 | 2 | 4.35 | | | | C | | 96.4 | |
| 1914 | 10/31/2017 17:07 | 2 | 2.88 | | | | W | 0.02 | 144.3 | 0.01 |
| 1915 | 10/31/2017 17:24 | 2 | 1.35 | | | 0.29 | UW | 0.07 | 139.9 | 0.03 |
| 1916 | 10/31/2017 17:42 | 2 | 2.21 | | 0.26 | | U | 0.02 | 235.4 | 0.30 |
| 1917 | 10/31/2017 17:59 | 2 | 0.89 | 3.45 | 0.25 | | UW | 0.03 | 222.0 | |
| 1918 | 10/31/2017 18:16 | 2 | -0.53 | | | | U | | 67.3 | 0.06 |
| 1919 | 10/31/2017 20:15 | 2 | -1.18 | | | | C | 0.03 | 154.5 | 0.11 |
| 1920 | 10/31/2017 20:32 | 2 | -0.74 | | | | W | | 200.5 | |
| 1921 | 10/31/2017 20:50 | 2 | -0.62 | | | | C | 0.01 | 89.2 | |
| 1922 | 10/31/2017 21:07 | 2 | -0.64 | | | | W | 0.02 | 116.3 | |
| 1923 | 10/31/2017 21:24 | 2 | -0.38 | | | 0.28 | UW | 0.01 | 155.2 | |
| 1924 | 10/31/2017 21:42 | 2 | -0.20 | | 0.25 | | U | 0.02 | 184.1 | 0.09 |
| 1925 | 10/31/2017 21:59 | 2 | -0.14 | 2.29 | 0.24 | | UW | | 247.3 | |
| 1926 | 10/31/2017 22:16 | 2 | -0.19 | | | | U | 0.02 | 175.9 | 0.04 |
| 1927 | 11/1/2017 0:15 | 2 | -0.58 | | | | C | 0.01 | 95.6 | 0.06 |
| 1928 | 11/1/2017 0:33 | 2 | -0.58 | | | | W | 0.02 | 304.8 | |
| 1929 | 11/1/2017 0:50 | 2 | -0.57 | | | | C | | 65.2 | |
| 1930 | 11/1/2017 1:07 | 2 | -0.71 | | | | W | | 52.6 | |
| 1931 | 11/1/2017 1:25 | 2 | -0.54 | | | 0.28 | UW | 0.03 | 104.1 | |
| 1932 | 11/1/2017 1:42 | 2 | -0.62 | | 0.25 | | U | | 112.3 | 0.04 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1933 | 11/1/2017 1:59 | 2 | -0.60 | 2.34 | 0.24 | | UW | | 254.2 | 0.15 |
| 1934 | 11/1/2017 2:16 | 2 | -0.55 | | | | U | 0.02 | 89.5 | 0.02 |
| 1935 | 11/1/2017 4:15 | 2 | -0.96 | | | | C | 0.02 | 64.5 | 0.05 |
| 1936 | 11/1/2017 4:32 | 2 | -0.93 | | | | W | 0.01 | 314.7 | |
| 1937 | 11/1/2017 4:50 | 2 | -0.88 | | | | C | | 69.1 | |
| 1938 | 11/1/2017 5:07 | 2 | -1.01 | | | | W | 0.02 | 82.5 | |
| 1939 | 11/1/2017 5:24 | 2 | -0.79 | | | 0.28 | UW | | 111.7 | |
| 1940 | 11/1/2017 5:42 | 2 | -0.91 | | 0.25 | | U | | 72.6 | 0.03 |
| 1941 | 11/1/2017 5:59 | 2 | -0.90 | 2.25 | 0.24 | | UW | 0.02 | 310.5 | 0.14 |
| 1942 | 11/1/2017 6:16 | 2 | -1.22 | | | | U | | 68.5 | 0.01 |
| 1943 | 11/1/2017 8:15 | 2 | -1.55 | | | | C | 0.02 | 98.6 | 0.08 |
| 1944 | 11/1/2017 8:32 | 2 | -1.35 | | | | W | 0.02 | 250.0 | |
| 1945 | 11/1/2017 8:50 | 2 | -1.37 | | | | C | 0.01 | 75.9 | |
| 1946 | 11/1/2017 9:07 | 2 | -1.13 | | | | W | 0.03 | 82.9 | |
| 1947 | 11/1/2017 9:24 | 2 | -1.02 | | | 0.28 | UW | 0.04 | 136.6 | |
| 1948 | 11/1/2017 9:42 | 2 | -1.03 | | 0.25 | | U | | 123.6 | 0.02 |
| 1949 | 11/1/2017 9:59 | 2 | -0.74 | 2.28 | 0.24 | | UW | 0.03 | 272.2 | 0.06 |
| 1950 | 11/1/2017 10:16 | 2 | -0.35 | | | | U | | 165.5 | 0.02 |
| 1951 | 11/1/2017 12:15 | 2 | 2.86 | | | | C | | 75.6 | 0.14 |
| 1952 | 11/1/2017 12:32 | 2 | 2.88 | | | | W | 0.02 | 351.6 | |
| 1953 | 11/1/2017 12:50 | 2 | 3.47 | | | | C | | 59.9 | |
| 1954 | 11/1/2017 13:07 | 2 | 2.83 | | | | W | 0.02 | 81.2 | |
| 1955 | 11/1/2017 13:24 | 2 | 3.84 | | | 0.32 | UW | 0.03 | 184.8 | 0.01 |
| 1956 | 11/1/2017 13:42 | 2 | 4.50 | | 0.26 | | U | 0.05 | 248.7 | 0.34 |
| 1957 | 11/1/2017 13:59 | 2 | 4.62 | 5.08 | 0.25 | | UW | 0.04 | 348.3 | |
| 1958 | 11/1/2017 14:16 | 2 | 6.58 | | | | U | 0.02 | 247.0 | 0.10 |
| 1959 | 11/2/2017 0:28 | 3 | 3.69 | | | | C | 0.02 | 199.2 | |
| 1960 | 11/2/2017 0:45 | 3 | 3.75 | 5.31 | 0.24 | | C | 0.03 | 205.4 | |
| 1961 | 11/2/2017 1:20 | 3 | 2.68 | | | | U | | 726.1 | 0.03 |
| 1962 | 11/2/2017 1:37 | 3 | 3.29 | | | | UW | 0.01 | 567.8 | |
| 1963 | 11/2/2017 1:55 | 3 | 2.70 | | | | U | | 726.1 | |
| 1964 | 11/2/2017 2:12 | 3 | 2.57 | | | | UW | 0.02 | 615.8 | |
| 1965 | 11/2/2017 4:27 | 3 | 1.58 | | | | C | 0.01 | 240.6 | 0.04 |
| 1966 | 11/2/2017 4:44 | 3 | 1.70 | 4.59 | 0.24 | | C | 0.05 | 144.8 | |
| 1967 | 11/2/2017 5:19 | 3 | 2.02 | | | | U | 0.06 | 766.8 | 0.14 |
| 1968 | 11/2/2017 5:36 | 3 | 1.93 | | | | UW | 0.01 | 506.4 | |
| 1969 | 11/2/2017 5:54 | 3 | 1.83 | | | | U | 0.03 | 537.2 | |
| 1970 | 11/2/2017 6:11 | 3 | 1.90 | | | | UW | 0.02 | 720.0 | 1.36 |
| 1971 | 11/2/2017 8:27 | 3 | 1.41 | | | | C | | 422.3 | 0.04 |
| 1972 | 11/2/2017 8:45 | 3 | 1.47 | 4.38 | 0.24 | | C | 0.03 | 158.0 | |
| 1973 | 11/2/2017 9:19 | 3 | 2.17 | | | | U | 0.03 | 957.6 | 0.15 |
| 1974 | 11/2/2017 9:36 | 3 | 2.05 | | | | UW | | 476.6 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 1975 | 11/2/2017 9:54 | 3 | 2.02 | | | | U | | 644.1 | |
| 1976 | 11/2/2017 10:11 | 3 | 2.54 | | | | UW | 0.04 | 796.5 | 0.27 |
| 1977 | 11/2/2017 12:27 | 3 | 7.70 | | | | C | 0.03 | 533.1 | 0.14 |
| 1978 | 11/2/2017 12:44 | 3 | 6.60 | 6.86 | 0.25 | | C | 0.01 | 141.7 | |
| 1979 | 11/2/2017 13:19 | 3 | 4.67 | | | | U | 0.01 | 866.5 | 0.21 |
| 1980 | 11/2/2017 13:36 | 3 | 7.63 | | | | UW | | 649.5 | |
| 1981 | 11/2/2017 13:54 | 3 | 5.93 | | | | U | | 633.7 | |
| 1982 | 11/2/2017 14:11 | 3 | 5.89 | | | | UW | 0.09 | 1160.4 | |
| 1983 | 11/2/2017 16:27 | 3 | 3.52 | | | | C | | 692.0 | |
| 1984 | 11/2/2017 16:45 | 3 | 2.93 | 6.96 | 0.24 | | C | 0.04 | 148.0 | |
| 1985 | 11/2/2017 17:19 | 3 | 1.97 | | | | U | 0.01 | 818.1 | 0.17 |
| 1986 | 11/2/2017 17:36 | 3 | 2.11 | | | | UW | 0.01 | 707.2 | |
| 1987 | 11/2/2017 17:54 | 3 | 1.63 | | | | U | | 522.1 | |
| 1988 | 11/2/2017 18:11 | 3 | 1.22 | | | | UW | 0.11 | 1691.2 | |
| 1989 | 11/2/2017 20:27 | 3 | 0.26 | | | | C | 0.03 | 367.4 | |
| 1990 | 11/2/2017 20:45 | 3 | 0.11 | 4.77 | 0.24 | | C | 0.01 | 179.4 | |
| 1991 | 11/2/2017 21:19 | 3 | -0.36 | | | | U | | 558.4 | 0.21 |
| 1992 | 11/2/2017 21:36 | 3 | -0.10 | | | | UW | 0.05 | 811.0 | |
| 1993 | 11/2/2017 21:54 | 3 | -0.41 | | | | U | | 571.4 | |
| 1994 | 11/2/2017 22:11 | 3 | -0.53 | | | | UW | 0.05 | 807.6 | |
| 1995 | 11/3/2017 0:15 | 3 | -0.63 | | | | C | 0.02 | 295.8 | |
| 1996 | 11/3/2017 0:33 | 3 | -0.64 | 3.73 | 0.24 | | C | | 135.8 | |
| 1997 | 11/3/2017 1:07 | 3 | -1.67 | | | | U | 0.02 | 645.1 | 0.25 |
| 1998 | 11/3/2017 1:24 | 3 | -0.69 | | | | UW | 0.01 | 905.4 | |
| 1999 | 11/3/2017 1:42 | 3 | -1.19 | | | | U | | 500.8 | |
| 2000 | 11/3/2017 1:59 | 3 | -1.40 | | | | UW | 0.04 | 836.6 | |
| 2001 | 11/3/2017 4:15 | 3 | -4.44 | | | | C | 0.04 | 341.8 | |
| 2002 | 11/3/2017 4:33 | 3 | -3.71 | 2.51 | 0.23 | | C | 0.03 | 131.7 | |
| 2003 | 11/3/2017 5:07 | 3 | -3.00 | | | | U | 0.03 | 466.9 | 0.20 |
| 2004 | 11/3/2017 5:24 | 3 | -2.28 | | | | UW | 0.02 | 819.5 | |
| 2005 | 11/3/2017 5:42 | 3 | -2.77 | | | | U | 0.01 | 451.8 | |
| 2006 | 11/3/2017 5:59 | 3 | -2.22 | | | | UW | | 533.5 | |
| 2007 | 11/3/2017 8:15 | 3 | -2.49 | | | | C | 0.04 | 334.2 | 0.07 |
| 2008 | 11/3/2017 8:33 | 3 | -2.36 | 2.32 | 0.23 | | C | 0.02 | 166.2 | |
| 2009 | 11/3/2017 9:07 | 3 | -2.22 | | | | U | 0.04 | 567.7 | 0.32 |
| 2010 | 11/3/2017 9:24 | 3 | -1.47 | | | | UW | 0.01 | 742.8 | |
| 2011 | 11/3/2017 9:42 | 3 | -1.74 | | | | U | | 416.4 | 0.01 |
| 2012 | 11/3/2017 9:59 | 3 | -1.18 | | | | UW | 0.03 | 587.6 | |
| 2013 | 11/3/2017 12:15 | 3 | 0.87 | | | | C | | 259.1 | |
| 2014 | 11/3/2017 12:33 | 3 | 1.21 | 3.50 | 0.24 | | C | 0.02 | 213.0 | |
| 2015 | 11/3/2017 13:07 | 3 | 0.10 | | | | U | 0.04 | 590.3 | 0.52 |
| 2016 | 11/3/2017 13:24 | 3 | 0.90 | | | | UW | | 849.0 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2017 | 11/3/2017 13:42 | 3 | 1.19 | | | | U | 0.02 | 633.8 | 0.06 |
| 2018 | 11/3/2017 13:59 | 3 | 0.88 | | | | UW | 0.02 | 557.6 | |
| 2019 | 11/3/2017 16:15 | 3 | 1.96 | | | | C | 0.02 | 252.9 | |
| 2020 | 11/3/2017 16:33 | 3 | 2.00 | 4.46 | 0.24 | | C | 0.03 | 237.8 | |
| 2021 | 11/3/2017 17:07 | 3 | 0.53 | | | | U | 0.05 | 569.4 | 0.46 |
| 2022 | 11/3/2017 17:24 | 3 | 1.01 | | | | UW | 0.03 | 796.4 | |
| 2023 | 11/3/2017 17:42 | 3 | 0.87 | | | | U | 0.01 | 443.7 | 0.02 |
| 2024 | 11/3/2017 17:59 | 3 | 0.41 | | | | UW | 0.01 | 709.3 | |
| 2025 | 11/3/2017 20:15 | 3 | -0.37 | | | | C | 0.02 | 543.5 | |
| 2026 | 11/3/2017 20:33 | 3 | -0.49 | 3.49 | 0.24 | | C | 0.02 | 253.1 | |
| 2027 | 11/3/2017 21:07 | 3 | -0.69 | | | | U | 0.04 | 548.3 | 0.28 |
| 2028 | 11/3/2017 21:24 | 3 | -0.58 | | | | UW | 0.01 | 718.5 | |
| 2029 | 11/3/2017 21:42 | 3 | -0.74 | | | | U | | 900.0 | |
| 2030 | 11/3/2017 21:59 | 3 | -0.67 | | | | UW | 0.04 | 744.2 | |
| 2031 | 11/4/2017 0:15 | 3 | -0.36 | | | | C | 0.03 | 240.1 | |
| 2032 | 11/4/2017 0:33 | 3 | -0.25 | 3.07 | 0.24 | | C | 0.05 | 267.7 | |
| 2033 | 11/4/2017 1:07 | 3 | -0.08 | | | | U | 0.06 | 448.0 | 0.36 |
| 2034 | 11/4/2017 1:25 | 3 | -0.03 | | | | UW | | 549.0 | |
| 2035 | 11/4/2017 1:42 | 3 | 0.08 | | | | U | 0.05 | 519.1 | 0.02 |
| 2036 | 11/4/2017 1:59 | 3 | 0.09 | | | | UW | 0.04 | 486.8 | |
| 2037 | 11/4/2017 4:15 | 3 | 0.35 | | | | C | 0.01 | 232.0 | |
| 2038 | 11/4/2017 4:33 | 3 | 0.49 | 3.26 | 0.24 | | C | 0.02 | 250.6 | |
| 2039 | 11/4/2017 5:07 | 3 | 0.31 | | | | U | 0.04 | 424.4 | 0.60 |
| 2040 | 11/4/2017 5:24 | 3 | 0.12 | | | | UW | 0.01 | 557.7 | |
| 2041 | 11/4/2017 5:42 | 3 | 0.30 | | | | U | 0.03 | 601.4 | 0.05 |
| 2042 | 11/4/2017 5:59 | 3 | 0.25 | | | | UW | 0.01 | 504.5 | |
| 2043 | 11/4/2017 8:15 | 3 | 1.34 | | | | C | 0.02 | 160.6 | |
| 2044 | 11/4/2017 8:32 | 3 | 1.47 | 3.55 | 0.24 | | C | 0.01 | 246.2 | |
| 2045 | 11/4/2017 9:07 | 3 | 2.03 | | | | U | 0.04 | 458.9 | 0.83 |
| 2046 | 11/4/2017 9:24 | 3 | 1.86 | | | | UW | 0.01 | 492.5 | |
| 2047 | 11/4/2017 9:42 | 3 | 2.17 | | | | U | 0.03 | 481.9 | 0.10 |
| 2048 | 11/4/2017 9:59 | 3 | 2.47 | | | | UW | 0.02 | 533.7 | |
| 2049 | 11/4/2017 12:15 | 3 | 4.78 | | | | C | 0.04 | 185.3 | |
| 2050 | 11/4/2017 12:33 | 3 | 5.24 | 5.33 | 0.24 | | C | 0.01 | 339.8 | |
| 2051 | 11/4/2017 13:07 | 3 | 5.05 | | | | U | 0.01 | 401.8 | 1.38 |
| 2052 | 11/4/2017 13:24 | 3 | 5.47 | | | | UW | 0.04 | 466.3 | |
| 2053 | 11/4/2017 13:42 | 3 | 5.70 | | | | U | 0.05 | 455.0 | 0.20 |
| 2054 | 11/4/2017 13:59 | 3 | 5.80 | | | | UW | 0.01 | 366.9 | |
| 2055 | 11/4/2017 16:15 | 3 | 6.58 | | | | C | 0.01 | 111.6 | |
| 2056 | 11/4/2017 16:32 | 3 | 6.61 | 6.70 | 0.24 | | C | | 316.7 | |
| 2057 | 11/4/2017 17:07 | 3 | 6.22 | | | | U | 0.03 | 359.6 | 1.25 |
| 2058 | 11/4/2017 17:24 | 3 | 6.47 | | | | UW | 0.06 | 480.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2059 | 11/4/2017 17:42 | 3 | 6.35 | | | | U | 0.02 | 465.7 | 0.12 |
| 2060 | 11/4/2017 17:59 | 3 | 5.75 | | | | UW | | 465.1 | |
| 2061 | 11/4/2017 20:15 | 3 | 4.01 | | | | C | | 190.9 | |
| 2062 | 11/4/2017 20:33 | 3 | 4.24 | 5.93 | 0.24 | | C | 0.01 | 223.8 | |
| 2063 | 11/4/2017 21:07 | 3 | 5.28 | | | | U | 0.03 | 494.2 | 3.24 |
| 2064 | 11/4/2017 21:24 | 3 | 4.78 | | | | UW | 0.04 | 566.7 | |
| 2065 | 11/4/2017 21:42 | 3 | 4.85 | | | | U | 0.01 | 556.5 | 0.27 |
| 2066 | 11/4/2017 21:59 | 3 | 4.66 | | | | UW | 0.04 | 571.6 | |
| 2067 | 11/5/2017 0:15 | 3 | 2.90 | | | | C | | 536.7 | |
| 2068 | 11/5/2017 0:33 | 3 | 2.11 | 5.62 | 0.24 | | C | 0.02 | 150.8 | |
| 2069 | 11/5/2017 1:07 | 3 | 1.05 | | | | U | 0.06 | 528.6 | 0.28 |
| 2070 | 11/5/2017 1:25 | 3 | 0.65 | | | | UW | | 202.9 | |
| 2071 | 11/5/2017 1:42 | 3 | 0.11 | | | | U | 0.01 | 238.2 | |
| 2072 | 11/5/2017 1:59 | 3 | 0.19 | | | | UW | 0.02 | 279.0 | |
| 2073 | 11/5/2017 4:15 | 3 | -0.23 | | | | C | | 144.2 | 0.03 |
| 2074 | 11/5/2017 4:33 | 3 | -0.29 | 4.11 | 0.25 | | C | | 130.7 | 0.01 |
| 2075 | 11/5/2017 5:07 | 3 | -0.91 | | | | U | 0.04 | 320.1 | |
| 2076 | 11/5/2017 5:24 | 3 | 0.15 | | | | UW | | 2948.9 | 0.04 |
| 2077 | 11/5/2017 5:42 | 3 | -0.39 | | | | U | 0.01 | 15.9 | |
| 2078 | 11/5/2017 5:59 | 3 | -0.94 | | | | UW | | 18.1 | |
| 2079 | 11/5/2017 8:15 | 3 | -4.17 | | | | C | | 199.2 | 0.12 |
| 2080 | 11/5/2017 8:33 | 3 | -4.20 | 3.73 | 0.25 | | C | 0.02 | 269.4 | |
| 2081 | 11/5/2017 9:07 | 3 | -3.15 | | | | U | 0.02 | 37.3 | |
| 2082 | 11/5/2017 9:24 | 3 | -2.75 | | | | UW | | 119.7 | |
| 2083 | 11/5/2017 9:42 | 3 | -3.67 | | | | U | 0.02 | | |
| 2084 | 11/5/2017 9:59 | 3 | -2.93 | | | | UW | | 17.1 | |
| 2085 | 11/5/2017 12:18 | 3 | -1.77 | | | | C | | | 0.25 |
| 2086 | 11/5/2017 12:35 | 3 | -2.23 | 3.92 | 0.25 | | C | 0.01 | 28.7 | |
| 2087 | 11/5/2017 13:10 | 3 | -3.26 | | | | U | 0.02 | 112.6 | |
| 2088 | 11/5/2017 13:27 | 3 | -1.35 | | | | UW | | 335.3 | |
| 2089 | 11/5/2017 13:45 | 3 | -2.03 | | | | U | | 16.1 | |
| 2090 | 11/5/2017 14:02 | 3 | -2.19 | | | | UW | | 50.5 | |
| 2091 | 11/5/2017 16:15 | 3 | -2.53 | | | | C | | 154.0 | 0.56 |
| 2092 | 11/5/2017 16:33 | 3 | -2.90 | 3.78 | 0.26 | | C | | 130.3 | |
| 2093 | 11/5/2017 17:07 | 3 | -4.70 | | | | U | | 86.3 | |
| 2094 | 11/5/2017 17:24 | 3 | -2.81 | | | | UW | | 150.3 | |
| 2095 | 11/5/2017 17:42 | 3 | -3.51 | | | | U | | 5.6 | |
| 2096 | 11/5/2017 17:59 | 3 | -4.01 | | | | UW | | 76.5 | |
| 2097 | 11/5/2017 20:15 | 3 | -10.32 | | | | C | 0.02 | 255.8 | 0.90 |
| 2098 | 11/5/2017 20:35 | 3 | -10.19 | 2.96 | 0.24 | | C | | 206.0 | 0.09 |
| 2099 | 11/5/2017 21:10 | 3 | -11.13 | | | | U | 0.01 | 283.5 | |
| 2100 | 11/5/2017 21:30 | 3 | -8.70 | | | | UW | | 189.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2101 | 11/5/2017 21:50 | 3 | -10.62 | | | | U | 0.01 | | |
| 2102 | 11/5/2017 22:07 | 3 | -10.68 | | | | UW | | | |
| 2103 | 11/6/2017 0:18 | 3 | -11.95 | | | | C | | 190.3 | 0.93 |
| 2104 | 11/6/2017 0:29 | 3 | -12.35 | | | | C | 0.02 | 141.0 | |
| 2105 | 11/6/2017 0:38 | 3 | -11.59 | 2.45 | 0.24 | | C | | 110.7 | |
| 2106 | 11/6/2017 0:49 | 3 | -11.43 | 2.32 | 0.23 | | C | 0.03 | 190.8 | |
| 2107 | 11/6/2017 1:13 | 3 | -10.96 | | | | U | | 103.1 | 0.10 |
| 2108 | 11/6/2017 1:23 | 3 | -10.85 | | | | U | | 316.2 | 0.43 |
| 2109 | 11/6/2017 1:43 | 3 | -8.23 | | | | UW | | 40.8 | 0.45 |
| 2110 | 11/6/2017 2:01 | 3 | -8.66 | | | | U | | | 0.24 |
| 2111 | 11/6/2017 2:18 | 3 | -8.68 | | | | UW | 0.02 | 359.1 | |
| 2112 | 11/6/2017 4:28 | 3 | -7.45 | | | | C | 0.01 | 210.6 | |
| 2113 | 11/6/2017 4:48 | 3 | -7.19 | 2.03 | 0.23 | | C | | 130.7 | |
| 2114 | 11/6/2017 5:23 | 3 | -7.85 | | | | U | | 346.1 | 0.26 |
| 2115 | 11/6/2017 5:40 | 3 | -5.28 | | | | UW | 0.02 | 73.4 | 0.42 |
| 2116 | 11/6/2017 5:57 | 3 | -6.11 | | | | U | 0.01 | 302.9 | |
| 2117 | 11/6/2017 6:15 | 3 | -6.05 | | | | UW | 0.01 | 233.4 | |
| 2118 | 11/6/2017 8:28 | 3 | -4.14 | | | | C | | 104.2 | |
| 2119 | 11/6/2017 8:48 | 3 | -3.78 | 1.99 | 0.23 | | C | 0.02 | | |
| 2120 | 11/6/2017 9:23 | 3 | -4.12 | | | | U | 0.01 | 398.2 | 0.24 |
| 2121 | 11/6/2017 9:40 | 3 | -2.67 | | | | UW | | 231.1 | 0.03 |
| 2122 | 11/6/2017 9:58 | 3 | -2.13 | | | | U | 0.01 | 302.6 | 0.08 |
| 2123 | 11/6/2017 10:15 | 3 | -2.24 | | | | UW | | 297.4 | |
| 2124 | 11/6/2017 12:28 | 3 | -1.90 | | | | C | | 139.1 | |
| 2125 | 11/6/2017 12:48 | 3 | -1.44 | 2.14 | 0.23 | | C | | | |
| 2126 | 11/6/2017 13:23 | 3 | -1.66 | | | | U | | 301.6 | 0.10 |
| 2127 | 11/6/2017 13:43 | 3 | -1.76 | | | | UW | | 314.8 | |
| 2128 | 11/6/2017 14:03 | 3 | -1.49 | | | | U | 0.03 | 255.0 | 0.07 |
| 2129 | 11/6/2017 14:20 | 3 | -1.23 | | | | UW | 0.02 | 241.6 | |
| 2130 | 11/6/2017 16:28 | 3 | -2.15 | | | | C | 0.02 | 103.4 | |
| 2131 | 11/6/2017 16:48 | 3 | -1.60 | 2.29 | 0.25 | | C | | 44.8 | |
| 2132 | 11/6/2017 17:23 | 3 | -2.56 | | | | U | 0.03 | 204.3 | 0.01 |
| 2133 | 11/6/2017 17:43 | 3 | -3.00 | | | | UW | 0.03 | 292.6 | |
| 2134 | 11/6/2017 18:00 | 3 | -2.80 | | | | U | | 168.9 | 0.10 |
| 2135 | 11/6/2017 18:17 | 3 | -3.04 | | | | UW | | 318.5 | |
| 2136 | 11/6/2017 20:28 | 3 | -3.59 | | | | C | 0.02 | 235.5 | |
| 2137 | 11/6/2017 20:48 | 3 | -2.41 | 2.46 | 0.26 | | C | | 3.0 | |
| 2138 | 11/6/2017 21:23 | 3 | -3.28 | | | | U | | 663.9 | 0.02 |
| 2139 | 11/6/2017 21:40 | 3 | -3.14 | | | | UW | 0.02 | 459.7 | 0.08 |
| 2140 | 11/6/2017 22:00 | 3 | -3.25 | | | | U | 0.01 | 348.7 | 0.05 |
| 2141 | 11/6/2017 22:18 | 3 | -3.29 | | | | UW | 0.02 | 641.0 | |
| 2142 | 11/7/2017 0:15 | 3 | -3.18 | | | | C | 0.02 | 211.9 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2143 | 11/7/2017 0:35 | 3 | -2.19 | 2.60 | 0.26 | | C | 0.01 | 21.4 | |
| 2144 | 11/7/2017 1:10 | 3 | -3.20 | | | | U | 0.02 | 578.8 | 0.02 |
| 2145 | 11/7/2017 1:27 | 3 | -2.93 | | | | UW | 0.01 | 465.1 | 0.04 |
| 2146 | 11/7/2017 1:47 | 3 | -3.01 | | | | U | 0.01 | 351.9 | 0.04 |
| 2147 | 11/7/2017 2:05 | 3 | -3.05 | | | | UW | 0.02 | 598.2 | |
| 2148 | 11/7/2017 4:15 | 3 | -6.22 | | | | C | 0.01 | 229.3 | |
| 2149 | 11/7/2017 4:35 | 3 | -3.56 | 2.68 | 0.26 | | C | 0.01 | | 0.01 |
| 2150 | 11/7/2017 5:10 | 3 | -4.10 | | | | U | | 364.4 | 0.02 |
| 2151 | 11/7/2017 5:27 | 3 | -3.52 | | | | UW | | 382.5 | 0.08 |
| 2152 | 11/7/2017 5:47 | 3 | -3.99 | | | | U | | 339.8 | 0.04 |
| 2153 | 11/7/2017 6:05 | 3 | -4.23 | | | | UW | 0.02 | 622.4 | |
| 2154 | 11/7/2017 8:15 | 3 | -4.45 | | | | C | 0.04 | 307.7 | 0.01 |
| 2155 | 11/7/2017 8:35 | 3 | -3.06 | 2.77 | 0.26 | | C | 0.03 | 153.5 | 0.01 |
| 2156 | 11/7/2017 9:13 | 3 | -2.32 | | | | U | | 490.5 | 0.03 |
| 2157 | 11/7/2017 9:33 | 3 | 0.75 | | | | UW | 0.03 | 269.8 | 0.04 |
| 2158 | 11/7/2017 9:53 | 3 | -0.46 | | | | U | 0.03 | 346.1 | 0.05 |
| 2159 | 11/7/2017 10:10 | 3 | 0.09 | | | | UW | 0.01 | 433.0 | 0.41 |
| 2160 | 11/7/2017 12:15 | 3 | 0.26 | | | | C | | 312.1 | |
| 2161 | 11/7/2017 12:32 | 3 | -0.27 | 2.96 | 0.26 | | C | | 153.8 | |
| 2162 | 11/7/2017 13:07 | 3 | -1.31 | | | | U | | 466.6 | 0.01 |
| 2163 | 11/7/2017 13:24 | 3 | 0.09 | | | | UW | 0.01 | 280.1 | 0.05 |
| 2164 | 11/7/2017 13:42 | 3 | -0.18 | | | | U | 0.01 | 157.7 | 0.03 |
| 2165 | 11/7/2017 13:59 | 3 | -0.54 | | | | UW | | 444.1 | 1.26 |
| 2166 | 11/7/2017 16:15 | 3 | -1.70 | | | | C | | 266.7 | |
| 2167 | 11/7/2017 16:35 | 3 | -1.85 | 2.86 | 0.26 | | C | | 140.0 | |
| 2168 | 11/7/2017 17:10 | 3 | -2.25 | | | | U | 0.01 | 521.1 | 0.02 |
| 2169 | 11/7/2017 17:27 | 3 | -2.37 | | | | UW | | 331.5 | 0.06 |
| 2170 | 11/7/2017 17:45 | 3 | -2.33 | | | | U | 0.04 | 832.2 | 0.02 |
| 2171 | 11/7/2017 18:02 | 3 | -2.58 | | | | UW | | 37.2 | 0.60 |
| 2172 | 11/7/2017 20:15 | 3 | -2.66 | | | | C | | 387.2 | 0.01 |
| 2173 | 11/7/2017 20:33 | 3 | -2.52 | 2.75 | 0.26 | | C | | 99.0 | |
| 2174 | 11/7/2017 21:07 | 3 | -2.59 | | | | U | | 695.2 | 0.01 |
| 2175 | 11/7/2017 21:24 | 3 | -2.61 | | | | UW | 0.01 | 258.3 | 0.06 |
| 2176 | 11/7/2017 21:42 | 3 | -2.60 | | | | U | 0.03 | 969.9 | 0.02 |
| 2177 | 11/7/2017 21:59 | 3 | -2.69 | | | | UW | 0.01 | 119.4 | 0.25 |
| 2178 | 11/8/2017 0:15 | 3 | -5.62 | | | | C | 0.01 | 277.4 | |
| 2179 | 11/8/2017 0:36 | 3 | -6.69 | 2.68 | 0.25 | | C | 0.02 | 192.2 | |
| 2180 | 11/8/2017 1:10 | 3 | -7.87 | | | | U | 0.01 | 549.5 | 0.04 |
| 2181 | 11/8/2017 1:27 | 3 | -9.50 | | | | UW | 0.01 | 347.5 | |
| 2182 | 11/8/2017 1:45 | 3 | -8.60 | | | | U | 0.03 | 544.4 | 0.13 |
| 2183 | 11/8/2017 2:02 | 3 | -9.06 | | | | UW | | 295.6 | |
| 2184 | 11/8/2017 4:15 | 3 | -9.78 | | | | C | 0.01 | 145.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2185 | 11/8/2017 4:33 | 3 | -10.94 | 2.44 | 0.24 | | C | 0.03 | 318.2 | |
| 2186 | 11/8/2017 5:07 | 3 | -10.70 | | | | U | 0.01 | 489.9 | 0.10 |
| 2187 | 11/8/2017 5:24 | 3 | -12.09 | | | | UW | 0.02 | 312.2 | |
| 2188 | 11/8/2017 5:42 | 3 | -10.21 | | | | U | 0.03 | 379.1 | 0.17 |
| 2189 | 11/8/2017 5:59 | 3 | -11.36 | | | | UW | | 352.8 | |
| 2190 | 11/8/2017 8:15 | 3 | -7.23 | | | | C | | 105.9 | 0.16 |
| 2191 | 11/8/2017 8:33 | 3 | -5.08 | 2.36 | 0.24 | | C | 0.02 | 214.1 | |
| 2192 | 11/8/2017 9:07 | 3 | -3.82 | | | | U | 0.01 | 427.1 | 0.01 |
| 2193 | 11/8/2017 9:24 | 3 | -3.88 | | | | UW | | 238.2 | 0.19 |
| 2194 | 11/8/2017 9:42 | 3 | -2.06 | | | | U | 0.01 | 370.4 | 0.13 |
| 2195 | 11/8/2017 9:59 | 3 | -0.42 | | | | UW | | 134.0 | 1.43 |
| 2196 | 11/8/2017 12:15 | 3 | 2.24 | | | | C | | 77.1 | |
| 2197 | 11/8/2017 12:33 | 3 | 1.45 | 2.58 | 0.27 | | C | 0.01 | 304.6 | |
| 2198 | 11/8/2017 13:07 | 3 | 2.98 | | | | U | 0.01 | 317.4 | 0.03 |
| 2199 | 11/8/2017 13:24 | 3 | 3.41 | | | | UW | | 88.2 | |
| 2200 | 11/8/2017 13:42 | 3 | 3.61 | | | | U | 0.03 | 214.5 | 0.71 |
| 2201 | 11/8/2017 13:59 | 3 | 3.56 | | | | UW | | 214.4 | |
| 2202 | 11/8/2017 16:15 | 3 | 2.01 | | | | C | 0.02 | 229.6 | |
| 2203 | 11/8/2017 16:33 | 3 | 1.13 | 2.74 | 0.32 | | C | 0.05 | 180.6 | |
| 2204 | 11/8/2017 17:07 | 3 | 0.77 | | | | U | 0.03 | 390.5 | 0.41 |
| 2205 | 11/8/2017 17:24 | 3 | -0.09 | | | | UW | 0.03 | 158.1 | |
| 2206 | 11/8/2017 17:42 | 3 | -0.18 | | | | U | 0.03 | 503.4 | 0.92 |
| 2207 | 11/8/2017 17:59 | 3 | -0.46 | | | | UW | | 344.7 | |
| 2208 | 11/8/2017 20:15 | 3 | -1.46 | | | | C | 0.03 | 314.0 | |
| 2209 | 11/8/2017 20:33 | 3 | -1.87 | 2.56 | 0.31 | | C | 0.02 | 147.1 | |
| 2210 | 11/8/2017 21:07 | 3 | -2.48 | | | | U | 0.01 | 579.5 | 0.16 |
| 2211 | 11/8/2017 21:24 | 3 | -2.10 | | | | UW | 0.02 | 279.7 | |
| 2212 | 11/8/2017 21:42 | 3 | -2.28 | | | | U | 0.06 | 826.5 | 0.33 |
| 2213 | 11/8/2017 21:59 | 3 | -2.63 | | | | UW | 0.05 | 376.3 | |
| 2214 | 11/9/2017 0:15 | 3 | -5.33 | | | | C | 0.05 | 306.9 | |
| 2215 | 11/9/2017 0:33 | 3 | -6.12 | 2.25 | 0.23 | | C | | 3.8 | 0.03 |
| 2216 | 11/9/2017 1:07 | 3 | -5.83 | | | | U | | 30.2 | |
| 2217 | 11/9/2017 1:25 | 3 | -4.76 | | | | UW | 0.01 | 272.6 | 0.02 |
| 2218 | 11/9/2017 1:42 | 3 | -5.23 | | | | U | 0.04 | 859.0 | 0.18 |
| 2219 | 11/9/2017 1:59 | 3 | -5.60 | | | | UW | 0.03 | 313.8 | |
| 2220 | 11/9/2017 4:15 | 3 | -6.14 | | | | C | 0.03 | 603.1 | 0.08 |
| 2221 | 11/9/2017 4:33 | 3 | -6.88 | 1.90 | 0.20 | | C | | | 0.01 |
| 2222 | 11/9/2017 5:07 | 3 | -9.08 | | | | U | | 1548.1 | |
| 2223 | 11/9/2017 5:24 | 3 | -7.93 | | | | UW | 0.01 | 188.5 | 0.01 |
| 2224 | 11/9/2017 5:42 | 3 | -9.13 | | | | U | | | |
| 2225 | 11/9/2017 5:59 | 3 | -8.91 | | | | UW | 0.02 | 254.7 | |
| 2226 | 11/9/2017 8:15 | 3 | -8.01 | | | | C | 0.05 | 233.6 | 0.01 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2227 | 11/9/2017 8:33 | 3 | -8.37 | 1.54 | 0.18 | | C | 0.03 | | 0.02 |
| 2228 | 11/9/2017 9:07 | 3 | -7.49 | | | | U | 0.01 | 24.5 | |
| 2229 | 11/9/2017 9:24 | 3 | -3.83 | | | | UW | 0.04 | 185.2 | 0.08 |
| 2230 | 11/9/2017 9:42 | 3 | -4.97 | | | | U | | | |
| 2231 | 11/9/2017 9:59 | 3 | -3.85 | | | | UW | 0.03 | 243.9 | 0.38 |
| 2232 | 11/9/2017 12:15 | 3 | -3.76 | | | | C | 0.05 | 660.8 | |
| 2233 | 11/9/2017 12:33 | 3 | -5.00 | 1.56 | 0.19 | | C | | 76.3 | |
| 2234 | 11/9/2017 13:07 | 3 | -5.28 | | | | U | 0.03 | 75.4 | |
| 2235 | 11/9/2017 13:24 | 3 | -2.75 | | | | UW | 0.02 | 238.2 | 0.12 |
| 2236 | 11/9/2017 13:42 | 3 | -2.20 | | | | U | 0.01 | | |
| 2237 | 11/9/2017 13:59 | 3 | -1.88 | | | | UW | 0.02 | 292.8 | 0.02 |
| 2238 | 11/9/2017 16:15 | 3 | -6.03 | | | | C | 0.04 | 347.7 | |
| 2239 | 11/9/2017 16:33 | 3 | -7.25 | 1.50 | 0.18 | | C | 0.02 | 89.0 | |
| 2240 | 11/9/2017 17:07 | 3 | -8.93 | | | | U | 0.02 | 71.6 | |
| 2241 | 11/9/2017 17:24 | 3 | -8.25 | | | | UW | | 216.6 | 0.03 |
| 2242 | 11/9/2017 17:42 | 3 | -9.31 | | | | U | | 116.1 | |
| 2243 | 11/9/2017 17:59 | 3 | -9.35 | | | | UW | | 202.9 | |
| 2244 | 11/9/2017 20:15 | 3 | -13.51 | | | | C | 0.03 | 164.7 | |
| 2245 | 11/9/2017 20:33 | 3 | -13.27 | 1.04 | 0.17 | | C | 0.03 | 209.3 | |
| 2246 | 11/9/2017 21:07 | 3 | -13.26 | | | | U | 0.02 | | |
| 2247 | 11/9/2017 21:24 | 3 | -12.23 | | | | UW | 0.01 | 165.3 | 0.04 |
| 2248 | 11/9/2017 21:42 | 3 | -13.65 | | | | U | | | |
| 2249 | 11/9/2017 21:59 | 3 | -12.80 | | | | UW | 0.01 | 202.4 | 0.01 |
| 2250 | 11/10/2017 0:15 | 3 | -9.68 | | | | C | 0.02 | 189.0 | 0.07 |
| 2251 | 11/10/2017 0:33 | 3 | -9.43 | 0.62 | 0.17 | | C | 0.05 | 126.3 | |
| 2252 | 11/10/2017 1:07 | 3 | -11.11 | | | | U | | 23.3 | |
| 2253 | 11/10/2017 1:25 | 3 | -8.70 | | | | UW | | 138.8 | 0.06 |
| 2254 | 11/10/2017 1:42 | 3 | -9.50 | | | | U | | | |
| 2255 | 11/10/2017 1:59 | 3 | -9.13 | | | | UW | 0.02 | 219.5 | 0.02 |
| 2256 | 11/10/2017 4:15 | 3 | -9.51 | | | | C | | 146.7 | 0.01 |
| 2257 | 11/10/2017 4:33 | 3 | -9.20 | 0.19 | 0.17 | | C | 0.04 | 195.9 | |
| 2258 | 11/10/2017 5:07 | 3 | -10.07 | | | | U | 0.03 | 18.3 | |
| 2259 | 11/10/2017 5:24 | 3 | -8.93 | | | | UW | 0.01 | 174.0 | 0.07 |
| 2260 | 11/10/2017 5:42 | 3 | -9.52 | | | | U | | | |
| 2261 | 11/10/2017 5:59 | 3 | -9.18 | | | | UW | 0.05 | 249.5 | 0.02 |
| 2262 | 11/10/2017 8:15 | 3 | -8.80 | | | | C | | 72.4 | 0.02 |
| 2263 | 11/10/2017 8:33 | 3 | -8.33 | -0.15 | 0.17 | | C | 0.04 | 276.5 | |
| 2264 | 11/10/2017 9:07 | 3 | -8.65 | | | | U | 0.01 | 39.5 | |
| 2265 | 11/10/2017 9:24 | 3 | -7.79 | | | | UW | | 34.1 | 0.07 |
| 2266 | 11/10/2017 9:42 | 3 | -7.92 | | | | U | | | |
| 2267 | 11/10/2017 9:59 | 3 | -7.46 | | | | UW | | 163.3 | 0.02 |
| 2268 | 11/10/2017 12:15 | 3 | -6.39 | | | | C | 0.01 | 29.4 | 0.09 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2269 | 11/10/2017 12:33 | 3 | -5.79 | -0.05 | 0.17 | | C | 0.03 | 504.0 | |
| 2270 | 11/10/2017 13:07 | 3 | -6.42 | | | | U | | | |
| 2271 | 11/10/2017 13:24 | 3 | -5.42 | | | | UW | | 33.4 | 0.08 |
| 2272 | 11/10/2017 13:42 | 3 | -5.47 | | | | U | | | |
| 2273 | 11/10/2017 13:59 | 3 | -5.27 | | | | UW | 0.01 | 108.3 | 0.02 |
| 2274 | 11/10/2017 16:15 | 3 | -4.83 | | | | C | | 69.3 | 0.01 |
| 2275 | 11/10/2017 16:33 | 3 | -4.74 | -0.11 | 0.17 | | C | 0.01 | 339.5 | |
| 2276 | 11/10/2017 17:07 | 3 | -4.83 | | | | U | 0.04 | 307.4 | |
| 2277 | 11/10/2017 17:24 | 3 | -4.50 | | | | UW | 0.01 | 106.2 | 0.09 |
| 2278 | 11/10/2017 17:42 | 3 | -4.58 | | | | U | | | |
| 2279 | 11/10/2017 17:59 | 3 | -4.37 | | | | UW | 0.02 | 128.4 | 0.13 |
| 2280 | 11/10/2017 20:15 | 3 | -3.62 | | | | C | 0.01 | 33.3 | 0.01 |
| 2281 | 11/10/2017 20:33 | 3 | -3.50 | 0.01 | 0.17 | | C | 0.01 | 269.4 | |
| 2282 | 11/10/2017 21:07 | 3 | -3.35 | | | | U | | 18.6 | |
| 2283 | 11/10/2017 21:24 | 3 | -3.08 | | | | UW | 0.02 | 58.4 | 0.11 |
| 2284 | 11/10/2017 21:42 | 3 | -3.13 | | | | U | 0.01 | | |
| 2285 | 11/10/2017 21:59 | 3 | -3.03 | | | | UW | 0.01 | 100.9 | 0.55 |
| 2286 | 11/11/2017 0:15 | 3 | -3.68 | | | | C | | 72.9 | 0.10 |
| 2287 | 11/11/2017 0:33 | 3 | -3.62 | -0.10 | 0.17 | | C | 0.05 | 236.3 | |
| 2288 | 11/11/2017 1:07 | 3 | -3.76 | | | | U | 0.03 | 3.6 | |
| 2289 | 11/11/2017 1:25 | 3 | -3.63 | | | | UW | | 38.8 | 0.07 |
| 2290 | 11/11/2017 1:42 | 3 | -4.22 | | | | U | | | |
| 2291 | 11/11/2017 1:59 | 3 | -4.19 | | | | UW | 0.01 | 107.1 | 0.50 |
| 2292 | 11/11/2017 4:15 | 3 | -5.37 | | | | C | | 71.3 | 0.15 |
| 2293 | 11/11/2017 4:33 | 3 | -5.56 | -0.33 | 0.17 | | C | 0.04 | 215.5 | |
| 2294 | 11/11/2017 5:07 | 3 | -6.19 | | | | U | 0.04 | 8.5 | |
| 2295 | 11/11/2017 5:24 | 3 | -6.31 | | | | UW | | 89.9 | 0.04 |
| 2296 | 11/11/2017 5:42 | 3 | -7.25 | | | | U | | | |
| 2297 | 11/11/2017 5:59 | 3 | -6.71 | | | | UW | 0.02 | 111.3 | 0.02 |
| 2298 | 11/11/2017 8:15 | 3 | -5.70 | | | | C | 0.04 | 74.0 | 0.05 |
| 2299 | 11/11/2017 8:32 | 3 | -5.48 | -0.48 | 0.17 | | C | 0.02 | 170.5 | |
| 2300 | 11/11/2017 9:07 | 3 | 0.26 | | | | U | 0.02 | 32.9 | |
| 2301 | 11/11/2017 9:24 | 3 | 1.78 | | | | UW | | 142.7 | 0.08 |
| 2302 | 11/11/2017 9:42 | 3 | 2.90 | | | | U | 0.04 | 401.8 | 0.12 |
| 2303 | 11/11/2017 9:59 | 3 | 3.31 | | | | UW | 0.01 | 232.8 | |
| 2304 | 11/11/2017 12:15 | 3 | 9.43 | | | | C | | 101.6 | |
| 2305 | 11/11/2017 12:33 | 3 | 5.92 | 1.37 | 0.28 | | C | | 152.3 | |
| 2306 | 11/11/2017 13:07 | 3 | 7.70 | | | | U | 0.01 | 455.7 | 0.78 |
| 2307 | 11/11/2017 13:24 | 3 | 10.48 | | | | UW | 0.03 | 556.3 | 0.56 |
| 2308 | 11/11/2017 13:42 | 3 | 10.36 | | | | U | 0.03 | 844.1 | 3.40 |
| 2309 | 11/11/2017 13:59 | 3 | 8.83 | | | | UW | 0.04 | 462.1 | |
| 2310 | 11/11/2017 16:15 | 3 | 6.90 | | | | C | 0.01 | 196.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2311 | 11/11/2017 16:33 | 3 | 5.41 | 2.13 | 0.31 | | C | 0.03 | 155.8 | |
| 2312 | 11/11/2017 17:07 | 3 | 1.27 | | | | U | 0.02 | 283.4 | 3.07 |
| 2313 | 11/11/2017 17:24 | 3 | -0.60 | | | | UW | 0.05 | 341.1 | |
| 2314 | 11/11/2017 17:42 | 3 | -1.88 | | | | U | 0.02 | 253.3 | 1.37 |
| 2315 | 11/11/2017 17:59 | 3 | -1.24 | | | | UW | 0.01 | 376.7 | 0.11 |
| 2316 | 11/11/2017 20:15 | 3 | -0.94 | | | | C | | 177.5 | |
| 2317 | 11/11/2017 20:33 | 3 | -0.55 | 1.69 | 0.27 | | C | 0.02 | 178.1 | |
| 2318 | 11/11/2017 21:07 | 3 | -0.36 | | | | U | 0.07 | 485.0 | 1.21 |
| 2319 | 11/11/2017 21:24 | 3 | -0.21 | | | | UW | 0.02 | 277.3 | |
| 2320 | 11/11/2017 21:42 | 3 | -0.50 | | | | U | 0.05 | 509.2 | 0.84 |
| 2321 | 11/11/2017 21:59 | 3 | -0.40 | | | | UW | 0.03 | 364.5 | |
| 2322 | 11/12/2017 0:15 | 3 | -4.75 | | | | C | 0.01 | 129.3 | |
| 2323 | 11/12/2017 0:33 | 3 | -3.86 | 1.64 | 0.23 | | C | 0.05 | 144.4 | |
| 2324 | 11/12/2017 1:07 | 3 | -3.76 | | | | U | 0.01 | 398.4 | 0.93 |
| 2325 | 11/12/2017 1:25 | 3 | -3.68 | | | | UW | 0.03 | 270.8 | |
| 2326 | 11/12/2017 1:42 | 3 | -4.61 | | | | U | 0.04 | 311.5 | 0.77 |
| 2327 | 11/12/2017 1:59 | 3 | -4.27 | | | | UW | 0.01 | 247.5 | |
| 2328 | 11/12/2017 4:15 | 3 | -6.72 | | | | C | 0.01 | 129.6 | |
| 2329 | 11/12/2017 4:33 | 3 | -7.11 | 1.26 | 0.19 | | C | 0.05 | 126.6 | |
| 2330 | 11/12/2017 5:07 | 3 | -7.44 | | | | U | 0.03 | 295.5 | 1.05 |
| 2331 | 11/12/2017 5:24 | 3 | -6.73 | | | | UW | 0.04 | 261.4 | |
| 2332 | 11/12/2017 5:42 | 3 | -7.29 | | | | U | 0.01 | 188.9 | 1.07 |
| 2333 | 11/12/2017 5:59 | 3 | -7.06 | | | | UW | 0.01 | 141.4 | |
| 2334 | 11/12/2017 8:15 | 3 | -4.56 | | | | C | 0.02 | 117.3 | |
| 2335 | 11/12/2017 8:33 | 3 | -4.40 | 0.28 | 0.17 | | C | 0.03 | 141.5 | |
| 2336 | 11/12/2017 9:07 | 3 | -0.82 | | | | U | 0.04 | 325.6 | 0.78 |
| 2337 | 11/12/2017 9:24 | 3 | 0.62 | | | | UW | 0.02 | 210.6 | |
| 2338 | 11/12/2017 9:42 | 3 | 1.48 | | | | U | 0.01 | 579.6 | 1.10 |
| 2339 | 11/12/2017 9:59 | 3 | 2.72 | | | | UW | 0.04 | 224.8 | |
| 2340 | 11/12/2017 12:15 | 3 | 7.19 | | | | C | | 147.5 | |
| 2341 | 11/12/2017 12:33 | 3 | 4.17 | 1.61 | 0.28 | | C | 0.02 | 159.5 | |
| 2342 | 11/12/2017 13:07 | 3 | 6.00 | | | | U | 0.01 | 511.8 | 2.02 |
| 2343 | 11/12/2017 13:24 | 3 | 8.28 | | | | UW | | 288.1 | |
| 2344 | 11/12/2017 13:42 | 3 | 8.07 | | | | U | 0.06 | 792.3 | 1.49 |
| 2345 | 11/12/2017 13:59 | 3 | 7.41 | | | | UW | 0.01 | 424.9 | |
| 2346 | 11/12/2017 16:15 | 3 | 6.77 | | | | C | 0.01 | 153.2 | |
| 2347 | 11/12/2017 16:33 | 3 | 4.89 | 2.36 | 0.29 | | C | 0.02 | 187.9 | |
| 2348 | 11/12/2017 17:07 | 3 | -1.44 | | | | U | | 286.2 | 3.25 |
| 2349 | 11/12/2017 17:24 | 3 | -1.40 | | | | UW | | 221.9 | 0.06 |
| 2350 | 11/12/2017 17:42 | 3 | -2.28 | | | | U | 0.01 | 302.3 | 1.46 |
| 2351 | 11/12/2017 17:59 | 3 | -2.69 | | | | UW | | 291.5 | 0.32 |
| 2352 | 11/12/2017 20:15 | 3 | -3.31 | | | | C | 0.04 | 135.0 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2353 | 11/12/2017 20:33 | 3 | -3.88 | 1.67 | 0.24 | | C | 0.03 | 199.1 | |
