Permit to Construct Modification

Sorrento Lactalis, Inc.
Facility ID No. 027-00071
Permit to Construct P-2007.0023

Consent Order Case No. E-2014.0007 & E-2015.0003

RECEIVED
APR 2 6 2016
DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE A Q PROGRAM

RECEIVED
APR 2 2 2016
DEPARTMENT OF
ENVIRONMENTAL QUALITY
BOISE REGIONAL OFFICE

V#00501816 AD

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Cover Sheet for Air Permit Application – Permit to Construct **Form CSPTC**

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER			
1. Company Name	Sorrento Lactalis		
2. Facility Name	Same	3. Facility ID No.	027-00071
4. Brief Project Description - One sentence or less	MODIFICATION OF PTC PER CONSENT ORDERS E-2014.0007 & E2015.0003		

PERMIT APPLICATION TYPE

5. ☐ New Source ☐ New Source at Existing Facility ☐ PTC for a Tier I Source Processed Pursuant to IDAPA 58.01.01.209.05.c
☐ Unpermitted Existing Source ☐ Facility Emissions Cap ☒ Modify Existing Source: Permit No.: P-2009.0023 Date Issued: 5/1/15
☒ Required by Enforcement Action: Case No.: E-2014.0007 & E2015.0003

6. ☐ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms		DEQ Verify
☒	☐	Form CSPTC – Cover Sheet		☐
☒	☐	Form GI – Facility Information		☐
☒	☐	Form EU0 – Emissions Units General		☐
☒	☐	Form EU1– Industrial Engine Information	Please specify number of EU1s attached: 1	☐
☐	☒	Form EU2– Nonmetallic Mineral Processing Plants	Please specify number of EU2s attached: ____	☐
☐	☒	Form EU3– Spray Paint Booth Information	Please specify number of EU3s attached: ____	☐
☐	☒	Form EU4– Cooling Tower Information	Please specify number of EU3s attached: ____	☐
☒	☐	Form EU5 – Boiler Information	Please specify number of EU5s attached: 4	☐
☐	☒	Form CBP– Concrete Batch Plant	Please specify number of CBPs attached: ____	☐
☐	☒	Form HMAP – Hot Mix Asphalt Plant	Please specify number of HMAPs attached: ____	☐
☐	☒	PERF – Portable Equipment Relocation Form		☐
☐	☒	Form AO – Afterburner/Oxidizer		☐
☐	☒	Form CA – Carbon Adsorber		☐
☐	☒	Form CYS – Cyclone Separator		☐
☐	☒	Form ESP – Electrostatic Precipitator		☐
☒	☐	Form BCE– Baghouses Control Equipment		☐
☒	☐	Form SCE– Scrubbers Control Equipment		☐
☒	☐	Form VSCE – Venturi Scrubber Control Equipment		☐
☐	☒	Form CAM – Compliance Assurance Monitoring		☐
☒	☐	Forms EI-– Emissions Inventory		☐
☒	☐	PP – Plot Plan -		☐
☒	☐	Forms MI1 – MI4 – Modeling	(Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability		☐

Instructions for Form CSPTC

This form is the cover sheet for an air quality permit application. It provides DEQ with basic information regarding the company and the proposed permitting action. This form helps DEQ efficiently determine whether the application is administratively complete. This form also provides the applicant with a list of forms available to aid the applicant to successfully submit a complete application.

Company Name, Facility Name, and Facility ID Number

1-3. Provide the name of your company, the name of the facility (if different than company name), and the facility identification (ID) number (Facility ID No.) in the boxes provided. The facility ID number is also known as the AIRS number or AIRS/AFS number (example: 095-00077). If you already have a permit, the facility ID number is located in the upper right hand corner of the cover page. The facility ID number must be provided unless your facility has not received one, in which case you may leave this box empty. **Use these same names and ID number on all forms**. This is useful in case any pages of the application are separated.

4. Provide a brief description of this permitting project in one sentence or less. Examples might be "Install/construct a new boiler" or "Increase the allowable process throughput." **This description will be used by DEQ as a unique identifier for this permitting project, in conjunction with the name(s) and ID number referenced in 1-3.** You will need to put this description, using the exact same words, on all other forms that are part of this project application. This is useful in case any pages of the application are separated.

Permit Application Type

5. Provide the reason you are submitting the permit application by checking the appropriate box (e.g., a new facility being constructed, a new source being constructed at an existing facility, an unpermitted existing source (as-built) applying for a permit for the first time, a permitted source to be modified, or the permit application is the result of an enforcement action, in which case provide the case number). If you are modifying an existing permitted source, provide the number and issue date of the most recent permit.

   If this PTC is for a Tier I source issued pursuant to the procedures contained at IDAPA 58.01.01.209.05.c, the source or modification may operate upon submittal of a Tier I Administrative Amendment issued pursuant to IDAPA 58.01.01.381.

6. Indicate if the application is a minor permit to construct application or a major permit to construct application by checking the appropriate box (e.g., major PTC or minor PTC). If the permit to construct application is for a major new source or major modification, you must ensure that all necessary information required by IDAPA 58.01.01.202, and .204, or .205, as applicable, is provided.

Forms Included

Check the "Included" box for each form included in this permit to construct application. If there are multiples of a form for multiple units of that type, check the box and fill in the number of forms in the blank provided.

The "N/A" box should only be checked if the form is absolutely unnecessary to complete the application. Additional information may be requested.