| 2354 | 11/12/2017 21:07 | 3 | -2.99 | | | | U | 0.04 | 493.0 | 4.06 |
| 2355 | 11/12/2017 21:24 | 3 | -2.86 | | | | UW | 0.02 | 274.1 | |
| 2356 | 11/12/2017 21:42 | 3 | -3.09 | | | | U | 0.02 | 318.3 | 1.52 |
| 2357 | 11/12/2017 21:59 | 3 | -2.80 | | | | UW | 0.03 | 368.7 | |
| 2358 | 11/13/2017 0:15 | 3 | -2.94 | | | | C | 0.03 | 166.4 | |
| 2359 | 11/13/2017 0:33 | 3 | -3.44 | 1.56 | 0.20 | | C | 0.02 | 165.9 | |
| 2360 | 11/13/2017 1:07 | 3 | -2.98 | | | | U | 0.05 | 347.4 | 2.33 |
| 2361 | 11/13/2017 1:25 | 3 | -3.05 | | | | UW | 0.02 | 216.6 | |
| 2362 | 11/13/2017 1:42 | 3 | -3.33 | | | | U | 0.01 | 297.2 | 1.20 |
| 2363 | 11/13/2017 1:59 | 3 | -3.07 | | | | UW | 0.03 | 220.3 | |
| 2364 | 11/13/2017 4:15 | 3 | -2.03 | | | | C | 0.01 | 119.3 | |
| 2365 | 11/13/2017 4:33 | 3 | -1.94 | 1.25 | 0.18 | | C | 0.04 | 178.0 | |
| 2366 | 11/13/2017 5:07 | 3 | -1.10 | | | | U | 0.03 | 294.8 | 0.87 |
| 2367 | 11/13/2017 5:24 | 3 | -0.86 | | | | UW | | 135.7 | |
| 2368 | 11/13/2017 5:42 | 3 | -1.16 | | | | U | 0.02 | 216.0 | 0.72 |
| 2369 | 11/13/2017 5:59 | 3 | -1.01 | | | | UW | 0.01 | 172.6 | |
| 2370 | 11/13/2017 8:15 | 3 | -0.02 | | | | C | | 99.9 | |
| 2371 | 11/13/2017 8:33 | 3 | 0.66 | 1.28 | 0.19 | | C | 0.01 | 319.0 | |
| 2372 | 11/13/2017 9:07 | 3 | 2.46 | | | | U | | 212.4 | 0.49 |
| 2373 | 11/13/2017 9:24 | 3 | 2.08 | | | | UW | | 104.3 | |
| 2374 | 11/13/2017 9:42 | 3 | 2.97 | | | | U | 0.01 | 239.9 | 0.62 |
| 2375 | 11/13/2017 9:59 | 3 | 2.46 | | | | UW | | 158.1 | |
| 2376 | 11/13/2017 12:15 | 3 | 9.04 | | | | C | | 85.3 | |
| 2377 | 11/13/2017 12:33 | 3 | 8.40 | 1.93 | 0.27 | | C | 0.04 | 454.0 | |
| 2378 | 11/13/2017 13:07 | 3 | 6.76 | | | | U | 0.02 | 456.2 | 1.59 |
| 2379 | 11/13/2017 13:24 | 3 | 7.16 | | | | UW | | 145.6 | |
| 2380 | 11/13/2017 13:42 | 3 | 7.44 | | | | U | 0.05 | 922.7 | 0.50 |
| 2381 | 11/13/2017 13:59 | 3 | 6.77 | | | | UW | 0.01 | 278.9 | |
| 2382 | 11/13/2017 16:15 | 3 | 5.10 | | | | C | 0.01 | 77.9 | |
| 2383 | 11/13/2017 16:33 | 3 | 4.98 | 3.06 | 0.27 | | C | 0.04 | 393.2 | |
| 2384 | 11/13/2017 17:07 | 3 | 5.67 | | | | U | 0.04 | 273.6 | 1.56 |
| 2385 | 11/13/2017 17:24 | 3 | 4.45 | | | | UW | 0.01 | 162.4 | |
| 2386 | 11/13/2017 17:42 | 3 | 4.40 | | | | U | | 273.9 | 0.34 |
| 2387 | 11/13/2017 17:59 | 3 | 4.30 | | | | UW | 0.03 | 209.9 | |
| 2388 | 11/13/2017 20:15 | 3 | 0.96 | | | | C | 0.02 | 136.3 | |
| 2389 | 11/13/2017 20:33 | 3 | 0.34 | 2.53 | 0.27 | | C | 0.01 | 241.3 | |
| 2390 | 11/13/2017 21:07 | 3 | 5.09 | | | | U | 0.06 | 249.3 | 1.39 |
| 2391 | 11/13/2017 21:24 | 3 | 3.33 | | | | UW | 0.01 | 224.1 | |
| 2392 | 11/13/2017 21:42 | 3 | 3.90 | | | | U | | 554.8 | 0.43 |
| 2393 | 11/13/2017 21:59 | 3 | 4.25 | | | | UW | 0.03 | 294.0 | |
| 2394 | 11/14/2017 0:15 | 3 | 4.91 | | | | C | | 118.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2395 | 11/14/2017 0:33 | 3 | 4.96 | 4.53 | 0.28 | | C | 0.02 | 350.2 | |
| 2396 | 11/14/2017 1:07 | 3 | 5.25 | | | | U | 0.01 | 390.5 | 1.67 |
| 2397 | 11/14/2017 1:24 | 3 | 4.77 | | | | UW | | 326.8 | |
| 2398 | 11/14/2017 1:42 | 3 | 4.74 | | | | U | 0.03 | 407.0 | 0.38 |
| 2399 | 11/14/2017 1:59 | 3 | 4.71 | | | | UW | | 254.7 | |
| 2400 | 11/14/2017 4:15 | 3 | 4.93 | | | | C | | 159.4 | |
| 2401 | 11/14/2017 4:33 | 3 | 4.93 | 5.26 | 0.29 | | C | 0.02 | 296.4 | |
| 2402 | 11/14/2017 5:07 | 3 | 5.44 | | | | U | 0.03 | 402.7 | 1.91 |
| 2403 | 11/14/2017 5:24 | 3 | 4.86 | | | | UW | | 211.4 | |
| 2404 | 11/14/2017 5:42 | 3 | 4.81 | | | | U | 0.01 | 348.5 | 0.58 |
| 2405 | 11/14/2017 5:59 | 3 | 4.94 | | | | UW | | 272.5 | |
| 2406 | 11/14/2017 8:15 | 3 | 5.38 | | | | C | | 191.4 | |
| 2407 | 11/14/2017 8:33 | 3 | 5.47 | 5.78 | 0.30 | | C | | 363.8 | |
| 2408 | 11/14/2017 9:07 | 3 | 6.48 | | | | U | 0.02 | 444.9 | 1.80 |
| 2409 | 11/14/2017 9:24 | 3 | 5.95 | | | | UW | | 194.3 | |
| 2410 | 11/14/2017 9:42 | 3 | 6.19 | | | | U | 0.01 | 548.1 | 0.73 |
| 2411 | 11/14/2017 9:59 | 3 | 6.46 | | | | UW | 0.03 | 342.7 | |
| 2412 | 11/14/2017 12:15 | 3 | 6.86 | | | | C | | 155.4 | |
| 2413 | 11/14/2017 12:33 | 3 | 7.06 | 7.02 | 0.31 | | C | 0.02 | 467.9 | |
| 2414 | 11/14/2017 13:07 | 3 | 7.25 | | | | U | 0.04 | 450.4 | 1.71 |
| 2415 | 11/14/2017 13:24 | 3 | 7.03 | | | | UW | 0.02 | 288.8 | |
| 2416 | 11/14/2017 13:42 | 3 | 7.03 | | | | U | 0.05 | 735.5 | 0.62 |
| 2417 | 11/14/2017 13:59 | 3 | 7.18 | | | | UW | | 305.8 | |
| 2418 | 11/14/2017 16:15 | 3 | 7.81 | | | | C | | 232.6 | |
| 2419 | 11/14/2017 16:33 | 3 | 7.52 | 7.67 | 0.31 | | C | | 365.9 | |
| 2420 | 11/14/2017 17:07 | 3 | 6.43 | | | | U | 0.01 | 548.1 | 4.95 |
| 2421 | 11/14/2017 17:24 | 3 | 5.90 | | | | UW | 0.04 | 282.8 | |
| 2422 | 11/14/2017 17:42 | 3 | 6.03 | | | | U | 0.01 | 421.9 | 2.20 |
| 2423 | 11/14/2017 17:59 | 3 | 5.54 | | | | UW | 0.01 | 363.5 | |
| 2424 | 11/14/2017 20:15 | 3 | 1.56 | | | | C | 0.01 | 182.7 | |
| 2425 | 11/14/2017 20:33 | 3 | 1.98 | 5.33 | 0.30 | | C | 0.01 | 297.9 | |
| 2426 | 11/14/2017 21:07 | 3 | 6.25 | | | | U | 0.02 | 392.4 | 2.87 |
| 2427 | 11/14/2017 21:24 | 3 | 4.83 | | | | UW | 0.01 | 288.6 | |
| 2428 | 11/14/2017 21:42 | 3 | 5.06 | | | | U | 0.03 | 700.0 | 1.91 |
| 2429 | 11/14/2017 21:59 | 3 | 5.72 | | | | UW | | 453.8 | |
| 2430 | 11/15/2017 0:15 | 3 | 2.35 | | | | C | 0.01 | 482.8 | |
| 2431 | 11/15/2017 0:33 | 3 | 2.23 | 5.31 | 0.30 | | C | 0.01 | 187.5 | |
| 2432 | 11/15/2017 1:07 | 3 | 2.73 | | | | U | 0.05 | 600.6 | 1.01 |
| 2433 | 11/15/2017 1:25 | 3 | 1.38 | | | | UW | | 228.8 | |
| 2434 | 11/15/2017 1:42 | 3 | 1.02 | | | | U | 0.03 | 447.1 | 0.77 |
| 2435 | 11/15/2017 1:59 | 3 | 1.38 | | | | UW | 0.04 | 349.3 | |
| 2436 | 11/15/2017 4:15 | 3 | 0.22 | | | | C | 0.01 | 229.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2437 | 11/15/2017 4:33 | 3 | 0.34 | 3.42 | 0.30 | | C | 0.05 | 173.5 | |
| 2438 | 11/15/2017 5:07 | 3 | 0.90 | | | | U | 0.06 | 585.6 | 0.91 |
| 2439 | 11/15/2017 5:24 | 3 | 0.26 | | | | UW | | 232.1 | |
| 2440 | 11/15/2017 5:42 | 3 | 0.06 | | | | U | 0.01 | 400.4 | 0.67 |
| 2441 | 11/15/2017 5:59 | 3 | 0.14 | | | | UW | 0.02 | 313.7 | |
| 2442 | 11/15/2017 8:15 | 3 | -1.61 | | | | C | 0.02 | 715.7 | |
| 2443 | 11/15/2017 8:33 | 3 | -1.75 | 2.83 | 0.29 | | C | 0.01 | 105.2 | |
| 2444 | 11/15/2017 9:07 | 3 | -2.41 | | | | U | 0.03 | 748.8 | 0.32 |
| 2445 | 11/15/2017 9:24 | 3 | -1.85 | | | | UW | 0.01 | 381.6 | |
| 2446 | 11/15/2017 9:42 | 3 | -2.40 | | | | U | | 811.7 | 0.36 |
| 2447 | 11/15/2017 9:59 | 3 | -2.18 | | | | UW | | 379.3 | |
| 2448 | 5/4/2018 16:15 | 4 | 28.30 | 16.67 | 0.41 | | C | 0.32 | 537.3 | |
| 2449 | 5/4/2018 16:32 | 4 | 25.60 | | | | W | 0.22 | 1725.3 | |
| 2450 | 5/4/2018 16:48 | 4 | 28.64 | | | | C | 0.70 | 614.0 | |
| 2451 | 5/4/2018 17:05 | 4 | 25.88 | | | | W | 0.02 | 806.0 | |
| 2452 | 5/4/2018 17:21 | 4 | 26.40 | | | | U | 0.29 | 1061.9 | 11.35 |
| 2453 | 5/4/2018 17:38 | 4 | 25.02 | 16.96 | | 0.40 | UW | 0.32 | 1711.4 | 45.20 |
| 2454 | 5/4/2018 17:54 | 4 | 24.93 | 11.97 | | 0.40 | UW | 0.20 | 2195.3 | 30.76 |
| 2455 | 5/4/2018 18:11 | 4 | 25.68 | | | | U | 0.10 | 875.8 | 3.38 |
| 2456 | 5/4/2018 20:15 | 4 | 18.83 | 14.78 | 0.40 | | C | 0.37 | 525.1 | |
| 2457 | 5/4/2018 20:32 | 4 | 17.43 | | | | W | 0.09 | 712.3 | |
| 2458 | 5/4/2018 20:48 | 4 | 16.96 | | | | C | 0.44 | 540.9 | |
| 2459 | 5/4/2018 21:05 | 4 | 15.42 | | | | W | | 249.0 | |
| 2460 | 5/4/2018 21:21 | 4 | 15.97 | | | | U | 0.33 | 879.9 | 8.48 |
| 2461 | 5/4/2018 21:38 | 4 | 14.51 | 12.30 | | 0.39 | UW | 0.26 | 1113.9 | 39.90 |
| 2462 | 5/4/2018 21:54 | 4 | 14.60 | 7.09 | | 0.39 | UW | 0.31 | 1283.8 | 31.83 |
| 2463 | 5/4/2018 22:11 | 4 | 14.22 | | | | U | 0.26 | 773.1 | 2.19 |
| 2464 | 5/5/2018 0:15 | 4 | 10.40 | 11.97 | 0.40 | | C | 1.09 | 703.9 | |
| 2465 | 5/5/2018 0:32 | 4 | 10.47 | | | | W | 0.11 | 581.9 | |
| 2466 | 5/5/2018 0:48 | 4 | 11.90 | | | | C | 0.85 | 583.5 | |
| 2467 | 5/5/2018 1:05 | 4 | 10.68 | | | | W | 0.03 | 480.2 | |
| 2468 | 5/5/2018 1:22 | 4 | 9.52 | | | | U | 0.52 | 902.0 | 6.45 |
| 2469 | 5/5/2018 1:38 | 4 | 9.36 | 9.12 | | 0.39 | UW | 0.38 | 963.1 | 18.59 |
| 2470 | 5/5/2018 1:55 | 4 | 8.57 | 3.95 | | 0.38 | UW | 0.32 | 1041.0 | 17.53 |
| 2471 | 5/5/2018 2:11 | 4 | 7.46 | | | | U | 0.32 | 813.0 | 3.95 |
| 2472 | 5/5/2018 4:15 | 4 | 5.97 | 9.84 | 0.40 | | C | 0.73 | 549.6 | |
| 2473 | 5/5/2018 4:32 | 4 | 5.99 | | | | W | 0.10 | 489.4 | |
| 2474 | 5/5/2018 4:48 | 4 | 5.77 | | | | C | 0.85 | 671.1 | |
| 2475 | 5/5/2018 5:05 | 4 | 5.39 | | | | W | 0.06 | 325.1 | |
| 2476 | 5/5/2018 5:21 | 4 | 5.05 | | | | U | 0.48 | 727.4 | 7.95 |
| 2477 | 5/5/2018 5:38 | 4 | 5.49 | 6.71 | | 0.38 | UW | 0.43 | 794.5 | 15.47 |
| 2478 | 5/5/2018 5:55 | 4 | 5.12 | 1.62 | | 0.38 | UW | 0.25 | 736.0 | 18.97 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2479 | 5/5/2018 6:11 | 4 | 5.04 | | | | U | 0.34 | 1020.5 | 4.69 |
| 2480 | 5/5/2018 8:15 | 4 | 11.64 | 9.10 | 0.40 | | C | 0.71 | 530.9 | |
| 2481 | 5/5/2018 8:32 | 4 | 13.32 | | | | W | 0.17 | 501.0 | |
| 2482 | 5/5/2018 8:48 | 4 | 14.24 | | | | C | 1.47 | 558.7 | |
| 2483 | 5/5/2018 9:05 | 4 | 15.47 | | | | W | 0.03 | 212.6 | |
| 2484 | 5/5/2018 9:21 | 4 | 16.99 | | | | U | 0.85 | 1386.1 | 20.27 |
| 2485 | 5/5/2018 9:38 | 4 | 16.87 | 10.80 | | 0.39 | UW | 0.75 | 1168.9 | 16.10 |
| 2486 | 5/5/2018 9:54 | 4 | 18.58 | 5.37 | | 0.39 | UW | 0.69 | 1350.6 | 32.64 |
| 2487 | 5/5/2018 10:11 | 4 | 20.42 | | | | U | 0.54 | 1397.7 | 5.38 |
| 2488 | 5/5/2018 12:15 | 4 | 27.72 | 14.67 | 0.40 | | C | 1.43 | 991.6 | |
| 2489 | 5/5/2018 12:32 | 4 | 26.38 | | | | W | 0.35 | 957.7 | 14.51 |
| 2490 | 5/5/2018 12:48 | 4 | 31.53 | | | | C | 1.48 | 834.0 | |
| 2491 | 5/5/2018 13:05 | 4 | 30.27 | | | | W | 0.07 | 498.1 | |
| 2492 | 5/5/2018 13:21 | 4 | 31.06 | | | | U | 1.08 | 1560.6 | 41.34 |
| 2493 | 5/5/2018 13:38 | 4 | 30.44 | 20.20 | | 0.38 | UW | 1.42 | 2643.8 | 101.07 |
| 2494 | 5/5/2018 13:54 | 4 | 29.30 | 14.31 | | 0.38 | UW | 1.61 | 2111.1 | 81.31 |
| 2495 | 5/5/2018 14:11 | 4 | 30.90 | | | | U | 0.59 | 1472.6 | 12.26 |
| 2496 | 5/5/2018 16:15 | 4 | 23.47 | 17.82 | 0.40 | | C | 0.46 | 564.2 | |
| 2497 | 5/5/2018 16:32 | 4 | 18.99 | | | | W | 0.16 | 687.0 | |
| 2498 | 5/5/2018 16:48 | 4 | 15.81 | | | | C | 0.41 | 871.5 | |
| 2499 | 5/5/2018 17:05 | 4 | 17.11 | | | | W | 0.02 | 302.8 | |
| 2500 | 5/5/2018 17:21 | 4 | 24.06 | | | | U | 0.69 | 1886.5 | 12.30 |
| 2501 | 5/5/2018 17:38 | 4 | 23.18 | 17.10 | | 0.37 | UW | 0.36 | 1046.1 | 16.92 |
| 2502 | 5/5/2018 17:54 | 4 | 21.40 | 11.67 | | 0.38 | UW | 0.52 | 1315.6 | 15.18 |
| 2503 | 5/5/2018 18:11 | 4 | 21.79 | | | | U | 0.24 | 1500.8 | 6.19 |
| 2504 | 5/5/2018 20:15 | 4 | 17.80 | 15.68 | 0.40 | | C | 0.60 | 670.3 | |
| 2505 | 5/5/2018 20:32 | 4 | 17.24 | | | | W | 0.16 | 684.3 | |
| 2506 | 5/5/2018 20:48 | 4 | 15.79 | | | | C | 0.45 | 643.7 | |
| 2507 | 5/5/2018 21:05 | 4 | 13.95 | | | | W | 0.05 | 922.7 | |
| 2508 | 5/5/2018 21:21 | 4 | 13.28 | | | | U | 0.41 | 901.8 | 7.54 |
| 2509 | 5/5/2018 21:38 | 4 | 12.79 | 12.62 | | 0.37 | UW | 0.40 | 857.4 | 14.51 |
| 2510 | 5/5/2018 21:54 | 4 | 12.27 | 7.32 | | 0.37 | UW | 0.49 | 808.1 | 12.62 |
| 2511 | 5/5/2018 22:11 | 4 | 10.76 | | | | U | 0.28 | 838.4 | 5.86 |
| 2512 | 5/6/2018 0:15 | 4 | 8.95 | 12.34 | 0.40 | | C | 0.63 | 703.9 | |
| 2513 | 5/6/2018 0:32 | 4 | 9.00 | | | | W | 0.08 | 663.6 | |
| 2514 | 5/6/2018 0:49 | 4 | 8.14 | | | | C | 1.34 | 652.8 | |
| 2515 | 5/6/2018 1:05 | 4 | 7.75 | | | | W | 2.30 | 1960.7 | |
| 2516 | 5/6/2018 1:22 | 4 | 7.42 | | | | U | 0.48 | 777.9 | 7.40 |
| 2517 | 5/6/2018 1:38 | 4 | 7.00 | 9.09 | | 0.37 | UW | 0.46 | 646.9 | 5.95 |
| 2518 | 5/6/2018 1:55 | 4 | 6.85 | 3.96 | | 0.36 | UW | 0.43 | 628.7 | 8.83 |
| 2519 | 5/6/2018 2:11 | 4 | 6.27 | | | | U | 0.70 | 933.1 | 3.46 |
| 2520 | 5/6/2018 4:15 | 4 | 10.01 | 10.32 | 0.39 | | C | 1.76 | 1158.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2521 | 5/6/2018 4:32 | 4 | 9.87 | | | | W | 0.13 | 630.2 | |
| 2522 | 5/6/2018 4:48 | 4 | 10.08 | | | | C | 2.65 | 1235.5 | |
| 2523 | 5/6/2018 5:05 | 4 | 10.60 | | | | W | 0.03 | 178.1 | |
| 2524 | 5/6/2018 5:21 | 4 | 10.51 | | | | U | 2.25 | 1582.1 | 4.19 |
| 2525 | 5/6/2018 5:38 | 4 | 10.84 | 8.19 | | 0.37UW | | 1.93 | 1656.5 | 1.67 |
| 2526 | 5/6/2018 5:54 | 4 | 10.47 | 2.91 | | 0.37UW | | 0.55 | 933.0 | 1.43 |
| 2527 | 5/6/2018 6:11 | 4 | 10.12 | | | | U | 0.54 | 1159.1 | 0.75 |
| 2528 | 5/6/2018 8:15 | 4 | 13.13 | 10.07 | 0.40 | | C | 2.70 | 1299.2 | |
| 2529 | 5/6/2018 8:32 | 4 | 14.08 | | | | W | 0.23 | 815.8 | |
| 2530 | 5/6/2018 8:48 | 4 | 15.20 | | | | C | 3.11 | 1294.6 | |
| 2531 | 5/6/2018 9:05 | 4 | 15.84 | | | | W | 0.04 | 354.8 | |
| 2532 | 5/6/2018 9:21 | 4 | 16.79 | | | | U | 1.14 | 1342.4 | 4.63 |
| 2533 | 5/6/2018 9:38 | 4 | 17.36 | 11.47 | | 0.37UW | | 0.93 | 1414.1 | 1.95 |
| 2534 | 5/6/2018 9:54 | 4 | 19.15 | 6.11 | | 0.36UW | | 0.89 | 1211.6 | 5.32 |
| 2535 | 5/6/2018 10:11 | 4 | 20.04 | | | | U | 0.50 | 1446.3 | 2.74 |
| 2536 | 5/6/2018 12:15 | 4 | 27.08 | 14.32 | 0.40 | | C | 2.25 | 1398.2 | |
| 2537 | 5/6/2018 12:32 | 4 | 26.06 | | | | W | 0.36 | 982.5 | 11.21 |
| 2538 | 5/6/2018 12:48 | 4 | 28.48 | | | | C | 2.33 | 1352.4 | 2.12 |
| 2539 | 5/6/2018 13:05 | 4 | 26.82 | | | | W | 0.03 | 573.7 | |
| 2540 | 5/6/2018 13:21 | 4 | 28.89 | | | | U | 1.73 | 1635.8 | 14.49 |
| 2541 | 5/6/2018 13:38 | 4 | 28.41 | 18.82 | | 0.36UW | | 1.50 | 2336.0 | 40.48 |
| 2542 | 5/6/2018 13:54 | 4 | 28.04 | 13.49 | | 0.36UW | | 0.74 | 2052.5 | 34.73 |
| 2543 | 5/6/2018 14:11 | 4 | 29.38 | | | | U | 0.53 | 1355.0 | 22.10 |
| 2544 | 5/6/2018 16:15 | 4 | 30.54 | 18.59 | 0.39 | | C | 1.51 | 1187.7 | |
| 2545 | 5/6/2018 16:32 | 4 | 30.51 | | | | W | 0.33 | 1127.7 | 13.57 |
| 2546 | 5/6/2018 16:48 | 4 | 31.61 | | | | C | 1.42 | 1295.0 | 3.80 |
| 2547 | 5/6/2018 17:05 | 4 | 28.81 | | | | W | 0.06 | 463.6 | 13.62 |
| 2548 | 5/6/2018 17:21 | 4 | 28.83 | | | | U | 0.81 | 1090.2 | 6.27 |
| 2549 | 5/6/2018 17:38 | 4 | 27.81 | 19.69 | | 0.34UW | | 0.71 | 1355.7 | 20.85 |
| 2550 | 5/6/2018 17:54 | 4 | 27.33 | 14.81 | | 0.35UW | | 0.51 | 928.2 | 10.15 |
| 2551 | 5/6/2018 18:11 | 4 | 26.83 | | | | U | 0.48 | 1283.7 | 5.59 |
| 2552 | 5/6/2018 20:15 | 4 | 19.76 | 17.04 | 0.38 | | C | 0.72 | 819.7 | |
| 2553 | 5/6/2018 20:32 | 4 | 17.65 | | | | W | 0.23 | 851.6 | |
| 2554 | 5/6/2018 20:48 | 4 | 15.06 | | | | C | 0.63 | 801.4 | |
| 2555 | 5/6/2018 21:05 | 4 | 12.94 | | | | W | | 1055.1 | |
| 2556 | 5/6/2018 21:21 | 4 | 12.67 | | | | U | 0.55 | 906.7 | 2.67 |
| 2557 | 5/6/2018 21:38 | 4 | 12.05 | 13.13 | | 0.34UW | | 0.50 | 934.1 | 3.38 |
| 2558 | 5/6/2018 21:54 | 4 | 11.62 | 8.31 | | 0.34UW | | 0.49 | 705.5 | 1.22 |
| 2559 | 5/6/2018 22:11 | 4 | 11.13 | | | | U | 0.29 | 796.3 | 0.50 |
| 2560 | 5/7/2018 0:15 | 4 | 10.14 | 13.07 | 0.38 | | C | 0.74 | 732.1 | |
| 2561 | 5/7/2018 0:32 | 4 | 8.83 | | | | W | 0.17 | 727.4 | |
| 2562 | 5/7/2018 0:49 | 4 | 10.18 | | | | C | 0.67 | 700.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2563 | 5/7/2018 1:05 | 4 | 8.08 | | | | W | 0.03 | 305.2 | |
| 2564 | 5/7/2018 1:22 | 4 | 8.03 | | | | U | 0.51 | 752.1 | 1.44 |
| 2565 | 5/7/2018 1:38 | 4 | 8.07 | 9.47 | | 0.33 | UW | 0.47 | 915.8 | 1.28 |
| 2566 | 5/7/2018 1:55 | 4 | 7.56 | 4.61 | | 0.34 | UW | 0.59 | 468.6 | 0.55 |
| 2567 | 5/7/2018 2:11 | 4 | 6.69 | | | | U | 0.47 | 818.4 | 0.50 |
| 2568 | 5/7/2018 4:15 | 4 | 5.32 | 10.73 | 0.38 | | C | 0.46 | 565.5 | |
| 2569 | 5/7/2018 4:32 | 4 | 5.52 | | | | W | 0.15 | 729.6 | |
| 2570 | 5/7/2018 4:48 | 4 | 5.92 | | | | C | 1.52 | 608.4 | |
| 2571 | 5/7/2018 5:05 | 4 | 5.19 | | | | W | 0.12 | 183.9 | |
| 2572 | 5/7/2018 5:21 | 4 | 4.60 | | | | U | 0.44 | 699.8 | 1.05 |
| 2573 | 5/7/2018 5:38 | 4 | 4.71 | 7.25 | | 0.33 | UW | 0.44 | 817.4 | 0.62 |
| 2574 | 5/7/2018 5:54 | 4 | 4.62 | 2.37 | | 0.34 | UW | 0.39 | 475.7 | 0.62 |
| 2575 | 5/7/2018 6:11 | 4 | 4.34 | | | | U | 0.30 | 724.1 | |
| 2576 | 5/7/2018 8:15 | 4 | 11.90 | 9.86 | 0.38 | | C | 0.74 | 831.9 | |
| 2577 | 5/7/2018 8:32 | 4 | 14.22 | | | | W | 0.26 | 750.5 | 0.33 |
| 2578 | 5/7/2018 8:48 | 4 | 15.57 | | | | C | 2.11 | 688.6 | 0.62 |
| 2579 | 5/7/2018 9:05 | 4 | 17.62 | | | | W | 0.03 | 327.9 | |
| 2580 | 5/7/2018 9:21 | 4 | 18.95 | | | | U | 0.92 | 1438.5 | 1.96 |
| 2581 | 5/7/2018 9:38 | 4 | 19.75 | 12.42 | | 0.34 | UW | 0.16 | 731.3 | 1.47 |
| 2582 | 5/7/2018 9:54 | 4 | 22.17 | 6.58 | | 0.34 | UW | 0.94 | 1265.4 | 1.41 |
| 2583 | 5/7/2018 10:11 | 4 | 23.40 | | | | U | 0.29 | 1088.4 | |
| 2584 | 5/7/2018 12:15 | 4 | 29.54 | 15.48 | 0.38 | | C | 0.34 | 825.8 | |
| 2585 | 5/7/2018 12:32 | 4 | 29.43 | | | | W | 0.68 | 1131.2 | |
| 2586 | 5/7/2018 12:48 | 4 | 30.44 | | | | C | 2.11 | 1569.4 | |
| 2587 | 5/7/2018 13:05 | 4 | 30.31 | | | | W | 0.18 | 856.8 | 0.56 |
| 2588 | 5/7/2018 13:21 | 4 | 30.91 | | | | U | 1.64 | 2050.8 | 2.51 |
| 2589 | 5/7/2018 13:38 | 4 | 30.41 | 20.11 | | 0.34 | UW | 0.23 | 1057.3 | 4.91 |
| 2590 | 5/7/2018 13:54 | 4 | 30.04 | 13.86 | | 0.34 | UW | 1.90 | 3058.4 | 2.87 |
| 2591 | 5/7/2018 14:11 | 4 | 31.29 | | | | U | 0.31 | 1341.9 | 1.54 |
| 2592 | 5/7/2018 15:57 | 4 | 31.66 | 18.76 | 0.37 | | C | 1.63 | 1213.9 | |
| 2593 | 5/7/2018 16:13 | 4 | 31.08 | | | | W | 0.62 | 1695.1 | 0.10 |
| 2594 | 5/7/2018 16:30 | 4 | 31.43 | | | | C | 2.12 | 1611.9 | 0.36 |
| 2595 | 5/7/2018 16:47 | 4 | 30.72 | | | | W | 0.15 | 1725.0 | 0.18 |
| 2596 | 5/7/2018 17:03 | 4 | 29.18 | | | | U | 1.81 | 2852.8 | 1.30 |
| 2597 | 5/7/2018 17:20 | 4 | 29.62 | 20.02 | | 0.33 | UW | 0.11 | 1372.1 | 2.20 |
| 2598 | 5/7/2018 17:36 | 4 | 29.16 | 14.41 | | 0.33 | UW | 1.86 | 2124.2 | 2.05 |
| 2599 | 5/7/2018 17:53 | 4 | 28.35 | | | | U | 0.31 | 1667.8 | 0.96 |
| 2600 | 5/7/2018 19:56 | 4 | 22.82 | 16.55 | 0.36 | | C | 0.69 | 760.1 | |
| 2601 | 5/7/2018 20:13 | 4 | 21.81 | | | | W | 0.33 | 1156.2 | 0.02 |
| 2602 | 5/7/2018 20:29 | 4 | 20.69 | | | | C | 0.61 | 796.4 | |
| 2603 | 5/7/2018 20:46 | 4 | 19.91 | | | | W | 0.06 | 450.0 | |
| 2604 | 5/7/2018 21:02 | 4 | 20.07 | | | | U | 0.85 | 1725.0 | 0.62 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2605 | 5/7/2018 21:19 | 4 | 19.69 | 15.17 | | 0.32 | UW | 1.13 | 1305.8 | 0.87 |
| 2606 | 5/7/2018 21:35 | 4 | 19.19 | 9.74 | | 0.32 | UW | 0.56 | 899.2 | 0.75 |
| 2607 | 5/7/2018 21:52 | 4 | 18.59 | | | | U | 0.39 | 1089.7 | 0.15 |
| 2608 | 5/7/2018 23:56 | 4 | 16.96 | 13.98 | 0.36 | | C | 1.10 | 1155.4 | |
| 2609 | 5/8/2018 0:13 | 4 | 16.70 | | | | W | 0.30 | 1228.7 | 0.02 |
| 2610 | 5/8/2018 0:29 | 4 | 17.14 | 13.74 | 0.36 | | C | 1.15 | 1048.8 | |
| 2611 | 5/8/2018 0:45 | 4 | 17.09 | | | | W | 0.32 | 1295.6 | 0.05 |
| 2612 | 5/8/2018 1:02 | 4 | 17.24 | | | | C | 1.30 | 1216.5 | |
| 2613 | 5/8/2018 1:18 | 4 | 17.18 | | | | W | 0.58 | 896.8 | |
| 2614 | 5/8/2018 1:35 | 4 | 17.03 | | | | U | 1.12 | 1374.8 | 0.38 |
| 2615 | 5/8/2018 1:51 | 4 | 15.42 | 12.40 | | 0.31 | UW | 0.70 | 683.4 | 0.49 |
| 2616 | 5/8/2018 2:08 | 4 | 13.32 | 7.05 | | 0.31 | UW | 0.44 | 730.4 | 0.13 |
| 2617 | 5/8/2018 2:25 | 4 | 12.69 | | | | U | 0.24 | 944.6 | |
| 2618 | 5/8/2018 4:31 | 4 | 13.16 | 12.78 | 0.40 | | C | 0.90 | 1384.4 | |
| 2619 | 5/8/2018 4:48 | 4 | 13.37 | | | | W | 0.33 | 810.3 | |
| 2620 | 5/8/2018 5:04 | 4 | 13.35 | | | | C | 4.26 | 1613.0 | |
| 2621 | 5/8/2018 5:21 | 4 | 13.26 | | | | W | 0.16 | 2492.4 | |
| 2622 | 5/8/2018 5:37 | 4 | 13.37 | | | | U | 0.54 | 1110.6 | 0.28 |
| 2623 | 5/8/2018 5:54 | 4 | 13.88 | 11.38 | | 0.37 | UW | 0.35 | 1002.4 | |
| 2624 | 5/8/2018 6:10 | 4 | 13.84 | 6.29 | | 0.36 | UW | 0.78 | 996.0 | 0.22 |
| 2625 | 5/8/2018 6:27 | 4 | 13.82 | | | | U | 0.69 | 2273.1 | 1.47 |
| 2626 | 5/8/2018 8:28 | 4 | 14.15 | 12.94 | 0.40 | | C | 0.13 | 414.3 | |
| 2627 | 5/8/2018 8:45 | 4 | 14.86 | | | | W | 0.24 | 811.1 | |
| 2628 | 5/8/2018 9:01 | 4 | 15.96 | | | | C | 2.11 | 1773.6 | |
| 2629 | 5/8/2018 9:18 | 4 | 16.03 | | | | W | 0.31 | 798.4 | |
| 2630 | 5/8/2018 9:34 | 4 | 18.26 | | | | U | 0.73 | 1825.5 | 0.72 |
| 2631 | 5/8/2018 9:51 | 4 | 19.03 | 14.22 | | 0.37 | UW | 0.16 | 1004.8 | |
| 2632 | 5/8/2018 10:07 | 4 | 19.99 | 9.14 | | 0.37 | UW | 1.25 | 1529.3 | 0.49 |
| 2633 | 5/8/2018 10:24 | 4 | 20.74 | | | | U | 0.31 | 2023.0 | 1.71 |
| 2634 | 5/8/2018 12:28 | 4 | 25.94 | 17.38 | 0.40 | | C | 0.31 | 1197.9 | 0.02 |
| 2635 | 5/8/2018 12:45 | 4 | 26.20 | | | | W | 0.33 | 1285.9 | |
| 2636 | 5/8/2018 13:01 | 4 | 27.56 | | | | C | 0.29 | 1404.3 | 0.01 |
| 2637 | 5/8/2018 13:18 | 4 | 27.54 | | | | W | 0.05 | 1226.5 | |
| 2638 | 5/8/2018 13:34 | 4 | 27.26 | | | | U | 1.04 | 3422.0 | 5.87 |
| 2639 | 5/8/2018 13:51 | 4 | 27.91 | 21.53 | | 0.36 | UW | 0.31 | 1877.1 | |
| 2640 | 5/8/2018 14:07 | 4 | 27.92 | 16.07 | | 0.36 | UW | 0.63 | 2033.9 | 0.48 |
| 2641 | 5/8/2018 14:24 | 4 | 27.25 | | | | U | 0.50 | 2925.9 | 10.73 |
| 2642 | 5/8/2018 16:28 | 4 | 23.70 | 19.90 | 0.40 | | C | 1.17 | 1672.5 | |
| 2643 | 5/8/2018 16:45 | 4 | 24.00 | | | | W | 0.48 | 1820.2 | |
| 2644 | 5/8/2018 17:01 | 4 | 25.66 | | | | C | 2.74 | 1837.6 | |
| 2645 | 5/8/2018 17:18 | 4 | 23.45 | 21.77 | | | W | 0.20 | 1699.3 | |
| 2646 | 5/8/2018 17:34 | 4 | 22.24 | | | | U | 2.16 | 2355.6 | 2.92 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2647 | 5/8/2018 17:51 | 4 | 20.72 | 17.79 | | 0.35 | UW | 1.34 | 2334.6 | |
| 2648 | 5/8/2018 18:07 | 4 | 20.83 | 13.09 | | 0.35 | UW | 1.26 | 1901.2 | 0.44 |
| 2649 | 5/8/2018 18:24 | 4 | 22.50 | | | | U | 0.59 | 2409.0 | 4.08 |
| 2650 | 5/8/2018 20:28 | 4 | 16.51 | 17.05 | 0.39 | | C | 0.77 | 900.0 | |
| 2651 | 5/8/2018 20:45 | 4 | 15.80 | | | | W | 0.30 | 1124.0 | |
| 2652 | 5/8/2018 21:01 | 4 | 15.73 | | | | C | 0.81 | 1008.5 | |
| 2653 | 5/8/2018 21:18 | 4 | 15.47 | 16.33 | | | W | 0.02 | 571.5 | |
| 2654 | 5/8/2018 21:34 | 4 | 15.08 | | | | U | 0.71 | 1295.1 | 1.05 |
| 2655 | 5/8/2018 21:51 | 4 | 14.67 | 14.09 | | 0.34 | UW | 0.48 | 987.0 | |
| 2656 | 5/8/2018 22:07 | 4 | 14.76 | 9.26 | | 0.34 | UW | 0.85 | 954.3 | |
| 2657 | 5/8/2018 22:24 | 4 | 13.89 | | | | U | 0.58 | 2003.5 | 0.10 |
| 2658 | 5/9/2018 0:15 | 4 | 13.25 | 14.77 | 0.41 | | C | 0.26 | 711.6 | |
| 2659 | 5/9/2018 0:32 | 4 | 12.95 | | | | W | 0.20 | 865.9 | |
| 2660 | 5/9/2018 0:49 | 4 | 12.32 | | | | C | 2.19 | 1827.5 | |
| 2661 | 5/9/2018 1:05 | 4 | 12.01 | 13.91 | | | W | 0.27 | 772.3 | |
| 2662 | 5/9/2018 1:22 | 4 | 11.72 | | | | U | 0.67 | 1002.1 | 0.38 |
| 2663 | 5/9/2018 1:38 | 4 | 11.13 | 11.76 | | 0.36 | UW | 0.40 | 934.4 | |
| 2664 | 5/9/2018 1:55 | 4 | 11.25 | 6.79 | | 0.36 | UW | 0.57 | 715.5 | |
| 2665 | 5/9/2018 2:11 | 4 | 10.89 | | | | U | 0.35 | 1388.7 | 0.81 |
| 2666 | 5/9/2018 4:15 | 4 | 10.78 | 12.82 | 0.40 | | C | 0.11 | 641.9 | |
| 2667 | 5/9/2018 4:32 | 4 | 11.18 | | | | W | 0.38 | 772.4 | |
| 2668 | 5/9/2018 4:48 | 4 | 11.19 | | | | C | 0.26 | 1786.2 | |
| 2669 | 5/9/2018 5:05 | 4 | 11.21 | 12.13 | | | W | 0.12 | 707.8 | |
| 2670 | 5/9/2018 5:21 | 4 | 10.90 | | | | U | 0.61 | 892.0 | 0.43 |
| 2671 | 5/9/2018 5:38 | 4 | 10.59 | 10.28 | | 0.36 | UW | 0.30 | 842.6 | |
| 2672 | 5/9/2018 5:54 | 4 | 10.72 | 5.26 | | 0.37 | UW | 0.50 | 669.7 | |
| 2673 | 5/9/2018 6:11 | 4 | 10.66 | | | | U | 0.33 | 1313.6 | 1.26 |
| 2674 | 5/9/2018 8:15 | 4 | 12.44 | 12.39 | 0.41 | | C | | 407.9 | |
| 2675 | 5/9/2018 8:32 | 4 | 12.29 | | | | W | 0.20 | 863.1 | |
| 2676 | 5/9/2018 8:48 | 4 | 12.73 | | | | C | 1.68 | 1483.0 | |
| 2677 | 5/9/2018 9:05 | 4 | 13.31 | 12.96 | | | W | 0.01 | 250.0 | |
| 2678 | 5/9/2018 9:22 | 4 | 13.63 | | | | U | 0.47 | 839.9 | 0.39 |
| 2679 | 5/9/2018 9:38 | 4 | 13.68 | 11.52 | | 0.36 | UW | 0.38 | 1020.9 | |
| 2680 | 5/9/2018 9:55 | 4 | 13.20 | 6.35 | | 0.37 | UW | 0.59 | 901.5 | |
| 2681 | 5/9/2018 10:11 | 4 | 12.87 | | | | U | 0.33 | 1266.0 | 1.00 |
| 2682 | 5/9/2018 12:16 | 4 | 20.72 | 14.39 | 0.41 | | C | 0.21 | 828.1 | |
| 2683 | 5/9/2018 12:33 | 4 | 21.04 | | | | W | 0.24 | 1108.9 | 0.06 |
| 2684 | 5/9/2018 12:49 | 4 | 21.78 | | | | C | 0.69 | 1219.7 | 0.01 |
| 2685 | 5/9/2018 13:06 | 4 | 21.39 | 18.82 | | | W | | 194.9 | 0.01 |
| 2686 | 5/9/2018 13:22 | 4 | 22.09 | | 0.30 | | U | 0.88 | 1489.0 | 1.69 |
| 2687 | 5/9/2018 13:39 | 4 | 23.60 | 17.39 | | 0.36 | UW | 0.60 | 1374.3 | |
| 2688 | 5/9/2018 13:56 | 4 | 24.64 | 12.18 | | 0.37 | UW | 1.26 | 2392.5 | 0.23 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2689 | 5/9/2018 14:12 | 4 | 24.11 | | | | U | 0.86 | 3204.5 | 7.11 |
| 2690 | 5/9/2018 16:16 | 4 | 21.87 | 17.81 | 0.40 | | C | 0.21 | 752.2 | |
| 2691 | 5/9/2018 16:33 | 4 | 16.79 | | | | W | 0.30 | 1130.3 | |
| 2692 | 5/9/2018 16:49 | 4 | 15.09 | | | | C | 0.87 | 909.5 | |
| 2693 | 5/9/2018 17:06 | 4 | 16.86 | 18.16 | | | W | 0.08 | 529.9 | 0.01 |
| 2694 | 5/9/2018 17:22 | 4 | 19.79 | | 0.33 | | U | 1.00 | 794.4 | 0.93 |
| 2695 | 5/9/2018 17:39 | 4 | 18.93 | 16.92 | | 0.37UW | | 0.44 | 765.8 | |
| 2696 | 5/9/2018 17:56 | 4 | 18.39 | 11.78 | | 0.39UW | | 0.60 | 623.4 | |
| 2697 | 5/9/2018 18:12 | 4 | 20.91 | | | | U | 0.36 | 1296.3 | 1.82 |
| 2698 | 5/9/2018 20:16 | 4 | 16.38 | 16.52 | 0.41 | | C | 0.18 | 745.3 | |
| 2699 | 5/9/2018 20:33 | 4 | 16.21 | | | | W | 0.15 | 870.5 | |
| 2700 | 5/9/2018 20:49 | 4 | 15.94 | | | | C | 1.07 | 1173.0 | |
| 2701 | 5/9/2018 21:06 | 4 | 15.24 | 16.14 | | | W | | 229.9 | |
| 2702 | 5/9/2018 21:22 | 4 | 14.37 | | 0.33 | | U | 0.67 | 985.3 | 0.62 |
| 2703 | 5/9/2018 21:39 | 4 | 13.74 | 13.69 | | 0.37UW | | 0.51 | 943.3 | |
| 2704 | 5/9/2018 21:55 | 4 | 13.50 | 8.48 | | 0.38UW | | 0.71 | 992.4 | |
| 2705 | 5/9/2018 22:12 | 4 | 12.99 | | | | U | 0.35 | 1379.4 | 0.91 |
| 2706 | 5/10/2018 0:15 | 4 | 11.20 | 13.85 | 0.41 | | C | 0.42 | 878.9 | |
| 2707 | 5/10/2018 0:32 | 4 | 10.59 | | | | W | 0.22 | 1096.3 | |
| 2708 | 5/10/2018 0:49 | 4 | 10.07 | | | | C | 2.19 | 1676.7 | |
| 2709 | 5/10/2018 1:05 | 4 | 9.55 | 12.14 | | | W | | 267.2 | |
| 2710 | 5/10/2018 1:22 | 4 | 9.12 | | 0.33 | | U | 0.85 | 1409.1 | 0.21 |
| 2711 | 5/10/2018 1:38 | 4 | 8.71 | 10.04 | | 0.37UW | | 0.55 | 1059.2 | |
| 2712 | 5/10/2018 1:55 | 4 | 8.40 | 4.99 | | 0.37UW | | 0.61 | 968.0 | |
| 2713 | 5/10/2018 2:11 | 4 | 7.68 | | | | U | 0.30 | 1206.0 | 9.51 |
| 2714 | 5/10/2018 4:15 | 4 | 6.22 | 10.44 | 0.41 | | C | 1.60 | 1471.3 | |
| 2715 | 5/10/2018 4:32 | 4 | 6.24 | | | | W | 0.26 | 1150.5 | |
| 2716 | 5/10/2018 4:48 | 4 | 6.02 | | | | C | 2.11 | 1402.4 | |
| 2717 | 5/10/2018 5:05 | 4 | 5.64 | 8.12 | | | W | 0.03 | 342.8 | |
| 2718 | 5/10/2018 5:21 | 4 | 5.15 | | 0.32 | | U | 1.43 | 1582.6 | 0.09 |
| 2719 | 5/10/2018 5:38 | 4 | 5.09 | 6.41 | | 0.36UW | | 0.61 | 1127.7 | |
| 2720 | 5/10/2018 5:54 | 4 | 4.95 | 1.58 | | 0.37UW | | 0.91 | 1591.4 | |
| 2721 | 5/10/2018 6:11 | 4 | 4.33 | | | | U | 0.55 | 1494.9 | 4.77 |
| 2722 | 5/10/2018 8:15 | 4 | 6.14 | 8.32 | 0.41 | | C | 1.19 | 1091.8 | 0.01 |
| 2723 | 5/10/2018 8:32 | 4 | 7.11 | | | | W | 0.27 | 1241.8 | |
| 2724 | 5/10/2018 8:48 | 4 | 7.48 | | | | C | 1.53 | 1576.7 | |
| 2725 | 5/10/2018 9:05 | 4 | 7.52 | 8.75 | | | W | 0.01 | 163.9 | |
| 2726 | 5/10/2018 9:21 | 4 | 8.51 | | 0.32 | | U | 0.84 | 1420.0 | 0.12 |
| 2727 | 5/10/2018 9:38 | 4 | 8.75 | 7.70 | | 0.36UW | | 1.35 | 1614.1 | 0.39 |
| 2728 | 5/10/2018 9:55 | 4 | 10.09 | 3.05 | | 0.37UW | | 0.61 | 1015.5 | 0.04 |
| 2729 | 5/10/2018 10:11 | 4 | 10.69 | | | | U | 0.92 | 1961.0 | 7.20 |
| 2730 | 5/10/2018 12:15 | 4 | 15.75 | 11.79 | 0.41 | | C | 0.58 | 1200.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2731 | 5/10/2018 12:32 | 4 | 14.16 | | | | W | 0.23 | 1185.8 | |
| 2732 | 5/10/2018 12:48 | 4 | 13.33 | | | | C | 1.38 | 1224.3 | |
| 2733 | 5/10/2018 13:05 | 4 | 11.50 | 12.86 | | | W | | 534.4 | |
| 2734 | 5/10/2018 13:21 | 4 | 10.70 | | 0.32 | | U | 1.05 | 1410.8 | 0.57 |
| 2735 | 5/10/2018 13:38 | 4 | 11.18 | 10.13 | | 0.35UW | | 0.62 | 1679.5 | |
| 2736 | 5/10/2018 13:54 | 4 | 11.35 | 5.23 | | 0.36UW | | 0.78 | 1025.6 | |
| 2737 | 5/10/2018 14:11 | 4 | 10.96 | | | | U | 0.48 | 1393.8 | 0.63 |
| 2738 | 5/10/2018 16:15 | 4 | 8.27 | 10.62 | 0.40 | | C | 0.50 | 1074.5 | |
| 2739 | 5/10/2018 16:32 | 4 | 7.97 | | | | W | 0.31 | 1191.5 | |
| 2740 | 5/10/2018 16:48 | 4 | 8.05 | | | | C | 2.40 | 1214.0 | |
| 2741 | 5/10/2018 17:05 | 4 | 8.47 | 9.93 | | | W | 0.14 | 660.2 | |
| 2742 | 5/10/2018 17:21 | 4 | 8.84 | | 0.32 | | U | 0.75 | 818.0 | 0.12 |
| 2743 | 5/10/2018 17:38 | 4 | 8.63 | 8.28 | | 0.35UW | | 0.51 | 981.4 | |
| 2744 | 5/10/2018 17:54 | 4 | 7.98 | 3.23 | | 0.37UW | | 0.64 | 680.5 | |
| 2745 | 5/10/2018 18:11 | 4 | 8.00 | | | | U | 0.32 | 594.1 | 0.35 |
| 2746 | 5/10/2018 20:15 | 4 | 7.96 | 9.66 | 0.41 | | C | 0.69 | 1076.3 | |
| 2747 | 5/10/2018 20:32 | 4 | 7.72 | | | | W | 0.22 | 921.2 | |
| 2748 | 5/10/2018 20:48 | 4 | 7.52 | | | | C | 3.07 | 1948.9 | |
| 2749 | 5/10/2018 21:05 | 4 | 7.28 | 8.54 | | | W | 0.19 | 570.3 | |
| 2750 | 5/10/2018 21:21 | 4 | 7.26 | | 0.33 | | U | 1.08 | 825.5 | 0.07 |
| 2751 | 5/10/2018 21:38 | 4 | 7.03 | 6.83 | | 0.36UW | | 0.56 | 1176.5 | |
| 2752 | 5/10/2018 21:55 | 4 | 6.82 | 1.90 | | 0.37UW | | 0.49 | 666.1 | |
| 2753 | 5/10/2018 22:11 | 4 | 6.46 | | | | U | 0.24 | 746.6 | 0.02 |
| 2754 | 5/11/2018 0:15 | 4 | 6.54 | 8.61 | 0.41 | | C | 0.32 | 590.8 | |
| 2755 | 5/11/2018 0:32 | 4 | 6.53 | | | | W | 0.21 | 748.8 | |
| 2756 | 5/11/2018 0:48 | 4 | 6.59 | | | | C | 1.16 | 1395.7 | |
| 2757 | 5/11/2018 1:05 | 4 | 6.49 | 7.73 | | | W | 0.17 | 369.5 | |
| 2758 | 5/11/2018 1:22 | 4 | 6.42 | | 0.31 | | U | 0.46 | 464.0 | 0.03 |
| 2759 | 5/11/2018 1:38 | 4 | 6.51 | 6.20 | | 0.37UW | | 0.25 | 317.0 | 0.22 |
| 2760 | 5/11/2018 1:55 | 4 | 6.31 | 1.22 | | 0.39UW | | 0.31 | 151.3 | |
| 2761 | 5/11/2018 2:11 | 4 | 5.96 | | | | U | 0.22 | 394.2 | 0.04 |
| 2762 | 5/11/2018 4:18 | 4 | 5.99 | 7.85 | 0.42 | | C | 0.15 | 258.0 | |
| 2763 | 5/11/2018 4:35 | 4 | 6.03 | | | | W | 0.10 | 418.5 | |
| 2764 | 5/11/2018 4:51 | 4 | 6.14 | | | | C | 4.49 | 2197.4 | |
| 2765 | 5/11/2018 5:08 | 4 | 6.05 | 6.99 | | | W | 0.28 | 702.2 | |
| 2766 | 5/11/2018 5:24 | 4 | 6.02 | | 0.37 | | U | 0.37 | 604.8 | 0.02 |
| 2767 | 5/11/2018 5:41 | 4 | 6.10 | 5.45 | | 0.39UW | | 0.15 | 226.4 | 0.05 |
| 2768 | 5/11/2018 5:57 | 4 | 6.05 | 0.57 | | 0.39UW | | 0.32 | 370.2 | |
| 2769 | 5/11/2018 6:14 | 4 | 5.93 | | | | U | 0.20 | 691.7 | 0.06 |
| 2770 | 5/11/2018 8:15 | 4 | 6.65 | 7.64 | 0.42 | | C | 0.13 | 222.6 | |
| 2771 | 5/11/2018 8:32 | 4 | 6.78 | | | | W | 0.13 | 361.5 | |
| 2772 | 5/11/2018 8:48 | 4 | 7.00 | | | | C | 4.14 | 2078.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2773 | 5/11/2018 9:05 | 4 | 7.23 | 7.48 | | | W | 0.21 | 1438.5 | |
| 2774 | 5/11/2018 9:22 | 4 | 7.62 | | 0.35 | | U | 0.60 | 822.3 | 0.01 |
| 2775 | 5/11/2018 9:38 | 4 | 8.07 | 6.31 | | 0.40 | UW | 0.33 | 437.5 | 0.01 |
| 2776 | 5/11/2018 9:55 | 4 | 9.34 | 1.59 | | 0.40 | UW | 0.58 | 1120.9 | 0.02 |
| 2777 | 5/11/2018 10:11 | 4 | 10.25 | | | | U | 0.22 | 795.0 | 0.10 |
| 2778 | 5/11/2018 12:15 | 4 | 8.71 | 8.88 | 0.42 | | C | 0.27 | 439.1 | |
| 2779 | 5/11/2018 12:32 | 4 | 8.47 | | | | W | 0.16 | 614.3 | |
| 2780 | 5/11/2018 12:48 | 4 | 8.73 | | | | C | 3.97 | 2019.5 | |
| 2781 | 5/11/2018 13:05 | 4 | 8.58 | 9.03 | | | W | 0.16 | 751.0 | |
| 2782 | 5/11/2018 13:21 | 4 | 8.41 | | 0.35 | | U | 0.59 | 985.3 | 0.02 |
| 2783 | 5/11/2018 13:38 | 4 | 8.71 | 7.40 | | 0.40 | UW | 0.81 | 705.4 | 0.01 |
| 2784 | 5/11/2018 13:54 | 4 | 9.08 | 2.36 | | 0.40 | UW | 0.55 | 612.9 | |
| 2785 | 5/11/2018 14:11 | 4 | 9.35 | | | | U | 0.41 | 1071.6 | 0.10 |
| 2786 | 5/11/2018 16:15 | 4 | 10.61 | 9.79 | 0.42 | | C | | 176.6 | |
| 2787 | 5/11/2018 16:32 | 4 | 10.36 | | | | W | 0.26 | 820.8 | |
| 2788 | 5/11/2018 16:48 | 4 | 10.57 | | | | C | 3.11 | 2133.8 | |
| 2789 | 5/11/2018 17:05 | 4 | 9.95 | 10.34 | | | W | 0.09 | 783.1 | |
| 2790 | 5/11/2018 17:22 | 4 | 9.66 | | 0.37 | | U | 0.64 | 816.6 | 0.03 |
| 2791 | 5/11/2018 17:38 | 4 | 9.60 | 8.39 | | 0.39 | UW | 0.10 | 452.4 | 0.22 |
| 2792 | 5/11/2018 17:55 | 4 | 9.22 | 3.10 | | 0.40 | UW | 0.51 | 739.4 | |
| 2793 | 5/11/2018 18:11 | 4 | 9.12 | | | | U | 0.33 | 1014.6 | 0.11 |
| 2794 | 5/11/2018 20:15 | 4 | 8.43 | 9.38 | 0.42 | | C | 0.04 | 470.2 | |
| 2795 | 5/11/2018 20:32 | 4 | 8.17 | | | | W | 0.12 | 552.4 | |
| 2796 | 5/11/2018 20:48 | 4 | 8.01 | | | | C | 0.78 | 926.2 | |
| 2797 | 5/11/2018 21:05 | 4 | 7.78 | 8.72 | | | W | 0.19 | 943.2 | |
| 2798 | 5/11/2018 21:22 | 4 | 7.73 | | 0.37 | | U | 0.73 | 979.0 | 0.02 |
| 2799 | 5/11/2018 21:38 | 4 | 7.88 | 7.03 | | 0.39 | UW | 0.21 | 416.5 | 0.10 |
| 2800 | 5/11/2018 21:55 | 4 | 7.80 | 1.95 | | 0.39 | UW | 0.36 | 559.9 | |
| 2801 | 5/11/2018 22:11 | 4 | 7.64 | | | | U | 0.27 | 931.3 | 0.06 |
| 2802 | 5/12/2018 0:15 | 4 | 7.76 | 8.57 | 0.42 | | C | 0.13 | 368.0 | |
| 2803 | 5/12/2018 0:32 | 4 | 7.64 | | | | W | 0.12 | 528.4 | |
| 2804 | 5/12/2018 0:49 | 4 | 7.49 | | | | C | 1.87 | 1870.9 | |
| 2805 | 5/12/2018 1:05 | 4 | 7.25 | 7.98 | | | W | | | |
| 2806 | 5/12/2018 1:22 | 4 | 7.12 | | 0.34 | | U | 0.47 | 642.6 | 0.03 |
| 2807 | 5/12/2018 1:38 | 4 | 7.16 | 6.27 | | 0.40 | UW | 0.42 | 497.4 | 0.04 |
| 2808 | 5/12/2018 1:55 | 4 | 6.95 | 1.19 | | 0.40 | UW | 0.42 | 392.4 | |
| 2809 | 5/12/2018 2:11 | 4 | 6.80 | | | | U | 0.24 | 790.1 | 0.06 |
| 2810 | 5/12/2018 4:15 | 4 | 6.97 | 7.97 | 0.42 | | C | 0.05 | 434.9 | |
| 2811 | 5/12/2018 4:32 | 4 | 6.44 | | | | W | 0.17 | 518.8 | |
| 2812 | 5/12/2018 4:48 | 4 | 6.19 | | | | C | 3.54 | 2229.9 | |
| 2813 | 5/12/2018 5:05 | 4 | 5.98 | 7.11 | | | W | 0.21 | 578.5 | |
| 2814 | 5/12/2018 5:21 | 4 | 5.81 | | 0.36 | | U | 0.43 | 676.0 | 0.02 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2815 | 5/12/2018 5:38 | 4 | 6.28 | 5.44 | | 0.39UW | | 0.18 | 464.8 | 0.01 |
| 2816 | 5/12/2018 5:55 | 4 | 6.66 | 0.54 | | 0.40UW | | 0.32 | 426.5 | |
| 2817 | 5/12/2018 6:11 | 4 | 6.72 | | | | U | 0.21 | 727.0 | 0.08 |
| 2818 | 5/12/2018 8:15 | 4 | 8.27 | 7.85 | 0.42 | | C | 0.12 | 548.7 | 0.01 |
| 2819 | 5/12/2018 8:32 | 4 | 8.71 | | | | W | 0.14 | 468.9 | |
| 2820 | 5/12/2018 8:48 | 4 | 9.07 | | | | C | 0.74 | 831.6 | |
| 2821 | 5/12/2018 9:05 | 4 | 8.95 | 8.46 | | | W | 0.13 | 730.2 | |
| 2822 | 5/12/2018 9:21 | 4 | 9.07 | | 0.36 | | U | 0.57 | 1057.8 | 0.05 |
| 2823 | 5/12/2018 9:38 | 4 | 9.27 | 7.01 | | 0.39UW | | 0.14 | 470.6 | 0.02 |
| 2824 | 5/12/2018 9:54 | 4 | 9.04 | 1.89 | | 0.39UW | | 0.68 | 1267.0 | |
| 2825 | 5/12/2018 10:11 | 4 | 9.20 | | | | U | 0.20 | 708.3 | 0.14 |
| 2826 | 5/12/2018 12:15 | 4 | 10.57 | 9.05 | 0.42 | | C | 0.07 | 325.0 | |
| 2827 | 5/12/2018 12:32 | 4 | 10.69 | | | | W | 0.15 | 554.1 | |
| 2828 | 5/12/2018 12:48 | 4 | 10.87 | | | | C | 0.76 | 735.6 | |
| 2829 | 5/12/2018 13:05 | 4 | 10.80 | 10.03 | | | W | 0.10 | 623.3 | |
| 2830 | 5/12/2018 13:21 | 4 | 11.07 | | 0.36 | | U | 0.70 | 868.7 | 0.11 |
| 2831 | 5/12/2018 13:38 | 4 | 11.71 | 8.49 | | 0.39UW | | 0.19 | 613.6 | 0.06 |
| 2832 | 5/12/2018 13:55 | 4 | 11.74 | 3.41 | | 0.39UW | | 0.77 | 1211.4 | 0.28 |
| 2833 | 5/12/2018 14:11 | 4 | 12.07 | | | | U | 0.37 | 1025.6 | 0.47 |
| 2834 | 5/12/2018 16:15 | 4 | 13.50 | 10.46 | 0.42 | | C | 0.33 | 696.1 | |
| 2835 | 5/12/2018 16:35 | 4 | 14.73 | | | | W | 0.17 | 657.6 | |
| 2836 | 5/12/2018 16:51 | 4 | 15.20 | | | | C | 0.35 | 925.4 | |
| 2837 | 5/12/2018 17:08 | 4 | 15.04 | 12.32 | | | W | 0.05 | 548.8 | |
| 2838 | 5/12/2018 17:24 | 4 | 15.79 | | 0.36 | | U | 0.47 | 916.4 | 0.26 |
| 2839 | 5/12/2018 17:41 | 4 | 16.68 | 10.92 | | 0.39UW | | 0.22 | 613.6 | 0.05 |
| 2840 | 5/12/2018 17:57 | 4 | 16.29 | 5.92 | | 0.39UW | | 0.43 | 827.0 | |
| 2841 | 5/12/2018 18:14 | 4 | 14.27 | | | | U | 0.30 | 1096.8 | 0.85 |
| 2842 | 5/12/2018 20:15 | 4 | 11.31 | 11.10 | 0.42 | | C | 0.95 | 903.8 | |
| 2843 | 5/12/2018 20:32 | 4 | 11.02 | | | | W | 0.15 | 698.6 | |
| 2844 | 5/12/2018 20:48 | 4 | 10.89 | | | | C | 0.76 | 721.3 | |
| 2845 | 5/12/2018 21:05 | 4 | 10.38 | 10.37 | | | W | | 269.5 | 0.02 |
| 2846 | 5/12/2018 21:21 | 4 | 10.41 | | 0.36 | | U | 0.53 | 801.2 | 0.09 |
| 2847 | 5/12/2018 21:38 | 4 | 10.53 | 8.58 | | 0.38UW | | 0.49 | 774.7 | |
| 2848 | 5/12/2018 21:55 | 4 | 10.45 | 3.54 | | 0.38UW | | 0.43 | 625.5 | |
| 2849 | 5/12/2018 22:11 | 4 | 10.19 | | | | U | 0.32 | 975.6 | 0.22 |
| 2850 | 5/13/2018 0:15 | 4 | 10.05 | 9.96 | 0.42 | | C | 0.15 | 552.5 | |
| 2851 | 5/13/2018 0:32 | 4 | 9.95 | | | | W | 0.13 | 599.4 | |
| 2852 | 5/13/2018 0:48 | 4 | 9.90 | | | | C | 0.32 | 596.5 | |
| 2853 | 5/13/2018 1:05 | 4 | 9.67 | 9.68 | | | W | 0.05 | 304.1 | 0.01 |
| 2854 | 5/13/2018 1:21 | 4 | 9.71 | | 0.35 | | U | 0.54 | 640.4 | 0.12 |
| 2855 | 5/13/2018 1:38 | 4 | 9.85 | 8.00 | | 0.38UW | | 0.31 | 623.2 | |
| 2856 | 5/13/2018 1:54 | 4 | 9.72 | 2.93 | | 0.38UW | | 0.76 | 496.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2857 | 5/13/2018 2:11 | 4 | 9.60 | | | | U | 0.33 | 877.4 | 0.16 |
| 2858 | 5/13/2018 4:15 | 4 | 9.65 | 9.57 | 0.42 | | C | 0.17 | 466.9 | |
| 2859 | 5/13/2018 4:32 | 4 | 9.62 | | | | W | 0.17 | 565.6 | |
| 2860 | 5/13/2018 4:48 | 4 | 9.58 | | | | C | 0.34 | 599.5 | |
| 2861 | 5/13/2018 5:05 | 4 | 9.41 | 9.37 | | | W | 0.05 | 219.7 | |
| 2862 | 5/13/2018 5:21 | 4 | 9.40 | | 0.35 | | U | 0.54 | 621.6 | 0.13 |
| 2863 | 5/13/2018 5:38 | 4 | 9.53 | 7.69 | | 0.38UW | | 0.25 | 567.5 | |
| 2864 | 5/13/2018 5:55 | 4 | 9.48 | 2.65 | | 0.38UW | | 0.42 | 457.8 | |
| 2865 | 5/13/2018 6:11 | 4 | 9.40 | | | | U | 0.52 | 911.2 | 0.28 |
| 2866 | 5/13/2018 8:15 | 4 | 10.93 | 9.62 | 0.42 | | C | 0.15 | 445.4 | |
| 2867 | 5/13/2018 8:32 | 4 | 10.98 | | | | W | 0.13 | 567.8 | |
| 2868 | 5/13/2018 8:48 | 4 | 11.21 | | | | C | 0.36 | 599.3 | |
| 2869 | 5/13/2018 9:05 | 4 | 11.66 | 10.34 | | | W | | 396.6 | |
| 2870 | 5/13/2018 9:21 | 4 | 12.45 | | 0.35 | | U | 0.73 | 792.9 | 0.16 |
| 2871 | 5/13/2018 9:38 | 4 | 13.46 | 9.27 | | 0.38UW | | 0.24 | 827.7 | 0.02 |
| 2872 | 5/13/2018 9:55 | 4 | 12.94 | 4.17 | | 0.38UW | | 0.47 | 656.6 | |
| 2873 | 5/13/2018 10:11 | 4 | 13.56 | | | | U | 0.42 | 1346.0 | 1.10 |
| 2874 | 5/13/2018 12:15 | 4 | 19.92 | 13.35 | 0.42 | | C | 0.29 | 884.2 | |
| 2875 | 5/13/2018 12:32 | 4 | 18.78 | | | | W | 0.55 | 908.3 | |
| 2876 | 5/13/2018 12:48 | 4 | 18.42 | | | | C | 0.30 | 861.5 | |
| 2877 | 5/13/2018 13:05 | 4 | 17.40 | 16.09 | | | W | 0.07 | 391.0 | |
| 2878 | 5/13/2018 13:21 | 4 | 17.30 | | 0.35 | | U | 1.27 | 1100.3 | 0.57 |
| 2879 | 5/13/2018 13:38 | 4 | 18.13 | 14.01 | | 0.38UW | | 0.81 | 992.7 | |
| 2880 | 5/13/2018 13:54 | 4 | 18.03 | 8.71 | | 0.38UW | | 0.79 | 948.1 | |
| 2881 | 5/13/2018 14:11 | 4 | 18.01 | | | | U | 0.68 | 1312.5 | 0.72 |
| 2882 | 5/13/2018 16:15 | 4 | 27.11 | 16.93 | 0.42 | | C | 0.22 | 1053.2 | |
| 2883 | 5/13/2018 16:32 | 4 | 25.52 | | | | W | 0.36 | 1242.8 | |
| 2884 | 5/13/2018 16:48 | 4 | 26.03 | | | | C | 0.25 | 1194.7 | |
| 2885 | 5/13/2018 17:05 | 4 | 22.39 | 20.97 | | | W | 0.02 | 584.1 | |
| 2886 | 5/13/2018 17:21 | 4 | 22.73 | | 0.35 | | U | 2.08 | 1288.4 | 1.14 |
| 2887 | 5/13/2018 17:38 | 4 | 22.36 | 18.09 | | 0.37UW | | 1.22 | 1419.5 | |
| 2888 | 5/13/2018 17:54 | 4 | 23.84 | 13.43 | | 0.38UW | | 0.34 | 1039.3 | |
| 2889 | 5/13/2018 18:11 | 4 | 23.28 | | | | U | 1.07 | 1605.1 | 1.64 |
| 2890 | 5/13/2018 20:15 | 4 | 18.64 | 16.74 | 0.41 | | C | 0.26 | 870.2 | |
| 2891 | 5/13/2018 20:32 | 4 | 17.05 | | | | W | 0.18 | 959.2 | |
| 2892 | 5/13/2018 20:48 | 4 | 16.74 | | | | C | 0.23 | 816.9 | |
| 2893 | 5/13/2018 21:05 | 4 | 16.03 | 16.53 | | | W | 0.07 | 749.0 | |
| 2894 | 5/13/2018 21:21 | 4 | 15.94 | | 0.35 | | U | 1.01 | 897.1 | 0.32 |
| 2895 | 5/13/2018 21:38 | 4 | 15.80 | 14.04 | | 0.37UW | | 0.78 | 970.9 | |
| 2896 | 5/13/2018 21:54 | 4 | 15.65 | 9.10 | | 0.37UW | | 0.88 | 731.6 | |
| 2897 | 5/13/2018 22:11 | 4 | 15.25 | | | | U | 0.58 | 1159.0 | 0.17 |
| 2898 | 5/14/2018 0:15 | 4 | 14.27 | 14.34 | 0.41 | | C | 0.20 | 807.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2899 | 5/14/2018 0:32 | 4 | 14.06 | | | | W | 0.17 | 838.4 | |
| 2900 | 5/14/2018 0:49 | 4 | 14.04 | | | | C | 0.30 | 859.4 | |
| 2901 | 5/14/2018 1:05 | 4 | 13.56 | 14.17 | | | W | 0.14 | 764.5 | |
| 2902 | 5/14/2018 1:22 | 4 | 13.57 | | 0.34 | | U | 0.98 | 857.9 | 0.22 |
| 2903 | 5/14/2018 1:38 | 4 | 13.54 | 12.14 | | 0.37UW | | 0.53 | 930.6 | |
| 2904 | 5/14/2018 1:55 | 4 | 13.41 | 7.07 | | 0.37UW | | 0.77 | 714.1 | |
| 2905 | 5/14/2018 2:11 | 4 | 13.08 | | | | U | 0.54 | 1155.9 | 0.12 |
| 2906 | 5/14/2018 4:15 | 4 | 10.03 | 12.58 | 0.41 | | C | 0.09 | 692.9 | |
| 2907 | 5/14/2018 4:32 | 4 | 9.56 | | | | W | 0.17 | 748.7 | |
| 2908 | 5/14/2018 4:48 | 4 | 10.09 | | | | C | 0.20 | 1186.6 | |
| 2909 | 5/14/2018 5:05 | 4 | 9.52 | 11.58 | | | W | 0.01 | 1643.4 | |
| 2910 | 5/14/2018 5:21 | 4 | 9.44 | | 0.34 | | U | 1.41 | 783.8 | 0.06 |
| 2911 | 5/14/2018 5:38 | 4 | 10.03 | 9.76 | | 0.36UW | | 0.45 | 730.5 | |
| 2912 | 5/14/2018 5:54 | 4 | 10.60 | 4.86 | | 0.37UW | | 0.69 | 563.9 | |
| 2913 | 5/14/2018 6:11 | 4 | 10.89 | | | | U | 0.44 | 1098.6 | 0.08 |
| 2914 | 5/14/2018 8:15 | 4 | 13.41 | 12.09 | 0.41 | | C | 0.35 | 839.3 | |
| 2915 | 5/14/2018 8:32 | 4 | 13.77 | | | | W | 0.23 | 865.7 | |
| 2916 | 5/14/2018 8:48 | 4 | 14.73 | | | | C | 0.44 | 978.4 | 0.01 |
| 2917 | 5/14/2018 9:05 | 4 | 15.42 | 13.45 | | | W | 0.02 | 314.4 | |
| 2918 | 5/14/2018 9:21 | 4 | 16.78 | | 0.34 | | U | 1.10 | 1112.2 | 0.17 |
| 2919 | 5/14/2018 9:38 | 4 | 17.50 | 12.61 | | 0.37UW | | 0.27 | 1125.4 | 0.20 |
| 2920 | 5/14/2018 9:54 | 4 | 18.41 | 7.56 | | 0.37UW | | 0.97 | 854.7 | 0.16 |
| 2921 | 5/14/2018 10:11 | 4 | 17.93 | | | | U | 0.69 | 1434.5 | 0.41 |
| 2922 | 5/14/2018 12:15 | 4 | 20.34 | 15.45 | 0.41 | | C | 0.17 | 780.1 | |
| 2923 | 5/14/2018 12:32 | 4 | 19.45 | | | | W | 0.18 | 930.3 | |
| 2924 | 5/14/2018 12:48 | 4 | 20.79 | | | | C | 0.24 | 952.6 | |
| 2925 | 5/14/2018 13:05 | 4 | 21.05 | 17.93 | | | W | 0.03 | 299.0 | 0.02 |
| 2926 | 5/14/2018 13:22 | 4 | 19.82 | | 0.34 | | U | 1.34 | 1083.7 | 0.33 |
| 2927 | 5/14/2018 13:38 | 4 | 18.52 | 15.66 | | 0.36UW | | 0.78 | 1035.5 | |
| 2928 | 5/14/2018 13:55 | 4 | 19.20 | 10.31 | | 0.37UW | | 1.14 | 887.0 | |
| 2929 | 5/14/2018 14:11 | 4 | 20.24 | | | | U | 0.83 | 1434.9 | 0.42 |
| 2930 | 5/14/2018 16:15 | 4 | 18.77 | 16.16 | 0.41 | | C | 0.25 | 954.6 | |
| 2931 | 5/14/2018 16:32 | 4 | 18.82 | | | | W | 0.15 | 1025.4 | |
| 2932 | 5/14/2018 16:48 | 4 | 18.44 | | | | C | 0.38 | 1222.5 | |
| 2933 | 5/14/2018 17:05 | 4 | 18.19 | 17.53 | | | W | 0.06 | 538.8 | |
| 2934 | 5/14/2018 17:21 | 4 | 19.58 | | 0.34 | | U | 1.20 | 1273.2 | 0.14 |
| 2935 | 5/14/2018 17:38 | 4 | 20.12 | 16.05 | | 0.36UW | | 1.35 | 1319.0 | 0.07 |
| 2936 | 5/14/2018 17:54 | 4 | 20.28 | 10.99 | | 0.37UW | | 1.16 | 928.1 | |
| 2937 | 5/14/2018 18:11 | 4 | 19.93 | | | | U | 0.94 | 1564.1 | 0.35 |
| 2938 | 5/14/2018 20:15 | 4 | 18.19 | 16.39 | 0.41 | | C | 0.33 | 1061.3 | |
| 2939 | 5/14/2018 20:32 | 4 | 16.15 | | | | W | 0.16 | 1075.2 | |
| 2940 | 5/14/2018 20:48 | 4 | 15.15 | | | | C | 0.30 | 1187.9 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2941 | 5/14/2018 21:05 | 4 | 13.64 | 15.83 | | | W | 1.98 | 2294.2 | |
| 2942 | 5/14/2018 21:21 | 4 | 13.16 | | 0.34 | | U | 1.17 | 986.6 | 0.06 |
| 2943 | 5/14/2018 21:38 | 4 | 12.85 | 13.25 | | 0.36 | UW | 0.68 | 1025.5 | |
| 2944 | 5/14/2018 21:54 | 4 | 12.56 | 8.24 | | 0.36 | UW | 0.69 | 668.3 | |
| 2945 | 5/14/2018 22:11 | 4 | 11.83 | | | | U | 0.60 | 1226.6 | |
| 2946 | 5/15/2018 0:15 | 4 | 10.39 | 13.44 | 0.41 | | C | 0.25 | 715.4 | |
| 2947 | 5/15/2018 0:32 | 4 | 10.48 | | | | W | 0.15 | 824.8 | |
| 2948 | 5/15/2018 0:48 | 4 | 10.57 | | | | C | 0.31 | 887.9 | |
| 2949 | 5/15/2018 1:05 | 4 | 10.00 | 12.37 | | | W | 0.15 | 755.2 | |
| 2950 | 5/15/2018 1:21 | 4 | 9.56 | | 0.33 | | U | 0.84 | 869.6 | 0.02 |
| 2951 | 5/15/2018 1:38 | 4 | 9.76 | 10.41 | | 0.36 | UW | 0.49 | 872.8 | 0.18 |
| 2952 | 5/15/2018 1:55 | 4 | 9.53 | 5.42 | | 0.36 | UW | 0.59 | 730.2 | |
| 2953 | 5/15/2018 2:11 | 4 | 9.35 | | | | U | 0.49 | 1164.7 | |
| 2954 | 5/15/2018 4:15 | 4 | 11.09 | 12.08 | 0.41 | | C | 0.37 | 894.7 | |
| 2955 | 5/15/2018 4:32 | 4 | 11.78 | | | | W | 0.20 | 826.0 | |
| 2956 | 5/15/2018 4:48 | 4 | 12.41 | | | | C | 0.40 | 1084.3 | |
| 2957 | 5/15/2018 5:05 | 4 | 12.74 | 12.03 | | | W | 0.07 | 530.1 | |
| 2958 | 5/15/2018 5:21 | 4 | 12.49 | | 0.33 | | U | 1.62 | 1379.6 | 0.01 |
| 2959 | 5/15/2018 5:38 | 4 | 12.07 | 10.25 | | 0.36 | UW | 0.74 | 1398.5 | 0.08 |
| 2960 | 5/15/2018 5:54 | 4 | 11.94 | 5.14 | | 0.36 | UW | 0.65 | 799.0 | |
| 2961 | 5/15/2018 6:11 | 4 | 11.11 | | | | U | 0.51 | 1240.7 | |
| 2962 | 5/15/2018 8:15 | 4 | 13.32 | 11.90 | 0.41 | | C | 0.39 | 1061.7 | 0.01 |
| 2963 | 5/15/2018 8:32 | 4 | 14.57 | | | | W | 0.14 | 880.5 | |
| 2964 | 5/15/2018 8:48 | 4 | 15.12 | | | | C | 0.46 | 965.2 | |
| 2965 | 5/15/2018 9:05 | 4 | 15.98 | 14.04 | | | W | 0.01 | 760.1 | |
| 2966 | 5/15/2018 9:22 | 4 | 16.48 | | 0.33 | | U | 0.68 | 1439.0 | 0.05 |
| 2967 | 5/15/2018 9:38 | 4 | 17.41 | 12.90 | | 0.36 | UW | 0.29 | 1482.9 | 0.06 |
| 2968 | 5/15/2018 9:55 | 4 | 19.45 | 7.48 | | 0.36 | UW | 0.81 | 885.3 | 0.02 |
| 2969 | 5/15/2018 10:11 | 4 | 19.66 | | | | U | 0.60 | 1484.8 | 0.30 |
| 2970 | 5/15/2018 12:15 | 4 | 25.54 | 16.73 | 0.41 | | C | 1.51 | 1413.1 | |
| 2971 | 5/15/2018 12:32 | 4 | 25.39 | | | | W | 0.21 | 1978.2 | |
| 2972 | 5/15/2018 12:48 | 4 | 27.16 | | | | C | 0.41 | 1391.8 | |
| 2973 | 5/15/2018 13:05 | 4 | 26.62 | 21.70 | | | W | 0.02 | 1725.2 | |
| 2974 | 5/15/2018 13:21 | 4 | 27.47 | | 0.34 | | U | 2.03 | 3475.0 | 0.99 |
| 2975 | 5/15/2018 13:38 | 4 | 27.49 | 20.43 | | 0.39 | UW | 2.28 | 1724.8 | 0.37 |
| 2976 | 5/15/2018 13:54 | 4 | 27.37 | 15.59 | | 0.39 | UW | 4.09 | 2712.3 | |
| 2977 | 5/15/2018 14:11 | 4 | 28.35 | | | | U | 1.34 | 2294.6 | 1.90 |
| 2978 | 5/15/2018 16:15 | 4 | 30.18 | 21.58 | 0.40 | | C | 0.44 | 1453.9 | |
| 2979 | 5/15/2018 16:32 | 4 | 28.48 | | | | W | 0.25 | 1797.7 | |
| 2980 | 5/15/2018 16:48 | 4 | 30.41 | | | | C | 0.33 | 1369.7 | |
| 2981 | 5/15/2018 17:05 | 4 | 28.71 | 24.68 | | | W | 0.02 | 1094.6 | |
| 2982 | 5/15/2018 17:21 | 4 | 29.06 | | 0.33 | | U | 1.51 | 2583.6 | 2.05 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 2983 | 5/15/2018 17:38 | 4 | 27.96 | 21.41 | | 0.37 | UW | 1.98 | 1670.9 | 0.20 |
| 2984 | 5/15/2018 17:54 | 4 | 27.39 | 16.90 | | 0.38 | UW | 1.31 | 1473.9 | |
| 2985 | 5/15/2018 18:11 | 4 | 27.35 | | | | U | 0.60 | 1608.9 | 1.72 |
| 2986 | 5/15/2018 20:15 | 4 | 21.47 | 19.10 | 0.39 | | C | 0.39 | 1205.5 | |
| 2987 | 5/15/2018 20:32 | 4 | 18.75 | | | | W | 0.16 | 1143.4 | |
| 2988 | 5/15/2018 20:48 | 4 | 18.34 | | | | C | 0.26 | 994.9 | |
| 2989 | 5/15/2018 21:05 | 4 | 16.00 | 18.25 | | | W | 0.03 | 1180.9 | |
| 2990 | 5/15/2018 21:21 | 4 | 15.39 | | 0.32 | | U | 0.73 | 1422.3 | 0.44 |
| 2991 | 5/15/2018 21:38 | 4 | 14.97 | 15.15 | | 0.36 | UW | 0.64 | 1104.0 | |
| 2992 | 5/15/2018 21:55 | 4 | 14.36 | 10.62 | | 0.37 | UW | 0.71 | 911.2 | |
| 2993 | 5/15/2018 22:11 | 4 | 13.64 | | | | U | 0.39 | 1329.8 | |
| 2994 | 5/16/2018 0:15 | 4 | 11.82 | 15.28 | 0.39 | | C | 0.25 | 852.1 | |
| 2995 | 5/16/2018 0:32 | 4 | 11.18 | | | | W | 0.11 | 875.8 | |
| 2996 | 5/16/2018 0:49 | 4 | 11.21 | | | | C | 0.28 | 839.6 | |
| 2997 | 5/16/2018 1:05 | 4 | 10.88 | 14.19 | | | W | | | |
| 2998 | 5/16/2018 1:22 | 4 | 10.82 | | 0.32 | | U | 0.57 | 1365.1 | 0.12 |
| 2999 | 5/16/2018 1:38 | 4 | 10.99 | 11.98 | | 0.36 | UW | 0.42 | 1005.8 | |
| 3000 | 5/16/2018 1:55 | 4 | 10.76 | 7.25 | | 0.36 | UW | 0.58 | 639.2 | |
| 3001 | 5/16/2018 2:11 | 4 | 9.92 | | | | U | 0.36 | 1059.3 | 0.20 |
| 3002 | 5/16/2018 4:15 | 4 | 9.32 | 13.10 | 0.39 | | C | 0.26 | 677.9 | |
| 3003 | 5/16/2018 4:32 | 4 | 9.55 | | | | W | 0.13 | 864.0 | |
| 3004 | 5/16/2018 4:48 | 4 | 9.21 | | | | C | 0.26 | 747.9 | |
| 3005 | 5/16/2018 5:05 | 4 | 9.01 | 12.07 | | | W | 0.02 | | |
| 3006 | 5/16/2018 5:21 | 4 | 8.83 | | 0.31 | | U | 0.51 | 962.5 | 0.05 |
| 3007 | 5/16/2018 5:38 | 4 | 9.19 | 10.07 | | 0.36 | UW | 0.38 | 822.9 | 0.12 |
| 3008 | 5/16/2018 5:54 | 4 | 9.33 | 5.28 | | 0.36 | UW | 0.49 | 588.0 | |
| 3009 | 5/16/2018 6:11 | 4 | 9.18 | | | | U | 0.33 | 1301.7 | 0.02 |
| 3010 | 5/16/2018 8:15 | 4 | 14.64 | 12.66 | 0.39 | | C | 0.37 | 1063.6 | 0.03 |
| 3011 | 5/16/2018 8:32 | 4 | 16.65 | | | | W | 0.13 | 892.8 | 0.01 |
| 3012 | 5/16/2018 8:48 | 4 | 17.69 | | | | C | 0.27 | 930.8 | 0.04 |
| 3013 | 5/16/2018 9:05 | 4 | 19.22 | 16.38 | | | W | 0.04 | 541.8 | |
| 3014 | 5/16/2018 9:21 | 4 | 20.01 | | 0.31 | | U | 0.85 | 1639.8 | 0.15 |
| 3015 | 5/16/2018 9:38 | 4 | 20.76 | 15.38 | | 0.36 | UW | 0.34 | 778.9 | 0.11 |
| 3016 | 5/16/2018 9:54 | 4 | 22.97 | 9.81 | | 0.37 | UW | 0.35 | 1437.1 | 0.01 |
| 3017 | 5/16/2018 10:11 | 4 | 23.86 | | | | U | 0.69 | 1490.6 | 6.17 |
| 3018 | 5/16/2018 12:15 | 4 | 30.05 | 19.05 | 0.39 | | C | 0.20 | 977.8 | |
| 3019 | 5/16/2018 12:32 | 4 | 29.51 | | | | W | 0.11 | 1280.3 | 0.02 |
| 3020 | 5/16/2018 12:48 | 4 | 31.11 | | | | C | 0.21 | 1141.6 | |
| 3021 | 5/16/2018 13:05 | 4 | 31.45 | 25.56 | | | W | 0.06 | 907.8 | |
| 3022 | 5/16/2018 13:21 | 4 | 32.19 | | 0.32 | | U | 1.36 | 2169.9 | 1.04 |
| 3023 | 5/16/2018 13:38 | 4 | 31.61 | 24.63 | | 0.36 | UW | 1.05 | 1468.8 | |
| 3024 | 5/16/2018 13:54 | 4 | 31.54 | 18.02 | | 0.36 | UW | 0.85 | 1456.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3025 | 5/16/2018 14:11 | 4 | 32.90 | | | | U | 0.56 | 1356.5 | 0.97 |
| 3026 | 5/16/2018 16:15 | 4 | 34.02 | 23.53 | 0.39 | | C | 0.27 | 1179.4 | |
| 3027 | 5/16/2018 16:32 | 4 | 32.73 | | | | W | 0.27 | 1594.6 | 0.22 |
| 3028 | 5/16/2018 16:48 | 4 | 33.45 | | | | C | 0.15 | 1213.9 | |
| 3029 | 5/16/2018 17:05 | 4 | 32.45 | 27.80 | | | W | | 971.2 | |
| 3030 | 5/16/2018 17:21 | 4 | 32.73 | | 0.32 | | U | 0.90 | 2366.1 | 1.01 |
| 3031 | 5/16/2018 17:38 | 4 | 30.71 | 24.57 | | 0.34UW | | 0.99 | 1315.8 | 0.22 |
| 3032 | 5/16/2018 17:54 | 4 | 31.06 | 19.01 | | 0.35UW | | 0.68 | 1393.1 | |
| 3033 | 5/16/2018 18:11 | 4 | 30.90 | | | | U | 0.28 | 1311.9 | 0.64 |
| 3034 | 5/16/2018 20:15 | 4 | 24.77 | 21.31 | 0.38 | | C | 0.33 | 1302.0 | |
| 3035 | 5/16/2018 20:32 | 4 | 22.94 | | | | W | 0.14 | 1227.3 | |
| 3036 | 5/16/2018 20:48 | 4 | 22.55 | | | | C | 0.25 | 1134.2 | |
| 3037 | 5/16/2018 21:05 | 4 | 20.97 | 21.36 | | | W | 0.02 | 906.2 | |
| 3038 | 5/16/2018 21:21 | 4 | 20.95 | | 0.31 | | U | 0.58 | 1649.2 | 0.34 |
| 3039 | 5/16/2018 21:38 | 4 | 20.43 | 18.35 | | 0.34UW | | 0.85 | 1410.2 | 0.07 |
| 3040 | 5/16/2018 21:54 | 4 | 20.19 | 13.34 | | 0.34UW | | 0.67 | 1028.7 | |
| 3041 | 5/16/2018 22:11 | 4 | 19.65 | | | | U | 0.22 | 1410.8 | 0.16 |
| 3042 | 5/17/2018 0:15 | 4 | 18.79 | 18.15 | 0.37 | | C | 0.24 | 882.6 | |
| 3043 | 5/17/2018 0:32 | 4 | 18.43 | | | | W | 0.14 | 1148.2 | |
| 3044 | 5/17/2018 0:48 | 4 | 17.63 | | | | C | 0.21 | 1012.0 | |
| 3045 | 5/17/2018 1:05 | 4 | 15.92 | 17.91 | | | W | | 443.7 | |
| 3046 | 5/17/2018 1:22 | 4 | 15.17 | | 0.30 | | U | 0.48 | 1344.3 | 0.14 |
| 3047 | 5/17/2018 1:38 | 4 | 14.52 | 15.21 | | 0.33UW | | 0.34 | 1228.8 | |
| 3048 | 5/17/2018 1:55 | 4 | 13.92 | 10.19 | | 0.34UW | | 0.60 | 815.6 | |
| 3049 | 5/17/2018 2:11 | 4 | 13.37 | | | | U | 0.28 | 1331.1 | |
| 3050 | 5/17/2018 4:15 | 4 | 11.86 | 15.60 | 0.37 | | C | 0.21 | 879.7 | |
| 3051 | 5/17/2018 4:32 | 4 | 12.24 | | | | W | 0.09 | 1006.3 | |
| 3052 | 5/17/2018 4:48 | 4 | 11.88 | | | | C | 0.33 | 889.2 | |
| 3053 | 5/17/2018 5:05 | 4 | 11.70 | 14.68 | | | W | | 580.8 | |
| 3054 | 5/17/2018 5:21 | 4 | 11.88 | | 0.29 | | U | 0.42 | 1285.3 | 0.04 |
| 3055 | 5/17/2018 5:38 | 4 | 11.60 | 12.51 | | 0.33UW | | 0.13 | 1066.9 | 0.31 |
| 3056 | 5/17/2018 5:55 | 4 | 11.46 | 7.57 | | 0.33UW | | 0.40 | 767.4 | |
| 3057 | 5/17/2018 6:11 | 4 | 11.22 | | | | U | 0.48 | 1219.0 | 0.01 |
| 3058 | 5/17/2018 8:15 | 4 | 18.13 | 14.86 | 0.37 | | C | 0.36 | 1217.3 | 0.02 |
| 3059 | 5/17/2018 8:32 | 4 | 18.82 | | | | W | 0.16 | 1173.9 | |
| 3060 | 5/17/2018 8:48 | 4 | 20.05 | | | | C | 0.42 | 1065.6 | |
| 3061 | 5/17/2018 9:05 | 4 | 21.14 | 17.48 | | | W | 0.06 | 730.4 | 0.01 |
| 3062 | 5/17/2018 9:21 | 4 | 21.80 | | 0.30 | | U | 0.61 | 1859.9 | 0.14 |
| 3063 | 5/17/2018 9:38 | 4 | 22.45 | 17.08 | | 0.33UW | | 0.18 | 1366.9 | 0.04 |
| 3064 | 5/17/2018 9:54 | 4 | 24.70 | 11.62 | | 0.34UW | | 0.39 | 2419.6 | 0.03 |
| 3065 | 5/17/2018 10:11 | 4 | 25.85 | | | | U | 0.22 | 1822.5 | 11.35 |
| 3066 | 5/17/2018 12:15 | 4 | 30.59 | 19.81 | 0.37 | | C | 0.62 | 1674.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3067 | 5/17/2018 12:32 | 4 | 29.16 | | | | W | 0.28 | 1647.3 | 0.02 |
| 3068 | 5/17/2018 12:48 | 4 | 31.43 | | | | C | 1.78 | 2370.1 | |
| 3069 | 5/17/2018 13:05 | 4 | 29.76 | 24.47 | | | W | | 799.9 | |
| 3070 | 5/17/2018 13:21 | 4 | 29.98 | | 0.30 | | U | 0.81 | 2179.1 | 0.28 |
| 3071 | 5/17/2018 13:38 | 4 | 30.48 | 23.11 | | 0.33UW | | 0.32 | 2480.3 | 0.10 |
| 3072 | 5/17/2018 13:54 | 4 | 32.29 | 17.71 | | 0.34UW | | 3.11 | 5220.4 | |
| 3073 | 5/17/2018 14:11 | 4 | 32.23 | | | | U | 0.34 | 1702.2 | 0.32 |
| 3074 | 5/17/2018 16:15 | 4 | 31.21 | 22.55 | 0.36 | | C | 0.74 | 1782.8 | |
| 3075 | 5/17/2018 16:32 | 4 | 31.34 | | | | W | 0.23 | 2414.7 | 0.10 |
| 3076 | 5/17/2018 16:48 | 4 | 32.40 | | | | C | 1.16 | 2716.0 | |
| 3077 | 5/17/2018 17:05 | 4 | 31.38 | 26.41 | | | W | 0.06 | 1482.5 | |
| 3078 | 5/17/2018 17:21 | 4 | 31.03 | | 0.30 | | U | 0.70 | 2511.5 | 0.19 |
| 3079 | 5/17/2018 17:38 | 4 | 30.24 | 23.06 | | 0.32UW | | 0.15 | 2322.5 | 0.07 |
| 3080 | 5/17/2018 17:54 | 4 | 28.58 | 17.83 | | 0.33UW | | 2.39 | 6201.2 | |
| 3081 | 5/17/2018 18:11 | 4 | 29.68 | | | | U | 0.26 | 1928.0 | 0.19 |
| 3082 | 5/17/2018 20:15 | 4 | 23.51 | 20.10 | 0.35 | | C | 0.28 | 1108.2 | |
| 3083 | 5/17/2018 20:32 | 4 | 22.28 | | | | W | 0.10 | 1216.3 | |
| 3084 | 5/17/2018 20:48 | 4 | 21.53 | | | | C | 0.36 | 1152.1 | |
| 3085 | 5/17/2018 21:05 | 4 | 20.94 | 20.78 | | | W | 0.05 | 717.3 | |
| 3086 | 5/17/2018 21:21 | 4 | 20.89 | | 0.29 | | U | 0.35 | 1880.1 | 0.10 |
| 3087 | 5/17/2018 21:38 | 4 | 20.35 | 17.63 | | 0.31UW | | 0.08 | 1554.9 | 0.02 |
| 3088 | 5/17/2018 21:54 | 4 | 19.66 | 12.59 | | 0.32UW | | 0.88 | 2012.8 | |
| 3089 | 5/17/2018 22:11 | 4 | 19.71 | | | | U | 0.16 | 1425.4 | 0.07 |
| 3090 | 5/18/2018 0:15 | 4 | 18.23 | 17.14 | 0.35 | | C | 0.29 | 978.0 | |
| 3091 | 5/18/2018 0:32 | 4 | 17.45 | | | | W | 0.10 | 1114.6 | |
| 3092 | 5/18/2018 0:49 | 4 | 17.13 | | | | C | 0.41 | 1302.6 | |
| 3093 | 5/18/2018 1:05 | 4 | 16.85 | 17.24 | | | W | 0.01 | 711.3 | |
| 3094 | 5/18/2018 1:22 | 4 | 16.73 | | 0.28 | | U | 0.38 | 1540.1 | 0.05 |
| 3095 | 5/18/2018 1:38 | 4 | 16.55 | 14.70 | | 0.31UW | | 0.23 | 1760.3 | 0.01 |
| 3096 | 5/18/2018 1:55 | 4 | 16.44 | 9.68 | | 0.31UW | | 0.35 | 1389.2 | |
| 3097 | 5/18/2018 2:11 | 4 | 16.68 | | | | U | 0.18 | 1361.4 | 0.04 |
| 3098 | 5/18/2018 4:15 | 4 | 17.24 | 15.58 | 0.35 | | C | 0.37 | 1065.5 | |
| 3099 | 5/18/2018 4:32 | 4 | 16.80 | | | | W | 0.14 | 1178.0 | |
| 3100 | 5/18/2018 4:48 | 4 | 16.83 | | | | C | 0.74 | 1869.7 | |
| 3101 | 5/18/2018 5:05 | 4 | 16.71 | 15.95 | | | W | 0.03 | 1150.2 | |
| 3102 | 5/18/2018 5:21 | 4 | 16.51 | | 0.28 | | U | 0.35 | 1647.9 | 0.03 |
| 3103 | 5/18/2018 5:38 | 4 | 16.14 | 13.77 | | 0.31UW | | 0.14 | 1769.2 | |
| 3104 | 5/18/2018 5:55 | 4 | 16.00 | 8.65 | | 0.31UW | | 0.77 | 2634.5 | |
| 3105 | 5/18/2018 6:11 | 4 | 16.02 | | | | U | 0.26 | 1538.8 | 0.04 |
| 3106 | 5/18/2018 8:15 | 4 | 17.81 | 15.35 | 0.35 | | C | 0.36 | 971.1 | |
| 3107 | 5/18/2018 8:32 | 4 | 18.19 | | | | W | 0.14 | 1099.7 | |
| 3108 | 5/18/2018 8:48 | 4 | 19.02 | | | | C | 0.70 | 1558.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3109 | 5/18/2018 9:05 | 4 | 19.38 | 16.78 | | | W | 0.03 | 761.6 | |
| 3110 | 5/18/2018 9:21 | 4 | 19.40 | | 0.28 | | U | 0.36 | 1888.9 | 0.04 |
| 3111 | 5/18/2018 9:38 | 4 | 19.84 | 15.42 | | 0.31 | UW | 0.17 | 2023.9 | 0.01 |
| 3112 | 5/18/2018 9:54 | 4 | 21.37 | 10.45 | | 0.31 | UW | 0.98 | 2212.9 | 0.02 |
| 3113 | 5/18/2018 10:11 | 4 | 22.40 | | | | U | 0.18 | 1359.0 | 0.14 |
| 3114 | 5/18/2018 12:15 | 4 | 26.29 | 18.69 | 0.35 | | C | 0.42 | 1156.4 | |
| 3115 | 5/18/2018 12:32 | 4 | 23.70 | | | | W | 0.25 | 2539.3 | 0.02 |
| 3116 | 5/18/2018 12:48 | 4 | 23.35 | | | | C | 0.68 | 1637.1 | |
| 3117 | 5/18/2018 13:05 | 4 | 21.60 | 20.73 | | | W | 0.06 | 2138.6 | |
| 3118 | 5/18/2018 13:21 | 4 | 22.73 | | | | U | 0.43 | 1831.1 | 0.04 |
| 3119 | 5/18/2018 13:38 | 4 | 21.45 | 18.41 | | 0.36 | UW | 0.20 | 654.3 | 0.21 |
| 3120 | 5/18/2018 13:55 | 4 | 21.48 | 12.93 | | 0.38 | UW | 0.49 | 1973.5 | |
| 3121 | 5/18/2018 14:11 | 4 | 22.86 | | | | U | 0.12 | 860.2 | |
| 3122 | 5/18/2018 16:15 | 4 | 26.95 | 19.58 | 0.34 | | C | 0.73 | 1570.0 | |
| 3123 | 5/18/2018 16:32 | 4 | 26.19 | | | | W | 0.54 | 1953.1 | 0.03 |
| 3124 | 5/18/2018 16:48 | 4 | 28.20 | | | | C | 1.11 | 1617.0 | |
| 3125 | 5/18/2018 17:05 | 4 | 25.49 | 22.94 | | | W | | 1119.8 | |
| 3126 | 5/18/2018 17:21 | 4 | 26.90 | | | | U | 0.73 | 1826.2 | 0.06 |
| 3127 | 5/18/2018 17:38 | 4 | 24.69 | 20.72 | | 0.35 | UW | 0.35 | 955.2 | 0.23 |
| 3128 | 5/18/2018 17:54 | 4 | 25.34 | 15.53 | | 0.37 | UW | 0.46 | 2849.6 | |
| 3129 | 5/18/2018 18:11 | 4 | 26.80 | | | | U | 0.08 | 1013.9 | 0.01 |
| 3130 | 5/18/2018 20:15 | 4 | 22.13 | 19.54 | 0.34 | | C | 0.14 | 655.1 | |
| 3131 | 5/18/2018 20:32 | 4 | 19.67 | | | | W | 0.21 | 964.8 | |
| 3132 | 5/18/2018 20:48 | 4 | 19.56 | | | | C | 0.16 | 815.3 | |
| 3133 | 5/18/2018 21:05 | 4 | 17.98 | 19.71 | | | W | 0.01 | 302.6 | |
| 3134 | 5/18/2018 21:21 | 4 | 18.03 | | | | U | 0.30 | 1588.2 | 0.02 |
| 3135 | 5/18/2018 21:38 | 4 | 17.14 | 16.76 | | 0.35 | UW | 0.34 | 1536.6 | 0.04 |
| 3136 | 5/18/2018 21:54 | 4 | 15.92 | 11.60 | | 0.36 | UW | 0.76 | 2231.3 | |
| 3137 | 5/18/2018 22:11 | 4 | 14.94 | | | | U | 0.13 | 1312.7 | |
| 3138 | 5/19/2018 0:15 | 4 | 11.09 | 15.56 | 0.33 | | C | 0.26 | 994.6 | |
| 3139 | 5/19/2018 0:32 | 4 | 11.19 | | | | W | 0.14 | 744.6 | |
| 3140 | 5/19/2018 0:49 | 4 | 10.90 | | | | C | 0.57 | 1794.3 | |
| 3141 | 5/19/2018 1:05 | 4 | 10.28 | 14.71 | | | W | | 56.1 | |
| 3142 | 5/19/2018 1:22 | 4 | 10.30 | | | | U | 0.22 | 1555.5 | |
| 3143 | 5/19/2018 1:38 | 4 | 10.05 | 12.26 | | 0.34 | UW | 0.24 | 983.0 | 0.01 |
| 3144 | 5/19/2018 1:55 | 4 | 9.99 | 7.29 | | 0.35 | UW | 0.54 | 2140.4 | |
| 3145 | 5/19/2018 2:11 | 4 | 9.69 | | | | U | 0.38 | 1545.3 | |
| 3146 | 5/19/2018 4:15 | 4 | 8.80 | 13.04 | 0.33 | | C | 0.44 | 1529.3 | |
| 3147 | 5/19/2018 4:32 | 4 | 8.93 | | | | W | 0.10 | 724.9 | |
| 3148 | 5/19/2018 4:48 | 4 | 9.08 | | | | C | 0.58 | 1711.6 | 0.01 |
| 3149 | 5/19/2018 5:05 | 4 | 8.84 | 12.52 | | | W | | 569.3 | |
| 3150 | 5/19/2018 5:21 | 4 | 8.94 | | | | U | 1.04 | 3636.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3151 | 5/19/2018 5:38 | 4 | 8.87 | 10.39 | | 0.34 | UW | 0.19 | 802.7 | |
| 3152 | 5/19/2018 5:55 | 4 | 8.88 | 5.41 | | 0.35 | UW | 0.62 | 1275.7 | |
| 3153 | 5/19/2018 6:11 | 4 | 8.65 | | | | U | 0.05 | 1236.0 | |
| 3154 | 5/19/2018 8:15 | 4 | 8.74 | 11.93 | 0.33 | | C | 0.36 | 1405.9 | 0.01 |
| 3155 | 5/19/2018 8:32 | 4 | 8.98 | | | | W | 0.17 | 740.3 | |
| 3156 | 5/19/2018 8:48 | 4 | 9.58 | | | | C | 0.80 | 2513.1 | |
| 3157 | 5/19/2018 9:05 | 4 | 9.43 | 11.99 | | | W | | 270.7 | |
| 3158 | 5/19/2018 9:21 | 4 | 10.14 | | | | U | 0.17 | 1559.8 | |
| 3159 | 5/19/2018 9:38 | 4 | 10.21 | 10.50 | | 0.33 | UW | 0.19 | 791.0 | |
| 3160 | 5/19/2018 9:55 | 4 | 9.99 | 5.41 | | 0.35 | UW | 0.73 | 1654.1 | 0.02 |
| 3161 | 5/19/2018 10:14 | 4 | 10.28 | | | | U | 0.17 | 1091.0 | 0.01 |
| 3162 | 5/19/2018 12:15 | 4 | 11.42 | 12.13 | 0.33 | | C | 0.39 | 1483.8 | 0.02 |
| 3163 | 5/19/2018 12:32 | 4 | 11.57 | | | | W | 0.14 | 670.9 | |
| 3164 | 5/19/2018 12:48 | 4 | 11.87 | | | | C | 0.71 | 2254.5 | |
| 3165 | 5/19/2018 13:05 | 4 | 11.30 | 13.01 | | | W | | 286.7 | |
| 3166 | 5/19/2018 13:21 | 4 | 11.95 | | | | U | 0.24 | 1670.1 | 0.02 |
| 3167 | 5/19/2018 13:38 | 4 | 11.98 | 11.40 | | 0.33 | UW | 0.15 | 1003.4 | |
| 3168 | 5/19/2018 13:55 | 4 | 12.74 | 6.45 | | 0.35 | UW | 0.71 | 1530.2 | 0.01 |
| 3169 | 5/19/2018 14:11 | 4 | 13.72 | | | | U | 0.17 | 1559.5 | 0.04 |
| 3170 | 5/19/2018 16:15 | 4 | 21.91 | 15.19 | 0.33 | | C | 0.41 | 1699.2 | 0.03 |
| 3171 | 5/19/2018 16:32 | 4 | 21.94 | | | | W | 0.14 | 794.6 | |
| 3172 | 5/19/2018 16:48 | 4 | 21.83 | | | | C | 0.54 | 2703.3 | 0.49 |
| 3173 | 5/19/2018 17:05 | 4 | 19.78 | 18.23 | | | W | 0.01 | 371.1 | |
| 3174 | 5/19/2018 17:21 | 4 | 22.07 | | | | U | 1.05 | 2205.6 | 0.01 |
| 3175 | 5/19/2018 17:38 | 4 | 21.42 | 16.68 | | 0.33 | UW | 0.20 | 2286.6 | 0.01 |
| 3176 | 5/19/2018 17:54 | 4 | 20.00 | 11.68 | | 0.34 | UW | 0.27 | 4101.0 | 0.54 |
| 3177 | 5/19/2018 18:11 | 4 | 19.34 | | | | U | 0.27 | 1209.9 | 0.05 |
| 3178 | 5/19/2018 20:15 | 4 | 16.21 | 15.10 | 0.33 | | C | 0.56 | 1420.5 | 0.16 |
| 3179 | 5/19/2018 20:32 | 4 | 15.35 | | | | W | 0.13 | 787.6 | |
| 3180 | 5/19/2018 20:48 | 4 | 15.14 | | | | C | 0.26 | 1547.3 | |
| 3181 | 5/19/2018 21:05 | 4 | 13.83 | 15.32 | | | W | | 465.5 | |
| 3182 | 5/19/2018 21:22 | 4 | 14.06 | | | | U | 0.33 | 1462.7 | |
| 3183 | 5/19/2018 21:38 | 4 | 13.02 | 12.58 | | 0.33 | UW | 0.21 | 1082.7 | 0.01 |
| 3184 | 5/19/2018 21:55 | 4 | 13.01 | 7.55 | | 0.34 | UW | 0.31 | 781.6 | 0.19 |
| 3185 | 5/19/2018 22:11 | 4 | 12.51 | | | | U | 0.13 | 848.3 | 0.01 |
| 3186 | 5/20/2018 0:15 | 4 | 11.76 | 12.95 | 0.32 | | C | 0.19 | 942.8 | 0.02 |
| 3187 | 5/20/2018 0:32 | 4 | 11.34 | | | | W | 0.10 | 623.8 | |
| 3188 | 5/20/2018 0:48 | 4 | 11.11 | | | | C | 0.31 | 1190.5 | 0.06 |
| 3189 | 5/20/2018 1:05 | 4 | 10.66 | 12.72 | | | W | | 455.4 | |
| 3190 | 5/20/2018 1:22 | 4 | 11.21 | | | | U | 0.26 | 1388.1 | |
| 3191 | 5/20/2018 1:38 | 4 | 10.97 | 10.60 | | 0.32 | UW | 0.18 | 1077.7 | |
| 3192 | 5/20/2018 1:55 | 4 | 11.06 | 5.62 | | 0.33 | UW | 0.32 | 835.5 | 0.07 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3193 | 5/20/2018 2:11 | 4 | 10.67 | | | | U | 0.16 | 951.9 | |
| 3194 | 5/20/2018 4:15 | 4 | 9.54 | 11.56 | 0.32 | | C | 0.21 | 1328.7 | 0.01 |
| 3195 | 5/20/2018 4:32 | 4 | 9.49 | | | | W | 0.08 | 598.2 | |
| 3196 | 5/20/2018 4:48 | 4 | 9.32 | | | | C | 0.80 | 1492.3 | 0.04 |
| 3197 | 5/20/2018 5:05 | 4 | 8.56 | 11.11 | | | W | 0.01 | 352.2 | |
| 3198 | 5/20/2018 5:21 | 4 | 8.46 | | | | U | 0.28 | 2220.0 | |
| 3199 | 5/20/2018 5:38 | 4 | 8.33 | 8.86 | | 0.32 | UW | 0.21 | 1122.3 | |
| 3200 | 5/20/2018 5:54 | 4 | 8.49 | 3.88 | | 0.33 | UW | 0.13 | 814.4 | |
| 3201 | 5/20/2018 6:11 | 4 | 8.11 | | | | U | 0.12 | 882.6 | |
| 3202 | 5/20/2018 8:15 | 4 | 9.82 | 10.60 | 0.32 | | C | 0.12 | 842.7 | 0.01 |
| 3203 | 5/20/2018 8:32 | 4 | 10.39 | | | | W | 0.15 | 571.6 | |
| 3204 | 5/20/2018 8:48 | 4 | 11.15 | | | | C | 0.29 | 1230.1 | 0.02 |
| 3205 | 5/20/2018 9:05 | 4 | 10.55 | 11.10 | | | W | 0.02 | 428.8 | |
| 3206 | 5/20/2018 9:22 | 4 | 11.75 | | | | U | 0.28 | 1090.6 | |
| 3207 | 5/20/2018 9:38 | 4 | 12.63 | 10.18 | | 0.32 | UW | 0.15 | 981.6 | |
| 3208 | 5/20/2018 9:55 | 4 | 15.42 | 5.44 | | 0.33 | UW | 0.32 | 1162.2 | 0.01 |
| 3209 | 5/20/2018 10:11 | 4 | 15.09 | | | | U | 0.01 | 242.1 | 0.03 |
| 3210 | 5/22/2018 15:29 | 5 | 33.91 | 24.17 | 0.33 | | C | 0.25 | 1295.3 | 0.04 |
| 3211 | 5/22/2018 15:46 | 5 | 34.60 | 21.80 | | 0.30 | W | 0.24 | 4674.5 | 0.04 |
| 3212 | 5/22/2018 16:02 | 5 | 33.10 | | | | C | 0.23 | 1207.8 | 0.56 |
| 3213 | 5/22/2018 16:19 | 5 | 35.49 | 24.90 | | 0.30 | W | 0.13 | 1624.5 | 0.01 |
| 3214 | 5/22/2018 16:35 | 5 | 32.90 | | | | U | 0.06 | 2382.5 | 0.23 |
| 3215 | 5/22/2018 16:52 | 5 | 32.16 | | | | UW | 0.12 | 2818.3 | 0.37 |
| 3216 | 5/22/2018 17:08 | 5 | 33.93 | 25.78 | | | U | 0.02 | 2351.5 | |
| 3217 | 5/22/2018 17:25 | 5 | 32.98 | | | | UW | 0.14 | 2577.5 | 0.14 |
| 3218 | 5/22/2018 19:28 | 5 | 26.13 | 22.31 | 0.32 | | C | 0.41 | 1136.7 | |
| 3219 | 5/22/2018 19:45 | 5 | 26.82 | 16.75 | | 0.29 | W | 0.35 | 2635.8 | |
| 3220 | 5/22/2018 20:01 | 5 | 26.14 | | | | C | 0.33 | 1490.6 | |
| 3221 | 5/22/2018 20:18 | 5 | 25.01 | 20.47 | | 0.29 | W | 0.17 | 1400.3 | |
| 3222 | 5/22/2018 20:34 | 5 | 23.81 | | | | U | 0.07 | 1678.0 | 0.15 |
| 3223 | 5/22/2018 20:51 | 5 | 22.76 | | | | UW | 0.18 | 2051.1 | 0.74 |
| 3224 | 5/22/2018 21:08 | 5 | 22.11 | 21.19 | | | U | 0.16 | 1184.1 | |
| 3225 | 5/22/2018 21:24 | 5 | 21.37 | | | | UW | 0.32 | 1663.8 | 0.49 |
| 3226 | 5/23/2018 0:01 | 5 | 18.52 | | | | C | 0.13 | 872.4 | |
| 3227 | 5/23/2018 0:17 | 5 | 18.42 | 18.55 | 0.31 | | C | 0.08 | 756.9 | |
| 3228 | 5/23/2018 0:34 | 5 | 18.87 | 11.87 | | 0.28 | W | 0.13 | 1116.3 | |
| 3229 | 5/23/2018 0:50 | 5 | 19.22 | | | | C | 0.56 | 930.7 | |
| 3230 | 5/23/2018 1:07 | 5 | 19.68 | 16.98 | | 0.28 | W | 0.15 | 1209.2 | |
| 3231 | 5/23/2018 1:23 | 5 | 19.41 | | | | U | 0.19 | 1791.1 | 2.19 |
| 3232 | 5/23/2018 1:40 | 5 | 19.20 | | | | UW | 0.13 | 1852.8 | 5.44 |
| 3233 | 5/23/2018 1:57 | 5 | 18.78 | 18.28 | | | U | 0.11 | 1211.6 | |
| 3234 | 5/23/2018 2:13 | 5 | 18.26 | | | | UW | 0.18 | 1665.9 | 4.49 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3235 | 5/23/2018 4:16 | 5 | 18.50 | 17.52 | 0.31 | | C | 0.14 | 794.6 | |
| 3236 | 5/23/2018 4:33 | 5 | 17.98 | 10.91 | | 0.29 | W | 0.19 | 2118.1 | |
| 3237 | 5/23/2018 4:49 | 5 | 17.88 | | | | C | 0.31 | 1628.9 | |
| 3238 | 5/23/2018 5:06 | 5 | 17.84 | 15.92 | | 0.30 | W | 0.12 | 2016.5 | |
| 3239 | 5/23/2018 5:22 | 5 | 17.78 | | | | U | 0.12 | 1867.5 | 1.27 |
| 3240 | 5/23/2018 5:39 | 5 | 17.66 | | | | UW | 0.14 | 2541.2 | 3.03 |
| 3241 | 5/23/2018 5:55 | 5 | 17.52 | 17.36 | | | U | 0.06 | 1885.0 | |
| 3242 | 5/23/2018 6:12 | 5 | 17.46 | | | | UW | 0.11 | 2004.1 | 2.92 |
| 3243 | 5/23/2018 8:16 | 5 | 17.79 | 16.86 | 0.32 | | C | 0.10 | 582.9 | |
| 3244 | 5/23/2018 8:33 | 5 | 17.65 | 10.38 | | 0.30 | W | 0.12 | 1318.1 | |
| 3245 | 5/23/2018 8:49 | 5 | 17.80 | | | | C | 0.15 | 1082.4 | |
| 3246 | 5/23/2018 9:06 | 5 | 18.59 | 15.65 | | 0.30 | W | 0.07 | 1301.4 | |
| 3247 | 5/23/2018 9:22 | 5 | 19.83 | | | | U | 0.17 | 2364.3 | 8.00 |
| 3248 | 5/23/2018 9:39 | 5 | 20.56 | | | | UW | 0.23 | 2722.7 | 9.54 |
| 3249 | 5/23/2018 9:55 | 5 | 21.32 | 18.26 | | | U | 0.07 | 2182.9 | |
| 3250 | 5/23/2018 10:12 | 5 | 22.27 | | | | UW | 0.57 | 2615.5 | 10.14 |
| 3251 | 5/23/2018 12:16 | 5 | 24.90 | 19.13 | 0.32 | | C | 0.14 | 708.6 | |
| 3252 | 5/23/2018 12:33 | 5 | 25.31 | 15.28 | | 0.30 | W | 1.49 | 5654.6 | |
| 3253 | 5/23/2018 12:49 | 5 | 26.10 | | | | C | 0.25 | 1518.8 | |
| 3254 | 5/23/2018 13:06 | 5 | 27.15 | 19.79 | | 0.31 | W | 0.06 | 1417.2 | |
| 3255 | 5/23/2018 13:22 | 5 | 27.57 | | | | U | 0.09 | 1795.8 | 8.55 |
| 3256 | 5/23/2018 13:39 | 5 | 29.60 | | | | UW | 0.27 | 3285.2 | 15.50 |
| 3257 | 5/23/2018 13:55 | 5 | 29.47 | 22.35 | | | U | 0.05 | 1787.3 | |
| 3258 | 5/23/2018 14:12 | 5 | 29.90 | | | | UW | 0.18 | 2564.6 | 8.15 |
| 3259 | 5/23/2018 16:15 | 5 | 30.34 | 22.63 | 0.32 | | C | 0.13 | 846.9 | |
| 3260 | 5/23/2018 16:32 | 5 | 32.21 | 19.52 | | 0.30 | W | 0.37 | 4156.5 | 0.14 |
| 3261 | 5/23/2018 16:48 | 5 | 29.51 | | | | C | 0.92 | 3169.3 | |
| 3262 | 5/23/2018 17:05 | 5 | 29.07 | 22.21 | | 0.30 | W | 0.12 | 1506.9 | |
| 3263 | 5/23/2018 17:21 | 5 | 28.35 | | | | U | 0.07 | 1511.6 | 4.08 |
| 3264 | 5/23/2018 17:38 | 5 | 28.05 | | | | UW | 0.20 | 2409.6 | 8.15 |
| 3265 | 5/23/2018 17:54 | 5 | 29.44 | 23.03 | | | U | 0.06 | 1342.3 | |
| 3266 | 5/23/2018 18:11 | 5 | 30.54 | | 0.24 | | UW | 0.14 | 1871.9 | 5.44 |
| 3267 | 5/23/2018 20:15 | 5 | 25.71 | 21.28 | 0.32 | | C | 0.16 | 1013.7 | |
| 3268 | 5/23/2018 20:32 | 5 | 24.65 | 15.45 | | 0.29 | W | 0.11 | 1147.4 | |
| 3269 | 5/23/2018 20:48 | 5 | 23.62 | | | | C | 0.09 | 942.0 | |
| 3270 | 5/23/2018 21:05 | 5 | 22.71 | 19.64 | | 0.29 | W | 0.12 | 1131.1 | |
| 3271 | 5/23/2018 21:21 | 5 | 21.59 | | | | U | 0.15 | 1654.8 | 3.96 |
| 3272 | 5/23/2018 21:38 | 5 | 21.21 | | | | UW | 0.13 | 1679.5 | 11.47 |
| 3273 | 5/23/2018 21:55 | 5 | 21.47 | 20.54 | | | U | 0.09 | 1193.3 | |
| 3274 | 5/23/2018 22:11 | 5 | 20.85 | | 0.23 | | UW | 0.14 | 1684.3 | 8.30 |
| 3275 | 5/24/2018 0:15 | 5 | 20.56 | 18.90 | 0.31 | | C | 0.07 | 917.3 | |
| 3276 | 5/24/2018 0:32 | 5 | 20.49 | 12.21 | | 0.28 | W | 0.18 | 1771.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3277 | 5/24/2018 0:48 | 5 | 20.35 | | | | C | 0.13 | 975.4 | |
| 3278 | 5/24/2018 1:05 | 5 | 20.65 | 17.28 | | 0.29 | W | 0.05 | 1174.4 | |
| 3279 | 5/24/2018 1:22 | 5 | 20.68 | | | | U | 0.13 | 1505.2 | 3.98 |
| 3280 | 5/24/2018 1:38 | 5 | 20.47 | | | | UW | 0.20 | 1770.5 | 10.60 |
| 3281 | 5/24/2018 1:55 | 5 | 20.79 | 18.69 | | | U | 0.10 | 1060.8 | |
| 3282 | 5/24/2018 2:11 | 5 | 20.76 | | 0.23 | | UW | 0.15 | 1495.6 | 6.45 |
| 3283 | 5/24/2018 4:15 | 5 | 19.87 | 18.15 | 0.31 | | C | 0.17 | 839.2 | |
| 3284 | 5/24/2018 4:32 | 5 | 19.99 | 11.60 | | 0.28 | W | 0.19 | 1588.6 | |
| 3285 | 5/24/2018 4:48 | 5 | 19.70 | | | | C | 0.43 | 1598.0 | |
| 3286 | 5/24/2018 5:05 | 5 | 19.61 | 16.58 | | 0.29 | W | 0.12 | 1115.2 | |
| 3287 | 5/24/2018 5:21 | 5 | 19.31 | | | | U | 0.18 | 1289.0 | 2.18 |
| 3288 | 5/24/2018 5:38 | 5 | 19.24 | | | | UW | 0.19 | 1763.9 | 5.66 |
| 3289 | 5/24/2018 5:54 | 5 | 19.15 | 17.96 | | | U | 0.09 | 969.0 | |
| 3290 | 5/24/2018 6:11 | 5 | 18.99 | | 0.23 | | UW | 0.15 | 1244.1 | 6.48 |
| 3291 | 5/24/2018 8:15 | 5 | 19.59 | 17.79 | 0.31 | | C | 0.14 | 1451.7 | |
| 3292 | 5/24/2018 8:32 | 5 | 21.28 | 12.28 | | 0.28 | W | 0.26 | 3744.4 | |
| 3293 | 5/24/2018 8:48 | 5 | 22.35 | | | | C | 0.85 | 2409.7 | |
| 3294 | 5/24/2018 9:05 | 5 | 23.38 | 17.54 | | 0.29 | W | 0.17 | 1389.1 | |
| 3295 | 5/24/2018 9:21 | 5 | 23.25 | | | | U | 0.09 | 1221.7 | 4.44 |
| 3296 | 5/24/2018 9:38 | 5 | 25.65 | | | | UW | 0.27 | 2389.9 | 7.85 |
| 3297 | 5/24/2018 9:54 | 5 | 25.85 | 20.00 | | | U | 0.09 | 1177.0 | |
| 3298 | 5/24/2018 10:11 | 5 | 25.01 | | 0.23 | | UW | 0.11 | 1285.3 | 6.31 |
| 3299 | 5/24/2018 12:15 | 5 | 34.71 | 22.27 | 0.32 | | C | 0.19 | 1277.6 | |
| 3300 | 5/24/2018 12:32 | 5 | 33.15 | 20.27 | | 0.29 | W | 0.10 | 2752.3 | |
| 3301 | 5/24/2018 12:48 | 5 | 34.26 | | | | C | 0.45 | 2202.3 | |
| 3302 | 5/24/2018 13:05 | 5 | 34.35 | 24.19 | | 0.29 | W | 0.11 | 1504.6 | |
| 3303 | 5/24/2018 13:21 | 5 | 34.34 | | | | U | 0.06 | 1272.4 | 6.17 |
| 3304 | 5/24/2018 13:38 | 5 | 35.02 | | | | UW | 0.28 | 2210.7 | 9.93 |
| 3305 | 5/24/2018 13:54 | 5 | 36.40 | 26.62 | | | U | 0.17 | 1773.3 | |
| 3306 | 5/24/2018 14:11 | 5 | 35.81 | | 0.24 | | UW | 0.18 | 1281.7 | 10.37 |
| 3307 | 5/24/2018 16:15 | 5 | 35.88 | 26.71 | 0.31 | | C | 0.14 | 1455.3 | |
| 3308 | 5/24/2018 16:32 | 5 | 35.97 | 23.03 | | 0.29 | W | 0.28 | 2168.8 | |
| 3309 | 5/24/2018 16:48 | 5 | 35.38 | | | | C | 0.44 | 2651.9 | |
| 3310 | 5/24/2018 17:05 | 5 | 34.48 | 26.04 | | 0.29 | W | 0.02 | 739.2 | |
| 3311 | 5/24/2018 17:21 | 5 | 35.25 | | | | U | 0.06 | 758.6 | 2.85 |
| 3312 | 5/24/2018 17:38 | 5 | 34.08 | | | | UW | 0.16 | 1462.5 | 4.63 |
| 3313 | 5/24/2018 17:54 | 5 | 34.65 | 27.60 | | | U | 0.63 | 1535.4 | |
| 3314 | 5/24/2018 18:11 | 5 | 31.24 | | 0.22 | | UW | 0.05 | 652.4 | 2.87 |
| 3315 | 5/24/2018 20:15 | 5 | 26.48 | 23.77 | 0.30 | | C | 0.11 | 1181.2 | |
| 3316 | 5/24/2018 20:32 | 5 | 26.27 | 17.13 | | 0.28 | W | 0.05 | 788.5 | |
| 3317 | 5/24/2018 20:48 | 5 | 24.92 | | | | C | 0.09 | 1103.2 | |
| 3318 | 5/24/2018 21:05 | 5 | 24.11 | 21.92 | | 0.28 | W | 0.07 | 1158.9 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3319 | 5/24/2018 21:21 | 5 | 23.19 | | | | U | 0.07 | 886.9 | 0.80 |
| 3320 | 5/24/2018 21:38 | 5 | 21.93 | | | | UW | 0.12 | 1124.8 | 2.29 |
| 3321 | 5/24/2018 21:54 | 5 | 21.43 | 22.34 | | | U | 0.07 | 571.1 | |
| 3322 | 5/24/2018 22:11 | 5 | 20.80 | | 0.22 | | UW | 0.12 | 842.2 | 1.63 |
| 3323 | 5/25/2018 0:15 | 5 | 18.90 | 20.39 | 0.29 | | C | 0.11 | 1009.4 | |
| 3324 | 5/25/2018 0:32 | 5 | 18.31 | 12.76 | | 0.27 | W | 0.11 | 1059.3 | |
| 3325 | 5/25/2018 0:49 | 5 | 18.47 | | | | C | 0.16 | 978.4 | |
| 3326 | 5/25/2018 1:05 | 5 | 18.23 | 18.28 | | 0.27 | W | 0.17 | 1033.2 | |
| 3327 | 5/25/2018 1:22 | 5 | 17.56 | | | | U | 0.16 | 1128.3 | 0.27 |
| 3328 | 5/25/2018 1:38 | 5 | 16.83 | | | | UW | 0.10 | 911.7 | 3.29 |
| 3329 | 5/25/2018 1:55 | 5 | 17.15 | 19.29 | | | U | 0.10 | 708.3 | |
| 3330 | 5/25/2018 2:11 | 5 | 16.20 | | 0.21 | | UW | 0.20 | 890.9 | 1.52 |
| 3331 | 5/25/2018 4:15 | 5 | 15.23 | 18.30 | 0.29 | | C | 0.07 | 961.5 | |
| 3332 | 5/25/2018 4:32 | 5 | 14.79 | 10.58 | | 0.27 | W | 0.09 | 913.1 | |
| 3333 | 5/25/2018 4:48 | 5 | 14.71 | | | | C | 0.10 | 910.0 | |
| 3334 | 5/25/2018 5:05 | 5 | 14.05 | 16.02 | | 0.27 | W | 0.06 | 864.9 | |
| 3335 | 5/25/2018 5:21 | 5 | 14.27 | | | | U | 0.12 | 1177.7 | 0.37 |
| 3336 | 5/25/2018 5:38 | 5 | 14.39 | | | | UW | 0.15 | 1182.2 | 4.02 |
| 3337 | 5/25/2018 5:54 | 5 | 13.66 | 17.22 | | | U | 0.09 | 566.6 | |
| 3338 | 5/25/2018 6:11 | 5 | 13.43 | | 0.21 | | UW | 0.16 | 985.6 | 2.15 |
| 3339 | 5/25/2018 8:15 | 5 | 18.61 | 17.62 | 0.29 | | C | 0.09 | 914.7 | |
| 3340 | 5/25/2018 8:32 | 5 | 21.49 | 12.32 | | 0.27 | W | 0.06 | 729.4 | |
| 3341 | 5/25/2018 8:48 | 5 | 22.35 | | | | C | 0.08 | 761.1 | 3.01 |
| 3342 | 5/25/2018 9:05 | 5 | 24.19 | 18.46 | | 0.27 | W | 0.09 | 818.8 | |
| 3343 | 5/25/2018 9:21 | 5 | 25.28 | | | | U | 0.33 | 956.2 | 3.60 |
| 3344 | 5/25/2018 9:38 | 5 | 25.92 | | | | UW | 0.13 | 1081.0 | 10.30 |
| 3345 | 5/25/2018 9:54 | 5 | 28.01 | 20.33 | | | U | 0.11 | 682.0 | |
| 3346 | 5/25/2018 10:11 | 5 | 29.58 | | 0.22 | | UW | 0.18 | 1077.8 | 8.75 |
| 3347 | 5/25/2018 12:15 | 5 | 36.15 | 24.26 | 0.30 | | C | 0.09 | 958.8 | |
| 3348 | 5/25/2018 12:32 | 5 | 34.40 | 22.85 | | 0.38 | W | 0.60 | 2560.6 | 0.16 |
| 3349 | 5/25/2018 12:48 | 5 | 37.00 | | | | C | 0.05 | 752.1 | |
| 3350 | 5/25/2018 13:05 | 5 | 35.17 | 27.28 | | 0.37 | W | 0.43 | 2723.4 | 0.30 |
| 3351 | 5/25/2018 13:21 | 5 | 36.74 | | | | U | 0.06 | 506.6 | 1.76 |
| 3352 | 5/25/2018 13:38 | 5 | 34.88 | | | | UW | 1.42 | 4526.6 | 62.91 |
| 3353 | 5/25/2018 13:54 | 5 | 37.39 | 28.53 | | | U | 0.06 | 429.9 | |
| 3354 | 5/25/2018 14:11 | 5 | 35.55 | | 0.23 | | UW | 0.89 | 3053.6 | 58.76 |
| 3355 | 5/25/2018 16:15 | 5 | 35.77 | 28.36 | 0.30 | | C | 0.04 | 889.3 | |
| 3356 | 5/25/2018 16:32 | 5 | 36.81 | 25.39 | | 0.36 | W | 0.05 | 1226.5 | 1.59 |
| 3357 | 5/25/2018 16:48 | 5 | 38.07 | | | | C | 0.04 | 864.8 | |
| 3358 | 5/25/2018 17:05 | 5 | 36.48 | 28.60 | | 0.35 | W | 0.11 | 1814.8 | 0.86 |
| 3359 | 5/25/2018 17:21 | 5 | 38.29 | | | | U | 0.14 | 1430.7 | 1.17 |
| 3360 | 5/25/2018 17:38 | 5 | 35.62 | | | | UW | 1.41 | 2913.1 | 58.40 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3361 | 5/25/2018 17:54 | 5 | 35.09 | 29.72 | | | U | 0.10 | 666.2 | |
| 3362 | 5/25/2018 18:11 | 5 | 32.57 | | 0.22 | | UW | 0.65 | 2059.1 | 39.19 |
| 3363 | 5/25/2018 20:15 | 5 | 28.52 | 25.75 | 0.29 | | C | 0.08 | 859.9 | |
| 3364 | 5/25/2018 20:32 | 5 | 27.41 | 18.96 | | 0.35 | W | 0.07 | 914.0 | 0.96 |
| 3365 | 5/25/2018 20:48 | 5 | 25.54 | | | | C | 0.08 | 872.6 | |
| 3366 | 5/25/2018 21:05 | 5 | 23.44 | 23.41 | | 0.34 | W | 0.05 | 1227.7 | 0.24 |
| 3367 | 5/25/2018 21:21 | 5 | 22.57 | | | | U | 0.10 | 919.1 | 0.55 |
| 3368 | 5/25/2018 21:38 | 5 | 21.17 | | | | UW | 0.47 | 1779.9 | 71.41 |
| 3369 | 5/25/2018 21:54 | 5 | 21.68 | 23.77 | | | U | 0.16 | 708.8 | |
| 3370 | 5/25/2018 22:11 | 5 | 20.04 | | 0.21 | | UW | 0.48 | 1221.0 | 35.53 |
| 3371 | 5/26/2018 0:15 | 5 | 15.85 | 21.29 | 0.28 | | C | 0.10 | 988.4 | |
| 3372 | 5/26/2018 0:32 | 5 | 15.67 | 13.14 | | 0.34 | W | 0.08 | 1157.3 | |
| 3373 | 5/26/2018 0:49 | 5 | 15.22 | | | | C | 0.12 | 902.6 | |
| 3374 | 5/26/2018 1:05 | 5 | 15.17 | 18.90 | | 0.33 | W | 0.07 | 1116.5 | |
| 3375 | 5/26/2018 1:22 | 5 | 14.77 | | | | U | 0.08 | 1027.5 | 0.09 |
| 3376 | 5/26/2018 1:38 | 5 | 14.93 | | | | UW | 0.71 | 1569.6 | 77.87 |
| 3377 | 5/26/2018 1:55 | 5 | 14.51 | 19.75 | | | U | 0.13 | 570.1 | |
| 3378 | 5/26/2018 2:11 | 5 | 14.36 | | 0.21 | | UW | 0.37 | 1167.5 | 35.04 |
| 3379 | 5/26/2018 4:15 | 5 | 12.61 | 18.61 | 0.27 | | C | 0.10 | 976.1 | |
| 3380 | 5/26/2018 4:32 | 5 | 12.95 | 10.52 | | 0.34 | W | 0.07 | 924.0 | |
| 3381 | 5/26/2018 4:48 | 5 | 12.43 | | | | C | 0.10 | 949.0 | |
| 3382 | 5/26/2018 5:05 | 5 | 12.79 | 16.30 | | 0.33 | W | 0.07 | 992.8 | |
| 3383 | 5/26/2018 5:22 | 5 | 12.00 | | | | U | 0.08 | 824.5 | 0.03 |
| 3384 | 5/26/2018 5:38 | 5 | 12.61 | | | | UW | 0.54 | 1428.0 | 90.14 |
| 3385 | 5/26/2018 5:55 | 5 | 12.20 | 17.38 | | | U | 0.24 | 632.0 | |
| 3386 | 5/26/2018 6:11 | 5 | 12.00 | | 0.21 | | UW | 0.27 | 1001.3 | 38.66 |
| 3387 | 5/26/2018 8:15 | 5 | 18.93 | 18.09 | 0.28 | | C | 0.24 | 909.7 | |
| 3388 | 5/26/2018 8:32 | 5 | 21.42 | 12.64 | | 0.34 | W | 0.05 | 992.1 | |
| 3389 | 5/26/2018 8:48 | 5 | 23.35 | | | | C | 0.13 | 743.1 | 32.66 |
| 3390 | 5/26/2018 9:05 | 5 | 24.11 | 18.74 | | 0.33 | W | 0.06 | 990.4 | 0.14 |
| 3391 | 5/26/2018 9:21 | 5 | 26.12 | | | | U | 0.09 | 808.4 | 1.25 |
| 3392 | 5/26/2018 9:38 | 5 | 26.68 | | | | UW | 1.60 | 1895.4 | 135.82 |
| 3393 | 5/26/2018 9:54 | 5 | 29.41 | 20.69 | | | U | 0.07 | 580.1 | |
| 3394 | 5/26/2018 10:11 | 5 | 30.13 | | 0.22 | | UW | 0.80 | 1452.8 | 68.08 |
| 3395 | 5/26/2018 12:15 | 5 | 36.38 | 24.55 | 0.29 | | C | 0.05 | 404.9 | |
| 3396 | 5/26/2018 12:32 | 5 | 35.33 | 22.62 | | 0.34 | W | 0.16 | 492.5 | |
| 3397 | 5/26/2018 12:48 | 5 | 36.82 | | | | C | 0.05 | 758.7 | |
| 3398 | 5/26/2018 13:05 | 5 | 37.08 | 27.35 | | 0.33 | W | 0.07 | 1646.5 | 0.71 |
| 3399 | 5/26/2018 13:21 | 5 | 37.85 | | | | U | 0.05 | 826.1 | 0.43 |
| 3400 | 5/26/2018 13:38 | 5 | 36.72 | | | | UW | 1.27 | 1775.5 | 57.56 |
| 3401 | 5/26/2018 13:54 | 5 | 38.60 | 28.69 | | | U | 0.05 | 150.3 | |
| 3402 | 5/26/2018 14:11 | 5 | 37.92 | | 0.22 | | UW | 0.07 | 1300.4 | 32.17 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3403 | 5/26/2018 16:15 | 5 | 38.92 | 29.40 | 0.28 | | C | 0.06 | 979.7 | |
| 3404 | 5/26/2018 16:32 | 5 | 38.56 | 26.69 | | 0.33 | W | 0.05 | 1518.9 | 0.45 |
| 3405 | 5/26/2018 16:48 | 5 | 38.80 | | | | C | 0.12 | 1430.8 | |
| 3406 | 5/26/2018 17:05 | 5 | 39.06 | 29.32 | | 0.32 | W | 0.08 | 1537.5 | 0.42 |
| 3407 | 5/26/2018 17:21 | 5 | 38.81 | | | | U | 0.12 | 1162.8 | 0.35 |
| 3408 | 5/26/2018 17:38 | 5 | 38.30 | | | | UW | 1.08 | 1467.0 | 28.08 |
| 3409 | 5/26/2018 17:54 | 5 | 39.60 | 31.21 | | | U | 0.07 | 909.0 | |
| 3410 | 5/26/2018 18:11 | 5 | 37.68 | | 0.21 | | UW | 1.02 | 1126.1 | 16.18 |
| 3411 | 5/26/2018 20:15 | 5 | 30.63 | 27.29 | 0.27 | | C | 0.14 | 1672.0 | |
| 3412 | 5/26/2018 20:32 | 5 | 30.29 | 21.00 | | 0.31 | W | 0.09 | 1396.3 | 0.78 |
| 3413 | 5/26/2018 20:48 | 5 | 27.02 | | | | C | 0.08 | 1110.1 | |
| 3414 | 5/26/2018 21:05 | 5 | 25.41 | 24.48 | | 0.31 | W | 0.19 | 1232.7 | 0.02 |
| 3415 | 5/26/2018 21:21 | 5 | 23.79 | | | | U | 0.11 | 1217.9 | 0.17 |
| 3416 | 5/26/2018 21:38 | 5 | 23.06 | | | | UW | 0.45 | 1061.3 | 12.71 |
| 3417 | 5/26/2018 21:54 | 5 | 23.18 | 25.23 | | | U | 0.06 | 670.7 | |
| 3418 | 5/26/2018 22:11 | 5 | 22.29 | | 0.21 | | UW | 0.60 | 1121.0 | 6.03 |
| 3419 | 5/27/2018 0:15 | 5 | 20.27 | 22.76 | 0.26 | | C | 0.08 | 1028.0 | |
| 3420 | 5/27/2018 0:32 | 5 | 20.02 | 14.99 | | 0.30 | W | 0.06 | 1212.4 | |
| 3421 | 5/27/2018 0:49 | 5 | 19.73 | | | | C | 0.09 | 959.3 | |
| 3422 | 5/27/2018 1:05 | 5 | 19.08 | 20.44 | | 0.30 | W | 0.06 | 1132.4 | 0.01 |
| 3423 | 5/27/2018 1:22 | 5 | 18.05 | | | | U | 0.10 | 1068.0 | 0.09 |
| 3424 | 5/27/2018 1:38 | 5 | 18.22 | | | | UW | 0.35 | 1064.9 | 5.49 |
| 3425 | 5/27/2018 1:55 | 5 | 18.40 | 21.34 | | | U | 0.08 | 738.1 | |
| 3426 | 5/27/2018 2:11 | 5 | 18.50 | | 0.21 | | UW | 0.20 | 883.3 | 2.74 |
| 3427 | 5/27/2018 4:15 | 5 | 18.33 | 20.50 | 0.26 | | C | 0.12 | 949.1 | |
| 3428 | 5/27/2018 4:32 | 5 | 18.44 | 12.80 | | 0.30 | W | 0.13 | 1077.5 | |
| 3429 | 5/27/2018 4:48 | 5 | 18.32 | | | | C | 0.09 | 933.3 | |
| 3430 | 5/27/2018 5:05 | 5 | 18.33 | 18.39 | | 0.30 | W | 0.05 | 946.0 | 0.01 |
| 3431 | 5/27/2018 5:21 | 5 | 18.91 | | | | U | 0.13 | 1201.4 | 0.15 |
| 3432 | 5/27/2018 5:38 | 5 | 18.81 | | | | UW | 0.30 | 1012.9 | 4.69 |
| 3433 | 5/27/2018 5:54 | 5 | 18.79 | 19.52 | | | U | 0.09 | 674.2 | |
| 3434 | 5/27/2018 6:11 | 5 | 19.22 | | 0.21 | | UW | 0.21 | 824.9 | 2.05 |
| 3435 | 5/27/2018 8:15 | 5 | 23.59 | 20.15 | 0.26 | | C | 0.11 | 1495.9 | |
| 3436 | 5/27/2018 8:32 | 5 | 25.06 | 14.63 | | 0.30 | W | 0.13 | 1687.5 | 0.02 |
| 3437 | 5/27/2018 8:48 | 5 | 26.22 | | | | C | 0.27 | 1622.0 | |
| 3438 | 5/27/2018 9:05 | 5 | 27.28 | 20.14 | | 0.30 | W | 0.08 | 876.7 | 0.04 |
| 3439 | 5/27/2018 9:21 | 5 | 28.43 | | | | U | 0.15 | 814.3 | 0.28 |
| 3440 | 5/27/2018 9:38 | 5 | 30.24 | | | | UW | 0.35 | 1091.1 | 4.34 |
| 3441 | 5/27/2018 9:55 | 5 | 31.96 | 22.73 | | | U | 0.13 | 791.5 | |
| 3442 | 5/27/2018 10:11 | 5 | 33.75 | | 0.21 | | UW | 0.29 | 905.8 | 3.56 |
| 3443 | 5/27/2018 12:15 | 5 | 35.01 | 25.22 | 0.27 | | C | 0.20 | 1897.5 | |
| 3444 | 5/27/2018 12:32 | 5 | 36.47 | 23.37 | | 0.30 | W | 0.18 | 1816.5 | 0.14 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3445 | 5/27/2018 12:48 | 5 | 40.01 | | | | C | 0.17 | 1205.4 | |
| 3446 | 5/27/2018 13:05 | 5 | 40.88 | 28.61 | | 0.30 | W | 0.12 | 1387.1 | 0.13 |
| 3447 | 5/27/2018 13:21 | 5 | 42.37 | | | | U | 0.41 | 1019.6 | 0.46 |
| 3448 | 5/27/2018 13:38 | 5 | 42.10 | | | | UW | 0.58 | 1536.1 | 9.48 |
| 3449 | 5/27/2018 13:54 | 5 | 43.34 | 30.93 | | | U | 0.12 | 1993.6 | |
| 3450 | 5/27/2018 14:11 | 5 | 41.12 | | 0.22 | | UW | 0.30 | 757.6 | 4.83 |
| 3451 | 5/27/2018 16:15 | 5 | 41.09 | 30.50 | 0.27 | | C | 0.08 | 1621.8 | |
| 3452 | 5/27/2018 16:32 | 5 | 40.48 | 27.17 | | 0.30 | W | 0.07 | 933.7 | 0.23 |
| 3453 | 5/27/2018 16:48 | 5 | 41.10 | | | | C | 0.45 | 2321.0 | 0.35 |
| 3454 | 5/27/2018 17:05 | 5 | 39.22 | 30.59 | | 0.30 | W | 0.02 | 873.3 | 0.11 |
| 3455 | 5/27/2018 17:21 | 5 | 38.76 | | | | U | 0.08 | 567.2 | 0.16 |
| 3456 | 5/27/2018 17:38 | 5 | 39.37 | | | | UW | 0.53 | 1432.4 | 3.83 |
| 3457 | 5/27/2018 17:54 | 5 | 41.47 | 32.29 | | | U | 0.14 | 1587.8 | |
| 3458 | 5/27/2018 18:11 | 5 | 37.85 | | 0.21 | | UW | 0.27 | 724.4 | 1.91 |
| 3459 | 5/27/2018 20:15 | 5 | 31.68 | 28.34 | 0.25 | | C | 0.07 | 1236.6 | |
| 3460 | 5/27/2018 20:32 | 5 | 31.66 | 22.24 | | 0.28 | W | 0.07 | 879.9 | 0.83 |
| 3461 | 5/27/2018 20:48 | 5 | 29.71 | | | | C | 0.07 | 998.9 | |
| 3462 | 5/27/2018 21:05 | 5 | 28.06 | 26.17 | | 0.28 | W | 0.06 | 1287.5 | |
| 3463 | 5/27/2018 21:21 | 5 | 26.04 | | | | U | 0.07 | 989.2 | 0.09 |
| 3464 | 5/27/2018 21:38 | 5 | 24.58 | | | | UW | 0.62 | 1098.7 | 2.19 |
| 3465 | 5/27/2018 21:55 | 5 | 24.35 | 26.84 | | | U | 0.03 | 620.8 | |
| 3466 | 5/27/2018 22:11 | 5 | 24.04 | | 0.20 | | UW | 0.25 | 1204.0 | 1.53 |
| 3467 | 5/28/2018 0:15 | 5 | 23.40 | 24.26 | 0.24 | | C | 0.11 | 1338.9 | |
| 3468 | 5/28/2018 0:32 | 5 | 23.86 | 16.82 | | 0.28 | W | 0.07 | 1119.9 | |
| 3469 | 5/28/2018 0:48 | 5 | 23.64 | | | | C | 0.10 | 1242.4 | |
| 3470 | 5/28/2018 1:05 | 5 | 24.17 | 22.38 | | 0.28 | W | 0.06 | 956.5 | 0.01 |
| 3471 | 5/28/2018 1:22 | 5 | 24.10 | | | | U | 0.06 | 1133.9 | 0.09 |
| 3472 | 5/28/2018 1:38 | 5 | 23.90 | | | | UW | 0.54 | 950.1 | 1.36 |
| 3473 | 5/28/2018 1:55 | 5 | 23.73 | 23.42 | | | U | 0.05 | 872.8 | |
| 3474 | 5/28/2018 2:11 | 5 | 23.21 | | 0.20 | | UW | 0.27 | 944.8 | 0.90 |
| 3475 | 5/28/2018 4:15 | 5 | 22.23 | 22.58 | 0.24 | | C | 0.08 | 1091.1 | |
| 3476 | 5/28/2018 4:32 | 5 | 22.23 | 15.24 | | 0.28 | W | 0.03 | 544.7 | |
| 3477 | 5/28/2018 4:48 | 5 | 21.72 | | | | C | 0.06 | 721.2 | |
| 3478 | 5/28/2018 5:05 | 5 | 21.42 | 20.61 | | 0.27 | W | 0.03 | 774.1 | |
| 3479 | 5/28/2018 5:21 | 5 | 20.45 | | | | U | 0.06 | 453.8 | 0.04 |
| 3480 | 5/28/2018 5:38 | 5 | 19.56 | | | | UW | 0.41 | 782.7 | 0.75 |
| 3481 | 5/28/2018 5:54 | 5 | 19.07 | 21.56 | | | U | 0.02 | 564.4 | |
| 3482 | 5/28/2018 6:11 | 5 | 18.84 | | 0.20 | | UW | 0.38 | 708.3 | 0.61 |
| 3483 | 5/28/2018 8:15 | 5 | 21.91 | 21.77 | 0.24 | | C | 0.08 | 722.9 | |
| 3484 | 5/28/2018 8:32 | 5 | 24.13 | 16.23 | | 0.28 | W | | 644.7 | |
| 3485 | 5/28/2018 8:48 | 5 | 24.89 | | | | C | 0.04 | 698.5 | |
| 3486 | 5/28/2018 9:05 | 5 | 25.81 | 21.85 | | 0.27 | W | 0.03 | 1007.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3487 | 5/28/2018 9:21 | 5 | 26.66 | | | | U | 0.02 | 525.1 | 0.18 |
| 3488 | 5/28/2018 9:38 | 5 | 27.09 | | | | UW | 0.22 | 757.8 | 1.57 |
| 3489 | 5/28/2018 9:54 | 5 | 28.87 | 23.61 | | | U | 0.01 | 374.2 | |
| 3490 | 5/28/2018 10:11 | 5 | 29.74 | | 0.21 | | UW | 0.13 | 643.5 | 1.22 |
| 3491 | 5/28/2018 12:15 | 5 | 36.48 | 26.45 | 0.25 | | C | 0.02 | 497.7 | |
| 3492 | 5/28/2018 12:32 | 5 | 36.21 | 24.77 | | 0.29 | W | | 483.4 | |
| 3493 | 5/28/2018 12:48 | 5 | 36.14 | | | | C | 0.04 | 760.9 | |
| 3494 | 5/28/2018 13:05 | 5 | 37.55 | 29.03 | | 0.28 | W | 0.07 | 1131.3 | 0.01 |
| 3495 | 5/28/2018 13:21 | 5 | 36.63 | | | | U | | 318.3 | 0.17 |
| 3496 | 5/28/2018 13:38 | 5 | 35.02 | | | | UW | 0.36 | 710.9 | 1.22 |
| 3497 | 5/28/2018 13:54 | 5 | 37.56 | 30.29 | | | U | | 196.2 | |
| 3498 | 5/28/2018 14:11 | 5 | 36.96 | | 0.20 | | UW | 0.04 | 613.9 | 0.99 |
| 3499 | 5/28/2018 16:15 | 5 | 38.70 | 30.76 | 0.25 | | C | 0.08 | 918.5 | |
| 3500 | 5/28/2018 16:32 | 5 | 37.54 | 27.86 | | 0.28 | W | 0.01 | 487.8 | |
| 3501 | 5/28/2018 16:48 | 5 | 37.02 | | | | C | | 729.3 | |
| 3502 | 5/28/2018 17:05 | 5 | 37.36 | 30.75 | | 0.28 | W | | 1427.1 | 0.01 |
| 3503 | 5/28/2018 17:21 | 5 | 36.68 | | | | U | 0.08 | 564.1 | 0.08 |
| 3504 | 5/28/2018 17:38 | 5 | 34.21 | | | | UW | 0.40 | 793.6 | 1.06 |
| 3505 | 5/28/2018 17:54 | 5 | 33.59 | 32.12 | | | U | 0.01 | 365.3 | |
| 3506 | 5/28/2018 18:11 | 5 | 34.03 | | 0.20 | | UW | 0.31 | 822.7 | 0.73 |
| 3507 | 5/28/2018 20:15 | 5 | 28.44 | 27.84 | 0.24 | | C | 0.11 | 1359.2 | |
| 3508 | 5/28/2018 20:32 | 5 | 27.58 | 21.27 | | 0.27 | W | 0.10 | 1154.4 | |
| 3509 | 5/28/2018 20:48 | 5 | 26.40 | | | | C | 0.10 | 1072.9 | |
| 3510 | 5/28/2018 21:05 | 5 | 26.94 | 26.04 | | 0.26 | W | 0.05 | 1380.2 | |
| 3511 | 5/28/2018 21:21 | 5 | 26.85 | | | | U | 0.05 | 1387.0 | 0.06 |
| 3512 | 5/28/2018 21:38 | 5 | 26.25 | | | | UW | 0.25 | 1162.6 | 0.79 |
| 3513 | 5/28/2018 21:55 | 5 | 26.38 | 26.99 | | | U | 0.01 | 437.3 | |
| 3514 | 5/28/2018 22:11 | 5 | 26.01 | | 0.20 | | UW | 0.21 | 1035.8 | 0.51 |
| 3515 | 5/29/2018 0:15 | 5 | 22.00 | 24.57 | 0.23 | | C | 0.10 | 936.1 | |
| 3516 | 5/29/2018 0:32 | 5 | 21.60 | 16.90 | | 0.26 | W | 0.12 | 1260.0 | |
| 3517 | 5/29/2018 0:48 | 5 | 21.38 | | | | C | 0.01 | 1056.5 | |
| 3518 | 5/29/2018 1:05 | 5 | 20.82 | 22.39 | | 0.26 | W | 0.07 | 1077.5 | |
| 3519 | 5/29/2018 1:22 | 5 | 19.78 | | | | U | 0.11 | 1049.2 | 0.01 |
| 3520 | 5/29/2018 1:38 | 5 | 19.23 | | | | UW | 0.18 | 938.9 | 0.34 |
| 3521 | 5/29/2018 1:55 | 5 | 18.69 | 23.35 | | | U | 0.03 | 621.1 | |
| 3522 | 5/29/2018 2:11 | 5 | 19.42 | | 0.20 | | UW | 0.25 | 979.5 | 0.24 |
| 3523 | 5/29/2018 4:15 | 5 | 20.22 | 22.34 | 0.23 | | C | 0.19 | 1267.0 | |
| 3524 | 5/29/2018 4:32 | 5 | 19.84 | 14.61 | | 0.26 | W | 0.21 | 2175.7 | |
| 3525 | 5/29/2018 4:48 | 5 | 19.63 | | | | C | 0.16 | 1357.4 | |
| 3526 | 5/29/2018 5:05 | 5 | 19.18 | 20.13 | | 0.26 | W | 0.08 | 1090.8 | |
| 3527 | 5/29/2018 5:21 | 5 | 18.60 | | | | U | 0.07 | 918.3 | 0.02 |
| 3528 | 5/29/2018 5:38 | 5 | 18.43 | | | | UW | 0.21 | 1061.4 | 0.18 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3529 | 5/29/2018 5:54 | 5 | 18.21 | 21.23 | | | U | 0.05 | 680.9 | |
| 3530 | 5/29/2018 6:11 | 5 | 17.55 | | 0.20 | | UW | 0.25 | 731.8 | 0.11 |
| 3531 | 5/29/2018 8:15 | 5 | 22.67 | 21.46 | 0.23 | | C | 0.10 | 1241.2 | |
| 3532 | 5/29/2018 8:32 | 5 | 25.20 | 15.89 | | 0.27 | W | 0.16 | 2218.3 | |
| 3533 | 5/29/2018 8:48 | 5 | 22.64 | | | | C | 0.23 | 1806.1 | |
| 3534 | 5/29/2018 9:05 | 5 | 21.48 | 20.50 | | 0.26 | W | 0.07 | 818.8 | |
| 3535 | 5/29/2018 9:21 | 5 | 23.66 | | | | U | 0.04 | 689.9 | 0.07 |
| 3536 | 5/29/2018 9:38 | 5 | 26.15 | | | | UW | 0.20 | 902.9 | 0.38 |
| 3537 | 5/29/2018 9:54 | 5 | 27.43 | 22.93 | | | U | 0.05 | 737.9 | |
| 3538 | 5/29/2018 10:11 | 5 | 28.63 | | 0.20 | | UW | 0.25 | 619.8 | 0.29 |
| 3539 | 5/29/2018 12:15 | 5 | 33.90 | 25.60 | 0.24 | | C | 0.11 | 1106.9 | |
| 3540 | 5/29/2018 12:32 | 5 | 31.86 | 23.03 | | 0.37 | W | 1.00 | 2840.5 | 0.04 |
| 3541 | 5/29/2018 12:48 | 5 | 36.55 | | | | C | 0.30 | 2606.5 | |
| 3542 | 5/29/2018 13:05 | 5 | 30.73 | 27.21 | | 0.36 | W | 0.69 | 1814.2 | 0.05 |
| 3543 | 5/29/2018 13:21 | 5 | 31.69 | | | | U | 0.04 | 711.5 | 0.01 |
| 3544 | 5/29/2018 13:38 | 5 | 30.38 | | | | UW | 0.91 | 2967.3 | 9.55 |
| 3545 | 5/29/2018 13:54 | 5 | 33.09 | 28.64 | | | U | 0.09 | 867.2 | |
| 3546 | 5/29/2018 14:11 | 5 | 31.41 | | 0.20 | | UW | 0.62 | 1886.9 | 6.87 |
| 3547 | 5/29/2018 16:15 | 5 | 30.98 | 27.16 | 0.23 | | C | 0.04 | 1372.6 | |
| 3548 | 5/29/2018 16:32 | 5 | 30.19 | 22.48 | | 0.35 | W | 0.08 | 1892.0 | 0.03 |
| 3549 | 5/29/2018 16:48 | 5 | 30.70 | | | | C | 0.20 | 2046.4 | |
| 3550 | 5/29/2018 17:05 | 5 | 28.53 | 26.83 | | 0.34 | W | 0.06 | 1019.1 | 0.14 |
| 3551 | 5/29/2018 17:21 | 5 | 31.83 | | | | U | 0.04 | 569.4 | |
| 3552 | 5/29/2018 17:38 | 5 | 30.49 | | | | UW | 1.02 | 1940.5 | 6.74 |
| 3553 | 5/29/2018 17:54 | 5 | 29.43 | 28.18 | | | U | 0.12 | 1490.4 | |
| 3554 | 5/29/2018 18:11 | 5 | 25.05 | | 0.20 | | UW | 0.33 | 1015.6 | 4.65 |
| 3555 | 5/29/2018 20:15 | 5 | 21.33 | 24.24 | 0.22 | | C | 0.09 | 1002.6 | |
| 3556 | 5/29/2018 20:32 | 5 | 20.81 | 16.69 | | 0.34 | W | 0.08 | 1223.8 | |
| 3557 | 5/29/2018 20:48 | 5 | 20.64 | | | | C | | 862.4 | |
| 3558 | 5/29/2018 21:05 | 5 | 19.93 | 22.11 | | 0.33 | W | 0.04 | 1442.3 | |
| 3559 | 5/29/2018 21:21 | 5 | 19.37 | | | | U | 0.07 | 892.0 | |
| 3560 | 5/29/2018 21:38 | 5 | 19.12 | | | | UW | 0.50 | 1568.5 | 2.90 |
| 3561 | 5/29/2018 21:54 | 5 | 18.73 | 23.04 | | | U | 0.04 | 817.6 | |
| 3562 | 5/29/2018 22:11 | 5 | 18.82 | | 0.19 | | UW | 0.34 | 1061.1 | 3.20 |
| 3563 | 5/30/2018 0:15 | 5 | 18.09 | 21.72 | 0.22 | | C | 0.06 | 907.3 | |
| 3564 | 5/30/2018 0:32 | 5 | 17.71 | 13.71 | | 0.34 | W | 0.06 | 1444.8 | |
| 3565 | 5/30/2018 0:48 | 5 | 17.56 | | | | C | 0.08 | 1095.0 | |
| 3566 | 5/30/2018 1:05 | 5 | 17.52 | 19.38 | | 0.33 | W | 0.18 | 1039.6 | |
| 3567 | 5/30/2018 1:21 | 5 | 17.55 | | | | U | | 881.1 | |
| 3568 | 5/30/2018 1:38 | 5 | 17.61 | | | | UW | 0.49 | 1473.8 | 2.20 |
| 3569 | 5/30/2018 1:55 | 5 | 17.30 | 20.69 | | | U | 0.07 | 943.9 | |
| 3570 | 5/30/2018 2:11 | 5 | 17.23 | | 0.19 | | UW | 0.30 | 1024.4 | 2.47 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3571 | 5/30/2018 4:15 | 5 | 17.32 | 20.37 | 0.22 | | C | 0.08 | 875.5 | |
| 3572 | 5/30/2018 4:32 | 5 | 16.85 | 12.44 | | 0.33 | W | 0.15 | 976.7 | |
| 3573 | 5/30/2018 4:48 | 5 | 16.51 | | | | C | 0.08 | 813.3 | |
| 3574 | 5/30/2018 5:05 | 5 | 17.02 | 18.07 | | 0.33 | W | 0.04 | 899.1 | |
| 3575 | 5/30/2018 5:21 | 5 | 16.81 | | | | U | 0.04 | 674.8 | |
| 3576 | 5/30/2018 5:38 | 5 | 17.09 | | | | UW | 0.48 | 1280.9 | 3.16 |
| 3577 | 5/30/2018 5:54 | 5 | 16.76 | 19.56 | | | U | 0.03 | 683.4 | |
| 3578 | 5/30/2018 6:11 | 5 | 17.04 | | 0.19 | | UW | 0.28 | 1071.0 | 5.65 |
| 3579 | 5/30/2018 8:15 | 5 | 18.29 | 19.86 | 0.22 | | C | 0.08 | 1045.9 | |
| 3580 | 5/30/2018 8:32 | 5 | 18.62 | 12.69 | | 0.33 | W | 0.06 | 2441.9 | 0.02 |
| 3581 | 5/30/2018 8:48 | 5 | 19.14 | | | | C | 0.11 | 1014.2 | |
| 3582 | 5/30/2018 9:05 | 5 | 19.27 | 18.24 | | 0.33 | W | 0.06 | 1094.5 | 0.01 |
| 3583 | 5/30/2018 9:21 | 5 | 20.00 | | | | U | 0.05 | 709.9 | 0.18 |
| 3584 | 5/30/2018 9:38 | 5 | 20.07 | | | | UW | 0.46 | 1408.8 | 3.21 |
| 3585 | 5/30/2018 9:55 | 5 | 20.36 | 20.07 | | | U | 0.04 | 776.6 | |
| 3586 | 5/30/2018 10:11 | 5 | 20.29 | | 0.20 | | UW | 0.28 | 976.8 | 5.77 |
| 3587 | 5/30/2018 12:15 | 5 | 29.47 | 21.83 | 0.23 | | C | 0.13 | 1110.6 | |
| 3588 | 5/30/2018 12:32 | 5 | 28.32 | 19.01 | | 0.33 | W | 0.15 | 1746.7 | 0.10 |
| 3589 | 5/30/2018 12:48 | 5 | 29.15 | | | | C | 0.06 | 1427.5 | |
| 3590 | 5/30/2018 13:05 | 5 | 28.25 | 23.18 | | 0.33 | W | 0.09 | 1176.2 | 0.05 |
| 3591 | 5/30/2018 13:21 | 5 | 29.88 | | | | U | 0.06 | 688.2 | 0.09 |
| 3592 | 5/30/2018 13:38 | 5 | 28.90 | | | | UW | 0.89 | 1433.9 | 4.30 |
| 3593 | 5/30/2018 13:54 | 5 | 30.94 | 25.73 | | | U | 0.07 | 658.5 | |
| 3594 | 5/30/2018 14:11 | 5 | 29.86 | | 0.20 | | UW | 0.60 | 1124.9 | 13.78 |
| 3595 | 5/30/2018 16:15 | 5 | 32.66 | 26.35 | 0.23 | | C | 0.09 | 1324.0 | |
| 3596 | 5/30/2018 16:32 | 5 | 30.47 | 23.35 | | 0.32 | W | 0.38 | 2683.1 | 0.18 |
| 3597 | 5/30/2018 16:48 | 5 | 29.97 | | | | C | 0.07 | 1010.7 | |
| 3598 | 5/30/2018 17:05 | 5 | 26.80 | 26.04 | | 0.32 | W | 0.07 | 1180.8 | 0.18 |
| 3599 | 5/30/2018 17:21 | 5 | 26.73 | | | | U | 0.07 | 949.6 | |
| 3600 | 5/30/2018 17:38 | 5 | 25.90 | | | | UW | 0.68 | 1189.2 | 3.37 |
| 3601 | 5/30/2018 17:54 | 5 | 29.30 | 26.89 | | | U | 0.05 | 672.6 | |
| 3602 | 5/30/2018 18:11 | 5 | 31.29 | | 0.20 | | UW | 0.37 | 1057.6 | 10.02 |
| 3603 | 5/30/2018 20:15 | 5 | 25.87 | 24.94 | 0.22 | | C | 0.09 | 1366.1 | |
| 3604 | 5/30/2018 20:32 | 5 | 25.71 | 19.01 | | 0.31 | W | 0.12 | 1198.8 | 0.27 |
| 3605 | 5/30/2018 20:48 | 5 | 23.83 | | | | C | 0.06 | 890.6 | |
| 3606 | 5/30/2018 21:05 | 5 | 21.98 | 22.42 | | 0.31 | W | 0.05 | 1172.2 | |
| 3607 | 5/30/2018 21:21 | 5 | 21.13 | | | | U | 0.06 | 1063.2 | |
| 3608 | 5/30/2018 21:38 | 5 | 20.16 | | | | UW | 0.43 | 1008.8 | 1.42 |
| 3609 | 5/30/2018 21:54 | 5 | 19.63 | 23.66 | | | U | 0.04 | 552.7 | |
| 3610 | 5/30/2018 22:11 | 5 | 18.91 | | 0.19 | | UW | 0.25 | 801.9 | 2.47 |
| 3611 | 5/31/2018 0:15 | 5 | 15.71 | 21.46 | 0.22 | | C | 0.05 | 851.9 | |
| 3612 | 5/31/2018 0:32 | 5 | 15.70 | 13.41 | | 0.30 | W | 0.10 | 872.6 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3613 | 5/31/2018 0:48 | 5 | 15.01 | | | | C | 0.07 | 811.2 | |
| 3614 | 5/31/2018 1:05 | 5 | 14.75 | 18.73 | | 0.30 | W | 0.08 | 825.0 | |
| 3615 | 5/31/2018 1:21 | 5 | 14.25 | | | | U | 0.08 | 733.3 | |
| 3616 | 5/31/2018 1:38 | 5 | 14.67 | | | | UW | 0.28 | 959.2 | 0.83 |
| 3617 | 5/31/2018 1:55 | 5 | 14.12 | 20.12 | | | U | | 428.1 | |
| 3618 | 5/31/2018 2:11 | 5 | 14.18 | | 0.19 | | UW | 0.21 | 954.7 | 2.25 |
| 3619 | 5/31/2018 4:15 | 5 | 13.60 | 19.25 | 0.21 | | C | 0.06 | 963.6 | |
| 3620 | 5/31/2018 4:32 | 5 | 13.87 | 11.16 | | 0.30 | W | 0.08 | 853.4 | |
| 3621 | 5/31/2018 4:48 | 5 | 13.25 | | | | C | 0.08 | 884.8 | |
| 3622 | 5/31/2018 5:05 | 5 | 13.02 | 16.67 | | 0.30 | W | 0.10 | 807.3 | |
| 3623 | 5/31/2018 5:21 | 5 | 12.71 | | | | U | 0.06 | 823.4 | |
| 3624 | 5/31/2018 5:38 | 5 | 13.34 | | | | UW | 0.26 | 962.1 | 0.76 |
| 3625 | 5/31/2018 5:55 | 5 | 13.35 | 18.17 | | | U | | 452.2 | |
| 3626 | 5/31/2018 6:11 | 5 | 12.75 | | 0.19 | | UW | 0.20 | 666.1 | 2.39 |
| 3627 | 5/31/2018 8:15 | 5 | 18.96 | 18.89 | 0.21 | | C | 0.05 | 605.9 | |
| 3628 | 5/31/2018 8:32 | 5 | 20.51 | 13.17 | | 0.30 | W | 0.05 | 1402.9 | 0.01 |
| 3629 | 5/31/2018 8:48 | 5 | 21.73 | | | | C | 0.07 | 1196.7 | 1.35 |
| 3630 | 5/31/2018 9:05 | 5 | 22.64 | 19.35 | | 0.30 | W | 0.05 | 1062.6 | 0.02 |
| 3631 | 5/31/2018 9:21 | 5 | 24.14 | | | | U | 0.09 | 1083.5 | 0.21 |
| 3632 | 5/31/2018 9:38 | 5 | 24.81 | | | | UW | 0.31 | 1105.7 | 1.56 |
| 3633 | 5/31/2018 9:54 | 5 | 26.67 | 21.16 | | | U | | 445.0 | |
| 3634 | 5/31/2018 10:11 | 5 | 28.17 | | 0.20 | | UW | 0.25 | 895.3 | 3.77 |
| 3635 | 5/31/2018 12:15 | 5 | 34.39 | 24.42 | 0.23 | | C | 0.06 | 1273.2 | |
| 3636 | 5/31/2018 12:32 | 5 | 33.87 | 23.60 | | 0.31 | W | 0.01 | 1453.6 | |
| 3637 | 5/31/2018 12:48 | 5 | 36.02 | | | | C | 0.06 | 923.0 | |
| 3638 | 5/31/2018 13:05 | 5 | 35.46 | 28.40 | | 0.31 | W | 0.11 | 1886.3 | 0.18 |
| 3639 | 5/31/2018 13:21 | 5 | 36.42 | | | | U | 0.06 | 889.2 | 0.05 |
| 3640 | 5/31/2018 13:38 | 5 | 35.47 | | | | UW | 1.28 | 1128.6 | 1.83 |
| 3641 | 5/31/2018 13:55 | 5 | 37.53 | 30.30 | | | U | | 459.8 | |
| 3642 | 5/31/2018 14:11 | 5 | 36.59 | | 0.20 | | UW | 0.31 | 1074.7 | 4.85 |
| 3643 | 5/31/2018 16:15 | 5 | 36.12 | 29.46 | 0.23 | | C | 0.08 | 1130.9 | |
| 3644 | 5/31/2018 16:32 | 5 | 37.89 | 28.31 | | 0.30 | W | 0.07 | 1485.5 | 0.03 |
| 3645 | 5/31/2018 16:48 | 5 | 38.96 | | | | C | 0.09 | 1466.8 | |
| 3646 | 5/31/2018 17:05 | 5 | 38.10 | 30.47 | | 0.30 | W | 0.16 | 1833.5 | 0.17 |
| 3647 | 5/31/2018 17:21 | 5 | 37.88 | | | | U | 0.10 | 1858.2 | 0.02 |
| 3648 | 5/31/2018 17:38 | 5 | 35.29 | | | | UW | 0.65 | 1212.7 | 1.48 |
| 3649 | 5/31/2018 17:54 | 5 | 36.76 | 32.45 | | | U | 0.02 | 759.8 | |
| 3650 | 5/31/2018 18:11 | 5 | 35.53 | | 0.20 | | UW | 0.27 | 856.3 | 2.34 |
| 3651 | 5/31/2018 20:15 | 5 | 26.85 | 27.24 | 0.22 | | C | 0.05 | 1623.6 | |
| 3652 | 5/31/2018 20:32 | 5 | 25.64 | 20.73 | | 0.28 | W | 0.07 | 1713.0 | |
| 3653 | 5/31/2018 20:48 | 5 | 23.92 | | | | C | 0.09 | 1067.9 | |
| 3654 | 5/31/2018 21:05 | 5 | 23.31 | 24.52 | | 0.29 | W | 0.07 | 1081.5 | 0.02 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3655 | 5/31/2018 21:21 | 5 | 22.65 | | | | U | 0.07 | 1151.1 | |
| 3656 | 5/31/2018 21:38 | 5 | 21.22 | | | | UW | 0.31 | 1071.8 | 0.43 |
| 3657 | 5/31/2018 21:54 | 5 | 20.90 | 25.70 | | | U | 0.01 | 483.1 | |
| 3658 | 5/31/2018 22:11 | 5 | 19.99 | | 0.19 | | UW | 0.38 | 859.3 | 0.44 |
| 3659 | 6/1/2018 0:15 | 5 | 16.57 | 22.60 | 0.21 | | C | 0.06 | 1249.3 | |
| 3660 | 6/1/2018 0:32 | 5 | 16.86 | 14.55 | | 0.28 | W | 0.05 | 963.2 | |
| 3661 | 6/1/2018 0:49 | 5 | 16.51 | | | | C | 0.10 | 1095.2 | |
| 3662 | 6/1/2018 1:05 | 5 | 16.15 | 20.06 | | 0.28 | W | 0.04 | 846.6 | |
| 3663 | 6/1/2018 1:22 | 5 | 14.59 | | | | U | 0.10 | 867.0 | |
| 3664 | 6/1/2018 1:38 | 5 | 14.94 | | | | UW | 0.17 | 844.1 | 0.14 |
| 3665 | 6/1/2018 1:55 | 5 | 15.04 | 21.35 | | | U | 0.04 | 498.1 | |
| 3666 | 6/1/2018 2:11 | 5 | 15.69 | | 0.19 | | UW | 0.20 | 718.6 | 0.24 |
| 3667 | 6/1/2018 4:15 | 5 | 14.75 | 20.19 | 0.20 | | C | 0.04 | 1054.7 | |
| 3668 | 6/1/2018 4:32 | 5 | 15.34 | 12.20 | | 0.28 | W | 0.05 | 1031.8 | |
| 3669 | 6/1/2018 4:48 | 5 | 14.72 | | | | C | 0.10 | 928.3 | |
| 3670 | 6/1/2018 5:05 | 5 | 15.21 | 17.87 | | 0.28 | W | 0.05 | 942.5 | |
| 3671 | 6/1/2018 5:21 | 5 | 15.32 | | | | U | 0.06 | 1017.9 | |
| 3672 | 6/1/2018 5:38 | 5 | 15.84 | | | | UW | 0.19 | 851.2 | 0.09 |
| 3673 | 6/1/2018 5:54 | 5 | 15.69 | 19.45 | | | U | 0.02 | 583.8 | |
| 3674 | 6/1/2018 6:11 | 5 | 15.90 | | 0.19 | | UW | 0.15 | 666.8 | 0.12 |
| 3675 | 6/1/2018 8:15 | 5 | 20.29 | 20.06 | 0.21 | | C | 0.08 | 988.7 | |
| 3676 | 6/1/2018 8:32 | 5 | 22.59 | 14.53 | | 0.28 | W | 0.13 | 1797.3 | 0.01 |
| 3677 | 6/1/2018 8:48 | 5 | 23.06 | | | | C | 0.05 | 813.4 | |
| 3678 | 6/1/2018 9:05 | 5 | 24.58 | 20.64 | | 0.28 | W | 0.03 | 1263.7 | |
| 3679 | 6/1/2018 9:21 | 5 | 25.65 | | | | U | 0.05 | 804.9 | 0.06 |
| 3680 | 6/1/2018 9:38 | 5 | 26.74 | | | | UW | 0.28 | 988.5 | 0.44 |
| 3681 | 6/1/2018 9:55 | 5 | 27.25 | 22.24 | | | U | 0.01 | 729.5 | |
| 3682 | 6/1/2018 10:11 | 5 | 29.12 | | 0.20 | | UW | 0.15 | 839.6 | 0.59 |
| 3683 | 6/1/2018 12:15 | 5 | 35.17 | 25.47 | 0.22 | | C | 0.05 | 1676.5 | |
| 3684 | 6/1/2018 12:32 | 5 | 33.86 | 25.16 | | 0.38 | W | 0.26 | 4682.9 | 0.04 |
| 3685 | 6/1/2018 12:48 | 5 | 37.50 | | | | C | 0.08 | 1188.4 | |
| 3686 | 6/1/2018 13:05 | 5 | 34.47 | 29.14 | | 0.37 | W | 0.31 | 2003.4 | 0.07 |
| 3687 | 6/1/2018 13:21 | 5 | 38.07 | | | | U | 0.02 | 756.8 | 4.55 |
| 3688 | 6/1/2018 13:38 | 5 | 35.34 | | | | UW | 0.83 | 3206.4 | 2.50 |
| 3689 | 6/1/2018 13:54 | 5 | 38.91 | 30.82 | | | U | 0.05 | 863.4 | |
| 3690 | 6/1/2018 14:11 | 5 | 36.32 | | 0.20 | | UW | 0.72 | 1621.9 | 6.69 |
| 3691 | 6/1/2018 16:15 | 5 | 37.59 | 29.98 | 0.22 | | C | 0.05 | 1198.8 | |
| 3692 | 6/1/2018 16:32 | 5 | 36.71 | 28.88 | | 0.35 | W | 0.14 | 4976.5 | 0.09 |
| 3693 | 6/1/2018 16:48 | 5 | 39.78 | | | | C | 0.11 | 3154.1 | |
| 3694 | 6/1/2018 17:05 | 5 | 36.88 | 30.65 | | 0.34 | W | 0.16 | 1539.4 | 0.12 |
| 3695 | 6/1/2018 17:21 | 5 | 38.43 | | | | U | 0.06 | 582.5 | |
| 3696 | 6/1/2018 17:38 | 5 | 36.41 | | | | UW | 0.86 | 1883.6 | 2.29 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3697 | 6/1/2018 17:54 | 5 | 38.14 | 32.47 | | | U | 0.05 | 1585.4 | |
| 3698 | 6/1/2018 18:11 | 5 | 36.71 | | 0.19 | | UW | 0.42 | 801.0 | 4.42 |
| 3699 | 6/1/2018 20:15 | 5 | 29.42 | 27.51 | 0.21 | | C | 0.07 | 1513.0 | |
| 3700 | 6/1/2018 20:32 | 5 | 28.49 | 21.51 | | 0.33 | W | 0.11 | 2602.0 | 0.03 |
| 3701 | 6/1/2018 20:48 | 5 | 28.57 | | | | C | 0.08 | 1021.1 | |
| 3702 | 6/1/2018 21:05 | 5 | 27.71 | 26.09 | | 0.33 | W | 0.11 | 1373.6 | 0.09 |
| 3703 | 6/1/2018 21:21 | 5 | 28.13 | | | | U | 0.03 | 774.6 | |
| 3704 | 6/1/2018 21:38 | 5 | 27.10 | | | | UW | 0.17 | 1209.4 | 0.81 |
| 3705 | 6/1/2018 21:54 | 5 | 27.01 | 26.98 | | | U | 0.02 | 786.0 | |
| 3706 | 6/1/2018 22:11 | 5 | 26.17 | | 0.19 | | UW | 0.29 | 670.6 | 1.35 |
| 3707 | 6/2/2018 0:15 | 5 | 17.49 | 23.28 | 0.20 | | C | 0.01 | 1404.7 | |
| 3708 | 6/2/2018 0:32 | 5 | 17.44 | 14.27 | | 0.37 | W | 0.02 | 631.3 | |
| 3709 | 6/2/2018 0:49 | 5 | 17.30 | | | | C | 0.06 | 1131.0 | |
| 3710 | 6/2/2018 1:05 | 5 | 17.27 | 20.42 | | 0.39 | W | 0.02 | 458.0 | |
| 3711 | 6/2/2018 1:21 | 5 | 17.28 | | | | U | 0.05 | 968.1 | |
| 3712 | 6/2/2018 1:38 | 5 | 17.55 | | | | UW | 0.52 | 714.5 | 0.03 |
| 3713 | 6/2/2018 1:55 | 5 | 17.19 | 21.32 | | | U | 0.06 | 1103.7 | |
| 3714 | 6/2/2018 2:11 | 5 | 17.13 | | 0.26 | | UW | 0.24 | 476.3 | 0.08 |
| 3715 | 6/2/2018 4:15 | 5 | 17.39 | 20.26 | 0.31 | | C | 0.05 | 980.0 | |
| 3716 | 6/2/2018 4:32 | 5 | 17.60 | 12.27 | | 0.40 | W | 0.19 | 598.9 | |
| 3717 | 6/2/2018 4:48 | 5 | 17.49 | | | | C | 0.23 | 2103.7 | |
| 3718 | 6/2/2018 5:05 | 5 | 17.41 | 18.16 | | 0.38 | W | 0.07 | 1630.0 | |
| 3719 | 6/2/2018 5:21 | 5 | 17.23 | | | | U | 0.20 | 1873.6 | |
| 3720 | 6/2/2018 5:38 | 5 | 17.37 | | | | UW | 0.95 | 903.4 | 0.02 |
| 3721 | 6/2/2018 5:54 | 5 | 17.13 | 19.49 | | | U | 0.30 | 2068.0 | 0.02 |
| 3722 | 6/2/2018 6:11 | 5 | 17.16 | | 0.34 | | UW | 0.38 | 694.7 | 0.13 |
| 3723 | 6/2/2018 8:15 | 5 | 17.17 | 19.30 | 0.32 | | C | 0.02 | 656.5 | |
| 3724 | 6/2/2018 8:32 | 5 | 17.72 | 11.73 | | 0.39 | W | 0.64 | 720.6 | |
| 3725 | 6/2/2018 8:48 | 5 | 18.01 | | | | C | 0.01 | 955.0 | |
| 3726 | 6/2/2018 9:05 | 5 | 16.80 | 17.35 | | 0.37 | W | 0.05 | 560.4 | |
| 3727 | 6/2/2018 9:21 | 5 | 16.47 | | | | U | 0.06 | 1435.7 | |
| 3728 | 6/2/2018 9:38 | 5 | 16.31 | | | | UW | 0.57 | 843.0 | 0.02 |
| 3729 | 6/2/2018 9:54 | 5 | 16.56 | 18.76 | | | U | 0.02 | 935.7 | 0.03 |
| 3730 | 6/2/2018 10:11 | 5 | 18.43 | | 0.30 | | UW | 0.36 | 730.0 | 0.17 |
| 3731 | 6/2/2018 12:15 | 5 | 24.10 | 20.67 | 0.32 | | C | 0.02 | 807.5 | |
| 3732 | 6/2/2018 12:32 | 5 | 22.36 | 15.56 | | 0.38 | W | 0.01 | 911.6 | |
| 3733 | 6/2/2018 12:48 | 5 | 23.61 | | | | C | | 999.9 | |
| 3734 | 6/2/2018 13:05 | 5 | 22.41 | 20.95 | | 0.36 | W | 0.01 | 346.9 | |
| 3735 | 6/2/2018 13:21 | 5 | 24.07 | | | | U | 0.06 | 1522.1 | 0.53 |
| 3736 | 6/2/2018 13:38 | 5 | 23.01 | | | | UW | 0.73 | 973.5 | |
| 3737 | 6/2/2018 13:54 | 5 | 23.71 | 22.46 | | | U | 0.01 | 1067.9 | 0.07 |
| 3738 | 6/2/2018 14:11 | 5 | 24.08 | | 0.28 | | UW | 0.24 | 974.1 | 0.19 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3739 | 6/2/2018 16:15 | 5 | 26.07 | 22.13 | 0.31 | | C | | 703.6 | |
| 3740 | 6/2/2018 16:32 | 5 | 25.96 | 17.09 | | 0.35 | W | 0.02 | 822.7 | |
| 3741 | 6/2/2018 16:48 | 5 | 26.46 | | | | C | | 939.6 | |
| 3742 | 6/2/2018 17:05 | 5 | 22.99 | 21.20 | | 0.34 | W | 0.02 | 1894.5 | |
| 3743 | 6/2/2018 17:21 | 5 | 24.74 | | | | U | | 2216.7 | 0.84 |
| 3744 | 6/2/2018 17:38 | 5 | 23.37 | | | | UW | 0.40 | 765.3 | |
| 3745 | 6/2/2018 17:54 | 5 | 22.92 | 21.96 | | | U | 0.03 | 1170.7 | 0.05 |
| 3746 | 6/2/2018 18:11 | 5 | 22.99 | | 0.26 | | UW | 0.19 | 519.3 | 0.24 |
| 3747 | 6/2/2018 20:15 | 5 | 20.15 | 19.91 | 0.30 | | C | 0.02 | 619.5 | |
| 3748 | 6/2/2018 20:32 | 5 | 19.02 | 12.39 | | 0.33 | W | 0.01 | 448.2 | |
| 3749 | 6/2/2018 20:48 | 5 | 18.70 | | | | C | 0.03 | 773.9 | |
| 3750 | 6/2/2018 21:05 | 5 | 17.45 | 17.55 | | 0.33 | W | | 891.9 | |
| 3751 | 6/2/2018 21:21 | 5 | 16.80 | | | | U | 0.13 | 1099.0 | 0.29 |
| 3752 | 6/2/2018 21:38 | 5 | 16.35 | | | | UW | 0.30 | 576.6 | |
| 3753 | 6/2/2018 21:54 | 5 | 15.59 | 18.14 | | | U | 0.03 | 877.7 | 0.02 |
| 3754 | 6/2/2018 22:11 | 5 | 14.48 | | 0.24 | | UW | 0.11 | 424.2 | 0.02 |
| 3755 | 6/3/2018 0:15 | 5 | 12.11 | 17.37 | 0.29 | | C | 0.06 | 1035.7 | |
| 3756 | 6/3/2018 0:32 | 5 | 12.39 | 8.67 | | 0.33 | W | 0.05 | 567.5 | |
| 3757 | 6/3/2018 0:48 | 5 | 12.64 | | | | C | 0.07 | 887.3 | |
| 3758 | 6/3/2018 1:05 | 5 | 12.95 | 14.63 | | 0.33 | W | 0.02 | 506.4 | |
| 3759 | 6/3/2018 1:21 | 5 | 12.93 | | | | U | 0.11 | 1072.5 | 0.07 |
| 3760 | 6/3/2018 1:38 | 5 | 13.10 | | | | UW | 0.42 | 573.0 | |
| 3761 | 6/3/2018 1:55 | 5 | 12.64 | 15.67 | | | U | | 787.0 | 0.04 |
| 3762 | 6/3/2018 2:11 | 5 | 13.08 | | 0.23 | | UW | 0.13 | 452.5 | 0.03 |
| 3763 | 6/3/2018 4:15 | 5 | 11.33 | 15.75 | 0.29 | | C | 0.02 | 599.8 | 0.71 |
| 3764 | 6/3/2018 4:32 | 5 | 11.99 | 7.05 | | 0.32 | W | 0.04 | 572.0 | |
| 3765 | 6/3/2018 4:48 | 5 | 11.91 | | | | C | 0.03 | 623.8 | |
| 3766 | 6/3/2018 5:05 | 5 | 11.59 | 12.85 | | 0.32 | W | 0.02 | 656.0 | |
| 3767 | 6/3/2018 5:21 | 5 | 11.61 | | | | U | 0.16 | 897.5 | 0.13 |
| 3768 | 6/3/2018 5:38 | 5 | 11.76 | | | | UW | 0.19 | 556.0 | |
| 3769 | 6/3/2018 5:54 | 5 | 11.49 | 13.94 | | | U | | 609.6 | 0.01 |
| 3770 | 6/3/2018 6:11 | 5 | 11.48 | | 0.23 | | UW | 0.02 | 358.4 | |
| 3771 | 6/3/2018 8:15 | 5 | 13.54 | 14.72 | 0.29 | | C | 0.01 | 436.6 | 0.03 |
| 3772 | 6/3/2018 8:32 | 5 | 14.24 | 7.48 | | 0.32 | W | 0.03 | 310.7 | |
| 3773 | 6/3/2018 8:48 | 5 | 14.89 | | | | C | 0.01 | 811.3 | |
| 3774 | 6/3/2018 9:05 | 5 | 15.39 | 13.72 | | 0.32 | W | 0.04 | 822.0 | 0.56 |
| 3775 | 6/3/2018 9:21 | 5 | 16.12 | | | | U | 0.08 | 654.7 | 0.53 |
| 3776 | 6/3/2018 9:38 | 5 | 16.93 | | | | UW | 0.17 | 441.6 | |
| 3777 | 6/3/2018 9:54 | 5 | 17.58 | 15.31 | | | U | 0.01 | 655.6 | 0.01 |
| 3778 | 6/3/2018 10:11 | 5 | 18.77 | | 0.24 | | UW | 0.10 | 350.0 | 0.04 |
| 3779 | 6/3/2018 12:15 | 5 | 24.26 | 18.36 | 0.29 | | C | 0.01 | 699.0 | |
| 3780 | 6/3/2018 12:32 | 5 | 24.05 | 15.38 | | 0.32 | W | | 329.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3781 | 6/3/2018 12:48 | 5 | 25.66 | | | | C | 0.04 | 941.0 | |
| 3782 | 6/3/2018 13:05 | 5 | 25.89 | 20.35 | | 0.32 | W | 0.07 | 1211.4 | 2.16 |
| 3783 | 6/3/2018 13:21 | 5 | 25.68 | | | | U | 0.26 | 1613.1 | 1.80 |
| 3784 | 6/3/2018 13:38 | 5 | 25.75 | | | | UW | 0.42 | 574.7 | |
| 3785 | 6/3/2018 13:54 | 5 | 26.67 | 21.85 | | | U | 0.04 | 728.2 | 0.14 |
| 3786 | 6/3/2018 14:11 | 5 | 26.25 | | 0.24 | | UW | 0.18 | 553.9 | 0.06 |
| 3787 | 6/3/2018 16:15 | 5 | 27.98 | 22.26 | 0.29 | | C | 0.04 | 1044.9 | |
| 3788 | 6/3/2018 16:32 | 5 | 28.17 | 19.09 | | 0.31 | W | 0.09 | 756.9 | |
| 3789 | 6/3/2018 16:48 | 5 | 28.27 | | | | C | 0.03 | 772.0 | 0.10 |
| 3790 | 6/3/2018 17:05 | 5 | 28.28 | 22.24 | | 0.31 | W | 0.11 | 809.6 | 0.07 |
| 3791 | 6/3/2018 17:21 | 5 | 28.03 | | | | U | 0.51 | 509.6 | 1.63 |
| 3792 | 6/3/2018 17:38 | 5 | 27.62 | | | | UW | 0.32 | 464.5 | |
| 3793 | 6/3/2018 17:54 | 5 | 27.95 | 24.09 | | | U | | 203.1 | 0.12 |
| 3794 | 6/3/2018 18:11 | 5 | 27.06 | | 0.23 | | UW | 0.15 | 181.9 | 0.03 |
| 3795 | 6/3/2018 20:15 | 5 | 21.81 | 20.94 | 0.28 | | C | 0.05 | 801.6 | |
| 3796 | 6/3/2018 20:32 | 5 | 22.17 | 14.17 | | 0.30 | W | 0.04 | 511.7 | |
| 3797 | 6/3/2018 20:48 | 5 | 19.29 | | | | C | 0.02 | 410.3 | |
| 3798 | 6/3/2018 21:05 | 5 | 17.96 | 18.72 | | 0.30 | W | 0.08 | 680.4 | 0.11 |
| 3799 | 6/3/2018 21:21 | 5 | 16.09 | | | | U | 0.32 | 1669.5 | 0.69 |
| 3800 | 6/3/2018 21:38 | 5 | 14.49 | | | | UW | 0.20 | 227.1 | |
| 3801 | 6/3/2018 21:54 | 5 | 13.54 | 19.32 | | | U | 0.05 | 683.2 | 0.04 |
| 3802 | 6/3/2018 22:11 | 5 | 12.68 | | 0.22 | | UW | 0.11 | 553.4 | |
| 3803 | 6/4/2018 0:15 | 5 | 10.07 | 17.37 | 0.27 | | C | 0.08 | 998.3 | |
| 3804 | 6/4/2018 0:32 | 5 | 10.19 | 8.84 | | 0.29 | W | 0.02 | 715.1 | |
| 3805 | 6/4/2018 0:49 | 5 | 9.78 | | | | C | 0.10 | 754.7 | |
| 3806 | 6/4/2018 1:05 | 5 | 10.06 | 14.79 | | 0.30 | W | 0.07 | 681.8 | |
| 3807 | 6/4/2018 1:22 | 5 | 9.86 | | | | U | 0.19 | 1011.0 | 0.02 |
| 3808 | 6/4/2018 1:38 | 5 | 9.71 | | | | UW | 0.22 | 612.5 | |
| 3809 | 6/4/2018 1:55 | 5 | 9.34 | 15.71 | | | U | 0.02 | 529.3 | 0.02 |
| 3810 | 6/4/2018 2:11 | 5 | 9.35 | | 0.22 | | UW | 0.08 | 398.1 | |
| 3811 | 6/4/2018 4:15 | 5 | 8.24 | 15.31 | 0.27 | | C | 0.06 | 884.1 | 0.25 |
| 3812 | 6/4/2018 4:32 | 5 | 8.63 | 6.75 | | 0.29 | W | 0.02 | 596.5 | |
| 3813 | 6/4/2018 4:48 | 5 | 8.57 | | | | C | 0.09 | 871.2 | |
| 3814 | 6/4/2018 5:05 | 5 | 8.35 | 12.71 | | 0.30 | W | 0.07 | 511.6 | |
| 3815 | 6/4/2018 5:21 | 5 | 8.09 | | | | U | 0.24 | 785.5 | 0.09 |
| 3816 | 6/4/2018 5:38 | 5 | 8.33 | | | | UW | 0.15 | 550.5 | |
| 3817 | 6/4/2018 5:54 | 5 | 8.11 | 13.81 | | | U | 0.02 | 395.2 | 0.04 |
| 3818 | 6/4/2018 6:11 | 5 | 9.40 | | 0.21 | | UW | 0.12 | 468.0 | |
| 3819 | 6/4/2018 8:15 | 5 | 18.47 | 15.45 | 0.27 | | C | 0.11 | 1199.4 | 0.02 |
| 3820 | 6/4/2018 8:32 | 5 | 19.87 | 9.46 | | 0.30 | W | 0.06 | 715.9 | 0.01 |
| 3821 | 6/4/2018 8:48 | 5 | 20.14 | | | | C | 0.14 | 1529.5 | |
| 3822 | 6/4/2018 9:05 | 5 | 21.32 | 15.58 | | 0.30 | W | 0.03 | 458.0 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3823 | 6/4/2018 9:21 | 5 | 21.94 | | | | U | 0.19 | 792.3 | 3.04 |
| 3824 | 6/4/2018 9:38 | 5 | 22.76 | | | | UW | 0.26 | 701.8 | |
| 3825 | 6/4/2018 9:54 | 5 | 23.72 | 17.47 | | | U | 0.09 | 1095.7 | 0.07 |
| 3826 | 6/4/2018 10:11 | 5 | 24.98 | | 0.22 | | UW | 0.10 | 547.6 | |
| 3827 | 6/4/2018 12:15 | 5 | 31.14 | 20.45 | 0.28 | | C | 0.02 | 1359.9 | |
| 3828 | 6/4/2018 12:32 | 5 | 31.31 | 18.66 | | 0.30 | W | 0.05 | 799.8 | |
| 3829 | 6/4/2018 12:48 | 5 | 32.36 | | | | C | 0.22 | 1854.1 | |
| 3830 | 6/4/2018 13:05 | 5 | 32.41 | 23.80 | | 0.30 | W | 0.03 | 640.3 | 0.02 |
| 3831 | 6/4/2018 13:21 | 5 | 32.92 | | | | U | 0.22 | 860.5 | 1.38 |
| 3832 | 6/4/2018 13:38 | 5 | 33.20 | | | | UW | 0.42 | 859.2 | |
| 3833 | 6/4/2018 13:54 | 5 | 34.27 | 26.31 | | | U | 0.06 | 1881.8 | 0.27 |
| 3834 | 6/4/2018 14:11 | 5 | 33.96 | | 0.22 | | UW | 0.23 | 501.0 | |
| 3835 | 6/4/2018 16:15 | 5 | 35.00 | 25.29 | 0.28 | | C | 0.01 | 1043.6 | |
| 3836 | 6/4/2018 16:32 | 5 | 35.36 | 22.53 | | 0.30 | W | | 432.9 | |
| 3837 | 6/4/2018 16:48 | 5 | 34.62 | | | | C | 0.06 | 982.7 | 0.79 |
| 3838 | 6/4/2018 17:05 | 5 | 32.89 | 26.66 | | 0.30 | W | 0.02 | 594.7 | 0.04 |
| 3839 | 6/4/2018 17:21 | 5 | 33.32 | | | | U | 0.16 | 518.6 | 1.21 |
| 3840 | 6/4/2018 17:38 | 5 | 32.24 | | | | UW | 0.33 | 710.9 | |
| 3841 | 6/4/2018 17:54 | 5 | 32.09 | 28.21 | | | U | 0.04 | 1209.2 | 0.17 |
| 3842 | 6/4/2018 18:11 | 5 | 31.61 | | 0.22 | | UW | 0.18 | 412.8 | |
| 3843 | 6/4/2018 20:15 | 5 | 27.23 | 23.73 | 0.27 | | C | 0.04 | 1168.0 | |
| 3844 | 6/4/2018 20:32 | 5 | 27.36 | 17.78 | | 0.28 | W | 0.03 | 561.9 | |
| 3845 | 6/4/2018 20:48 | 5 | 25.67 | | | | C | 0.02 | 815.6 | |
| 3846 | 6/4/2018 21:05 | 5 | 24.79 | 22.86 | | 0.29 | W | 0.06 | 637.4 | |
| 3847 | 6/4/2018 21:21 | 5 | 23.70 | | | | U | 0.13 | 580.0 | 0.50 |
| 3848 | 6/4/2018 21:38 | 5 | 23.06 | | | | UW | 0.25 | 672.4 | |
| 3849 | 6/4/2018 21:54 | 5 | 22.40 | 23.62 | | | U | 0.03 | 716.4 | 0.10 |
| 3850 | 6/4/2018 22:11 | 5 | 21.74 | | 0.21 | | UW | 0.15 | 566.9 | |
| 3851 | 6/5/2018 0:15 | 5 | 19.01 | 20.64 | 0.26 | | C | 0.07 | 1183.1 | |
| 3852 | 6/5/2018 0:32 | 5 | 19.22 | 13.09 | | 0.28 | W | 0.02 | 716.5 | |
| 3853 | 6/5/2018 0:48 | 5 | 19.35 | | | | C | 0.05 | 1034.2 | |
| 3854 | 6/5/2018 1:05 | 5 | 19.85 | 19.21 | | 0.28 | W | | 880.8 | |
| 3855 | 6/5/2018 1:22 | 5 | 19.84 | | | | U | | 829.3 | 0.20 |
| 3856 | 6/5/2018 1:38 | 5 | 19.86 | | | | UW | 0.22 | 723.8 | |
| 3857 | 6/5/2018 1:55 | 5 | 19.42 | 20.29 | | | U | 0.04 | 897.3 | 0.05 |
| 3858 | 6/5/2018 2:11 | 5 | 19.02 | | 0.21 | | UW | 0.14 | 607.4 | |
| 3859 | 6/5/2018 4:15 | 5 | 16.23 | 18.96 | 0.26 | | C | 0.04 | 1047.4 | |
| 3860 | 6/5/2018 4:32 | 5 | 16.14 | 11.08 | | 0.28 | W | 0.05 | 932.2 | |
| 3861 | 6/5/2018 4:48 | 5 | 15.79 | | | | C | 0.06 | 952.0 | |
| 3862 | 6/5/2018 5:05 | 5 | 15.85 | 17.06 | | 0.28 | W | 0.05 | 765.5 | |
| 3863 | 6/5/2018 5:21 | 5 | 15.49 | | | | U | 0.13 | 878.8 | 0.04 |
| 3864 | 6/5/2018 5:38 | 5 | 14.83 | | | | UW | 0.15 | 640.3 | 0.62 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3865 | 6/5/2018 5:55 | 5 | 14.99 | 18.17 | | | U | 0.05 | 496.4 | 0.05 |
| 3866 | 6/5/2018 6:11 | 5 | 14.60 | | 0.20 | | UW | 0.10 | 509.1 | |
| 3867 | 6/5/2018 8:15 | 5 | 20.05 | 18.32 | 0.26 | | C | 0.01 | 988.0 | |
| 3868 | 6/5/2018 8:32 | 5 | 21.93 | 12.88 | | 0.28 | W | 0.03 | 939.7 | |
| 3869 | 6/5/2018 8:48 | 5 | 22.47 | | | | C | 0.06 | 1195.7 | |
| 3870 | 6/5/2018 9:05 | 5 | 23.83 | 19.26 | | 0.28 | W | 0.06 | 617.7 | |
| 3871 | 6/5/2018 9:21 | 5 | 24.59 | | | | U | 0.11 | 837.6 | 0.57 |
| 3872 | 6/5/2018 9:38 | 5 | 25.85 | | | | UW | 0.19 | 723.4 | |
| 3873 | 6/5/2018 9:54 | 5 | 27.63 | 21.31 | | | U | 0.04 | 843.3 | 0.08 |
| 3874 | 6/5/2018 10:11 | 5 | 28.92 | | 0.21 | | UW | 0.12 | 593.3 | 0.01 |
| 3875 | 6/5/2018 12:15 | 5 | 36.99 | 24.21 | 0.27 | | C | 0.05 | 1239.9 | |
| 3876 | 6/5/2018 12:32 | 5 | 37.67 | 24.49 | | 0.29 | W | 0.04 | 1292.8 | |
| 3877 | 6/5/2018 12:48 | 5 | 39.16 | | | | C | 0.04 | 1334.5 | |
| 3878 | 6/5/2018 13:05 | 5 | 38.98 | 29.50 | | 0.29 | W | 0.06 | 1458.0 | 0.03 |
| 3879 | 6/5/2018 13:21 | 5 | 39.12 | | | | U | 0.21 | 1150.5 | 0.98 |
| 3880 | 6/5/2018 13:38 | 5 | 39.07 | | | | UW | 0.19 | 1076.5 | |
| 3881 | 6/5/2018 13:54 | 5 | 40.38 | 31.63 | | | U | 0.08 | 1298.2 | 0.21 |
| 3882 | 6/5/2018 14:11 | 5 | 40.08 | | 0.21 | | UW | 0.20 | 996.4 | 0.03 |
| 3883 | 6/5/2018 16:15 | 5 | 40.38 | 29.20 | 0.27 | | C | 0.03 | 2008.8 | |
| 3884 | 6/5/2018 16:32 | 5 | 40.59 | 28.50 | | 0.29 | W | 0.07 | 1590.2 | 1.43 |
| 3885 | 6/5/2018 16:48 | 5 | 40.12 | | | | C | 0.08 | 1641.9 | |
| 3886 | 6/5/2018 17:05 | 5 | 39.90 | 31.36 | | 0.28 | W | 0.07 | 1085.2 | 0.04 |
| 3887 | 6/5/2018 17:21 | 5 | 40.06 | | | | U | 0.13 | 876.2 | 0.63 |
| 3888 | 6/5/2018 17:38 | 5 | 39.26 | | | | UW | 0.34 | 1191.3 | |
| 3889 | 6/5/2018 17:54 | 5 | 39.74 | 33.94 | | | U | 0.07 | 1402.2 | 0.12 |
| 3890 | 6/5/2018 18:11 | 5 | 38.78 | | 0.21 | | UW | 0.19 | 818.9 | 0.09 |
| 3891 | 6/5/2018 20:15 | 5 | 31.72 | 26.96 | 0.26 | | C | | 1635.8 | |
| 3892 | 6/5/2018 20:32 | 5 | 31.44 | 22.28 | | 0.27 | W | 0.08 | 1669.2 | |
| 3893 | 6/5/2018 20:48 | 5 | 29.04 | | | | C | 0.01 | 1232.4 | |
| 3894 | 6/5/2018 21:05 | 5 | 28.35 | 26.28 | | 0.27 | W | 0.08 | 1371.9 | |
| 3895 | 6/5/2018 21:21 | 5 | 27.59 | | | | U | 0.20 | 1182.4 | 0.26 |
| 3896 | 6/5/2018 21:38 | 5 | 26.36 | | | | UW | 0.31 | 1089.2 | |
| 3897 | 6/5/2018 21:54 | 5 | 26.70 | 27.48 | | | U | 0.05 | 886.4 | 0.06 |
| 3898 | 6/5/2018 22:11 | 5 | 26.22 | | 0.20 | | UW | 0.40 | 993.6 | 0.01 |
| 3899 | 6/6/2018 0:15 | 5 | 24.49 | 23.64 | 0.25 | | C | 0.04 | 1349.9 | |
| 3900 | 6/6/2018 0:32 | 5 | 24.43 | 17.11 | | 0.27 | W | 0.09 | 1606.7 | |
| 3901 | 6/6/2018 0:48 | 5 | 24.51 | | | | C | 0.09 | 1775.3 | |
| 3902 | 6/6/2018 1:05 | 5 | 24.74 | 22.87 | | 0.27 | W | 0.10 | 1477.7 | |
| 3903 | 6/6/2018 1:21 | 5 | 24.46 | | | | U | 0.06 | 755.9 | 0.14 |
| 3904 | 6/6/2018 1:38 | 5 | 24.29 | | | | UW | 0.21 | 1579.1 | |
| 3905 | 6/6/2018 1:54 | 5 | 24.27 | 24.22 | | | U | 0.06 | 1510.4 | 0.04 |
| 3906 | 6/6/2018 2:11 | 5 | 24.09 | | 0.20 | | UW | 0.08 | 835.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3907 | 6/6/2018 4:15 | 5 | 18.93 | 21.70 | 0.26 | | C | | 1144.9 | |
| 3908 | 6/6/2018 4:32 | 5 | 19.25 | 13.81 | | 0.31 | W | 0.06 | 1877.8 | |
| 3909 | 6/6/2018 4:48 | 5 | 19.09 | | | | C | 0.19 | 2352.2 | |
| 3910 | 6/6/2018 5:05 | 5 | 18.96 | 19.79 | | 0.32 | W | 0.02 | 1088.3 | |
| 3911 | 6/6/2018 5:21 | 5 | 18.81 | | | | U | 0.07 | 1498.0 | |
| 3912 | 6/6/2018 5:38 | 5 | 18.75 | | | | UW | 0.45 | 1305.7 | 0.01 |
| 3913 | 6/6/2018 5:55 | 5 | 18.27 | 20.91 | | | U | | 960.7 | 0.03 |
| 3914 | 6/6/2018 6:11 | 5 | 17.86 | | 0.23 | | UW | 0.12 | 863.3 | 0.01 |
| 3915 | 6/6/2018 8:15 | 5 | 18.42 | 20.08 | 0.26 | | C | 0.05 | 1148.0 | |
| 3916 | 6/6/2018 8:32 | 5 | 19.33 | 13.00 | | 0.31 | W | 0.02 | 1494.0 | |
| 3917 | 6/6/2018 8:48 | 5 | 19.90 | | | | C | 0.01 | 1648.4 | |
| 3918 | 6/6/2018 9:05 | 5 | 21.07 | 19.39 | | 0.31 | W | 0.04 | 1230.0 | 0.01 |
| 3919 | 6/6/2018 9:21 | 5 | 21.77 | | | | U | 0.14 | 1589.9 | 0.11 |
| 3920 | 6/6/2018 9:38 | 5 | 22.37 | | | | UW | 0.69 | 1307.8 | 2.41 |
| 3921 | 6/6/2018 9:55 | 5 | 23.38 | 21.84 | | | U | 0.02 | 1303.3 | 0.05 |
| 3922 | 6/6/2018 10:11 | 5 | 25.59 | | 0.21 | | UW | 0.24 | 1092.1 | 0.02 |
| 3923 | 6/6/2018 12:15 | 5 | 32.36 | 24.67 | 0.28 | | C | 0.02 | 1722.8 | |
| 3924 | 6/6/2018 12:32 | 5 | 32.35 | 22.48 | | 0.32 | W | 0.01 | 1564.2 | |
| 3925 | 6/6/2018 12:48 | 5 | 33.94 | | | | C | | 1735.1 | |
| 3926 | 6/6/2018 13:05 | 5 | 32.09 | 27.51 | | 0.31 | W | 0.05 | 1570.2 | |
| 3927 | 6/6/2018 13:21 | 5 | 33.75 | | | | U | 0.34 | 2430.1 | 2.70 |
| 3928 | 6/6/2018 13:38 | 5 | 33.81 | | | | UW | 1.23 | 1637.1 | |
| 3929 | 6/6/2018 13:54 | 5 | 34.17 | 29.64 | | | U | 0.06 | 2147.3 | 0.67 |
| 3930 | 6/6/2018 14:11 | 5 | 33.88 | | 0.22 | | UW | 0.36 | 1550.5 | |
| 3931 | 6/6/2018 16:15 | 5 | 31.65 | 26.88 | 0.28 | | C | | 1454.2 | |
| 3932 | 6/6/2018 16:32 | 5 | 33.28 | 23.52 | | 0.30 | W | 0.17 | 2650.7 | |
| 3933 | 6/6/2018 16:48 | 5 | 32.47 | | | | C | 0.07 | 2158.6 | |
| 3934 | 6/6/2018 17:05 | 5 | 28.21 | 26.81 | | 0.30 | W | 0.08 | 1616.4 | |
| 3935 | 6/6/2018 17:21 | 5 | 25.78 | | | | U | 0.32 | 1559.9 | 0.39 |
| 3936 | 6/6/2018 17:38 | 5 | 25.34 | | | | UW | 0.35 | 1182.6 | |
| 3937 | 6/6/2018 17:54 | 5 | 25.93 | 26.51 | | | U | 0.04 | 756.4 | 0.09 |
| 3938 | 6/6/2018 18:11 | 5 | 24.51 | | 0.21 | | UW | 0.17 | 1058.4 | |
| 3939 | 6/6/2018 20:15 | 5 | 23.31 | 23.13 | 0.27 | | C | | 1965.3 | |
| 3940 | 6/6/2018 20:32 | 5 | 23.11 | 16.21 | | 0.29 | W | 0.05 | 2449.9 | |
| 3941 | 6/6/2018 20:48 | 5 | 21.57 | | | | C | 0.03 | 1154.7 | |
| 3942 | 6/6/2018 21:05 | 5 | 20.73 | 21.61 | | 0.29 | W | 0.02 | 957.5 | |
| 3943 | 6/6/2018 21:21 | 5 | 19.80 | | | | U | 0.15 | 1401.5 | 0.26 |
| 3944 | 6/6/2018 21:38 | 5 | 19.32 | | | | UW | 0.29 | 1028.7 | |
| 3945 | 6/6/2018 21:54 | 5 | 18.96 | 21.85 | | | U | 0.02 | 683.4 | 0.01 |
| 3946 | 6/6/2018 22:11 | 5 | 18.26 | | 0.20 | | UW | 0.10 | 838.9 | |
| 3947 | 6/7/2018 0:15 | 5 | 15.89 | 20.24 | 0.26 | | C | 0.06 | 1056.2 | |
| 3948 | 6/7/2018 0:32 | 5 | 15.80 | 12.39 | | 0.28 | W | 0.03 | 1000.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3949 | 6/7/2018 0:49 | 5 | 15.19 | | | | C | 0.08 | 1040.6 | |
| 3950 | 6/7/2018 1:05 | 5 | 15.37 | 18.31 | | 0.28 | W | 0.03 | 726.8 | |
| 3951 | 6/7/2018 1:22 | 5 | 15.39 | | | | U | 0.19 | 1021.4 | |
| 3952 | 6/7/2018 1:38 | 5 | 15.73 | | | | UW | 0.27 | 830.5 | 0.01 |
| 3953 | 6/7/2018 1:55 | 5 | 15.70 | 19.20 | | | U | 0.03 | 638.7 | 0.05 |
| 3954 | 6/7/2018 2:11 | 5 | 15.92 | | 0.20 | | UW | 0.15 | 744.0 | 0.63 |
| 3955 | 6/7/2018 4:15 | 5 | 15.97 | 18.54 | 0.26 | | C | 0.01 | 1655.2 | |
| 3956 | 6/7/2018 4:32 | 5 | 16.66 | 10.69 | | 0.28 | W | 0.01 | 1696.4 | |
| 3957 | 6/7/2018 4:48 | 5 | 16.59 | | | | C | 0.03 | 1163.5 | |
| 3958 | 6/7/2018 5:05 | 5 | 16.70 | 16.71 | | 0.28 | W | 0.03 | 1142.2 | 0.28 |
| 3959 | 6/7/2018 5:21 | 5 | 16.54 | | | | U | 0.25 | 1340.3 | 0.27 |
| 3960 | 6/7/2018 5:38 | 5 | 16.59 | | | | UW | 0.16 | 936.6 | |
| 3961 | 6/7/2018 5:54 | 5 | 16.41 | 17.72 | | | U | 0.02 | 382.0 | |
| 3962 | 6/7/2018 6:11 | 5 | 16.60 | | 0.20 | | UW | 0.11 | 806.8 | |
| 3963 | 6/7/2018 8:15 | 5 | 17.21 | 18.05 | 0.26 | | C | 0.06 | 1285.3 | 0.40 |
| 3964 | 6/7/2018 8:32 | 5 | 17.88 | 10.92 | | 0.28 | W | 0.07 | 1853.9 | |
| 3965 | 6/7/2018 8:48 | 5 | 18.12 | | | | C | 0.09 | 1256.2 | |
| 3966 | 6/7/2018 9:05 | 5 | 18.62 | 16.96 | | 0.28 | W | 0.03 | 1020.0 | |
| 3967 | 6/7/2018 9:21 | 5 | 19.14 | | | | U | 0.07 | 759.5 | 0.13 |
| 3968 | 6/7/2018 9:38 | 5 | 19.22 | | | | UW | 0.28 | 883.3 | |
| 3969 | 6/7/2018 9:54 | 5 | 19.07 | 18.33 | | | U | 0.04 | 547.4 | 0.04 |
| 3970 | 6/7/2018 10:11 | 5 | 19.16 | | 0.20 | | UW | 0.13 | 797.7 | |
| 3971 | 6/7/2018 12:15 | 5 | 19.28 | 19.02 | 0.26 | | C | 0.01 | 1938.9 | |
| 3972 | 6/7/2018 12:32 | 5 | 19.74 | 12.74 | | 0.28 | W | 0.08 | 4900.5 | |
| 3973 | 6/7/2018 12:48 | 5 | 20.14 | | | | C | | 942.1 | |
| 3974 | 6/7/2018 13:05 | 5 | 20.18 | 18.14 | | 0.28 | W | 0.04 | 1297.1 | |
| 3975 | 6/7/2018 13:21 | 5 | 21.66 | | | | U | 0.18 | 1481.1 | 0.14 |
| 3976 | 6/7/2018 13:38 | 5 | 24.09 | | | | UW | 0.29 | 1007.4 | |
| 3977 | 6/7/2018 13:55 | 5 | 26.00 | 20.41 | | | U | 0.02 | 1054.1 | 0.02 |
| 3978 | 6/7/2018 14:11 | 5 | 26.35 | | 0.20 | | UW | 0.07 | 951.4 | |
| 3979 | 6/7/2018 16:15 | 5 | 25.29 | 20.80 | 0.26 | | C | 0.02 | 1572.1 | |
| 3980 | 6/7/2018 16:32 | 5 | 25.33 | 16.75 | | 0.28 | W | 0.10 | 2070.9 | |
| 3981 | 6/7/2018 16:48 | 5 | 24.30 | | | | C | 0.05 | 1337.1 | |
| 3982 | 6/7/2018 17:05 | 5 | 23.64 | 21.38 | | 0.28 | W | 0.07 | 858.8 | |
| 3983 | 6/7/2018 17:21 | 5 | 22.20 | | | | U | 0.09 | 744.9 | 0.15 |
| 3984 | 6/7/2018 17:38 | 5 | 20.91 | | | | UW | 0.30 | 926.6 | |
| 3985 | 6/7/2018 17:54 | 5 | 20.88 | 21.41 | | | U | 0.01 | 664.4 | 0.07 |
| 3986 | 6/7/2018 18:11 | 5 | 20.53 | | 0.20 | | UW | 0.11 | 711.7 | |
| 3987 | 6/7/2018 20:15 | 5 | 19.25 | 19.69 | 0.25 | | C | 0.01 | 1001.2 | |
| 3988 | 6/7/2018 20:32 | 5 | 19.52 | 12.88 | | 0.28 | W | 0.05 | 1273.3 | |
| 3989 | 6/7/2018 20:48 | 5 | 19.64 | | | | C | | 1072.8 | |
| 3990 | 6/7/2018 21:05 | 5 | 19.41 | 18.58 | | 0.27 | W | 0.05 | 1014.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 3991 | 6/7/2018 21:21 | 5 | 18.45 | | | | U | 0.05 | 760.8 | 0.03 |
| 3992 | 6/7/2018 21:38 | 5 | 18.00 | | | | UW | 0.26 | 1013.9 | 0.47 |
| 3993 | 6/7/2018 21:54 | 5 | 17.62 | 19.13 | | | U | 0.02 | 754.8 | 0.03 |
| 3994 | 6/7/2018 22:11 | 5 | 17.49 | | 0.20 | | UW | 0.11 | 685.9 | |
| 3995 | 6/8/2018 0:15 | 5 | 17.75 | 18.39 | 0.25 | | C | 0.08 | 818.3 | |
| 3996 | 6/8/2018 0:32 | 5 | 18.03 | 11.32 | | 0.27W | | 0.01 | 973.2 | |
| 3997 | 6/8/2018 0:49 | 5 | 17.95 | | | | C | 0.06 | 921.9 | |
| 3998 | 6/8/2018 1:05 | 5 | 18.04 | 17.09 | | 0.27W | | | 741.0 | |
| 3999 | 6/8/2018 1:22 | 5 | 17.53 | | | | U | 0.25 | 809.4 | 0.02 |
| 4000 | 6/8/2018 1:38 | 5 | 17.66 | | | | UW | 0.22 | 698.6 | 0.02 |
| 4001 | 6/8/2018 1:55 | 5 | 17.37 | 18.18 | | | U | 0.03 | 547.7 | 0.03 |
| 4002 | 6/8/2018 2:11 | 5 | 17.02 | | 0.20 | | UW | 0.07 | 546.5 | |
| 4003 | 6/8/2018 4:15 | 5 | 17.83 | 18.05 | 0.25 | | C | 0.07 | 937.4 | |
| 4004 | 6/8/2018 4:32 | 5 | 17.84 | 11.06 | | 0.27W | | 0.07 | 1591.9 | |
| 4005 | 6/8/2018 4:48 | 5 | 17.52 | | | | C | 0.03 | 984.7 | |
| 4006 | 6/8/2018 5:05 | 5 | 17.09 | 16.58 | | 0.27W | | 0.07 | 830.4 | |
| 4007 | 6/8/2018 5:21 | 5 | 16.69 | | | | U | 0.11 | 741.4 | 0.02 |
| 4008 | 6/8/2018 5:38 | 5 | 16.46 | | | | UW | 0.22 | 723.9 | 0.03 |
| 4009 | 6/8/2018 5:54 | 5 | 16.09 | 17.66 | | | U | 0.02 | 419.4 | 0.01 |
| 4010 | 6/8/2018 6:11 | 5 | 16.19 | | 0.20 | | UW | 0.07 | 570.9 | 0.39 |
| 4011 | 6/8/2018 8:15 | 5 | 18.44 | 18.14 | 0.25 | | C | 0.02 | 1283.9 | |
| 4012 | 6/8/2018 8:32 | 5 | 19.00 | 11.94 | | 0.29W | | 0.05 | 1778.7 | |
| 4013 | 6/8/2018 8:48 | 5 | 19.64 | | | | C | 0.07 | 1804.5 | |
| 4014 | 6/8/2018 9:05 | 5 | 20.40 | 17.68 | | 0.28W | | 0.04 | 1355.3 | |
| 4015 | 6/8/2018 9:21 | 5 | 20.24 | | | | U | 0.09 | 788.5 | 0.05 |
| 4016 | 6/8/2018 9:38 | 5 | 22.08 | | | | UW | 0.35 | 1448.5 | 0.37 |
| 4017 | 6/8/2018 9:54 | 5 | 22.98 | 20.16 | | | U | 0.06 | 1504.0 | 0.01 |
| 4018 | 6/8/2018 10:11 | 5 | 24.26 | | 0.19 | | UW | 0.19 | 1242.2 | |
| 4019 | 6/8/2018 12:15 | 5 | 30.34 | 21.93 | 0.26 | | C | 0.02 | 1436.6 | |
| 4020 | 6/8/2018 12:32 | 5 | 31.57 | 20.44 | | 0.29W | | 0.11 | 2458.2 | |
| 4021 | 6/8/2018 12:48 | 5 | 31.41 | | | | C | 0.09 | 2377.2 | |
| 4022 | 6/8/2018 13:05 | 5 | 29.50 | 23.78 | | 0.28W | | 0.03 | 843.1 | |
| 4023 | 6/8/2018 13:21 | 5 | 29.87 | | | | U | 0.16 | 789.9 | 0.38 |
| 4024 | 6/8/2018 13:38 | 5 | 32.45 | | | | UW | 0.63 | 1258.0 | |
| 4025 | 6/8/2018 13:54 | 5 | 33.90 | 26.34 | | | U | 0.07 | 1398.1 | 0.09 |
| 4026 | 6/8/2018 14:11 | 5 | 33.20 | | 0.21 | | UW | 0.27 | 1032.1 | |
| 4027 | 6/8/2018 16:15 | 5 | 33.04 | 24.70 | 0.26 | | C | | 1397.5 | |
| 4028 | 6/8/2018 16:32 | 5 | 35.82 | 23.47 | | 0.29W | | 0.01 | 781.5 | |
| 4029 | 6/8/2018 16:48 | 5 | 35.70 | | | | C | 0.05 | 1363.0 | |
| 4030 | 6/8/2018 17:05 | 5 | 34.96 | 26.93 | | 0.28W | | 0.04 | 851.2 | |
| 4031 | 6/8/2018 17:21 | 5 | 34.60 | | | | U | 0.20 | 728.5 | 0.46 |
| 4032 | 6/8/2018 17:38 | 5 | 34.45 | | | | UW | 0.46 | 808.1 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4033 | 6/8/2018 17:54 | 5 | 35.73 | 29.38 | | | U | 0.03 | 854.8 | 0.24 |
| 4034 | 6/8/2018 18:11 | 5 | 33.53 | | 0.21 | | UW | 0.17 | 707.9 | |
| 4035 | 6/8/2018 20:15 | 5 | 27.64 | 24.15 | 0.26 | | C | | 1544.7 | |
| 4036 | 6/8/2018 20:32 | 5 | 26.96 | 19.40 | | 0.28 | W | 0.03 | 1211.9 | |
| 4037 | 6/8/2018 20:48 | 5 | 25.29 | | | | C | 0.05 | 1289.4 | |
| 4038 | 6/8/2018 21:05 | 5 | 24.72 | 23.29 | | 0.27 | W | 0.02 | 914.1 | |
| 4039 | 6/8/2018 21:21 | 5 | 24.12 | | | | U | 0.16 | 943.9 | 0.11 |
| 4040 | 6/8/2018 21:38 | 5 | 23.50 | | | | UW | 0.43 | 1008.2 | |
| 4041 | 6/8/2018 21:54 | 5 | 23.40 | 24.54 | | | U | 0.06 | 736.9 | 0.09 |
| 4042 | 6/8/2018 22:11 | 5 | 22.32 | | 0.20 | | UW | 0.15 | 756.4 | |
| 4043 | 6/9/2018 0:15 | 5 | 21.20 | 21.45 | 0.25 | | C | 0.03 | 1128.7 | |
| 4044 | 6/9/2018 0:32 | 5 | 21.57 | 14.95 | | 0.27 | W | 0.07 | 1397.5 | |
| 4045 | 6/9/2018 0:48 | 5 | 21.59 | | | | C | 0.02 | 1069.8 | |
| 4046 | 6/9/2018 1:05 | 5 | 21.76 | 20.52 | | 0.27 | W | 0.02 | 1113.2 | |
| 4047 | 6/9/2018 1:21 | 5 | 21.56 | | | | U | 0.09 | 895.1 | 0.02 |
| 4048 | 6/9/2018 1:38 | 5 | 21.55 | | | | UW | 0.48 | 1023.9 | 0.07 |
| 4049 | 6/9/2018 1:55 | 5 | 21.50 | 22.04 | | | U | 0.03 | 708.7 | 0.05 |
| 4050 | 6/9/2018 2:11 | 5 | 21.34 | | 0.20 | | UW | 0.05 | 869.0 | |
| 4051 | 6/9/2018 4:15 | 5 | 18.50 | 20.46 | 0.25 | | C | 0.01 | 1356.0 | |
| 4052 | 6/9/2018 4:32 | 5 | 18.77 | 13.20 | | 0.27 | W | 0.05 | 1094.2 | |
| 4053 | 6/9/2018 4:48 | 5 | 18.64 | | | | C | 0.03 | 1284.1 | |
| 4054 | 6/9/2018 5:05 | 5 | 18.77 | 18.86 | | 0.27 | W | 0.08 | 896.6 | |
| 4055 | 6/9/2018 5:21 | 5 | 18.71 | | | | U | 0.13 | 1061.1 | |
| 4056 | 6/9/2018 5:38 | 5 | 18.82 | | | | UW | 0.25 | 931.2 | 0.01 |
| 4057 | 6/9/2018 5:54 | 5 | 18.70 | 20.36 | | | U | 0.02 | 788.3 | 0.02 |
| 4058 | 6/9/2018 6:11 | 5 | 18.70 | | 0.22 | | UW | 0.12 | 956.3 | 0.09 |
| 4059 | 6/9/2018 8:15 | 5 | 19.39 | 19.86 | 0.25 | | C | 0.01 | 1347.9 | |
| 4060 | 6/9/2018 8:32 | 5 | 19.92 | 13.18 | | 0.28 | W | 0.04 | 1868.7 | |
| 4061 | 6/9/2018 8:48 | 5 | 21.15 | | | | C | 0.06 | 2083.6 | |
| 4062 | 6/9/2018 9:05 | 5 | 21.26 | 19.04 | | 0.27 | W | 0.07 | 1312.5 | 0.01 |
| 4063 | 6/9/2018 9:22 | 5 | 21.07 | | | | U | 0.18 | 1293.4 | |
| 4064 | 6/9/2018 9:38 | 5 | 20.95 | | | | UW | 0.31 | 1459.0 | 0.12 |
| 4065 | 6/9/2018 9:55 | 5 | 20.33 | 20.73 | | | U | 0.02 | 530.2 | 0.03 |
| 4066 | 6/9/2018 10:11 | 5 | 20.56 | | 0.20 | | UW | 0.09 | 833.7 | |
| 4067 | 6/9/2018 12:15 | 5 | 21.14 | 20.66 | 0.29 | | C | 0.06 | 1222.2 | |
| 4068 | 6/9/2018 12:32 | 5 | 21.80 | 14.59 | | 0.32 | W | 0.08 | 1370.3 | |
| 4069 | 6/9/2018 12:48 | 5 | 23.51 | | | | C | 0.02 | 1971.0 | |
| 4070 | 6/9/2018 13:05 | 5 | 23.57 | 20.17 | | 0.32 | W | | 1101.3 | 0.01 |
| 4071 | 6/9/2018 13:21 | 5 | 23.47 | | | | U | 0.13 | 1204.5 | 0.08 |
| 4072 | 6/9/2018 13:38 | 5 | 22.75 | | | | UW | 0.70 | 1453.8 | |
| 4073 | 6/9/2018 13:55 | 5 | 21.73 | 21.79 | | | U | 0.01 | 1353.6 | 0.01 |
| 4074 | 6/9/2018 14:11 | 5 | 21.08 | | 0.22 | | UW | 0.16 | 1132.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4075 | 6/9/2018 16:15 | 5 | 29.82 | 23.05 | 0.30 | | C | | 1704.0 | |
| 4076 | 6/9/2018 16:32 | 5 | 29.86 | 19.99 | | 0.32 | W | 0.04 | 2023.6 | 2.33 |
| 4077 | 6/9/2018 16:48 | 5 | 30.70 | | | | C | 0.01 | 1689.9 | |
| 4078 | 6/9/2018 17:05 | 5 | 28.93 | 22.66 | | 0.32 | W | 0.09 | 2454.0 | |
| 4079 | 6/9/2018 17:21 | 5 | 29.07 | | | | U | 0.30 | 1747.4 | 0.27 |
| 4080 | 6/9/2018 17:38 | 5 | 29.19 | | | | UW | 0.89 | 1440.0 | |
| 4081 | 6/9/2018 17:54 | 5 | 29.63 | 25.57 | | | U | 0.06 | 1060.0 | 0.04 |
| 4082 | 6/9/2018 18:11 | 5 | 29.33 | | 0.22 | | UW | 0.34 | 1215.8 | |
| 4083 | 6/9/2018 20:15 | 5 | 22.60 | 22.80 | 0.30 | | C | | 1414.0 | |
| 4084 | 6/9/2018 20:32 | 5 | 22.57 | 15.82 | | 0.31 | W | 0.06 | 1765.3 | |
| 4085 | 6/9/2018 20:48 | 5 | 21.11 | | | | C | | 1294.0 | |
| 4086 | 6/9/2018 21:05 | 5 | 19.92 | 19.62 | | 0.30 | W | 0.03 | 943.3 | |
| 4087 | 6/9/2018 21:21 | 5 | 19.23 | | | | U | 0.15 | 1094.4 | |
| 4088 | 6/9/2018 21:38 | 5 | 18.79 | | | | UW | 0.49 | 1096.8 | |
| 4089 | 6/9/2018 21:55 | 5 | 18.27 | 21.12 | | | U | 0.07 | 727.6 | 0.01 |
| 4090 | 6/9/2018 22:11 | 5 | 18.04 | | 0.20 | | UW | 0.20 | 805.3 | 0.67 |
| 4091 | 6/10/2018 0:16 | 5 | 18.98 | 20.21 | 0.30 | | C | 0.05 | 1661.0 | |
| 4092 | 6/10/2018 0:32 | 5 | 19.18 | 12.70 | | 0.31 | W | 0.07 | 1637.4 | |
| 4093 | 6/10/2018 0:49 | 5 | 19.17 | | | | C | 0.03 | 1558.9 | |
| 4094 | 6/10/2018 1:05 | 5 | 19.17 | 17.90 | | 0.30 | W | 0.03 | 937.8 | |
| 4095 | 6/10/2018 1:22 | 5 | 19.11 | | | | U | 0.13 | 949.6 | |
| 4096 | 6/10/2018 1:38 | 5 | 19.13 | | | | UW | 0.39 | 1208.6 | 0.02 |
| 4097 | 6/10/2018 1:55 | 5 | 18.96 | 19.65 | | | U | 0.01 | 920.5 | 0.03 |
| 4098 | 6/10/2018 2:11 | 5 | 18.98 | | 0.20 | | UW | 0.46 | 935.9 | 0.03 |
| 4099 | 6/10/2018 4:15 | 5 | 16.21 | 19.22 | 0.30 | | C | 0.03 | 1060.5 | |
| 4100 | 6/10/2018 4:32 | 5 | 15.80 | 10.91 | | 0.31 | W | 0.04 | 1075.0 | |
| 4101 | 6/10/2018 4:48 | 5 | 15.67 | | | | C | 0.08 | 1125.5 | |
| 4102 | 6/10/2018 5:05 | 5 | 16.33 | 16.38 | | 0.29 | W | 0.04 | 791.3 | |
| 4103 | 6/10/2018 5:22 | 5 | 16.91 | | | | U | 0.14 | 989.2 | |
| 4104 | 6/10/2018 5:38 | 5 | 17.39 | | | | UW | 0.33 | 1042.4 | |
| 4105 | 6/10/2018 5:55 | 5 | 17.23 | 18.27 | | | U | 0.10 | 1060.8 | 0.01 |
| 4106 | 6/10/2018 6:11 | 5 | 17.44 | | 0.20 | | UW | 0.17 | 802.7 | 0.03 |
| 4107 | 6/10/2018 8:16 | 5 | 19.27 | 18.95 | 0.29 | | C | 0.07 | 1454.6 | |
| 4108 | 6/10/2018 8:32 | 5 | 19.94 | 12.29 | | 0.31 | W | 0.04 | 1568.1 | |
| 4109 | 6/10/2018 8:49 | 5 | 20.15 | | | | C | 0.04 | 1541.4 | |
| 4110 | 6/10/2018 9:05 | 5 | 20.45 | 17.62 | | 0.30 | W | 0.04 | 955.8 | |
| 4111 | 6/10/2018 9:22 | 5 | 21.36 | | | | U | 0.11 | 812.8 | 0.09 |
| 4112 | 6/10/2018 9:38 | 5 | 22.32 | | | | UW | 0.42 | 1545.1 | 0.22 |
| 4113 | 6/10/2018 9:55 | 5 | 22.88 | 20.20 | | | U | 0.03 | 661.8 | |
| 4114 | 6/10/2018 10:11 | 5 | 24.91 | | 0.21 | | UW | 0.05 | 987.0 | 0.01 |
| 4115 | 6/10/2018 12:15 | 5 | 29.45 | 21.95 | 0.30 | | C | | 1816.0 | |
| 4116 | 6/10/2018 12:32 | 5 | 30.93 | 20.45 | | 0.31 | W | 0.14 | 3322.0 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4117 | 6/10/2018 12:48 | 5 | 31.11 | | | | C | 0.06 | 1669.6 | |
| 4118 | 6/10/2018 13:05 | 5 | 31.74 | 25.10 | | 0.30 | W | 0.02 | 1112.0 | |
| 4119 | 6/10/2018 13:21 | 5 | 31.71 | | | | U | 0.12 | 1206.6 | 0.18 |
| 4120 | 6/10/2018 13:38 | 5 | 31.88 | | | | UW | 0.81 | 1507.4 | |
| 4121 | 6/10/2018 13:54 | 5 | 33.14 | 26.75 | | | U | 0.04 | 1020.8 | 0.04 |
| 4122 | 6/10/2018 14:11 | 5 | 33.24 | | 0.22 | | UW | 0.27 | 1290.6 | |
| 4123 | 6/10/2018 16:15 | 5 | 32.26 | 24.89 | 0.30 | | C | | 1799.9 | |
| 4124 | 6/10/2018 16:32 | 5 | 33.19 | 23.59 | | 0.30 | W | 0.10 | 4886.6 | |
| 4125 | 6/10/2018 16:48 | 5 | 32.99 | | | | C | 0.01 | 1560.0 | |
| 4126 | 6/10/2018 17:05 | 5 | 32.03 | 26.80 | | 0.29 | W | | 1452.3 | |
| 4127 | 6/10/2018 17:21 | 5 | 31.58 | | | | U | 0.11 | 798.5 | 0.10 |
| 4128 | 6/10/2018 17:38 | 5 | 31.40 | | | | UW | 0.50 | 1775.3 | |
| 4129 | 6/10/2018 17:54 | 5 | 30.36 | 27.73 | | | U | 0.01 | 1034.4 | 0.01 |
| 4130 | 6/10/2018 18:11 | 5 | 30.83 | | 0.21 | | UW | 0.61 | 1000.2 | |
| 4131 | 6/10/2018 20:15 | 5 | 24.73 | 23.15 | 0.29 | | C | | 1803.8 | |
| 4132 | 6/10/2018 20:32 | 5 | 24.96 | 18.21 | | 0.29 | W | 0.11 | 4695.2 | |
| 4133 | 6/10/2018 20:48 | 5 | 23.56 | | | | C | 0.07 | 1565.3 | |
| 4134 | 6/10/2018 21:05 | 5 | 22.79 | 22.44 | | 0.28 | W | 0.03 | 1531.8 | |
| 4135 | 6/10/2018 21:21 | 5 | 21.85 | | | | U | 0.04 | 812.8 | |
| 4136 | 6/10/2018 21:38 | 5 | 21.26 | | | | UW | 0.34 | 1538.6 | 0.04 |
| 4137 | 6/10/2018 21:55 | 5 | 20.87 | 22.98 | | | U | 0.06 | 865.9 | |
| 4138 | 6/10/2018 22:11 | 5 | 20.58 | | 0.20 | | UW | 0.10 | 997.5 | 0.26 |
| 4139 | 6/11/2018 0:15 | 5 | 20.02 | 20.89 | 0.28 | | C | 0.03 | 957.1 | |
| 4140 | 6/11/2018 0:32 | 5 | 20.27 | 14.22 | | 0.28 | W | 0.09 | 4449.9 | |
| 4141 | 6/11/2018 0:49 | 5 | 20.15 | | | | C | 0.02 | 1437.2 | |
| 4142 | 6/11/2018 1:05 | 5 | 20.30 | 19.72 | | 0.28 | W | 0.02 | 1633.1 | |
| 4143 | 6/11/2018 1:22 | 5 | 20.15 | | | | U | 0.03 | 805.1 | |
| 4144 | 6/11/2018 1:38 | 5 | 20.20 | | | | UW | 0.28 | 1380.2 | 0.01 |
| 4145 | 6/11/2018 1:55 | 5 | 19.98 | 20.85 | | | U | 0.02 | 613.7 | 0.01 |
| 4146 | 6/11/2018 2:11 | 5 | 19.88 | | 0.20 | | UW | 0.11 | 923.7 | 0.03 |
| 4147 | 6/11/2018 4:15 | 5 | 18.31 | 19.86 | 0.28 | | C | | 1377.9 | |
| 4148 | 6/11/2018 4:32 | 5 | 18.23 | 12.73 | | 0.28 | W | 0.12 | 2757.0 | |
| 4149 | 6/11/2018 4:48 | 5 | 17.98 | | | | C | 0.05 | 1559.1 | |
| 4150 | 6/11/2018 5:05 | 5 | 18.14 | 18.25 | | 0.28 | W | 0.01 | 1010.1 | |
| 4151 | 6/11/2018 5:21 | 5 | 18.31 | | | | U | 0.03 | 687.6 | |
| 4152 | 6/11/2018 5:38 | 5 | 18.64 | | | | UW | 0.25 | 1182.6 | 0.01 |
| 4153 | 6/11/2018 5:55 | 5 | 18.63 | 19.54 | | | U | 0.10 | 452.5 | 0.01 |
| 4154 | 6/11/2018 6:11 | 5 | 18.81 | | 0.20 | | UW | 0.15 | 609.9 | 0.01 |
| 4155 | 6/11/2018 8:15 | 5 | 18.99 | 19.40 | 0.28 | | C | 0.01 | 1020.5 | |
| 4156 | 6/11/2018 8:32 | 5 | 19.47 | 12.67 | | 0.28 | W | 0.05 | 1231.2 | |
| 4157 | 6/11/2018 8:48 | 5 | 19.21 | | | | C | 0.04 | 1378.4 | |
| 4158 | 6/11/2018 9:05 | 5 | 19.07 | 17.99 | | 0.28 | W | 0.05 | 1108.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4159 | 6/11/2018 9:21 | 5 | 18.90 | | | | U | 0.19 | 1167.0 | |
| 4160 | 6/11/2018 9:38 | 5 | 18.78 | | | | UW | 0.24 | 1209.8 | |
| 4161 | 6/11/2018 9:54 | 5 | 18.70 | 19.40 | | | U | 0.01 | 395.7 | |
| 4162 | 6/11/2018 10:11 | 5 | 18.81 | | 0.20 | | UW | 0.15 | 1508.8 | 0.01 |
| 4163 | 6/11/2018 12:15 | 5 | 19.40 | 19.46 | 0.28 | | C | | 1407.2 | |
| 4164 | 6/11/2018 12:32 | 5 | 20.21 | 12.89 | | 0.29 | W | 0.08 | 1808.2 | |
| 4165 | 6/11/2018 12:48 | 5 | 19.85 | | | | C | 0.06 | 1145.9 | |
| 4166 | 6/11/2018 13:05 | 5 | 19.17 | 18.13 | | 0.28 | W | 0.03 | 969.2 | |
| 4167 | 6/11/2018 13:22 | 5 | 19.48 | | | | U | 0.05 | 1096.6 | |
| 4168 | 6/11/2018 13:38 | 5 | 19.71 | | | | UW | 0.29 | 1305.9 | |
| 4169 | 6/11/2018 13:55 | 5 | 19.10 | 19.66 | | | U | 0.03 | 604.5 | |
| 4170 | 6/11/2018 14:11 | 5 | 18.88 | | 0.21 | | UW | 0.16 | 807.5 | 0.01 |
| 4171 | 6/11/2018 16:15 | 5 | 17.69 | 18.82 | 0.31 | | C | 0.13 | 2534.4 | |
| 4172 | 6/11/2018 16:32 | 5 | 17.90 | 11.44 | | 0.32 | W | | 1367.9 | |
| 4173 | 6/11/2018 16:49 | 5 | 18.12 | | | | C | 0.10 | 2143.8 | |
| 4174 | 6/11/2018 17:05 | 5 | 18.31 | 17.09 | | 0.33 | W | 0.03 | 480.9 | |
| 4175 | 6/11/2018 17:22 | 5 | 18.68 | | | | U | 0.07 | 702.1 | |
| 4176 | 6/11/2018 17:38 | 5 | 19.31 | | | | UW | 0.50 | 1166.7 | |
| 4177 | 6/11/2018 17:55 | 5 | 19.15 | 19.22 | | | U | 0.04 | 1409.0 | 0.01 |
| 4178 | 6/11/2018 18:11 | 5 | 19.73 | | 0.27 | | UW | 0.18 | 731.0 | 0.01 |
| 4179 | 6/11/2018 20:15 | 5 | 19.11 | 19.35 | 0.32 | | C | | 1695.4 | |
| 4180 | 6/11/2018 20:32 | 5 | 19.35 | 12.35 | | 0.33 | W | 0.04 | 1218.3 | |
| 4181 | 6/11/2018 20:49 | 5 | 19.08 | | | | C | 0.06 | 1484.4 | |
| 4182 | 6/11/2018 21:05 | 5 | 18.82 | 17.56 | | 0.33 | W | | 569.1 | |
| 4183 | 6/11/2018 21:22 | 5 | 18.63 | | | | U | 0.25 | 1019.0 | |
| 4184 | 6/11/2018 21:38 | 5 | 18.78 | | | | UW | 0.33 | 1075.4 | 0.01 |
| 4185 | 6/11/2018 21:55 | 5 | 18.54 | 19.01 | | | U | 0.02 | 665.5 | |
| 4186 | 6/11/2018 22:11 | 5 | 18.42 | | 0.25 | | UW | 0.19 | 920.4 | 0.01 |
| 4187 | 6/12/2018 0:16 | 5 | 18.45 | 18.88 | 0.32 | | C | | 1224.9 | |
| 4188 | 6/12/2018 0:32 | 5 | 18.56 | 11.57 | | 0.34 | W | 0.01 | 1105.8 | |
| 4189 | 6/12/2018 0:49 | 5 | 18.37 | | | | C | 0.01 | 1482.5 | |
| 4190 | 6/12/2018 1:05 | 5 | 18.04 | 16.91 | | 0.33 | W | 0.03 | 710.9 | |
| 4191 | 6/12/2018 1:22 | 5 | 17.63 | | | | U | 0.26 | 1129.1 | |
| 4192 | 6/12/2018 1:38 | 5 | 17.97 | | | | UW | 0.56 | 1112.3 | |
| 4193 | 6/12/2018 1:55 | 5 | 17.92 | 18.39 | | | U | 0.06 | 656.6 | |
| 4194 | 6/12/2018 2:12 | 5 | 17.95 | | 0.25 | | UW | 0.28 | 1120.8 | 0.01 |
| 4195 | 6/12/2018 4:15 | 5 | 17.77 | 18.48 | 0.32 | | C | 0.03 | 860.1 | |
| 4196 | 6/12/2018 4:32 | 5 | 17.76 | 11.05 | | 0.34 | W | 0.07 | 1126.3 | |
| 4197 | 6/12/2018 4:48 | 5 | 17.72 | | | | C | 0.03 | 1320.3 | |
| 4198 | 6/12/2018 5:05 | 5 | 17.64 | 16.47 | | 0.33 | W | 0.03 | 725.5 | |
| 4199 | 6/12/2018 5:21 | 5 | 17.41 | | | | U | 0.29 | 1108.5 | |
| 4200 | 6/12/2018 5:38 | 5 | 17.39 | | | | UW | 0.52 | 946.2 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4201 | 6/12/2018 5:55 | 5 | 17.15 | 18.07 | | | U | 0.06 | 643.3 | |
| 4202 | 6/12/2018 6:11 | 5 | 17.10 | | 0.25 | | UW | 0.22 | 735.7 | |
| 4203 | 6/12/2018 8:15 | 5 | 19.04 | 18.48 | 0.32 | | C | 0.04 | 1058.2 | |
| 4204 | 6/12/2018 8:32 | 5 | 19.13 | 11.89 | | 0.34 | W | 0.06 | 969.9 | |
| 4205 | 6/12/2018 8:48 | 5 | 19.03 | | | | C | 0.08 | 1068.9 | |
| 4206 | 6/12/2018 9:05 | 5 | 19.10 | 17.17 | | 0.33 | W | 0.10 | 886.6 | |
| 4207 | 6/12/2018 9:21 | 5 | 19.56 | | | | U | 0.28 | 1217.3 | |
| 4208 | 6/12/2018 9:38 | 5 | 19.18 | | | | UW | 0.58 | 984.9 | 0.03 |
| 4209 | 6/12/2018 9:55 | 5 | 19.08 | 19.17 | | | U | 0.02 | 571.2 | |
| 4210 | 6/12/2018 10:11 | 5 | 20.94 | | 0.25 | | UW | 0.26 | 799.6 | 0.01 |
| 4211 | 6/12/2018 12:15 | 5 | 19.24 | 19.12 | 0.32 | | C | 0.01 | 1276.4 | 1.20 |
| 4212 | 6/12/2018 12:32 | 5 | 21.32 | 13.12 | | 0.33 | W | 0.05 | 1397.1 | |
| 4213 | 6/12/2018 12:48 | 5 | 21.98 | | | | C | 0.08 | 1595.0 | |
| 4214 | 6/12/2018 13:05 | 5 | 21.96 | 18.69 | | 0.33 | W | 0.10 | 1039.1 | 0.06 |
| 4215 | 6/12/2018 13:21 | 5 | 22.18 | | | | U | 0.33 | 1310.3 | 0.02 |
| 4216 | 6/12/2018 13:38 | 5 | 25.38 | | | | UW | 0.65 | 1076.3 | 0.44 |
| 4217 | 6/12/2018 13:55 | 5 | 24.80 | 21.89 | | | U | 0.06 | 1165.9 | |
| 4218 | 6/12/2018 14:11 | 5 | 22.00 | | 0.24 | | UW | 0.38 | 1031.8 | |
| 4219 | 6/12/2018 16:15 | 6 | 29.20 | 22.82 | 0.32 | | C | 0.03 | 1303.7 | |
| 4220 | 6/12/2018 16:32 | 6 | 28.30 | | 0.27 | | C | 0.09 | 1243.0 | |
| 4221 | 6/12/2018 16:48 | 6 | 26.62 | | | | C | | 1400.0 | |
| 4222 | 6/12/2018 17:05 | 6 | 29.03 | | | | C | 0.11 | 1112.4 | |
| 4223 | 6/12/2018 17:21 | 6 | 25.48 | 23.01 | 0.37 | | U | 0.12 | 2315.9 | 0.24 |
| 4224 | 6/12/2018 17:38 | 6 | 27.11 | 18.26 | -0.04 | | U | 0.02 | 2492.5 | 0.02 |
| 4225 | 6/12/2018 17:54 | 6 | 26.02 | 25.48 | | | U | 0.07 | 2463.5 | 0.34 |
| 4226 | 6/12/2018 18:11 | 6 | 26.09 | | | | U | 0.59 | 2538.1 | 2.48 |
| 4227 | 6/12/2018 20:15 | 6 | 21.36 | 21.24 | 0.31 | | C | 0.03 | 1368.9 | |
| 4228 | 6/12/2018 20:32 | 6 | 22.41 | | 0.26 | | C | 0.06 | 817.1 | |
| 4229 | 6/12/2018 20:48 | 6 | 19.69 | | | | C | 0.02 | 1085.0 | |
| 4230 | 6/12/2018 21:05 | 6 | 18.91 | | | | C | 0.10 | 910.4 | |
| 4231 | 6/12/2018 21:21 | 6 | 17.05 | 18.51 | 0.36 | | U | 0.22 | 1919.8 | 2.04 |
| 4232 | 6/12/2018 21:38 | 6 | 15.64 | 13.22 | -0.04 | | U | 0.08 | 1968.7 | |
| 4233 | 6/12/2018 21:55 | 6 | 14.96 | 20.54 | | | U | 0.14 | 1572.0 | 1.37 |
| 4234 | 6/12/2018 22:11 | 6 | 14.35 | | | | U | 0.22 | 1888.0 | 8.45 |
| 4235 | 6/13/2018 0:15 | 6 | 11.02 | 18.14 | 0.30 | | C | 0.03 | 975.5 | |
| 4236 | 6/13/2018 0:32 | 6 | 10.33 | | 0.25 | | C | 0.06 | 719.8 | |
| 4237 | 6/13/2018 0:49 | 6 | 10.23 | | | | C | 0.02 | 865.5 | |
| 4238 | 6/13/2018 1:05 | 6 | 9.29 | | | | C | 0.11 | 633.1 | |
| 4239 | 6/13/2018 1:22 | 6 | 9.60 | 14.43 | 0.36 | | U | 0.16 | 1403.3 | 4.68 |
| 4240 | 6/13/2018 1:38 | 6 | 9.15 | 9.05 | -0.04 | | U | 0.09 | 1299.6 | 1.37 |
| 4241 | 6/13/2018 1:55 | 6 | 8.96 | 16.06 | | | U | 0.10 | 1517.5 | 2.41 |
| 4242 | 6/13/2018 2:11 | 6 | 8.34 | | | | U | 0.17 | 1418.8 | 14.25 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4243 | 6/13/2018 4:18 | 6 | 7.22 | 15.60 | 0.30 | | C | 0.04 | 858.7 | |
| 4244 | 6/13/2018 4:35 | 6 | 6.87 | | 0.25 | | C | | 552.3 | |
| 4245 | 6/13/2018 4:51 | 6 | 6.83 | | | | C | 0.08 | 923.6 | |
| 4246 | 6/13/2018 5:08 | 6 | 6.44 | | | | C | 0.09 | 679.4 | |
| 4247 | 6/13/2018 5:24 | 6 | 7.48 | 11.79 | 0.36 | | U | 0.16 | 1474.0 | 6.12 |
| 4248 | 6/13/2018 5:41 | 6 | 6.81 | 6.35 | -0.04 | | U | 0.06 | 1115.8 | 1.37 |
| 4249 | 6/13/2018 5:57 | 6 | 6.84 | 13.27 | | | U | 0.06 | 1238.1 | 2.73 |
| 4250 | 6/13/2018 6:14 | 6 | 6.95 | | | | U | 0.14 | 1364.3 | 14.02 |
| 4251 | 6/13/2018 8:15 | 6 | 13.40 | 15.05 | 0.30 | | C | 0.05 | 801.0 | |
| 4252 | 6/13/2018 8:32 | 6 | 16.05 | | 0.25 | | C | 0.01 | 619.0 | |
| 4253 | 6/13/2018 8:48 | 6 | 16.52 | | | | C | 0.05 | 879.4 | 0.03 |
| 4254 | 6/13/2018 9:05 | 6 | 18.26 | | | | C | 0.06 | 712.6 | |
| 4255 | 6/13/2018 9:21 | 6 | 19.12 | 15.79 | 0.36 | | U | 0.14 | 1891.5 | 25.88 |
| 4256 | 6/13/2018 9:38 | 6 | 22.18 | 12.59 | -0.04 | | U | 0.11 | 1683.0 | 4.10 |
| 4257 | 6/13/2018 9:54 | 6 | 22.69 | 19.58 | | | U | 0.14 | 1839.9 | 18.72 |
| 4258 | 6/13/2018 10:11 | 6 | 24.41 | | | | U | 1.09 | 1933.9 | 40.30 |
| 4259 | 6/13/2018 12:15 | 6 | 32.16 | 20.36 | 0.31 | | C | 0.09 | 1152.0 | |
| 4260 | 6/13/2018 12:32 | 6 | 32.16 | | 0.26 | | C | | 905.4 | |
| 4261 | 6/13/2018 12:48 | 6 | 32.47 | | | | C | 0.04 | 1255.5 | |
| 4262 | 6/13/2018 13:05 | 6 | 32.93 | | | | C | 0.15 | 777.9 | 1.22 |
| 4263 | 6/13/2018 13:21 | 6 | 32.82 | 24.89 | 0.36 | | U | 0.16 | 1850.5 | 20.93 |
| 4264 | 6/13/2018 13:38 | 6 | 32.38 | 22.60 | -0.04 | | U | 0.24 | 1687.7 | 2.62 |
| 4265 | 6/13/2018 13:54 | 6 | 32.67 | 29.74 | | | U | 0.17 | 1751.5 | 4.30 |
| 4266 | 6/13/2018 14:11 | 6 | 31.89 | | | | U | 0.44 | 1498.9 | 10.08 |
| 4267 | 6/13/2018 16:15 | 6 | 19.97 | 20.90 | 0.30 | | C | 0.08 | 1771.8 | |
| 4268 | 6/13/2018 16:32 | 6 | 19.38 | | 0.25 | | C | 0.12 | 864.4 | |
| 4269 | 6/13/2018 16:48 | 6 | 21.10 | | | | C | 0.06 | 1823.3 | |
| 4270 | 6/13/2018 17:05 | 6 | 22.08 | | | | C | 0.14 | 1012.9 | |
| 4271 | 6/13/2018 17:21 | 6 | 22.12 | 19.68 | 0.35 | | U | 0.14 | 1343.7 | 4.60 |
| 4272 | 6/13/2018 17:38 | 6 | 21.45 | 15.56 | -0.04 | | U | 0.08 | 989.5 | 0.78 |
| 4273 | 6/13/2018 17:54 | 6 | 19.35 | 22.83 | | | U | 0.09 | 1188.6 | 1.48 |
| 4274 | 6/13/2018 18:11 | 6 | 19.93 | | | | U | 0.02 | 1238.5 | 2.65 |
| 4275 | 6/13/2018 20:15 | 6 | 18.93 | 19.02 | 0.29 | | C | 0.05 | 1161.0 | |
| 4276 | 6/13/2018 20:32 | 6 | 18.61 | | 0.25 | | C | 0.12 | 736.8 | |
| 4277 | 6/13/2018 20:48 | 6 | 17.44 | | | | C | 0.02 | 1177.1 | |
| 4278 | 6/13/2018 21:05 | 6 | 17.28 | | | | C | 0.08 | 663.1 | |
| 4279 | 6/13/2018 21:21 | 6 | 17.37 | 17.19 | 0.35 | | U | 0.13 | 1243.6 | 4.90 |
| 4280 | 6/13/2018 21:38 | 6 | 17.23 | 12.73 | -0.04 | | U | 0.07 | 935.5 | |
| 4281 | 6/13/2018 21:55 | 6 | 17.07 | 20.05 | | | U | 0.08 | 991.7 | 1.22 |
| 4282 | 6/13/2018 22:11 | 6 | 16.90 | | | | U | 0.41 | 1010.2 | 0.81 |
| 4283 | 6/14/2018 0:15 | 6 | 14.92 | 17.63 | 0.29 | | C | 0.02 | 878.9 | |
| 4284 | 6/14/2018 0:32 | 6 | 15.24 | | 0.25 | | C | 0.06 | 559.0 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4285 | 6/14/2018 0:48 | 6 | 15.01 | | | | C | 0.04 | 897.8 | |
| 4286 | 6/14/2018 1:05 | 6 | 14.31 | | | | C | 0.06 | 589.8 | |
| 4287 | 6/14/2018 1:22 | 6 | 14.10 | 15.03 | 0.35 | | U | 0.15 | 1275.8 | 6.54 |
| 4288 | 6/14/2018 1:38 | 6 | 14.06 | 10.26 | -0.04 | | U | 0.12 | 1015.8 | |
| 4289 | 6/14/2018 1:55 | 6 | 13.77 | 17.40 | | | U | 0.10 | 899.9 | 0.61 |
| 4290 | 6/14/2018 2:11 | 6 | 14.05 | | | | U | 0.18 | 940.7 | 0.90 |
| 4291 | 6/14/2018 4:15 | 6 | 15.00 | 16.49 | 0.28 | | C | 0.04 | 1043.4 | |
| 4292 | 6/14/2018 4:32 | 6 | 14.86 | | 0.25 | | C | 0.05 | 620.1 | |
| 4293 | 6/14/2018 4:48 | 6 | 14.94 | | | | C | 0.05 | 1012.7 | |
| 4294 | 6/14/2018 5:05 | 6 | 14.82 | | | | C | 0.07 | 597.0 | |
| 4295 | 6/14/2018 5:21 | 6 | 15.02 | 14.11 | 0.35 | | U | 0.33 | 1298.3 | 7.38 |
| 4296 | 6/14/2018 5:38 | 6 | 15.96 | 9.40 | -0.04 | | U | 0.12 | 1166.1 | |
| 4297 | 6/14/2018 5:55 | 6 | 16.55 | 16.72 | | | U | 0.09 | 1005.1 | 0.63 |
| 4298 | 6/14/2018 6:11 | 6 | 17.01 | | | | U | 0.15 | 948.5 | 0.86 |
| 4299 | 6/14/2018 8:15 | 6 | 19.58 | 16.85 | 0.28 | | C | 0.04 | 1973.5 | |
| 4300 | 6/14/2018 8:32 | 6 | 20.92 | | 0.25 | | C | 0.10 | 903.7 | |
| 4301 | 6/14/2018 8:48 | 6 | 20.73 | | | | C | 0.09 | 2198.9 | |
| 4302 | 6/14/2018 9:05 | 6 | 21.17 | | | | C | 0.09 | 1023.4 | |
| 4303 | 6/14/2018 9:21 | 6 | 22.43 | 17.27 | 0.35 | | U | 0.16 | 1642.2 | 6.65 |
| 4304 | 6/14/2018 9:38 | 6 | 23.77 | 13.44 | -0.04 | | U | 0.42 | 1534.2 | |
| 4305 | 6/14/2018 9:54 | 6 | 24.34 | 20.93 | | | U | 0.12 | 1186.2 | 1.08 |
| 4306 | 6/14/2018 10:11 | 6 | 25.24 | | | | U | 0.15 | 1077.9 | 0.85 |
| 4307 | 6/14/2018 12:15 | 6 | 29.32 | 20.30 | 0.29 | | C | 0.07 | 1718.0 | |
| 4308 | 6/14/2018 12:32 | 6 | 27.58 | | 0.25 | | C | 0.09 | 1270.1 | |
| 4309 | 6/14/2018 12:48 | 6 | 26.62 | | | | C | 0.03 | 2388.8 | |
| 4310 | 6/14/2018 13:05 | 6 | 29.07 | | | | C | 0.15 | 1806.0 | |
| 4311 | 6/14/2018 13:21 | 6 | 31.04 | 22.92 | 0.35 | | U | 0.08 | 1328.6 | 4.17 |
| 4312 | 6/14/2018 13:38 | 6 | 32.72 | 19.72 | -0.04 | | U | 0.10 | 2026.1 | |
| 4313 | 6/14/2018 13:54 | 6 | 33.28 | 27.87 | | | U | 0.15 | 1174.5 | 0.55 |
| 4314 | 6/14/2018 14:11 | 6 | 32.61 | | | | U | 0.11 | 909.0 | 0.71 |
| 4315 | 6/14/2018 16:15 | 6 | 31.22 | 23.22 | 0.29 | | C | 0.02 | 1534.5 | |
| 4316 | 6/14/2018 16:32 | 6 | 34.27 | | 0.25 | | C | 0.09 | 1038.6 | |
| 4317 | 6/14/2018 16:48 | 6 | 30.35 | | | | C | 0.02 | 2005.4 | |
| 4318 | 6/14/2018 17:05 | 6 | 30.04 | | | | C | 0.23 | 2323.5 | |
| 4319 | 6/14/2018 17:21 | 6 | 30.91 | 25.24 | 0.35 | | U | 0.03 | 802.9 | 1.23 |
| 4320 | 6/14/2018 17:38 | 6 | 32.13 | 20.98 | -0.05 | | U | 0.15 | 2229.5 | |
| 4321 | 6/14/2018 17:54 | 6 | 31.32 | 29.16 | | | U | 0.10 | 941.2 | 0.14 |
| 4322 | 6/14/2018 18:11 | 6 | 30.95 | | | | U | 0.06 | 756.2 | 0.01 |
| 4323 | 6/14/2018 20:15 | 6 | 28.02 | 22.55 | 0.28 | | C | | 1715.4 | |
| 4324 | 6/14/2018 20:32 | 6 | 27.66 | | 0.25 | | C | 0.10 | 974.9 | |
| 4325 | 6/14/2018 20:48 | 6 | 26.45 | | | | C | 0.04 | 1757.7 | |
| 4326 | 6/14/2018 21:05 | 6 | 25.87 | | | | C | 0.08 | 1517.3 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4327 | 6/14/2018 21:21 | 6 | 25.14 | 22.32 | 0.34 | | U | 0.08 | 937.3 | 0.48 |
| 4328 | 6/14/2018 21:38 | 6 | 25.00 | 17.52 | -0.04 | | U | 0.05 | 1310.5 | |
| 4329 | 6/14/2018 21:54 | 6 | 24.33 | 25.16 | | | U | 0.06 | 645.8 | 0.03 |
| 4330 | 6/14/2018 22:11 | 6 | 24.08 | | | | U | 0.11 | 847.4 | 0.10 |
| 4331 | 6/15/2018 0:15 | 6 | 22.83 | 21.24 | 0.27 | | C | | 1203.8 | |
| 4332 | 6/15/2018 0:32 | 6 | 22.61 | | 0.25 | | C | 0.06 | 1036.8 | |
| 4333 | 6/15/2018 0:48 | 6 | 22.57 | | | | C | 0.04 | 1675.4 | |
| 4334 | 6/15/2018 1:05 | 6 | 22.67 | | | | C | 0.12 | 1131.7 | |
| 4335 | 6/15/2018 1:22 | 6 | 22.50 | 20.03 | 0.34 | | U | 0.09 | 1133.1 | 0.48 |
| 4336 | 6/15/2018 1:38 | 6 | 22.63 | 15.26 | -0.04 | | U | 0.07 | 1767.8 | |
| 4337 | 6/15/2018 1:55 | 6 | 22.65 | 22.77 | | | U | 0.05 | 836.7 | 0.12 |
| 4338 | 6/15/2018 2:11 | 6 | 22.84 | | | | U | 0.09 | 922.3 | 0.18 |
| 4339 | 6/15/2018 4:15 | 6 | 22.41 | 20.71 | 0.27 | | C | 0.02 | 2000.4 | |
| 4340 | 6/15/2018 4:32 | 6 | 22.16 | | 0.24 | | C | 0.09 | 837.5 | |
| 4341 | 6/15/2018 4:48 | 6 | 22.29 | | | | C | 0.02 | 1709.4 | |
| 4342 | 6/15/2018 5:05 | 6 | 22.32 | | | | C | 0.04 | 1088.4 | |
| 4343 | 6/15/2018 5:21 | 6 | 22.25 | 19.24 | 0.34 | | U | 0.13 | 1194.4 | 1.25 |
| 4344 | 6/15/2018 5:38 | 6 | 22.07 | 14.32 | -0.04 | | U | 0.01 | 889.6 | |
| 4345 | 6/15/2018 5:55 | 6 | 21.69 | 21.64 | | | U | 0.04 | 871.3 | 0.38 |
| 4346 | 6/15/2018 6:11 | 6 | 21.31 | | | | U | 0.13 | 1055.1 | 1.18 |
| 4347 | 6/15/2018 8:15 | 6 | 25.71 | 20.68 | 0.27 | | C | 0.02 | 1201.4 | |
| 4348 | 6/15/2018 8:32 | 6 | 27.09 | | 0.24 | | C | 0.08 | 1156.5 | |
| 4349 | 6/15/2018 8:48 | 6 | 27.70 | | | | C | 0.04 | 1248.8 | |
| 4350 | 6/15/2018 9:05 | 6 | 26.97 | | | | C | 0.03 | 676.5 | |
| 4351 | 6/15/2018 9:21 | 6 | 25.82 | 20.81 | 0.34 | | U | 0.10 | 788.9 | 1.87 |
| 4352 | 6/15/2018 9:38 | 6 | 25.32 | 16.44 | -0.04 | | U | 0.04 | 372.9 | |
| 4353 | 6/15/2018 9:54 | 6 | 24.87 | 23.47 | | | U | 0.07 | 491.1 | 0.38 |
| 4354 | 6/15/2018 10:11 | 6 | 26.76 | | | | U | 0.20 | 756.9 | 0.82 |
| 4355 | 6/15/2018 12:15 | 6 | 33.02 | 22.21 | 0.27 | | C | 0.07 | 1491.5 | |
| 4356 | 6/15/2018 12:32 | 6 | 34.02 | | 0.25 | | C | 0.05 | 762.3 | |
| 4357 | 6/15/2018 12:48 | 6 | 33.21 | | | | C | 0.01 | 941.9 | |
| 4358 | 6/15/2018 13:05 | 6 | 32.46 | | | | C | 0.03 | 554.0 | |
| 4359 | 6/15/2018 13:21 | 6 | 31.90 | 25.19 | 0.34 | | U | 0.07 | 509.0 | 1.09 |
| 4360 | 6/15/2018 13:38 | 6 | 34.19 | 21.70 | -0.04 | | U | 0.01 | 473.4 | |
| 4361 | 6/15/2018 13:54 | 6 | 34.24 | 29.14 | | | U | 0.08 | 458.5 | 0.12 |
| 4362 | 6/15/2018 14:11 | 6 | 34.88 | | | | U | 0.28 | 678.8 | 0.32 |
| 4363 | 6/15/2018 16:15 | 6 | 36.75 | 24.21 | 0.27 | | C | | 1525.5 | |
| 4364 | 6/15/2018 16:32 | 6 | 37.90 | | 0.25 | | C | 0.06 | 847.6 | |
| 4365 | 6/15/2018 16:48 | 6 | 37.65 | | | | C | | 1263.6 | |
| 4366 | 6/15/2018 17:05 | 6 | 38.50 | | | | C | 0.06 | 622.3 | |
| 4367 | 6/15/2018 17:21 | 6 | 38.38 | 28.79 | 0.34 | | U | 0.10 | 572.1 | 0.92 |
| 4368 | 6/15/2018 17:38 | 6 | 37.87 | 25.01 | -0.05 | | U | 0.03 | 251.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4369 | 6/15/2018 17:54 | 6 | 37.42 | 32.61 | | | U | 0.06 | 494.2 | 0.04 |
| 4370 | 6/15/2018 18:11 | 6 | 35.66 | | | | U | 0.33 | 735.3 | 0.24 |
| 4371 | 6/15/2018 20:15 | 6 | 29.85 | 24.48 | 0.27 | | C | | 1377.9 | |
| 4372 | 6/15/2018 20:32 | 6 | 30.11 | | 0.25 | | C | 0.06 | 843.9 | |
| 4373 | 6/15/2018 20:48 | 6 | 28.56 | | | | C | 0.01 | 944.4 | |
| 4374 | 6/15/2018 21:05 | 6 | 27.98 | | | | C | 0.06 | 746.4 | |
| 4375 | 6/15/2018 21:21 | 6 | 26.33 | 24.82 | 0.34 | | U | 0.09 | 670.8 | 0.49 |
| 4376 | 6/15/2018 21:38 | 6 | 25.13 | 20.04 | -0.04 | | U | 0.05 | 559.1 | |
| 4377 | 6/15/2018 21:55 | 6 | 24.24 | 27.42 | | | U | 0.08 | 468.8 | 0.06 |
| 4378 | 6/15/2018 22:11 | 6 | 23.39 | | | | U | 0.31 | 732.1 | 0.08 |
| 4379 | 6/16/2018 0:15 | 6 | 24.46 | 22.63 | 0.26 | | C | | 1830.3 | |
| 4380 | 6/16/2018 0:32 | 6 | 24.48 | | 0.24 | | C | 0.02 | 798.0 | |
| 4381 | 6/16/2018 0:49 | 6 | 24.52 | | | | C | 0.04 | 1578.0 | |
| 4382 | 6/16/2018 1:05 | 6 | 24.93 | | | | C | 0.01 | 858.7 | |
| 4383 | 6/16/2018 1:22 | 6 | 24.95 | 21.96 | 0.33 | | U | 0.05 | 1030.6 | 0.32 |
| 4384 | 6/16/2018 1:38 | 6 | 25.08 | 17.20 | -0.04 | | U | 0.02 | 1155.5 | |
| 4385 | 6/16/2018 1:55 | 6 | 24.81 | 24.72 | | | U | 0.09 | 638.9 | 0.01 |
| 4386 | 6/16/2018 2:11 | 6 | 24.68 | | | | U | 0.58 | 838.2 | 0.18 |
| 4387 | 6/16/2018 4:15 | 6 | 23.45 | 22.01 | 0.26 | | C | 0.04 | 1459.4 | |
| 4388 | 6/16/2018 4:32 | 6 | 23.69 | | 0.24 | | C | 0.10 | 981.9 | |
| 4389 | 6/16/2018 4:48 | 6 | 23.42 | | | | C | 0.03 | 1613.3 | |
| 4390 | 6/16/2018 5:05 | 6 | 23.56 | | | | C | 0.05 | 857.9 | |
| 4391 | 6/16/2018 5:21 | 6 | 23.75 | 20.91 | 0.33 | | U | 0.09 | 988.6 | 0.28 |
| 4392 | 6/16/2018 5:38 | 6 | 23.98 | 16.07 | -0.04 | | U | 0.03 | 631.3 | |
| 4393 | 6/16/2018 5:54 | 6 | 23.93 | 23.54 | | | U | 0.08 | 556.6 | 0.01 |
| 4394 | 6/16/2018 6:11 | 6 | 23.60 | | | | U | 0.33 | 776.5 | 0.07 |
| 4395 | 6/16/2018 8:15 | 6 | 23.25 | 21.70 | 0.26 | | C | | 1626.8 | |
| 4396 | 6/16/2018 8:32 | 6 | 24.13 | | 0.24 | | C | 0.06 | 1131.5 | |
| 4397 | 6/16/2018 8:48 | 6 | 24.73 | | | | C | | 1796.9 | |
| 4398 | 6/16/2018 9:05 | 6 | 25.20 | | | | C | 0.08 | 1076.4 | |
| 4399 | 6/16/2018 9:21 | 6 | 25.19 | 21.32 | 0.33 | | U | 0.23 | 1196.8 | 2.31 |
| 4400 | 6/16/2018 9:38 | 6 | 26.46 | 16.48 | -0.04 | | U | 0.07 | 1111.0 | |
| 4401 | 6/16/2018 9:55 | 6 | 26.86 | 24.22 | | | U | 0.05 | 958.2 | 0.55 |
| 4402 | 6/16/2018 10:11 | 6 | 25.92 | | | | U | 0.24 | 1085.5 | 1.91 |
| 4403 | 6/16/2018 12:15 | 6 | 31.81 | 23.68 | 0.26 | | C | 0.05 | 1506.7 | |
| 4404 | 6/16/2018 12:32 | 6 | 35.04 | | 0.24 | | C | 0.15 | 1120.8 | |
| 4405 | 6/16/2018 12:48 | 6 | 35.54 | | | | C | 0.03 | 1678.6 | |
| 4406 | 6/16/2018 13:05 | 6 | 34.21 | | | | C | 0.06 | 1186.6 | |
| 4407 | 6/16/2018 13:21 | 6 | 35.20 | 27.60 | 0.34 | | U | 0.09 | 939.1 | 1.00 |
| 4408 | 6/16/2018 13:38 | 6 | 34.63 | 23.39 | -0.05 | | U | 0.05 | 1452.7 | |
| 4409 | 6/16/2018 13:54 | 6 | 37.90 | 31.84 | | | U | 0.11 | 682.1 | 0.16 |
| 4410 | 6/16/2018 14:11 | 6 | 38.18 | | | | U | 0.50 | 849.7 | 0.07 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4411 | 6/16/2018 16:15 | 6 | 37.72 | 27.01 | 0.26 | | C | 0.03 | 1623.5 | |
| 4412 | 6/16/2018 16:32 | 6 | 36.09 | | 0.25 | | C | 0.09 | 1178.9 | |
| 4413 | 6/16/2018 16:48 | 6 | 36.70 | | | | C | | 2032.0 | |
| 4414 | 6/16/2018 17:05 | 6 | 35.95 | | | | C | 0.14 | 1807.6 | |
| 4415 | 6/16/2018 17:21 | 6 | 36.42 | 30.18 | 0.34 | | U | 0.02 | 787.6 | 0.33 |
| 4416 | 6/16/2018 17:38 | 6 | 33.82 | 25.35 | -0.04 | | U | 0.06 | 620.5 | |
| 4417 | 6/16/2018 17:54 | 6 | 33.08 | 32.95 | | | U | 0.08 | 592.5 | 0.01 |
| 4418 | 6/16/2018 18:11 | 6 | 33.47 | | | | U | 0.41 | 1107.8 | 0.20 |
| 4419 | 6/16/2018 20:15 | 6 | 30.68 | 25.49 | 0.26 | | C | | 1297.3 | |
| 4420 | 6/16/2018 20:32 | 6 | 30.43 | | 0.24 | | C | 0.04 | 1115.0 | |
| 4421 | 6/16/2018 20:48 | 6 | 29.68 | | | | C | | 1517.1 | |
| 4422 | 6/16/2018 21:05 | 6 | 29.72 | | | | C | 0.09 | 1086.8 | |
| 4423 | 6/16/2018 21:21 | 6 | 29.19 | 25.84 | 0.33 | | U | | 749.8 | 0.18 |
| 4424 | 6/16/2018 21:38 | 6 | 29.05 | 20.98 | -0.04 | | U | 0.01 | 590.7 | 0.01 |
| 4425 | 6/16/2018 21:54 | 6 | 28.60 | 28.62 | | | U | 0.06 | 620.1 | 0.05 |
| 4426 | 6/16/2018 22:11 | 6 | 28.03 | | | | U | 0.23 | 918.5 | 0.08 |
| 4427 | 6/17/2018 0:15 | 6 | 26.66 | 24.08 | 0.25 | | C | 0.01 | 1854.4 | |
| 4428 | 6/17/2018 0:32 | 6 | 26.63 | | 0.24 | | C | 0.03 | 969.9 | |
| 4429 | 6/17/2018 0:48 | 6 | 26.17 | | | | C | 0.02 | 962.0 | |
| 4430 | 6/17/2018 1:05 | 6 | 26.73 | | | | C | 0.02 | 750.2 | |
| 4431 | 6/17/2018 1:22 | 6 | 26.25 | 23.47 | 0.33 | | U | 0.09 | 671.6 | 0.14 |
| 4432 | 6/17/2018 1:38 | 6 | 25.48 | 18.59 | -0.04 | | U | 0.03 | 796.3 | 0.02 |
| 4433 | 6/17/2018 1:55 | 6 | 24.66 | 26.11 | | | U | 0.06 | 642.5 | |
| 4434 | 6/17/2018 2:11 | 6 | 25.02 | | | | U | 0.20 | 838.0 | 0.05 |
| 4435 | 6/17/2018 4:15 | 6 | 24.59 | 23.13 | 0.25 | | C | 0.05 | 1285.1 | |
| 4436 | 6/17/2018 4:32 | 6 | 24.60 | | 0.24 | | C | 0.04 | 786.4 | |
| 4437 | 6/17/2018 4:48 | 6 | 24.16 | | | | C | 0.01 | 1133.5 | |
| 4438 | 6/17/2018 5:05 | 6 | 24.63 | | | | C | 0.02 | 789.1 | |
| 4439 | 6/17/2018 5:21 | 6 | 24.72 | 22.13 | 0.33 | | U | 0.05 | 967.6 | 0.13 |
| 4440 | 6/17/2018 5:38 | 6 | 23.83 | 17.21 | -0.04 | | U | 0.05 | 684.9 | |
| 4441 | 6/17/2018 5:55 | 6 | 23.34 | 24.66 | | | U | 0.10 | 668.1 | 0.05 |
| 4442 | 6/17/2018 6:11 | 6 | 23.22 | | | | U | 0.11 | 874.3 | 0.01 |
| 4443 | 6/17/2018 8:15 | 6 | 25.26 | 22.86 | 0.25 | | C | 0.04 | 1436.3 | |
| 4444 | 6/17/2018 8:32 | 6 | 25.58 | | 0.23 | | C | 0.06 | 842.1 | |
| 4445 | 6/17/2018 8:48 | 6 | 25.30 | | | | C | | 1230.8 | |
| 4446 | 6/17/2018 9:05 | 6 | 25.75 | | | | C | 0.01 | 802.1 | |
| 4447 | 6/17/2018 9:21 | 6 | 26.06 | 22.54 | 0.33 | | U | 0.10 | 840.3 | 0.18 |
| 4448 | 6/17/2018 9:38 | 6 | 26.48 | 17.84 | -0.04 | | U | 0.09 | 719.2 | 0.05 |
| 4449 | 6/17/2018 9:54 | 6 | 25.20 | 25.57 | | | U | 0.03 | 1606.1 | 0.06 |
| 4450 | 6/17/2018 10:11 | 6 | 25.49 | | | | U | 0.18 | 1813.8 | |
| 4451 | 6/17/2018 12:15 | 6 | 29.20 | 23.91 | 0.27 | | C | 0.01 | 1659.5 | |
| 4452 | 6/17/2018 12:32 | 6 | 29.61 | | 0.22 | | C | 0.57 | 1516.8 | 0.01 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4453 | 6/17/2018 12:48 | 6 | 31.47 | | | | C | 0.06 | 1923.3 | |
| 4454 | 6/17/2018 13:05 | 6 | 32.79 | | | | C | 0.47 | 1458.6 | |
| 4455 | 6/17/2018 13:21 | 6 | 30.79 | 26.85 | 0.34 | | U | 0.09 | 2812.9 | 4.37 |
| 4456 | 6/17/2018 13:38 | 6 | 31.86 | 22.24 | -0.04 | | U | 0.02 | 2995.8 | |
| 4457 | 6/17/2018 13:55 | 6 | 32.17 | 29.98 | | | U | 0.13 | 2684.7 | 2.12 |
| 4458 | 6/17/2018 14:11 | 6 | 33.14 | | | | U | 0.34 | 2957.9 | 3.87 |
| 4459 | 6/17/2018 16:15 | 6 | 33.42 | 25.98 | 0.27 | | C | | 1845.4 | |
| 4460 | 6/17/2018 16:32 | 6 | 31.87 | | 0.23 | | C | 0.07 | 1134.3 | |
| 4461 | 6/17/2018 16:48 | 6 | 30.76 | | | | C | | 1626.8 | |
| 4462 | 6/17/2018 17:05 | 6 | 27.58 | | | | C | 0.05 | 1259.0 | |
| 4463 | 6/17/2018 17:21 | 6 | 25.56 | 26.06 | 0.34 | | U | 0.13 | 2015.9 | 4.92 |
| 4464 | 6/17/2018 17:38 | 6 | 24.42 | 20.88 | -0.04 | | U | 0.11 | 2395.0 | |
| 4465 | 6/17/2018 17:54 | 6 | 25.14 | 27.92 | | | U | 0.05 | 1639.3 | 0.92 |
| 4466 | 6/17/2018 18:11 | 6 | 23.56 | | | | U | 0.25 | 1749.4 | 1.36 |
| 4467 | 6/17/2018 20:15 | 6 | 21.32 | 23.23 | 0.26 | | C | | 2041.0 | |
| 4468 | 6/17/2018 20:32 | 6 | 20.74 | | 0.24 | | C | 0.07 | 981.3 | |
| 4469 | 6/17/2018 20:48 | 6 | 20.61 | | | | C | 0.04 | 1742.9 | |
| 4470 | 6/17/2018 21:05 | 6 | 19.87 | | | | C | 0.06 | 1289.7 | |
| 4471 | 6/17/2018 21:21 | 6 | 19.68 | 21.07 | 0.33 | | U | 0.18 | 1866.5 | 2.72 |
| 4472 | 6/17/2018 21:38 | 6 | 19.28 | 15.74 | -0.04 | | U | 0.11 | 2560.0 | |
| 4473 | 6/17/2018 21:55 | 6 | 18.97 | 23.00 | | | U | 0.08 | 1470.3 | 0.75 |
| 4474 | 6/17/2018 22:11 | 6 | 18.74 | | | | U | 0.18 | 1677.1 | 0.65 |
| 4475 | 6/18/2018 0:15 | 6 | 18.91 | 21.22 | 0.26 | | C | 0.04 | 1895.3 | |
| 4476 | 6/18/2018 0:32 | 6 | 19.06 | | 0.23 | | C | 0.12 | 743.9 | |
| 4477 | 6/18/2018 0:49 | 6 | 19.01 | | | | C | 0.04 | 1601.9 | |
| 4478 | 6/18/2018 1:05 | 6 | 18.98 | | | | C | 0.11 | 1040.5 | |
| 4479 | 6/18/2018 1:22 | 6 | 19.15 | 19.10 | 0.33 | | U | 0.13 | 1706.6 | 4.63 |
| 4480 | 6/18/2018 1:38 | 6 | 19.17 | 13.88 | -0.04 | | U | 0.12 | 1911.2 | |
| 4481 | 6/18/2018 1:55 | 6 | 19.06 | 21.30 | | | U | 0.06 | 1368.2 | 1.28 |
| 4482 | 6/18/2018 2:11 | 6 | 19.00 | | | | U | 0.20 | 1611.1 | 1.59 |
| 4483 | 6/18/2018 4:15 | 6 | 18.77 | 20.51 | 0.26 | | C | 0.06 | 1821.7 | |
| 4484 | 6/18/2018 4:32 | 6 | 18.75 | | 0.25 | | C | 0.03 | 937.5 | |
| 4485 | 6/18/2018 4:48 | 6 | 18.83 | | | | C | 0.08 | 1904.6 | |
| 4486 | 6/18/2018 5:05 | 6 | 18.62 | | | | C | 0.05 | 1112.6 | |
| 4487 | 6/18/2018 5:22 | 6 | 18.59 | 18.36 | 0.33 | | U | 0.12 | 1715.9 | 5.00 |
| 4488 | 6/18/2018 5:38 | 6 | 18.51 | 13.03 | -0.04 | | U | 0.13 | 1836.8 | |
| 4489 | 6/18/2018 5:55 | 6 | 18.30 | 20.40 | | | U | 0.11 | 1515.9 | 1.00 |
| 4490 | 6/18/2018 6:11 | 6 | 18.14 | | | | U | 0.18 | 1705.3 | 2.01 |
| 4491 | 6/18/2018 8:15 | 6 | 18.18 | 19.89 | 0.26 | | C | 0.08 | 2941.0 | |
| 4492 | 6/18/2018 8:32 | 6 | 18.29 | | 0.25 | | C | 0.04 | 841.4 | |
| 4493 | 6/18/2018 8:48 | 6 | 18.42 | | | | C | 0.01 | 1406.8 | |
| 4494 | 6/18/2018 9:05 | 6 | 18.21 | | | | C | 0.04 | 1064.0 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4495 | 6/18/2018 9:21 | 6 | 18.67 | 17.98 | 0.34 | | U | 0.16 | 1741.3 | 6.10 |
| 4496 | 6/18/2018 9:38 | 6 | 18.88 | 12.70 | -0.04 | | U | 0.26 | 2325.5 | |
| 4497 | 6/18/2018 9:54 | 6 | 18.45 | 20.15 | | | U | 0.11 | 1474.8 | 1.42 |
| 4498 | 6/18/2018 10:11 | 6 | 18.44 | | | | U | 0.18 | 1714.0 | 2.87 |
| 4499 | 6/18/2018 12:15 | 6 | 20.85 | 19.98 | 0.27 | | C | 0.04 | 3055.7 | |
| 4500 | 6/18/2018 12:32 | 6 | 22.07 | | 0.22 | | C | 0.05 | 813.6 | |
| 4501 | 6/18/2018 12:48 | 6 | 23.41 | | | | C | 0.05 | 1528.0 | |
| 4502 | 6/18/2018 13:05 | 6 | 23.90 | | | | C | 0.08 | 955.6 | |
| 4503 | 6/18/2018 13:21 | 6 | 24.27 | 20.30 | 0.34 | | U | 0.16 | 2135.4 | 12.64 |
| 4504 | 6/18/2018 13:38 | 6 | 25.17 | 15.22 | -0.04 | | U | 0.18 | 3031.1 | 3.44 |
| 4505 | 6/18/2018 13:54 | 6 | 24.50 | 22.81 | | | U | 0.13 | 2056.5 | 4.09 |
| 4506 | 6/18/2018 14:11 | 6 | 22.70 | | | | U | 0.31 | 1532.8 | 5.73 |
| 4507 | 6/18/2018 16:15 | 6 | 24.69 | 21.12 | 0.27 | | C | 0.08 | 3165.3 | |
| 4508 | 6/18/2018 16:32 | 6 | 25.47 | | 0.22 | | C | 0.05 | 888.6 | |
| 4509 | 6/18/2018 16:48 | 6 | 24.76 | | | | C | 0.02 | 1207.0 | |
| 4510 | 6/18/2018 17:05 | 6 | 24.31 | | | | C | 0.10 | 904.6 | |
| 4511 | 6/18/2018 17:21 | 6 | 23.74 | 21.20 | 0.34 | | U | 0.16 | 1691.0 | 13.91 |
| 4512 | 6/18/2018 17:38 | 6 | 22.86 | 15.83 | -0.04 | | U | 0.18 | 2017.6 | 3.36 |
| 4513 | 6/18/2018 17:54 | 6 | 22.67 | 23.01 | | | U | 0.09 | 1416.6 | 3.18 |
| 4514 | 6/18/2018 18:11 | 6 | 22.94 | | | | U | 0.49 | 1443.9 | 2.32 |
| 4515 | 6/18/2018 20:15 | 6 | 21.77 | 20.90 | 0.27 | | C | 0.06 | 2106.3 | |
| 4516 | 6/18/2018 20:32 | 6 | 21.55 | | 0.22 | | C | 0.05 | 716.0 | |
| 4517 | 6/18/2018 20:48 | 6 | 21.26 | | | | C | | 1078.0 | |
| 4518 | 6/18/2018 21:05 | 6 | 21.13 | | | | C | 0.02 | 832.2 | |
| 4519 | 6/18/2018 21:21 | 6 | 20.81 | 19.40 | 0.34 | | U | 0.15 | 1296.4 | 8.39 |
| 4520 | 6/18/2018 21:38 | 6 | 20.63 | 14.09 | -0.04 | | U | 0.23 | 1825.1 | 1.67 |
| 4521 | 6/18/2018 21:54 | 6 | 20.47 | 21.36 | | | U | 0.12 | 1238.4 | 1.40 |
| 4522 | 6/18/2018 22:11 | 6 | 20.37 | | | | U | 0.15 | 1144.7 | 1.30 |
| 4523 | 6/19/2018 0:15 | 6 | 19.09 | 20.02 | 0.27 | | C | 0.08 | 1663.2 | |
| 4524 | 6/19/2018 0:32 | 6 | 18.59 | | 0.40 | | C | 0.02 | 80.8 | |
| 4525 | 6/19/2018 0:48 | 6 | 18.56 | | | | C | 0.04 | 897.9 | |
| 4526 | 6/19/2018 1:05 | 6 | 18.56 | | | | C | | 276.8 | |
| 4527 | 6/19/2018 1:22 | 6 | 18.69 | 17.54 | 0.39 | | U | 0.22 | 586.6 | 1.47 |
| 4528 | 6/19/2018 1:38 | 6 | 18.70 | 12.09 | -0.04 | | U | 0.07 | 326.0 | |
| 4529 | 6/19/2018 1:55 | 6 | 18.66 | 19.76 | | | U | 0.10 | 393.0 | |
| 4530 | 6/19/2018 2:11 | 6 | 18.69 | | | | U | 0.33 | 417.4 | |
| 4531 | 6/19/2018 4:15 | 6 | 18.37 | 19.41 | 0.36 | | C | | 400.4 | |
| 4532 | 6/19/2018 4:32 | 6 | 18.01 | | 0.33 | | C | 0.09 | 621.3 | |
| 4533 | 6/19/2018 4:48 | 6 | 18.08 | | | | C | 0.02 | 871.9 | |
| 4534 | 6/19/2018 5:05 | 6 | 17.78 | | | | C | 0.08 | 658.3 | |
| 4535 | 6/19/2018 5:21 | 6 | 17.65 | 17.05 | 0.38 | | U | 0.17 | 985.9 | 1.47 |
| 4536 | 6/19/2018 5:38 | 6 | 17.62 | 11.66 | 0.56 | | U | 0.07 | 797.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4537 | 6/19/2018 5:54 | 6 | 17.57 | 19.05 | | | U | 0.08 | 697.2 | 0.10 |
| 4538 | 6/19/2018 6:11 | 6 | 17.61 | | | | U | 0.21 | 699.2 | 0.28 |
| 4539 | 6/19/2018 8:15 | 6 | 17.89 | 18.89 | 0.36 | | C | 0.03 | 588.1 | |
| 4540 | 6/19/2018 8:32 | 6 | 17.82 | | 0.34 | | C | 0.04 | 582.3 | |
| 4541 | 6/19/2018 8:48 | 6 | 18.67 | | | | C | 0.04 | 1151.5 | |
| 4542 | 6/19/2018 9:05 | 6 | 18.15 | | | | C | 0.09 | 720.0 | |
| 4543 | 6/19/2018 9:21 | 6 | 18.59 | 17.29 | 0.38 | | U | 0.23 | 1346.3 | 1.54 |
| 4544 | 6/19/2018 9:38 | 6 | 19.15 | 12.08 | 0.48 | | U | 0.15 | 1629.1 | 0.16 |
| 4545 | 6/19/2018 9:55 | 6 | 19.51 | 19.69 | | | U | 0.08 | 927.3 | 0.33 |
| 4546 | 6/19/2018 10:11 | 6 | 20.01 | | | | U | 0.17 | 864.6 | 0.64 |
| 4547 | 6/19/2018 12:15 | 6 | 20.49 | 19.48 | 0.37 | | C | 0.04 | 933.4 | |
| 4548 | 6/19/2018 12:32 | 6 | 20.94 | | 0.31 | | C | 0.10 | 778.2 | |
| 4549 | 6/19/2018 12:48 | 6 | 22.25 | | | | C | 0.03 | 1355.8 | |
| 4550 | 6/19/2018 13:05 | 6 | 21.78 | | | | C | 0.13 | 791.7 | |
| 4551 | 6/19/2018 13:21 | 6 | 21.38 | 19.18 | 0.38 | | U | 0.35 | 1735.7 | 2.92 |
| 4552 | 6/19/2018 13:38 | 6 | 21.35 | 13.63 | 0.41 | | U | 0.14 | 1890.2 | 0.49 |
| 4553 | 6/19/2018 13:54 | 6 | 21.51 | 21.21 | | | U | 0.14 | 1355.2 | 1.11 |
| 4554 | 6/19/2018 14:11 | 6 | 21.67 | | | | U | 0.25 | 1043.3 | 0.46 |
| 4555 | 6/19/2018 16:15 | 6 | 22.63 | 20.09 | 0.37 | | C | 0.04 | 1621.7 | |
| 4556 | 6/19/2018 16:32 | 6 | 21.56 | | 0.30 | | C | 0.11 | 911.3 | |
| 4557 | 6/19/2018 16:48 | 6 | 22.11 | | | | C | 0.10 | 1653.7 | |
| 4558 | 6/19/2018 17:05 | 6 | 21.45 | | | | C | 0.11 | 908.2 | |
| 4559 | 6/19/2018 17:21 | 6 | 21.76 | 19.70 | 0.37 | | U | 0.28 | 1651.4 | 3.13 |
| 4560 | 6/19/2018 17:38 | 6 | 21.42 | 14.07 | 0.26 | | U | 0.17 | 1679.7 | |
| 4561 | 6/19/2018 17:54 | 6 | 21.92 | 21.61 | | | U | 0.13 | 1362.9 | 1.34 |
| 4562 | 6/19/2018 18:11 | 6 | 21.81 | | | | U | 0.29 | 1244.8 | |
| 4563 | 6/19/2018 20:15 | 6 | 18.78 | 19.93 | 0.36 | | C | 0.05 | 1727.3 | |
| 4564 | 6/19/2018 20:32 | 6 | 18.37 | | 0.29 | | C | 0.13 | 853.5 | |
| 4565 | 6/19/2018 20:48 | 6 | 18.61 | | | | C | 0.05 | 1421.0 | |
| 4566 | 6/19/2018 21:05 | 6 | 18.02 | | | | C | 0.09 | 785.1 | |
| 4567 | 6/19/2018 21:21 | 6 | 17.88 | 17.78 | 0.37 | | U | 0.32 | 1139.5 | 1.34 |
| 4568 | 6/19/2018 21:38 | 6 | 17.67 | 12.14 | 0.25 | | U | 0.13 | 1067.3 | |
| 4569 | 6/19/2018 21:55 | 6 | 17.12 | 19.38 | | | U | 0.13 | 924.3 | 0.26 |
| 4570 | 6/19/2018 22:11 | 6 | 17.13 | | | | U | 0.22 | 931.0 | |
| 4571 | 6/20/2018 0:15 | 6 | 16.97 | 19.01 | 0.36 | | C | 0.06 | 1384.6 | |
| 4572 | 6/20/2018 0:32 | 6 | 16.85 | | 0.29 | | C | 0.08 | 857.6 | |
| 4573 | 6/20/2018 0:48 | 6 | 17.01 | | | | C | 0.05 | 1192.2 | |
| 4574 | 6/20/2018 1:05 | 6 | 16.71 | | | | C | 0.07 | 733.4 | |
| 4575 | 6/20/2018 1:22 | 6 | 16.80 | 16.30 | 0.37 | | U | 0.24 | 1033.6 | 0.96 |
| 4576 | 6/20/2018 1:38 | 6 | 16.70 | 10.76 | 0.23 | | U | 0.13 | 1039.3 | 0.27 |
| 4577 | 6/20/2018 1:55 | 6 | 16.68 | 18.14 | | | U | 0.14 | 923.1 | 0.79 |
| 4578 | 6/20/2018 2:11 | 6 | 16.71 | | | | U | 0.20 | 927.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4579 | 6/20/2018 4:15 | 6 | 16.94 | 18.51 | 0.36 | | C | 0.08 | 1197.4 | |
| 4580 | 6/20/2018 4:32 | 6 | 16.74 | | 0.29 | | C | 0.09 | 814.0 | |
| 4581 | 6/20/2018 4:48 | 6 | 16.90 | | | | C | 0.06 | 1176.4 | |
| 4582 | 6/20/2018 5:05 | 6 | 16.55 | | | | C | 0.11 | 720.1 | |
| 4583 | 6/20/2018 5:21 | 6 | 16.64 | 15.86 | 0.37 | | U | 0.29 | 918.8 | 1.54 |
| 4584 | 6/20/2018 5:38 | 6 | 16.60 | 10.37 | 0.12 | | U | 0.13 | 976.1 | 0.35 |
| 4585 | 6/20/2018 5:54 | 6 | 16.49 | 17.68 | | | U | 0.14 | 785.1 | 0.66 |
| 4586 | 6/20/2018 6:11 | 6 | 16.50 | | | | U | 0.22 | 853.6 | |
| 4587 | 6/20/2018 8:15 | 6 | 17.53 | 18.15 | 0.36 | | C | 0.06 | 1374.3 | |
| 4588 | 6/20/2018 8:32 | 6 | 17.67 | | 0.28 | | C | 0.13 | 757.5 | |
| 4589 | 6/20/2018 8:48 | 6 | 18.19 | | | | C | 0.04 | 1183.1 | |
| 4590 | 6/20/2018 9:05 | 6 | 17.93 | | | | C | 0.07 | 710.2 | |
| 4591 | 6/20/2018 9:21 | 6 | 17.91 | 16.19 | 0.37 | | U | 0.31 | 1047.0 | 1.09 |
| 4592 | 6/20/2018 9:38 | 6 | 18.69 | 10.80 | 0.14 | | U | 0.24 | 1100.2 | 0.60 |
| 4593 | 6/20/2018 9:54 | 6 | 18.85 | 18.30 | | | U | 0.10 | 959.0 | 0.91 |
| 4594 | 6/20/2018 10:11 | 6 | 18.88 | | | | U | 0.17 | 999.3 | 0.35 |
| 4595 | 6/20/2018 12:15 | 6 | 17.95 | 18.23 | 0.36 | | C | 0.07 | 10516.1 | |
| 4596 | 6/20/2018 12:32 | 6 | 18.09 | | 0.32 | | C | 0.12 | 668.5 | |
| 4597 | 6/20/2018 12:48 | 6 | 18.79 | | | | C | 0.14 | 2175.2 | |
| 4598 | 6/20/2018 13:05 | 6 | 18.65 | | | | C | 0.05 | 601.1 | |
| 4599 | 6/20/2018 13:21 | 6 | 18.78 | 17.26 | 0.38 | | U | 0.35 | 547.5 | 0.35 |
| 4600 | 6/20/2018 13:38 | 6 | 19.38 | 11.95 | 0.12 | | U | 0.13 | 595.7 | 0.29 |
| 4601 | 6/20/2018 13:54 | 6 | 20.15 | 19.67 | | | U | 0.27 | 633.8 | 0.28 |
| 4602 | 6/20/2018 14:11 | 6 | 20.71 | | | | U | 0.18 | 538.0 | |
| 4603 | 6/20/2018 16:15 | 6 | 20.31 | 19.09 | 0.38 | | C | 0.04 | 787.3 | |
| 4604 | 6/20/2018 16:32 | 6 | 19.72 | | 0.30 | | C | 0.13 | 806.7 | |
| 4605 | 6/20/2018 16:48 | 6 | 19.43 | | | | C | 0.04 | 1320.5 | |
| 4606 | 6/20/2018 17:05 | 6 | 19.12 | | | | C | 0.09 | 804.6 | |
| 4607 | 6/20/2018 17:21 | 6 | 19.17 | 18.12 | 0.38 | | U | 0.46 | 833.5 | 0.41 |
| 4608 | 6/20/2018 17:38 | 6 | 19.13 | 12.60 | 0.15 | | U | 0.17 | 1075.3 | 0.06 |
| 4609 | 6/20/2018 17:54 | 6 | 19.01 | 19.87 | | | U | 0.14 | 592.4 | 0.29 |
| 4610 | 6/20/2018 18:11 | 6 | 18.87 | | | | U | 0.12 | 557.4 | |
| 4611 | 6/20/2018 20:15 | 6 | 17.14 | 18.70 | 0.38 | | C | 0.06 | 512.4 | |
| 4612 | 6/20/2018 20:32 | 6 | 16.97 | | 0.35 | | C | 0.11 | 518.4 | |
| 4613 | 6/20/2018 20:48 | 6 | 16.79 | | | | C | 0.07 | 2470.5 | |
| 4614 | 6/20/2018 21:05 | 6 | 15.99 | | | | C | 0.04 | 711.6 | |
| 4615 | 6/20/2018 21:21 | 6 | 16.73 | 16.09 | 0.39 | | U | 0.19 | 646.8 | 0.14 |
| 4616 | 6/20/2018 21:38 | 6 | 16.87 | 10.61 | 0.13 | | U | 0.10 | 579.7 | 0.06 |
| 4617 | 6/20/2018 21:54 | 6 | 16.82 | 17.88 | | | U | 0.10 | 541.0 | 0.15 |
| 4618 | 6/20/2018 22:11 | 6 | 16.84 | | | | U | 0.19 | 547.3 | |
| 4619 | 6/21/2018 0:15 | 6 | 16.20 | 17.86 | 0.39 | | C | 0.01 | 202.9 | |
| 4620 | 6/21/2018 0:32 | 6 | 15.95 | | 0.37 | | C | 0.09 | 487.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4621 | 6/21/2018 0:48 | 6 | 16.01 | | | | C | 0.05 | 639.8 | |
| 4622 | 6/21/2018 1:05 | 6 | 15.91 | | | | C | 0.07 | 738.5 | |
| 4623 | 6/21/2018 1:21 | 6 | 16.08 | 15.12 | 0.40 | | U | 0.18 | 515.0 | 0.06 |
| 4624 | 6/21/2018 1:38 | 6 | 16.15 | 9.71 | 0.12 | | U | 0.12 | 620.4 | 0.24 |
| 4625 | 6/21/2018 1:54 | 6 | 16.21 | 16.94 | | | U | 0.04 | 435.2 | 0.15 |
| 4626 | 6/21/2018 2:11 | 6 | 16.35 | | | | U | 0.10 | 307.4 | 0.03 |
| 4627 | 6/21/2018 4:15 | 6 | 16.31 | 17.47 | 0.40 | | C | 0.02 | 185.5 | |
| 4628 | 6/21/2018 4:32 | 6 | 15.99 | | 0.37 | | C | 0.03 | 177.4 | |
| 4629 | 6/21/2018 4:48 | 6 | 16.16 | | | | C | 0.02 | 410.9 | |
| 4630 | 6/21/2018 5:05 | 6 | 16.11 | | | | C | 0.04 | 456.9 | |
| 4631 | 6/21/2018 5:21 | 6 | 16.33 | 14.90 | 0.42 | | U | 0.03 | 342.3 | 0.03 |
| 4632 | 6/21/2018 5:38 | 6 | 16.33 | 9.51 | 0.13 | | U | 0.05 | 282.1 | 0.15 |
| 4633 | 6/21/2018 5:55 | 6 | 16.24 | 16.78 | | | U | 0.03 | 398.5 | 0.14 |
| 4634 | 6/21/2018 6:11 | 6 | 16.25 | | | | U | 0.15 | 201.6 | 0.09 |
| 4635 | 6/21/2018 8:15 | 6 | 17.73 | 17.36 | 0.41 | | C | 0.03 | 265.0 | |
| 4636 | 6/21/2018 8:32 | 6 | 17.87 | | 0.35 | | C | 0.13 | 521.5 | |
| 4637 | 6/21/2018 8:48 | 6 | 18.40 | | | | C | 0.22 | 3537.9 | |
| 4638 | 6/21/2018 9:05 | 6 | 18.69 | | | | C | 0.06 | 724.2 | |
| 4639 | 6/21/2018 9:21 | 6 | 18.93 | 16.39 | 0.40 | | U | 0.27 | 739.3 | 0.05 |
| 4640 | 6/21/2018 9:38 | 6 | 18.95 | 11.07 | 0.15 | | U | 0.07 | 965.7 | 0.27 |
| 4641 | 6/21/2018 9:54 | 6 | 18.74 | 18.40 | | | U | 0.12 | 658.2 | 0.12 |
| 4642 | 6/21/2018 10:11 | 6 | 18.80 | | | | U | 0.20 | 473.8 | 1.17 |
| 4643 | 6/21/2018 12:15 | 6 | 23.45 | 18.36 | 0.40 | | C | 0.10 | 415.7 | |
| 4644 | 6/21/2018 12:32 | 6 | 23.32 | | 0.32 | | C | 0.26 | 847.6 | |
| 4645 | 6/21/2018 12:48 | 6 | 24.46 | | | | C | 0.07 | 1232.7 | |
| 4646 | 6/21/2018 13:05 | 6 | 23.85 | | | | C | 0.08 | 850.3 | |
| 4647 | 6/21/2018 13:21 | 6 | 23.07 | 19.76 | 0.39 | | U | 0.49 | 1204.0 | 0.34 |
| 4648 | 6/21/2018 13:38 | 6 | 23.76 | 14.15 | 0.18 | | U | 0.17 | 1153.8 | 0.22 |
| 4649 | 6/21/2018 13:54 | 6 | 23.49 | 21.60 | | | U | 0.20 | 981.8 | 0.19 |
| 4650 | 6/21/2018 14:11 | 6 | 23.52 | | | | U | 0.36 | 827.2 | 0.21 |
| 4651 | 6/21/2018 16:15 | 6 | 26.10 | 19.99 | 0.40 | | C | 0.04 | 726.4 | |
| 4652 | 6/21/2018 16:32 | 6 | 26.46 | | 0.31 | | C | 0.17 | 937.3 | |
| 4653 | 6/21/2018 16:48 | 6 | 27.08 | | | | C | 0.11 | 1489.7 | |
| 4654 | 6/21/2018 17:05 | 6 | 26.45 | | | | C | 0.13 | 1078.6 | |
| 4655 | 6/21/2018 17:21 | 6 | 25.86 | 21.61 | 0.39 | | U | 0.72 | 1663.3 | 0.50 |
| 4656 | 6/21/2018 17:38 | 6 | 26.29 | 15.48 | 0.16 | | U | 0.58 | 1506.1 | 0.73 |
| 4657 | 6/21/2018 17:54 | 6 | 26.64 | 23.55 | | | U | 0.37 | 1383.5 | 0.54 |
| 4658 | 6/21/2018 18:11 | 6 | 26.71 | | | | U | 0.73 | 1411.4 | 0.10 |
| 4659 | 6/21/2018 20:15 | 6 | 21.03 | 20.21 | 0.40 | | C | 0.05 | 884.8 | |
| 4660 | 6/21/2018 20:32 | 6 | 21.02 | | 0.29 | | C | 0.19 | 1115.4 | |
| 4661 | 6/21/2018 20:48 | 6 | 20.28 | | | | C | 0.12 | 1457.5 | |
| 4662 | 6/21/2018 21:05 | 6 | 19.41 | | | | C | 0.13 | 1057.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4663 | 6/21/2018 21:21 | 6 | 18.67 | 18.87 | 0.38 | | U | 0.62 | 974.2 | 0.34 |
| 4664 | 6/21/2018 21:38 | 6 | 18.29 | 13.01 | 0.07 | | U | 0.39 | 782.4 | 0.10 |
| 4665 | 6/21/2018 21:54 | 6 | 17.95 | 20.43 | | | U | 0.31 | 779.1 | 0.22 |
| 4666 | 6/21/2018 22:11 | 6 | 17.73 | | | | U | 0.45 | 870.2 | |
| 4667 | 6/22/2018 0:15 | 6 | 16.69 | 18.99 | 0.40 | | C | 0.10 | 736.5 | |
| 4668 | 6/22/2018 0:32 | 6 | 16.31 | | 0.29 | | C | 0.13 | 796.1 | |
| 4669 | 6/22/2018 0:49 | 6 | 16.78 | | | | C | 0.11 | 1323.4 | |
| 4670 | 6/22/2018 1:05 | 6 | 16.43 | | | | C | 0.16 | 895.4 | |
| 4671 | 6/22/2018 1:22 | 6 | 16.42 | 16.45 | 0.38 | | U | 0.39 | 829.9 | 0.16 |
| 4672 | 6/22/2018 1:38 | 6 | 16.35 | 10.80 | 0.06 | | U | 0.41 | 673.7 | 0.31 |
| 4673 | 6/22/2018 1:55 | 6 | 16.24 | 18.28 | | | U | 0.24 | 749.4 | 0.24 |
| 4674 | 6/22/2018 2:11 | 6 | 16.15 | | | | U | 0.34 | 771.6 | |
| 4675 | 6/22/2018 4:15 | 6 | 15.41 | 18.22 | 0.40 | | C | 0.07 | 733.3 | |
| 4676 | 6/22/2018 4:32 | 6 | 15.11 | | 0.29 | | C | 0.14 | 761.0 | |
| 4677 | 6/22/2018 4:48 | 6 | 15.29 | | | | C | 0.07 | 1156.9 | |
| 4678 | 6/22/2018 5:05 | 6 | 15.06 | | | | C | 0.11 | 754.5 | |
| 4679 | 6/22/2018 5:21 | 6 | 15.63 | 15.26 | 0.38 | | U | 0.37 | 800.3 | 0.13 |
| 4680 | 6/22/2018 5:38 | 6 | 15.55 | 9.71 | 0.06 | | U | 0.24 | 606.0 | 0.36 |
| 4681 | 6/22/2018 5:54 | 6 | 14.86 | 17.07 | | | U | 0.23 | 671.8 | 0.19 |
| 4682 | 6/22/2018 6:11 | 6 | 14.67 | | | | U | 0.29 | 660.6 | |
| 4683 | 6/22/2018 8:15 | 6 | 17.72 | 17.93 | 0.40 | | C | 0.07 | 753.9 | |
| 4684 | 6/22/2018 8:32 | 6 | 18.33 | | 0.29 | | C | 0.17 | 879.4 | |
| 4685 | 6/22/2018 8:48 | 6 | 19.80 | | | | C | 0.06 | 1360.5 | |
| 4686 | 6/22/2018 9:05 | 6 | 19.76 | | | | C | 0.14 | 928.9 | 0.01 |
| 4687 | 6/22/2018 9:21 | 6 | 19.69 | 17.21 | 0.39 | | U | 0.75 | 904.0 | 0.08 |
| 4688 | 6/22/2018 9:38 | 6 | 20.78 | 12.18 | 0.09 | | U | 0.19 | 629.3 | 0.36 |
| 4689 | 6/22/2018 9:54 | 6 | 22.33 | 19.88 | | | U | 0.27 | 792.4 | 0.38 |
| 4690 | 6/22/2018 10:11 | 6 | 24.76 | | | | U | 0.53 | 1021.8 | 22.67 |
| 4691 | 6/22/2018 12:15 | 6 | 29.53 | 20.43 | 0.40 | | C | 0.09 | 1409.7 | |
| 4692 | 6/22/2018 12:32 | 6 | 26.63 | | 0.30 | | C | 0.29 | 1546.4 | |
| 4693 | 6/22/2018 12:48 | 6 | 29.98 | | | | C | 0.10 | 2060.2 | |
| 4694 | 6/22/2018 13:05 | 6 | 28.24 | | | | C | 0.16 | 1207.4 | |
| 4695 | 6/22/2018 13:21 | 6 | 28.99 | 23.57 | 0.39 | | U | 1.03 | 1449.9 | 0.82 |
| 4696 | 6/22/2018 13:38 | 6 | 29.59 | 18.57 | 0.22 | | U | 0.72 | 1524.5 | 1.04 |
| 4697 | 6/22/2018 13:54 | 6 | 29.07 | 25.76 | | | U | 0.61 | 1657.4 | 0.42 |
| 4698 | 6/22/2018 14:11 | 6 | 30.35 | | | | U | 1.49 | 1709.5 | 0.09 |
| 4699 | 6/22/2018 16:15 | 6 | 32.82 | 23.32 | 0.39 | | C | 0.18 | 2443.4 | |
| 4700 | 6/22/2018 16:32 | 6 | 29.05 | | 0.29 | | C | 0.20 | 1390.6 | |
| 4701 | 6/22/2018 16:48 | 6 | 28.50 | | | | C | 0.17 | 2162.4 | |
| 4702 | 6/22/2018 17:05 | 6 | 30.65 | | | | C | 0.43 | 1603.2 | |
| 4703 | 6/22/2018 17:21 | 6 | 31.16 | 25.66 | 0.38 | | U | 0.92 | 1520.4 | 1.46 |
| 4704 | 6/22/2018 17:38 | 6 | 29.50 | 19.97 | 0.26 | | U | 0.48 | 1578.2 | 0.26 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4705 | 6/22/2018 17:54 | 6 | 30.73 | 28.45 | | | U | 0.59 | 1341.4 | 0.17 |
| 4706 | 6/22/2018 18:11 | 6 | 30.07 | | | | U | 1.39 | 1379.3 | 0.16 |
| 4707 | 6/22/2018 20:15 | 6 | 22.25 | 22.16 | 0.39 | | C | 0.11 | 1917.0 | |
| 4708 | 6/22/2018 20:32 | 6 | 23.43 | | 0.28 | | C | 0.09 | 1049.7 | |
| 4709 | 6/22/2018 20:48 | 6 | 21.25 | | | | C | 0.08 | 1771.1 | |
| 4710 | 6/22/2018 21:05 | 6 | 20.63 | | | | C | 0.11 | 1270.9 | |
| 4711 | 6/22/2018 21:21 | 6 | 19.88 | 20.67 | 0.37 | | U | 0.41 | 998.3 | 0.64 |
| 4712 | 6/22/2018 21:38 | 6 | 19.13 | 14.51 | 0.12 | | U | 0.32 | 970.1 | |
| 4713 | 6/22/2018 21:54 | 6 | 18.66 | 22.51 | | | U | 0.30 | 861.0 | 0.11 |
| 4714 | 6/22/2018 22:11 | 6 | 18.09 | | | | U | 0.48 | 924.1 | |
| 4715 | 6/23/2018 0:15 | 6 | 16.50 | 20.19 | 0.39 | | C | 0.06 | 1433.8 | |
| 4716 | 6/23/2018 0:32 | 6 | 15.99 | | 0.27 | | C | 0.11 | 845.9 | |
| 4717 | 6/23/2018 0:48 | 6 | 15.76 | | | | C | 0.08 | 1305.8 | |
| 4718 | 6/23/2018 1:05 | 6 | 15.41 | | | | C | 0.10 | 928.3 | |
| 4719 | 6/23/2018 1:21 | 6 | 15.29 | 17.16 | 0.37 | | U | 0.33 | 745.7 | 0.13 |
| 4720 | 6/23/2018 1:38 | 6 | 14.96 | 11.30 | 0.09 | | U | 0.30 | 533.0 | 0.06 |
| 4721 | 6/23/2018 1:54 | 6 | 15.10 | 18.98 | | | U | 0.25 | 485.3 | 0.09 |
| 4722 | 6/23/2018 2:11 | 6 | 15.12 | | | | U | 0.31 | 1009.5 | |
| 4723 | 6/23/2018 4:15 | 6 | 13.97 | 18.77 | 0.39 | | C | 0.10 | 1352.3 | |
| 4724 | 6/23/2018 4:32 | 6 | 13.49 | | 0.27 | | C | 0.08 | 662.5 | |
| 4725 | 6/23/2018 4:48 | 6 | 13.78 | | | | C | 0.12 | 1158.8 | |
| 4726 | 6/23/2018 5:05 | 6 | 13.42 | | | | C | 0.09 | 949.8 | |
| 4727 | 6/23/2018 5:21 | 6 | 13.66 | 15.05 | 0.37 | | U | 0.26 | 1020.0 | 0.06 |
| 4728 | 6/23/2018 5:38 | 6 | 13.45 | 9.29 | 0.06 | | U | 0.27 | 713.5 | 0.06 |
| 4729 | 6/23/2018 5:55 | 6 | 13.46 | 16.90 | | | U | 0.20 | 701.8 | 0.08 |
| 4730 | 6/23/2018 6:11 | 6 | 13.65 | | | | U | 0.27 | 800.9 | |
| 4731 | 6/23/2018 8:15 | 6 | 17.26 | 18.28 | 0.39 | | C | 0.10 | 1593.2 | |
| 4732 | 6/23/2018 8:32 | 6 | 18.30 | | 0.27 | | C | 0.09 | 815.0 | |
| 4733 | 6/23/2018 8:48 | 6 | 18.96 | | | | C | 0.05 | 1478.3 | |
| 4734 | 6/23/2018 9:05 | 6 | 20.49 | | | | C | 0.24 | 973.2 | 0.07 |
| 4735 | 6/23/2018 9:21 | 6 | 21.36 | 18.03 | 0.37 | | U | 0.36 | 1131.9 | 0.09 |
| 4736 | 6/23/2018 9:38 | 6 | 22.76 | 13.26 | 0.09 | | U | 0.20 | 976.3 | 0.36 |
| 4737 | 6/23/2018 9:54 | 6 | 23.06 | 20.96 | | | U | 0.26 | 923.5 | 0.30 |
| 4738 | 6/23/2018 10:11 | 6 | 23.37 | | | | U | 0.46 | 888.8 | 4.93 |
| 4739 | 6/23/2018 12:15 | 6 | 26.46 | 20.22 | 0.39 | | C | 0.17 | 2401.7 | |
| 4740 | 6/23/2018 12:32 | 6 | 27.76 | | 0.27 | | C | 0.09 | 1089.5 | |
| 4741 | 6/23/2018 12:48 | 6 | 26.28 | | | | C | 0.07 | 2526.4 | |
| 4742 | 6/23/2018 13:05 | 6 | 29.27 | | | | C | 0.15 | 1292.5 | |
| 4743 | 6/23/2018 13:21 | 6 | 30.76 | 24.29 | 0.38 | | U | 0.60 | 1527.5 | 0.32 |
| 4744 | 6/23/2018 13:38 | 6 | 29.54 | 18.94 | 0.15 | | U | 0.30 | 1858.1 | 0.63 |
| 4745 | 6/23/2018 13:54 | 6 | 29.23 | 26.76 | | | U | 0.30 | 1128.7 | 0.04 |
| 4746 | 6/23/2018 14:11 | 6 | 29.33 | | | | U | 0.51 | 1199.8 | 5.65 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4747 | 6/23/2018 16:15 | 6 | 28.79 | 22.33 | 0.38 | | C | 0.17 | 3118.1 | |
| 4748 | 6/23/2018 16:32 | 6 | 28.00 | | 0.27 | | C | 0.07 | 1166.8 | |
| 4749 | 6/23/2018 16:48 | 6 | 25.11 | | | | C | 0.11 | 2538.9 | |
| 4750 | 6/23/2018 17:05 | 6 | 24.66 | | | | C | 0.13 | 1161.5 | |
| 4751 | 6/23/2018 17:21 | 6 | 26.04 | 24.33 | 0.37 | | U | 0.27 | 1342.0 | 0.32 |
| 4752 | 6/23/2018 17:38 | 6 | 28.32 | 18.57 | 0.18 | | U | 0.19 | 1498.8 | 0.22 |
| 4753 | 6/23/2018 17:54 | 6 | 29.25 | 26.78 | | | U | 0.23 | 953.1 | 0.11 |
| 4754 | 6/23/2018 18:11 | 6 | 26.74 | | | | U | 0.26 | 998.9 | |
| 4755 | 6/23/2018 20:15 | 6 | 21.62 | 21.13 | 0.38 | | C | 0.03 | 1953.0 | |
| 4756 | 6/23/2018 20:32 | 6 | 20.61 | | 0.27 | | C | 0.05 | 949.4 | |
| 4757 | 6/23/2018 20:48 | 6 | 20.39 | | | | C | 0.07 | 1651.2 | |
| 4758 | 6/23/2018 21:05 | 6 | 20.57 | | | | C | 0.11 | 1183.8 | |
| 4759 | 6/23/2018 21:21 | 6 | 20.45 | 20.59 | 0.36 | | U | 0.25 | 1081.2 | 0.14 |
| 4760 | 6/23/2018 21:38 | 6 | 20.21 | 14.69 | 0.05 | | U | 0.42 | 942.3 | |
| 4761 | 6/23/2018 21:54 | 6 | 19.87 | 22.42 | | | U | 0.28 | 929.7 | 0.09 |
| 4762 | 6/23/2018 22:11 | 6 | 19.42 | | | | U | 0.26 | 853.5 | |
| 4763 | 6/24/2018 0:15 | 6 | 18.70 | 20.15 | 0.38 | | C | 0.09 | 2225.3 | |
| 4764 | 6/24/2018 0:32 | 6 | 18.36 | | 0.27 | | C | 0.05 | 874.4 | |
| 4765 | 6/24/2018 0:48 | 6 | 18.36 | | | | C | 0.08 | 1665.7 | |
| 4766 | 6/24/2018 1:05 | 6 | 18.37 | | | | C | 0.11 | 935.3 | |
| 4767 | 6/24/2018 1:21 | 6 | 18.71 | 18.05 | 0.36 | | U | 0.09 | 1092.9 | 0.04 |
| 4768 | 6/24/2018 1:38 | 6 | 18.64 | 12.35 | 0.04 | | U | 0.33 | 971.9 | 0.09 |
| 4769 | 6/24/2018 1:55 | 6 | 18.40 | 20.06 | | | U | 0.21 | 736.7 | 0.09 |
| 4770 | 6/24/2018 2:11 | 6 | 18.05 | | | | U | 0.35 | 815.3 | |
| 4771 | 6/24/2018 4:15 | 6 | 18.60 | 19.48 | 0.38 | | C | 0.11 | 2131.1 | |
| 4772 | 6/24/2018 4:32 | 6 | 18.58 | | 0.28 | | C | 0.04 | 804.1 | |
| 4773 | 6/24/2018 4:48 | 6 | 18.72 | | | | C | 0.01 | 1682.3 | |
| 4774 | 6/24/2018 5:05 | 6 | 18.65 | | | | C | 0.07 | 887.6 | |
| 4775 | 6/24/2018 5:21 | 6 | 18.63 | 17.49 | 0.36 | | U | 0.25 | 1050.7 | 0.01 |
| 4776 | 6/24/2018 5:38 | 6 | 18.50 | 11.86 | 0.03 | | U | 0.24 | 854.3 | 0.09 |
| 4777 | 6/24/2018 5:55 | 6 | 18.27 | 19.49 | | | U | 0.28 | 637.3 | 0.08 |
| 4778 | 6/24/2018 6:11 | 6 | 18.02 | | | | U | 0.26 | 943.1 | |
| 4779 | 6/24/2018 8:15 | 6 | 20.18 | 19.48 | 0.38 | | C | 0.04 | 1586.2 | |
| 4780 | 6/24/2018 8:32 | 6 | 20.72 | | 0.26 | | C | 0.06 | 778.8 | |
| 4781 | 6/24/2018 8:48 | 6 | 21.92 | | | | C | 0.04 | 1586.1 | |
| 4782 | 6/24/2018 9:05 | 6 | 24.36 | | | | C | 0.10 | 935.2 | |
| 4783 | 6/24/2018 9:21 | 6 | 24.35 | 20.41 | 0.37 | | U | 0.44 | 1059.1 | 0.13 |
| 4784 | 6/24/2018 9:38 | 6 | 25.48 | 15.95 | 0.03 | | U | 0.33 | 946.8 | 0.25 |
| 4785 | 6/24/2018 9:54 | 6 | 26.06 | 23.71 | | | U | 0.27 | 773.5 | 0.16 |
| 4786 | 6/24/2018 10:11 | 6 | 26.92 | | | | U | 0.43 | 889.9 | |
| 4787 | 6/24/2018 12:15 | 6 | 30.15 | 21.85 | 0.38 | | C | 0.04 | 2381.5 | |
| 4788 | 6/24/2018 12:32 | 6 | 30.90 | | 0.27 | | C | 0.08 | 993.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4789 | 6/24/2018 12:48 | 6 | 31.02 | | | | C | 0.01 | 2129.6 | |
| 4790 | 6/24/2018 13:05 | 6 | 33.30 | | | | C | 0.09 | 1091.9 | |
| 4791 | 6/24/2018 13:21 | 6 | 34.06 | 27.99 | 0.37 | | U | 0.40 | 1386.0 | 0.28 |
| 4792 | 6/24/2018 13:38 | 6 | 33.79 | 23.45 | 0.03 | | U | 0.47 | 1564.3 | 0.27 |
| 4793 | 6/24/2018 13:54 | 6 | 32.13 | 30.45 | | | U | 0.26 | 964.3 | 0.18 |
| 4794 | 6/24/2018 14:11 | 6 | 32.24 | | | | U | 0.52 | 1097.9 | |
| 4795 | 6/24/2018 16:15 | 6 | 29.91 | 23.69 | 0.37 | | C | 0.05 | 3212.5 | |
| 4796 | 6/24/2018 16:32 | 6 | 29.69 | | 0.27 | | C | 0.09 | 1072.6 | |
| 4797 | 6/24/2018 16:48 | 6 | 31.05 | | | | C | 0.04 | 2010.1 | |
| 4798 | 6/24/2018 17:05 | 6 | 33.47 | | | | C | 0.10 | 1096.1 | |
| 4799 | 6/24/2018 17:21 | 6 | 34.30 | 28.76 | 0.36 | | U | 0.34 | 1308.2 | 0.26 |
| 4800 | 6/24/2018 17:38 | 6 | 34.33 | 23.61 | 0.18 | | U | 0.32 | 1240.0 | 0.27 |
| 4801 | 6/24/2018 17:54 | 6 | 34.47 | 31.67 | | | U | 0.26 | 970.5 | 0.12 |
| 4802 | 6/24/2018 18:11 | 6 | 29.57 | | | | U | 0.39 | 1028.3 | |
| 4803 | 6/24/2018 20:15 | 6 | 21.75 | 22.52 | 0.37 | | C | 0.04 | 2215.3 | |
| 4804 | 6/24/2018 20:32 | 6 | 21.79 | | 0.27 | | C | 0.07 | 944.9 | |
| 4805 | 6/24/2018 20:48 | 6 | 21.27 | | | | C | 0.01 | 1751.0 | |
| 4806 | 6/24/2018 21:05 | 6 | 20.83 | | | | C | 0.13 | 918.9 | |
| 4807 | 6/24/2018 21:21 | 6 | 20.28 | 22.19 | 0.35 | | U | 0.20 | 1123.9 | 0.03 |
| 4808 | 6/24/2018 21:38 | 6 | 20.06 | 16.49 | 0.05 | | U | 0.13 | 959.1 | 0.01 |
| 4809 | 6/24/2018 21:54 | 6 | 20.02 | 24.07 | | | U | 0.26 | 694.1 | 0.05 |
| 4810 | 6/24/2018 22:11 | 6 | 19.63 | | | | U | 0.23 | 761.8 | |
| 4811 | 6/25/2018 0:15 | 6 | 18.58 | 20.72 | 0.36 | | C | 0.17 | 1779.8 | |
| 4812 | 6/25/2018 0:32 | 6 | 18.70 | | 0.26 | | C | 0.05 | 831.3 | |
| 4813 | 6/25/2018 0:49 | 6 | 18.88 | | | | C | 0.05 | 1952.9 | |
| 4814 | 6/25/2018 1:05 | 6 | 18.90 | | | | C | 0.07 | 844.0 | |
| 4815 | 6/25/2018 1:22 | 6 | 18.76 | 19.17 | 0.35 | | U | 0.13 | 972.3 | 0.01 |
| 4816 | 6/25/2018 1:38 | 6 | 18.29 | 13.66 | 0.03 | | U | 0.09 | 770.4 | 0.07 |
| 4817 | 6/25/2018 1:55 | 6 | 18.11 | 21.33 | | | U | 0.10 | 608.7 | 0.04 |
| 4818 | 6/25/2018 2:11 | 6 | 17.84 | | | | U | 0.19 | 719.9 | |
| 4819 | 6/25/2018 4:15 | 6 | 16.47 | 19.71 | 0.36 | | C | 0.03 | 1533.1 | |
| 4820 | 6/25/2018 4:32 | 6 | 16.33 | | 0.26 | | C | 0.15 | 699.3 | |
| 4821 | 6/25/2018 4:48 | 6 | 16.50 | | | | C | 0.02 | 1264.4 | |
| 4822 | 6/25/2018 5:05 | 6 | 16.55 | | | | C | 0.06 | 715.3 | |
| 4823 | 6/25/2018 5:21 | 6 | 16.91 | 17.34 | 0.35 | | U | 0.13 | 966.7 | |
| 4824 | 6/25/2018 5:38 | 6 | 16.90 | 11.88 | 0.01 | | U | 0.21 | 805.2 | 0.04 |
| 4825 | 6/25/2018 5:54 | 6 | 16.99 | 19.60 | | | U | 0.08 | 633.7 | 0.04 |
| 4826 | 6/25/2018 6:11 | 6 | 16.94 | | | | U | 0.24 | 656.0 | 0.10 |
| 4827 | 6/25/2018 8:15 | 6 | 19.03 | 19.36 | 0.36 | | C | 0.02 | 1310.1 | |
| 4828 | 6/25/2018 8:32 | 6 | 20.29 | | 0.26 | | C | 0.08 | 715.2 | |
| 4829 | 6/25/2018 8:48 | 6 | 20.67 | | | | C | | 1316.4 | |
| 4830 | 6/25/2018 9:05 | 6 | 21.43 | | | | C | 0.09 | 685.9 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4831 | 6/25/2018 9:21 | 6 | 21.76 | 18.73 | 0.35 | | U | 0.17 | 1072.9 | 0.03 |
| 4832 | 6/25/2018 9:38 | 6 | 21.90 | 13.48 | 0.01 | | U | 0.41 | 1096.3 | 0.14 |
| 4833 | 6/25/2018 9:54 | 6 | 21.07 | 21.05 | | | U | 0.12 | 726.0 | 0.04 |
| 4834 | 6/25/2018 10:11 | 6 | 19.73 | | | | U | 0.20 | 749.9 | 0.03 |
| 4835 | 6/25/2018 12:15 | 6 | 19.13 | 19.41 | 0.41 | | C | | 99.3 | |
| 4836 | 6/25/2018 12:32 | 6 | 20.08 | | 0.38 | | C | | 199.3 | |
| 4837 | 6/25/2018 12:48 | 6 | 20.76 | | | | C | 0.07 | 2051.4 | |
| 4838 | 6/25/2018 13:05 | 6 | 20.77 | | | | C | 0.01 | 428.9 | |
| 4839 | 6/25/2018 13:21 | 6 | 20.91 | 19.05 | 0.40 | | U | 0.45 | 503.0 | |
| 4840 | 6/25/2018 13:38 | 6 | 20.67 | 13.62 | 0.00 | | U | 0.13 | 219.1 | 0.03 |
| 4841 | 6/25/2018 13:55 | 6 | 20.52 | 21.31 | | | U | 0.17 | 141.7 | 0.03 |
| 4842 | 6/25/2018 14:11 | 6 | 20.62 | | | | U | 0.14 | 160.3 | 0.03 |
| 4843 | 6/25/2018 16:15 | 6 | 23.64 | 20.30 | 0.41 | | C | | 540.9 | |
| 4844 | 6/25/2018 16:32 | 6 | 23.34 | | 0.35 | | C | 0.19 | 786.8 | |
| 4845 | 6/25/2018 16:48 | 6 | 22.39 | | | | C | 0.20 | 1125.6 | |
| 4846 | 6/25/2018 17:05 | 6 | 19.66 | | | | C | 0.05 | 165.5 | |
| 4847 | 6/25/2018 17:21 | 6 | 20.66 | 19.91 | 0.41 | | U | 0.92 | 396.8 | |
| 4848 | 6/25/2018 17:38 | 6 | 21.15 | 14.36 | 0.01 | | U | 0.27 | 352.4 | 0.06 |
| 4849 | 6/25/2018 17:54 | 6 | 20.56 | 22.10 | | | U | 0.17 | 297.9 | 0.05 |
| 4850 | 6/25/2018 18:11 | 6 | 20.99 | | | | U | 0.17 | 296.0 | |
| 4851 | 6/25/2018 20:15 | 6 | 19.70 | 20.09 | 0.41 | | C | 0.03 | 683.4 | |
| 4852 | 6/25/2018 20:32 | 6 | 19.54 | | 0.35 | | C | 0.22 | 1001.4 | |
| 4853 | 6/25/2018 20:48 | 6 | 19.15 | | | | C | 0.19 | 1388.0 | |
| 4854 | 6/25/2018 21:05 | 6 | 18.98 | | | | C | 0.15 | 671.8 | |
| 4855 | 6/25/2018 21:21 | 6 | 19.00 | 18.26 | 0.40 | | U | 2.52 | 672.5 | |
| 4856 | 6/25/2018 21:38 | 6 | 18.88 | 12.61 | 0.00 | | U | 0.33 | 407.5 | 0.04 |
| 4857 | 6/25/2018 21:55 | 6 | 18.80 | 20.25 | | | U | 0.36 | 410.3 | 0.01 |
| 4858 | 6/25/2018 22:11 | 6 | 18.71 | | | | U | 0.21 | 194.8 | 0.06 |
| 4859 | 6/26/2018 0:15 | 6 | 18.65 | 19.49 | 0.41 | | C | 0.01 | 715.1 | |
| 4860 | 6/26/2018 0:32 | 6 | 18.49 | | 0.36 | | C | 0.18 | 1115.8 | |
| 4861 | 6/26/2018 0:48 | 6 | 18.41 | | | | C | 0.65 | 3507.6 | |
| 4862 | 6/26/2018 1:05 | 6 | 18.27 | | | | C | 0.07 | 703.1 | |
| 4863 | 6/26/2018 1:22 | 6 | 18.40 | 17.21 | 0.40 | | U | 0.89 | 647.1 | |
| 4864 | 6/26/2018 1:38 | 6 | 18.31 | 11.63 | -0.02 | | U | 0.25 | 483.2 | 0.02 |
| 4865 | 6/26/2018 1:55 | 6 | 18.24 | 19.21 | | | U | 0.22 | 275.3 | 0.02 |
| 4866 | 6/26/2018 2:11 | 6 | 18.27 | | | | U | 0.16 | 171.5 | 0.01 |
| 4867 | 6/26/2018 4:15 | 6 | 18.29 | 19.11 | 0.41 | | C | 0.04 | 517.0 | |
| 4868 | 6/26/2018 4:32 | 6 | 18.18 | | 0.36 | | C | 0.21 | 1219.4 | |
| 4869 | 6/26/2018 4:48 | 6 | 18.32 | | | | C | 0.10 | 1401.6 | |
| 4870 | 6/26/2018 5:05 | 6 | 18.15 | | | | C | 0.10 | 754.6 | |
| 4871 | 6/26/2018 5:21 | 6 | 18.31 | 16.91 | 0.40 | | U | 0.84 | 800.5 | |
| 4872 | 6/26/2018 5:38 | 6 | 18.26 | 11.37 | -0.01 | | U | 0.38 | 646.0 | 0.03 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4873 | 6/26/2018 5:55 | 6 | 18.22 | 18.93 | | | U | 0.25 | 494.6 | 0.02 |
| 4874 | 6/26/2018 6:11 | 6 | 18.24 | | | | U | 0.21 | 344.0 | 0.01 |
| 4875 | 6/26/2018 8:15 | 6 | 18.63 | 19.03 | 0.41 | | C | 0.01 | 716.0 | |
| 4876 | 6/26/2018 8:32 | 6 | 18.78 | | 0.37 | | C | 0.28 | 1312.3 | |
| 4877 | 6/26/2018 8:48 | 6 | 19.36 | | | | C | 0.45 | 4706.3 | |
| 4878 | 6/26/2018 9:05 | 6 | 19.15 | | | | C | 0.10 | 809.1 | |
| 4879 | 6/26/2018 9:21 | 6 | 19.33 | 17.59 | 0.40 | | U | 1.05 | 757.2 | |
| 4880 | 6/26/2018 9:38 | 6 | 19.71 | 12.16 | -0.01 | | U | 0.45 | 835.6 | 0.03 |
| 4881 | 6/26/2018 9:55 | 6 | 20.50 | 19.90 | | | U | 0.32 | 592.3 | 0.07 |
| 4882 | 6/26/2018 10:11 | 6 | 20.32 | | | | U | 0.32 | 447.6 | 0.06 |
| 4883 | 6/26/2018 12:15 | 6 | 23.79 | 19.80 | 0.41 | | C | 0.06 | 1390.7 | |
| 4884 | 6/26/2018 12:32 | 6 | 23.58 | | 0.34 | | C | 0.22 | 1384.7 | |
| 4885 | 6/26/2018 12:48 | 6 | 24.08 | | | | C | 0.11 | 1641.1 | |
| 4886 | 6/26/2018 13:05 | 6 | 23.01 | | | | C | 0.14 | 910.9 | |
| 4887 | 6/26/2018 13:21 | 6 | 22.86 | 20.46 | 0.39 | | U | 1.36 | 1145.6 | 0.02 |
| 4888 | 6/26/2018 13:38 | 6 | 25.01 | 15.09 | 0.05 | | U | 1.01 | 1320.9 | 0.12 |
| 4889 | 6/26/2018 13:54 | 6 | 25.39 | 22.96 | | | U | 0.73 | 934.2 | 0.09 |
| 4890 | 6/26/2018 14:11 | 6 | 23.69 | | | | U | 0.25 | 670.5 | 0.80 |
| 4891 | 6/26/2018 16:15 | 6 | 30.24 | 21.19 | 0.41 | | C | 0.12 | 3306.7 | |
| 4892 | 6/26/2018 16:32 | 6 | 29.52 | | 0.33 | | C | 0.50 | 1746.0 | 1.67 |
| 4893 | 6/26/2018 16:48 | 6 | 29.88 | | | | C | 0.26 | 2346.7 | |
| 4894 | 6/26/2018 17:05 | 6 | 30.70 | | | | C | 0.25 | 1288.5 | 1.99 |
| 4895 | 6/26/2018 17:21 | 6 | 28.96 | 24.41 | 0.39 | | U | 2.28 | 1741.3 | 0.11 |
| 4896 | 6/26/2018 17:38 | 6 | 27.39 | 18.39 | 0.09 | | U | 1.64 | 1458.9 | 0.11 |
| 4897 | 6/26/2018 17:55 | 6 | 28.69 | 26.23 | | | U | 1.05 | 1224.2 | 0.12 |
| 4898 | 6/26/2018 18:11 | 6 | 27.04 | | | | U | 1.26 | 1105.9 | 0.29 |
| 4899 | 6/26/2018 20:15 | 6 | 22.65 | 21.58 | 0.41 | | C | 0.06 | 1386.5 | |
| 4900 | 6/26/2018 20:32 | 6 | 22.72 | | 0.32 | | C | 0.28 | 1444.4 | |
| 4901 | 6/26/2018 20:48 | 6 | 21.19 | | | | C | 0.10 | 1723.7 | |
| 4902 | 6/26/2018 21:05 | 6 | 20.30 | | | | C | 0.32 | 1187.2 | |
| 4903 | 6/26/2018 21:21 | 6 | 20.30 | 20.57 | 0.39 | | U | 0.85 | 1177.6 | 0.01 |
| 4904 | 6/26/2018 21:38 | 6 | 20.45 | 14.59 | 0.01 | | U | 0.96 | 938.8 | 0.12 |
| 4905 | 6/26/2018 21:54 | 6 | 20.02 | 22.41 | | | U | 0.64 | 858.4 | 0.05 |
| 4906 | 6/26/2018 22:11 | 6 | 19.33 | | | | U | 1.12 | 812.7 | 0.01 |
| 4907 | 6/27/2018 0:15 | 6 | 17.03 | 20.16 | 0.40 | | C | 0.16 | 1250.8 | |
| 4908 | 6/27/2018 0:32 | 6 | 17.07 | | 0.31 | | C | 0.17 | 933.5 | |
| 4909 | 6/27/2018 0:49 | 6 | 17.36 | | | | C | 0.14 | 1446.2 | |
| 4910 | 6/27/2018 1:05 | 6 | 16.45 | | | | C | 0.16 | 953.8 | |
| 4911 | 6/27/2018 1:22 | 6 | 16.34 | 17.42 | 0.38 | | U | 0.60 | 928.2 | 0.01 |
| 4912 | 6/27/2018 1:38 | 6 | 16.19 | 11.61 | -0.01 | | U | 0.61 | 714.8 | 0.02 |
| 4913 | 6/27/2018 1:54 | 6 | 16.16 | 19.42 | | | U | 0.50 | 671.4 | 0.05 |
| 4914 | 6/27/2018 2:11 | 6 | 16.00 | | | | U | 0.43 | 607.5 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4915 | 6/27/2018 4:15 | 6 | 15.82 | 19.06 | 0.40 | | C | 0.12 | 1259.6 | |
| 4916 | 6/27/2018 4:32 | 6 | 15.83 | | 0.31 | | C | 0.18 | 1132.3 | |
| 4917 | 6/27/2018 4:48 | 6 | 16.52 | | | | C | 0.13 | 1426.1 | |
| 4918 | 6/27/2018 5:05 | 6 | 16.08 | | | | C | 0.13 | 822.7 | |
| 4919 | 6/27/2018 5:21 | 6 | 16.37 | 16.22 | 0.38 | | U | 0.52 | 938.3 | |
| 4920 | 6/27/2018 5:38 | 6 | 16.31 | 10.53 | -0.01 | | U | 0.54 | 643.4 | 0.03 |
| 4921 | 6/27/2018 5:54 | 6 | 16.43 | 18.31 | | | U | 0.35 | 582.5 | 0.07 |
| 4922 | 6/27/2018 6:11 | 6 | 16.46 | | | | U | 0.46 | 633.9 | 0.11 |
| 4923 | 6/27/2018 8:15 | 6 | 17.67 | 18.83 | 0.40 | | C | 0.82 | 4404.2 | |
| 4924 | 6/27/2018 8:32 | 6 | 17.98 | | 0.33 | | C | 0.28 | 1630.5 | |
| 4925 | 6/27/2018 8:48 | 6 | 18.58 | | | | C | 0.09 | 1506.1 | |
| 4926 | 6/27/2018 9:05 | 6 | 19.11 | | | | C | 0.11 | 873.1 | |
| 4927 | 6/27/2018 9:21 | 6 | 19.74 | 17.10 | 0.39 | | U | 0.49 | 856.7 | |
| 4928 | 6/27/2018 9:38 | 6 | 20.09 | 11.72 | 0.03 | | U | 0.77 | 849.8 | 0.04 |
| 4929 | 6/27/2018 9:54 | 6 | 20.04 | 19.41 | | | U | 0.39 | 506.8 | 0.06 |
| 4930 | 6/27/2018 10:11 | 6 | 20.34 | | | | U | 0.50 | 670.5 | 0.03 |
| 4931 | 6/27/2018 12:15 | 6 | 29.63 | 20.25 | 0.41 | | C | 0.13 | 1997.2 | |
| 4932 | 6/27/2018 12:32 | 6 | 28.21 | | 0.32 | | C | 0.34 | 1461.8 | 3.01 |
| 4933 | 6/27/2018 12:48 | 6 | 30.18 | | | | C | 0.13 | 2235.9 | |
| 4934 | 6/27/2018 13:05 | 6 | 30.02 | | | | C | 0.23 | 1406.7 | 2.24 |
| 4935 | 6/27/2018 13:21 | 6 | 30.96 | 24.64 | 0.39 | | U | 0.99 | 1268.2 | 0.06 |
| 4936 | 6/27/2018 13:38 | 6 | 31.43 | 19.58 | 0.06 | | U | 2.69 | 1355.6 | 0.11 |
| 4937 | 6/27/2018 13:55 | 6 | 31.36 | 25.59 | | | U | 0.89 | 1393.6 | 0.12 |
| 4938 | 6/27/2018 14:11 | 6 | 32.06 | | | | U | 1.72 | 1698.8 | 0.77 |
| 4939 | 6/27/2018 16:15 | 6 | 34.76 | 23.81 | 0.40 | | C | 0.13 | 3706.3 | |
| 4940 | 6/27/2018 16:32 | 6 | 34.45 | | 0.31 | | C | 0.16 | 1510.2 | |
| 4941 | 6/27/2018 16:48 | 6 | 35.04 | | | | C | 0.09 | 2694.7 | |
| 4942 | 6/27/2018 17:05 | 6 | 33.65 | | | | C | 0.16 | 1579.7 | |
| 4943 | 6/27/2018 17:21 | 6 | 33.53 | 27.97 | 0.38 | | U | 0.94 | 1352.3 | 0.11 |
| 4944 | 6/27/2018 17:38 | 6 | 33.33 | 21.83 | 0.06 | | U | 0.89 | 1667.9 | 0.35 |
| 4945 | 6/27/2018 17:54 | 6 | 34.68 | 28.92 | | | U | 0.64 | 1193.6 | 0.04 |
| 4946 | 6/27/2018 18:11 | 6 | 33.49 | | | | U | 1.49 | 1443.2 | 3.87 |
| 4947 | 6/27/2018 20:15 | 6 | 24.95 | 23.21 | 0.40 | | C | 0.19 | 2222.6 | |
| 4948 | 6/27/2018 20:32 | 6 | 25.80 | | 0.29 | | C | 0.12 | 1245.3 | |
| 4949 | 6/27/2018 20:48 | 6 | 24.47 | | | | C | 0.06 | 1852.8 | |
| 4950 | 6/27/2018 21:05 | 6 | 24.48 | | | | C | 0.12 | 1248.1 | |
| 4951 | 6/27/2018 21:21 | 6 | 23.26 | 23.13 | 0.37 | | U | 0.55 | 1252.7 | 0.04 |
| 4952 | 6/27/2018 21:38 | 6 | 22.67 | 16.72 | -0.01 | | U | 0.53 | 1121.2 | |
| 4953 | 6/27/2018 21:54 | 6 | 22.18 | 24.25 | | | U | 0.45 | 917.5 | 0.01 |
| 4954 | 6/27/2018 22:11 | 6 | 21.56 | | | | U | 0.54 | 1120.0 | |
| 4955 | 6/28/2018 0:15 | 6 | 20.96 | 21.77 | 0.40 | | C | 0.17 | 2443.9 | |
| 4956 | 6/28/2018 0:32 | 6 | 20.84 | | 0.29 | | C | 0.12 | 1101.8 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4957 | 6/28/2018 0:48 | 6 | 20.84 | | | | C | 0.07 | 1839.2 | |
| 4958 | 6/28/2018 1:05 | 6 | 20.82 | | | | C | 0.10 | 1160.8 | |
| 4959 | 6/28/2018 1:21 | 6 | 21.18 | 20.17 | 0.37 | | U | 0.37 | 1137.6 | 0.01 |
| 4960 | 6/28/2018 1:38 | 6 | 20.94 | 14.27 | -0.01 | | U | 0.69 | 887.1 | 0.06 |
| 4961 | 6/28/2018 1:54 | 6 | 20.66 | 21.95 | | | U | 0.36 | 823.3 | 0.05 |
| 4962 | 6/28/2018 2:11 | 6 | 19.95 | | | | U | 0.53 | 995.9 | |
| 4963 | 6/28/2018 4:15 | 6 | 18.29 | 20.96 | 0.40 | | C | 0.17 | 1934.8 | |
| 4964 | 6/28/2018 4:32 | 6 | 17.95 | | 0.29 | | C | 0.13 | 887.6 | |
| 4965 | 6/28/2018 4:48 | 6 | 18.46 | | | | C | 0.05 | 1563.8 | |
| 4966 | 6/28/2018 5:05 | 6 | 17.95 | | | | C | 0.11 | 983.0 | |
| 4967 | 6/28/2018 5:21 | 6 | 17.56 | 18.23 | 0.37 | | U | 0.36 | 987.1 | 0.02 |
| 4968 | 6/28/2018 5:38 | 6 | 17.32 | 12.38 | -0.04 | | U | 0.47 | 815.9 | 0.02 |
| 4969 | 6/28/2018 5:54 | 6 | 17.76 | 20.11 | | | U | 0.29 | 874.0 | 0.02 |
| 4970 | 6/28/2018 6:11 | 6 | 17.64 | | | | U | 0.83 | 973.3 | 0.13 |
| 4971 | 6/28/2018 8:15 | 6 | 21.28 | 20.48 | 0.40 | | C | 0.14 | 2097.8 | |
| 4972 | 6/28/2018 8:32 | 6 | 23.21 | | 0.29 | | C | 0.12 | 1053.5 | 0.01 |
| 4973 | 6/28/2018 8:48 | 6 | 23.01 | | | | C | 0.07 | 1866.6 | |
| 4974 | 6/28/2018 9:05 | 6 | 24.69 | | | | C | 0.11 | 1088.3 | |
| 4975 | 6/28/2018 9:21 | 6 | 25.06 | 21.00 | 0.37 | | U | 0.42 | 1250.3 | 0.01 |
| 4976 | 6/28/2018 9:38 | 6 | 26.79 | 16.44 | -0.01 | | U | 0.44 | 1072.0 | 0.07 |
| 4977 | 6/28/2018 9:54 | 6 | 27.00 | 23.93 | | | U | 0.42 | 885.7 | 0.09 |
| 4978 | 6/28/2018 10:11 | 6 | 27.05 | | | | U | 0.76 | 1083.6 | 0.28 |
| 4979 | 6/28/2018 12:15 | 6 | 28.46 | 22.58 | 0.40 | | C | 0.23 | 2607.8 | |
| 4980 | 6/28/2018 12:32 | 6 | 27.15 | | 0.29 | | C | 0.12 | 1188.9 | |
| 4981 | 6/28/2018 12:48 | 6 | 26.02 | | | | C | | 1633.8 | |
| 4982 | 6/28/2018 13:05 | 6 | 26.71 | | | | C | 0.09 | 1111.4 | |
| 4983 | 6/28/2018 13:21 | 6 | 25.61 | 23.41 | 0.37 | | U | 0.63 | 2026.5 | |
| 4984 | 6/28/2018 13:38 | 6 | 25.81 | 17.38 | -0.03 | | U | 0.78 | 1595.0 | 0.10 |
| 4985 | 6/28/2018 13:54 | 6 | 27.15 | 25.08 | | | U | 0.41 | 1017.1 | 0.01 |
| 4986 | 6/28/2018 14:11 | 6 | 27.15 | | | | U | 0.78 | 1023.0 | 0.42 |
| 4987 | 6/28/2018 16:15 | 6 | 28.82 | 23.34 | 0.40 | | C | 0.32 | 2190.1 | |
| 4988 | 6/28/2018 16:32 | 6 | 28.61 | | 0.28 | | C | 0.13 | 1529.5 | |
| 4989 | 6/28/2018 16:48 | 6 | 30.02 | | | | C | | 1799.7 | |
| 4990 | 6/28/2018 17:05 | 6 | 33.55 | | | | C | 0.13 | 1268.2 | |
| 4991 | 6/28/2018 17:21 | 6 | 31.11 | 26.31 | 0.36 | | U | 0.58 | 2021.8 | 0.02 |
| 4992 | 6/28/2018 17:38 | 6 | 27.75 | 19.90 | -0.03 | | U | 0.49 | 1156.5 | 0.04 |
| 4993 | 6/28/2018 17:54 | 6 | 28.74 | 26.99 | | | U | 0.66 | 1042.9 | 0.03 |
| 4994 | 6/28/2018 18:11 | 6 | 29.32 | | | | U | 0.61 | 1186.5 | 0.07 |
| 4995 | 6/28/2018 20:15 | 6 | 25.76 | 23.19 | 0.39 | | C | 0.28 | 2058.5 | |
| 4996 | 6/28/2018 20:32 | 6 | 27.06 | | 0.28 | | C | 0.12 | 1212.1 | |
| 4997 | 6/28/2018 20:48 | 6 | 25.17 | | | | C | | 1770.8 | |
| 4998 | 6/28/2018 21:05 | 6 | 24.90 | | | | C | 0.06 | 1096.7 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 4999 | 6/28/2018 21:21 | 6 | 23.85 | 22.88 | 0.36 | | U | 0.40 | 1498.8 | |
| 5000 | 6/28/2018 21:38 | 6 | 23.60 | 16.77 | -0.04 | | U | 0.44 | 1325.8 | 0.04 |
| 5001 | 6/28/2018 21:55 | 6 | 23.37 | 24.40 | | | U | 0.32 | 920.9 | 0.02 |
| 5002 | 6/28/2018 22:11 | 6 | 22.99 | | | | U | 0.50 | 1007.6 | 0.57 |
| 5003 | 6/29/2018 0:15 | 6 | 22.43 | 22.37 | 0.39 | | C | 0.20 | 1832.5 | |
| 5004 | 6/29/2018 0:32 | 6 | 22.50 | | 0.27 | | C | 0.14 | 1264.4 | |
| 5005 | 6/29/2018 0:49 | 6 | 22.36 | | | | C | | 1655.1 | |
| 5006 | 6/29/2018 1:05 | 6 | 22.42 | | | | C | 0.07 | 1074.7 | |
| 5007 | 6/29/2018 1:22 | 6 | 22.73 | 20.80 | 0.36 | | U | 0.36 | 1633.1 | |
| 5008 | 6/29/2018 1:38 | 6 | 22.96 | 15.03 | -0.04 | | U | 0.27 | 1487.9 | 0.01 |
| 5009 | 6/29/2018 1:55 | 6 | 22.91 | 22.78 | | | U | 0.34 | 950.8 | 0.02 |
| 5010 | 6/29/2018 2:11 | 6 | 22.61 | | | | U | 0.39 | 971.5 | 0.01 |
| 5011 | 6/29/2018 4:15 | 6 | 22.59 | 21.97 | 0.39 | | C | 0.12 | 2787.5 | |
| 5012 | 6/29/2018 4:32 | 6 | 22.61 | | 0.27 | | C | 0.17 | 1647.5 | |
| 5013 | 6/29/2018 4:48 | 6 | 22.59 | | | | C | 0.03 | 1684.9 | |
| 5014 | 6/29/2018 5:05 | 6 | 22.55 | | | | C | 0.07 | 1084.6 | |
| 5015 | 6/29/2018 5:21 | 6 | 22.64 | 20.31 | 0.36 | | U | 0.39 | 1498.5 | |
| 5016 | 6/29/2018 5:38 | 6 | 22.79 | 14.62 | -0.04 | | U | 0.21 | 1224.3 | 0.01 |
| 5017 | 6/29/2018 5:54 | 6 | 22.86 | 22.27 | | | U | 0.29 | 883.5 | 0.01 |
| 5018 | 6/29/2018 6:11 | 6 | 22.80 | | | | U | 0.44 | 978.4 | 0.02 |
| 5019 | 6/29/2018 8:15 | 6 | 24.26 | 21.89 | 0.39 | | C | 0.01 | 2210.7 | |
| 5020 | 6/29/2018 8:32 | 6 | 25.59 | | 0.27 | | C | 0.12 | 1244.9 | |
| 5021 | 6/29/2018 8:48 | 6 | 25.58 | | | | C | | 1474.1 | |
| 5022 | 6/29/2018 9:05 | 6 | 27.04 | | | | C | 0.08 | 1079.2 | |
| 5023 | 6/29/2018 9:21 | 6 | 27.65 | 22.31 | 0.36 | | U | 0.34 | 1171.3 | |
| 5024 | 6/29/2018 9:38 | 6 | 28.80 | 17.79 | -0.01 | | U | 0.14 | 832.3 | 0.05 |
| 5025 | 6/29/2018 9:54 | 6 | 29.20 | 25.00 | | | U | 0.61 | 707.9 | 0.06 |
| 5026 | 6/29/2018 10:11 | 6 | 29.70 | | | | U | 0.50 | 983.1 | 0.13 |
| 5027 | 6/29/2018 12:15 | 6 | 33.34 | 23.79 | 0.39 | | C | | 3024.4 | |
| 5028 | 6/29/2018 12:32 | 6 | 34.61 | | 0.28 | | C | 0.21 | 1463.2 | |
| 5029 | 6/29/2018 12:48 | 6 | 34.87 | | | | C | | 1763.7 | |
| 5030 | 6/29/2018 13:05 | 6 | 35.37 | | | | C | 0.10 | 1102.3 | |
| 5031 | 6/29/2018 13:21 | 6 | 36.05 | 29.71 | 0.36 | | U | 0.48 | 668.1 | 1.05 |
| 5032 | 6/29/2018 13:38 | 6 | 36.25 | 25.60 | -0.01 | | U | 0.13 | 802.2 | 0.05 |
| 5033 | 6/29/2018 13:54 | 6 | 36.66 | 31.52 | | | U | 0.24 | 788.8 | 0.03 |
| 5034 | 6/29/2018 14:11 | 6 | 36.33 | | | | U | 0.41 | 1089.2 | 0.09 |
| 5035 | 6/29/2018 16:15 | 6 | 34.50 | 25.53 | 0.38 | | C | | 2703.3 | |
| 5036 | 6/29/2018 16:32 | 6 | 36.22 | | 0.27 | | C | 0.07 | 1190.0 | |
| 5037 | 6/29/2018 16:48 | 6 | 35.03 | | | | C | | 1565.8 | |
| 5038 | 6/29/2018 17:05 | 6 | 35.82 | | | | C | 0.09 | 1001.2 | |
| 5039 | 6/29/2018 17:21 | 6 | 35.03 | 30.86 | 0.36 | | U | 0.58 | 467.7 | |
| 5040 | 6/29/2018 17:38 | 6 | 34.18 | 25.60 | -0.02 | | U | 0.23 | 536.7 | 0.03 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 5041 | 6/29/2018 17:54 | 6 | 33.87 | 32.12 | | | U | 0.22 | 681.4 | 0.01 |
| 5042 | 6/29/2018 18:11 | 6 | 33.27 | | | | U | 0.27 | 966.1 | 0.04 |
| 5043 | 6/29/2018 20:15 | 6 | 28.50 | 24.95 | 0.38 | | C | | 2307.4 | |
| 5044 | 6/29/2018 20:32 | 6 | 29.12 | | 0.27 | | C | 0.09 | 992.1 | |
| 5045 | 6/29/2018 20:48 | 6 | 27.43 | | | | C | | 1717.8 | |
| 5046 | 6/29/2018 21:05 | 6 | 27.78 | | | | C | | 1104.4 | |
| 5047 | 6/29/2018 21:21 | 6 | 26.81 | 26.27 | 0.35 | | U | 0.51 | 828.1 | 0.01 |
| 5048 | 6/29/2018 21:38 | 6 | 26.34 | 20.76 | -0.04 | | U | 0.33 | 741.1 | 0.01 |
| 5049 | 6/29/2018 21:54 | 6 | 26.22 | 28.00 | | | U | 0.25 | 739.7 | 0.03 |
| 5050 | 6/29/2018 22:11 | 6 | 25.96 | | | | U | 0.30 | 1012.8 | |
| 5051 | 6/30/2018 0:15 | 6 | 24.66 | 23.99 | 0.37 | | C | 0.04 | 2323.5 | |
| 5052 | 6/30/2018 0:32 | 6 | 24.59 | | 0.26 | | C | 0.12 | 838.0 | |
| 5053 | 6/30/2018 0:48 | 6 | 23.64 | | | | C | | 1525.9 | |
| 5054 | 6/30/2018 1:05 | 6 | 23.52 | | | | C | 0.03 | 836.9 | |
| 5055 | 6/30/2018 1:21 | 6 | 22.94 | 23.16 | 0.35 | | U | 0.92 | 780.5 | |
| 5056 | 6/30/2018 1:38 | 6 | 22.84 | 17.61 | -0.04 | | U | 0.17 | 972.0 | 0.01 |
| 5057 | 6/30/2018 1:54 | 6 | 22.29 | 24.97 | | | U | 0.12 | 610.8 | 0.01 |
| 5058 | 6/30/2018 2:11 | 6 | 21.73 | | | | U | 0.30 | 961.1 | 0.05 |
| 5059 | 6/30/2018 4:15 | 6 | 20.09 | 22.71 | 0.37 | | C | 0.05 | 1887.4 | |
| 5060 | 6/30/2018 4:32 | 6 | 20.18 | | 0.26 | | C | 0.04 | 834.5 | |
| 5061 | 6/30/2018 4:48 | 6 | 20.19 | | | | C | 0.04 | 1543.1 | |
| 5062 | 6/30/2018 5:05 | 6 | 20.21 | | | | C | 0.08 | 809.2 | |
| 5063 | 6/30/2018 5:21 | 6 | 20.40 | 20.74 | 0.34 | | U | 0.15 | 819.8 | |
| 5064 | 6/30/2018 5:38 | 6 | 20.36 | 15.28 | -0.04 | | U | 0.17 | 670.0 | |
| 5065 | 6/30/2018 5:54 | 6 | 20.43 | 22.98 | | | U | 0.17 | 626.3 | 0.01 |
| 5066 | 6/30/2018 6:11 | 6 | 20.41 | | | | U | 0.28 | 775.7 | 0.01 |
| 5067 | 6/30/2018 8:15 | 6 | 21.22 | 22.05 | 0.37 | | C | 0.01 | 1891.3 | |
| 5068 | 6/30/2018 8:32 | 6 | 22.11 | | 0.26 | | C | 0.05 | 785.4 | |
| 5069 | 6/30/2018 8:48 | 6 | 23.82 | | | | C | | 1550.3 | |
| 5070 | 6/30/2018 9:05 | 6 | 24.39 | | | | C | 0.05 | 769.3 | 0.02 |
| 5071 | 6/30/2018 9:21 | 6 | 24.67 | 21.72 | 0.35 | | U | 0.38 | 736.9 | |
| 5072 | 6/30/2018 9:38 | 6 | 24.42 | 16.63 | -0.04 | | U | 0.17 | 553.4 | 0.03 |
| 5073 | 6/30/2018 9:55 | 6 | 22.69 | 23.48 | | | U | 0.18 | 426.8 | 0.02 |
| 5074 | 6/30/2018 10:11 | 6 | 21.90 | | | | U | 0.25 | 639.0 | 0.03 |
| 5075 | 6/30/2018 12:15 | 6 | 22.14 | 21.96 | 0.37 | | C | 0.03 | 1931.2 | |
| 5076 | 6/30/2018 12:32 | 6 | 21.83 | | 0.26 | | C | 0.04 | 620.9 | 0.21 |
| 5077 | 6/30/2018 12:48 | 6 | 20.22 | | | | C | 0.02 | 1380.5 | |
| 5078 | 6/30/2018 13:05 | 6 | 20.13 | | | | C | 0.08 | 1061.5 | |
| 5079 | 6/30/2018 13:21 | 6 | 21.26 | 20.83 | 0.35 | | U | 0.71 | 691.6 | |
| 5080 | 6/30/2018 13:38 | 6 | 24.62 | 15.93 | -0.04 | | U | 0.57 | 1095.6 | |
| 5081 | 6/30/2018 13:54 | 6 | 26.86 | 24.32 | | | U | 0.51 | 968.8 | 0.01 |
| 5082 | 6/30/2018 14:11 | 6 | 25.64 | | | | U | 0.54 | 867.3 | 0.04 |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 5083 | 6/30/2018 16:15 | 6 | 26.42 | 23.20 | 0.37 | | C | 0.02 | 2296.6 | |
| 5084 | 6/30/2018 16:32 | 6 | 26.56 | | 0.26 | | C | 0.12 | 899.9 | |
| 5085 | 6/30/2018 16:48 | 6 | 24.67 | | | | C | 0.01 | 1600.9 | |
| 5086 | 6/30/2018 17:05 | 6 | 25.44 | | | | C | 0.05 | 861.6 | |
| 5087 | 6/30/2018 17:21 | 6 | 25.43 | 23.98 | 0.35 | | U | 0.41 | 800.9 | |
| 5088 | 6/30/2018 17:38 | 6 | 24.77 | 18.44 | -0.04 | | U | 0.50 | 671.2 | 0.04 |
| 5089 | 6/30/2018 17:54 | 6 | 23.26 | 25.22 | | | U | 0.18 | 588.1 | 0.03 |
| 5090 | 6/30/2018 18:11 | 6 | 22.30 | | | | U | 0.47 | 701.4 | 0.01 |
| 5091 | 6/30/2018 20:15 | 6 | 20.21 | 22.04 | 0.38 | | C | 0.08 | 1863.8 | |
| 5092 | 6/30/2018 20:32 | 6 | 20.12 | | 0.28 | | C | 0.07 | 1073.5 | |
| 5093 | 6/30/2018 20:48 | 6 | 20.31 | | | | C | 0.04 | 2248.1 | |
| 5094 | 6/30/2018 21:05 | 6 | 20.17 | | | | C | 0.07 | 1067.6 | |
| 5095 | 6/30/2018 21:21 | 6 | 20.21 | 20.28 | 0.35 | | U | 0.59 | 916.6 | |
| 5096 | 6/30/2018 21:38 | 6 | 20.08 | 14.73 | -0.04 | | U | 0.48 | 795.0 | |
| 5097 | 6/30/2018 21:54 | 6 | 20.01 | 22.32 | | | U | 0.33 | 796.6 | |
| 5098 | 6/30/2018 22:11 | 6 | 19.97 | | | | U | 0.54 | 888.1 | |
| 5099 | 7/1/2018 0:15 | 6 | 20.00 | 21.43 | 0.40 | | C | 0.02 | 557.2 | |
| 5100 | 7/1/2018 0:32 | 6 | 19.66 | | 0.35 | | C | 0.10 | 530.0 | |
| 5101 | 7/1/2018 0:49 | 6 | 19.76 | | | | C | 0.14 | 2110.6 | |
| 5102 | 7/1/2018 1:05 | 6 | 19.64 | | | | C | 0.02 | 297.0 | |
| 5103 | 7/1/2018 1:22 | 6 | 19.64 | 19.06 | 0.40 | | U | 0.48 | 284.4 | |
| 5104 | 7/1/2018 1:38 | 6 | 19.41 | 13.47 | -0.04 | | U | 0.21 | 158.8 | |
| 5105 | 7/1/2018 1:55 | 6 | 19.33 | 21.09 | | | U | 0.21 | 225.7 | |
| 5106 | 7/1/2018 2:11 | 6 | 19.35 | | | | U | 0.23 | 113.6 | |
| 5107 | 7/1/2018 4:15 | 6 | 18.89 | 20.79 | 0.41 | | C | | 607.6 | |
| 5108 | 7/1/2018 4:32 | 6 | 18.42 | | 0.36 | | C | 0.07 | 118.3 | |
| 5109 | 7/1/2018 4:48 | 6 | 18.74 | | | | C | 0.24 | 4734.2 | |
| 5110 | 7/1/2018 5:05 | 6 | 18.58 | | | | C | 0.04 | 348.6 | |
| 5111 | 7/1/2018 5:21 | 6 | 18.63 | 18.02 | 0.41 | | U | 1.19 | 203.2 | |
| 5112 | 7/1/2018 5:38 | 6 | 18.40 | 12.48 | 0.36 | | U | 0.20 | 158.3 | |
| 5113 | 7/1/2018 5:55 | 6 | 18.08 | 20.07 | | | U | 0.04 | 69.6 | |
| 5114 | 7/1/2018 6:11 | 6 | 18.02 | | | | U | 0.35 | 38.1 | |
| 5115 | 7/1/2018 8:15 | 6 | 16.70 | 19.53 | 0.42 | | C | 0.01 | 368.2 | 0.42 |
| 5116 | 7/1/2018 8:32 | 6 | 16.17 | | 0.37 | | C | 0.05 | 124.3 | |
| 5117 | 7/1/2018 8:48 | 6 | 16.90 | | | | C | 0.37 | 4320.3 | |
| 5118 | 7/1/2018 9:05 | 6 | 16.91 | | | | C | 0.02 | 223.1 | |
| 5119 | 7/1/2018 9:22 | 6 | 17.42 | 16.65 | 0.41 | | U | 0.97 | 285.8 | |
| 5120 | 7/1/2018 9:38 | 6 | 17.94 | 11.44 | 0.92 | | U | 0.13 | 167.1 | |
| 5121 | 7/1/2018 9:55 | 6 | 19.49 | 19.20 | | | U | 0.41 | 269.0 | |
| 5122 | 7/1/2018 10:11 | 6 | 21.18 | | | | U | 0.67 | 438.0 | 0.01 |
| 5123 | 7/1/2018 12:15 | 6 | 27.42 | 20.90 | 0.41 | | C | 0.06 | 1969.3 | |
| 5124 | 7/1/2018 12:32 | 6 | 25.95 | | 0.35 | | C | 0.20 | 1027.3 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 5125 | 7/1/2018 12:48 | 6 | 29.69 | | | | C | 0.71 | 2282.4 | |
| 5126 | 7/1/2018 13:05 | 6 | 27.92 | | | | C | 0.16 | 761.1 | 0.01 |
| 5127 | 7/1/2018 13:21 | 6 | 28.90 | 25.57 | 0.39 | | U | 2.11 | 1067.3 | |
| 5128 | 7/1/2018 13:38 | 6 | 28.38 | 20.23 | 0.68 | | U | 1.55 | 775.2 | 0.07 |
| 5129 | 7/1/2018 13:54 | 6 | 29.15 | 25.93 | | | U | 1.90 | 1112.1 | 0.02 |
| 5130 | 7/1/2018 14:11 | 6 | 30.31 | | | | U | 2.44 | 1298.6 | 0.07 |
| 5131 | 7/1/2018 16:15 | 6 | 26.97 | 23.55 | 0.41 | | C | 0.02 | 2315.5 | |
| 5132 | 7/1/2018 16:32 | 6 | 27.06 | | 0.33 | | C | 0.19 | 1331.1 | |
| 5133 | 7/1/2018 16:48 | 6 | 25.11 | | | | C | 0.33 | 2241.2 | |
| 5134 | 7/1/2018 17:05 | 6 | 23.44 | | | | C | 0.08 | 1132.6 | |
| 5135 | 7/1/2018 17:21 | 6 | 23.14 | 24.00 | 0.38 | | U | 0.78 | 986.7 | |
| 5136 | 7/1/2018 17:38 | 6 | 23.23 | 18.09 | 0.52 | | U | 0.49 | 570.6 | |
| 5137 | 7/1/2018 17:54 | 6 | 26.36 | 25.05 | | | U | 0.66 | 1037.2 | 0.01 |
| 5138 | 7/1/2018 18:11 | 6 | 28.21 | | | | U | 0.92 | 1044.4 | 0.05 |
| 5139 | 7/1/2018 20:15 | 6 | 22.93 | 22.45 | 0.41 | | C | | 1511.7 | |
| 5140 | 7/1/2018 20:32 | 6 | 24.49 | | 0.32 | | C | 0.11 | 1126.0 | |
| 5141 | 7/1/2018 20:48 | 6 | 21.90 | | | | C | 0.14 | 1680.1 | |
| 5142 | 7/1/2018 21:05 | 6 | 21.98 | | | | C | 0.15 | 1022.6 | |
| 5143 | 7/1/2018 21:21 | 6 | 20.12 | 21.11 | 0.38 | | U | 0.62 | 877.1 | |
| 5144 | 7/1/2018 21:38 | 6 | 19.41 | 15.42 | 0.34 | | U | 0.42 | 639.7 | |
| 5145 | 7/1/2018 21:54 | 6 | 19.09 | 22.95 | | | U | 0.56 | 782.8 | |
| 5146 | 7/1/2018 22:11 | 6 | 18.56 | | | | U | 0.55 | 839.1 | |
| 5147 | 7/2/2018 0:15 | 6 | 17.90 | 21.14 | 0.41 | | C | 0.03 | 1278.6 | |
| 5148 | 7/2/2018 0:32 | 6 | 17.38 | | 0.32 | | C | 0.12 | 928.3 | |
| 5149 | 7/2/2018 0:49 | 6 | 17.50 | | | | C | | 1463.4 | |
| 5150 | 7/2/2018 1:05 | 6 | 17.03 | | | | C | 0.13 | 864.1 | |
| 5151 | 7/2/2018 1:22 | 6 | 17.11 | 17.79 | 0.38 | | U | 0.56 | 744.9 | |
| 5152 | 7/2/2018 1:38 | 6 | 16.81 | 12.11 | 0.33 | | U | 0.28 | 532.8 | |
| 5153 | 7/2/2018 1:55 | 6 | 16.75 | 20.05 | | | U | 0.44 | 654.1 | |
| 5154 | 7/2/2018 2:11 | 6 | 16.62 | | | | U | 0.39 | 664.4 | |
| 5155 | 7/2/2018 4:15 | 6 | 16.49 | 20.12 | 0.41 | | C | | 1101.7 | |
| 5156 | 7/2/2018 4:32 | 6 | 16.20 | | 0.33 | | C | 0.09 | 885.1 | |
| 5157 | 7/2/2018 4:48 | 6 | 16.21 | | | | C | 0.05 | 1391.7 | |
| 5158 | 7/2/2018 5:05 | 6 | 15.36 | | | | C | 0.07 | 779.8 | |
| 5159 | 7/2/2018 5:21 | 6 | 15.39 | 16.23 | 0.38 | | U | 0.42 | 722.0 | |
| 5160 | 7/2/2018 5:38 | 6 | 14.98 | 10.56 | 0.31 | | U | 0.27 | 552.8 | |
| 5161 | 7/2/2018 5:54 | 6 | 14.85 | 18.53 | | | U | 0.33 | 565.2 | 0.06 |
| 5162 | 7/2/2018 6:11 | 6 | 14.73 | | | | U | 0.42 | 624.8 | 0.01 |
| 5163 | 7/2/2018 8:15 | 6 | 18.63 | 19.65 | 0.41 | | C | | 1067.6 | 0.14 |
| 5164 | 7/2/2018 8:32 | 6 | 20.33 | | 0.33 | | C | 0.10 | 894.4 | 0.01 |
| 5165 | 7/2/2018 8:48 | 6 | 20.36 | | | | C | 0.01 | 1386.6 | |
| 5166 | 7/2/2018 9:05 | 6 | 21.67 | | | | C | 0.12 | 923.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 5167 | 7/2/2018 9:21 | 6 | 22.36 | 19.05 | 0.38 | | U | 0.46 | 945.7 | |
| 5168 | 7/2/2018 9:38 | 6 | 23.04 | 14.35 | 0.30 | | U | 0.21 | 542.9 | 0.02 |
| 5169 | 7/2/2018 9:55 | 6 | 24.80 | 21.73 | | | U | 0.46 | 677.2 | 0.02 |
| 5170 | 7/2/2018 10:11 | 6 | 24.98 | | | | U | 0.61 | 684.9 | 0.01 |
| 5171 | 7/2/2018 12:15 | 6 | 28.67 | 21.54 | 0.41 | | C | 0.01 | 1865.8 | |
| 5172 | 7/2/2018 12:32 | 6 | 29.11 | | 0.32 | | C | 0.11 | 1401.2 | |
| 5173 | 7/2/2018 12:48 | 6 | 29.46 | | | | C | | 1736.1 | |
| 5174 | 7/2/2018 13:05 | 6 | 30.54 | | | | C | 0.11 | 1353.1 | 0.20 |
| 5175 | 7/2/2018 13:21 | 6 | 30.67 | 25.06 | 0.38 | | U | 0.57 | 1302.9 | |
| 5176 | 7/2/2018 13:38 | 6 | 30.06 | 19.68 | 0.33 | | U | 0.45 | 1306.6 | 0.02 |
| 5177 | 7/2/2018 13:54 | 6 | 30.67 | 27.12 | | | U | 0.61 | 1181.4 | 0.07 |
| 5178 | 7/2/2018 14:11 | 6 | 30.69 | | | | U | 1.16 | 1256.9 | 0.02 |
| 5179 | 7/2/2018 16:15 | 6 | 30.21 | 23.37 | 0.40 | | C | 0.06 | 3107.8 | |
| 5180 | 7/2/2018 16:32 | 6 | 30.85 | | 0.31 | | C | 0.25 | 1537.3 | |
| 5181 | 7/2/2018 16:48 | 6 | 30.86 | | | | C | 0.03 | 1716.3 | |
| 5182 | 7/2/2018 17:05 | 6 | 31.99 | | | | C | 0.11 | 1433.8 | |
| 5183 | 7/2/2018 17:21 | 6 | 31.19 | 27.05 | 0.37 | | U | 0.51 | 1392.0 | |
| 5184 | 7/2/2018 17:38 | 6 | 29.39 | 19.94 | 0.38 | | U | 0.23 | 1101.9 | 0.01 |
| 5185 | 7/2/2018 17:55 | 6 | 29.15 | 26.93 | | | U | 0.56 | 1008.2 | 0.01 |
| 5186 | 7/2/2018 18:11 | 6 | 27.77 | | | | U | 0.63 | 910.5 | 0.04 |
| 5187 | 7/2/2018 20:15 | 6 | 24.38 | 22.62 | 0.40 | | C | 0.02 | 2697.3 | |
| 5188 | 7/2/2018 20:32 | 6 | 24.52 | | 0.30 | | C | 0.13 | 1103.4 | |
| 5189 | 7/2/2018 20:48 | 6 | 24.04 | | | | C | 0.03 | 1483.1 | |
| 5190 | 7/2/2018 21:05 | 6 | 24.07 | | | | C | 0.07 | 1045.0 | |
| 5191 | 7/2/2018 21:21 | 6 | 23.74 | 22.40 | 0.37 | | U | 0.13 | 1243.6 | |
| 5192 | 7/2/2018 21:38 | 6 | 23.36 | 15.95 | 0.28 | | U | 0.32 | 1059.6 | |
| 5193 | 7/2/2018 21:54 | 6 | 23.20 | 23.43 | | | U | 0.36 | 878.1 | |
| 5194 | 7/2/2018 22:11 | 6 | 23.09 | | | | U | 0.45 | 772.9 | 0.01 |
| 5195 | 7/3/2018 0:15 | 6 | 21.94 | 21.72 | 0.40 | | C | 0.02 | 2595.4 | |
| 5196 | 7/3/2018 0:32 | 6 | 22.11 | | 0.30 | | C | 0.10 | 1205.7 | |
| 5197 | 7/3/2018 0:49 | 6 | 22.35 | | | | C | | 1400.7 | |
| 5198 | 7/3/2018 1:05 | 6 | 23.27 | | | | C | 0.05 | 923.3 | |
| 5199 | 7/3/2018 1:22 | 6 | 23.04 | 20.56 | 0.37 | | U | 0.34 | 865.5 | 0.12 |
| 5200 | 7/3/2018 1:38 | 6 | 22.50 | 14.51 | 0.27 | | U | 0.41 | 709.3 | 0.01 |
| 5201 | 7/3/2018 1:55 | 6 | 22.25 | 22.19 | | | U | 0.31 | 715.0 | 0.01 |
| 5202 | 7/3/2018 2:11 | 6 | 22.29 | | | | U | 0.58 | 841.9 | 0.02 |
| 5203 | 7/3/2018 4:15 | 6 | 19.68 | 21.11 | 0.40 | | C | | 1669.3 | |
| 5204 | 7/3/2018 4:32 | 6 | 19.58 | | 0.31 | | C | 0.09 | 277.3 | |
| 5205 | 7/3/2018 4:48 | 6 | 20.00 | | | | C | 0.05 | 1876.3 | |
| 5206 | 7/3/2018 5:05 | 6 | 20.01 | | | | C | 0.04 | 586.4 | |
| 5207 | 7/3/2018 5:21 | 6 | 20.34 | 19.21 | 0.37 | | U | 0.45 | 704.8 | |
| 5208 | 7/3/2018 5:38 | 6 | 19.92 | 13.34 | 0.23 | | U | 0.28 | 356.4 | |

| ID # | Date & Time | Run | A Tmp | S Tmp | N Mst | NS Mst | Trt | $N_2O$-N | $CO_2$-C | $NH_3$-N |
|---|---|---|---|---|---|---|---|---|---|---|
| 5209 | 7/3/2018 5:54 | 6 | 19.58 | 20.93 | | | U | 0.15 | 121.1 | |
| 5210 | 7/3/2018 6:11 | 6 | 19.37 | | | | U | 0.14 | 183.4 | |
| 5211 | 7/3/2018 8:15 | 6 | 18.78 | 20.48 | 0.41 | | C | | 580.2 | |
| 5212 | 7/3/2018 8:32 | 6 | 18.68 | | 0.37 | | C | 0.07 | 497.7 | |
| 5213 | 7/3/2018 8:48 | 6 | 18.91 | | | | C | 0.23 | 3002.4 | |
| 5214 | 7/3/2018 9:05 | 6 | 18.72 | | | | C | 0.08 | 477.1 | |
| 5215 | 7/3/2018 9:21 | 6 | 19.16 | 18.12 | 0.40 | | U | 0.82 | 1621.9 | |
| 5216 | 7/3/2018 9:38 | 6 | 19.76 | 12.48 | 0.58 | | U | 0.35 | 1654.5 | |
| 5217 | 7/3/2018 9:55 | 6 | 21.13 | 20.50 | | | U | 1.41 | 766.6 | |
| 5218 | 7/3/2018 10:11 | 6 | 21.23 | | | | U | 1.18 | 332.0 | |