Application Fee

All applicants for a PTC shall submit a PTC application fee of $1000.00 to DEQ <u>at the time of the original submission of the application</u> as required by IDAPA 58.01.01.224. An application fee is not required for exemption applicability determinations, typographical errors, and name or ownership changes. An application fee can be paid by check, credit card, or Electronic Funds Transfer (EFT). If you choose to pay by credit card or EFT, call DEQs Fiscal Office to complete the necessary paperwork. Paper checks must be submitted with the original application as described below.

Submit Application

When complete, enclose a check for the application fee along with the hardcopy application certified by a responsible official (as defined in IDAPA 58.01.01.006.94), and send to:

Air Quality Program Office – Application Processing
Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706-1255

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Preapplication Meeting Information Form FRA (Federal Requirements Applicability) - Regulatory Review

In each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION	
1. Company Name: SORRENTO LACTALIS	2. Facility Name: SORRENTO LACTALIS
3. Brief Project Description: MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003	

APPLICABILITY DETERMINATION	
4. List all applicable subparts of the New Source Performance Standards (NSPS) (40 CFR part 60). List all non-applicable subparts of the NSPS which may appear to apply to the facility but do not. Examples of NSPS-affected emissions units include internal combustion engines, boilers, turbines, etc. Applicant must thoroughly review the list of affected emissions units.	List of all applicable subpart(s): 40 CFR Part 60 Subpart Dc List of all non-applicable subpart(s) which may appear to apply but do not: ☑ Not Applicable
5. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR part 61 and 40 CFR part 63). List all non-applicable subparts of the NESHAP which may appear to apply to the facility but do not. Examples of affected emission units include solvent cleaning operations, industrial cooling towers, paint stripping and miscellaneous surface coating. Reference EPA's webpage on NESHAPs for more information.	List of all applicable subpart(s): 40 CFR Part 63 Subpart ZZZZ List of all non-applicable subpart(s) which may appear to apply but do not: ☑ Not Applicable
6. For each subpart identified above, conduct a complete regulatory analysis using the instructions and referencing the example on the following pages. **Note** - Regulatory reviews must be submitted with sufficient detail so that DEQ can verify applicability and document in legal terms why the regulation does or does not apply. Regulatory reviews submitted with insufficient detail will be determined incomplete.	☑ A detailed regulatory review is provided (Follow instructions and example). ☐ DEQ has already been provided a detailed regulatory review. Give a reference to the document including the date.

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT.

It is emphasized that it is the applicant's responsibility to satisfy all technical and regulatory requirements, and that DEQ will help the applicant understand those requirements prior to submittal of the application but that DEQ will not perform the required technical or regulatory analyses on the applicant's behalf.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline: 1-877-5PERMIT

General Information **Form GI**
Revision 7
6/29/12

Please see instructions on back page before filling out the form. All information is required. If information is missing, the application will not be processed.

Identification

1. Facility name Sorrento Lactalis

2. Existing facility identification number 027-00071

☐ **Check if new facility (not yet operating)**

3. Brief project description Update, modification of existing PTC as required by Consent Orders E-2014.0007 & E-2015.0003.

Facility Information

4. Primary facility permitting contact name Nicolas Depuydt **Contact type** Responsible official

Telephone number 208-463-6683 **E-mail** nicolas.depuydt@lactalis.us

5. Alternate facility permitting contact name Wendy York **Alternate contact type** Facility permitting contact

Telephone number 208-463-6674 **E-mail** wendy.york@lactalis.us

6. Mailing address where permit will be sent (street/city/county/state/zip code) 4912 East Franklin Road/Nampa/Canyon County/ID/83687

7. Physical address of permitted facility (if different than mailing address) (street/city/county/state/zip code) same

8. Is the equipment portable? ☐ **Yes*** ☒ **No** ***If yes, complete and attach PERF; see instructions.**

9. NAICS codes: Primary NAICS 311514 **Secondary NAICS** 311513

10. Brief business description and principal product produced Cheese and Whey Powder Manufacturer

11. Identify any adjacent or contiguous facility this company owns and/or operates N/A

12. Specify type of application ☒ **Permit to construct (PTC); application fee of $1,000 required. See instructions.**

☐ **Tier I permit** ☐ **Tier II permit** ☐ **Tier II/Permit to construct**

For Tier I permitted facilities only: If you are applying for a PTC then you must also specify how the PTC will be incorporated into the Tier I permit.

☐ **Co-process Tier I modification and PTC** ☐ **Incorporate PTC at the time of Tier I renewal** ☐ **Administratively amend the Tier I permit to incorporate the PTC upon applicant's request (IDAPA 58.01.01.209.05.a, b, or c)**

Certification

In accordance with IDAPA 58.01.01.123 (Rules for the Control of Air Pollution in Idaho), I certify based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.

13. Responsible official's name Nicolas Depuydt **Official's title** Nampa Site Director

Official's address 4912 E. Franklin Road, Nampa, ID 83687

Telephone number 208-463-6683 **E-mail** nicolas.depuydt@lactalis.us

Official's signature **Date** 4/22/2016

☒ **14. Check here to indicate that you want to review the draft permit before final issuance.**

Instructions for Form GI

This form is used by DEQ to identify a company or facility, equipment locations, and personnel involved with the permit application. Additional information may be required.

Identification

1. Provide the facility name. If the facility is *doing business as* (dba) a facility different in name than the primary facility, provide the dba name.
2. If the facility is an existing permitted facility in Idaho, provide the facility identification number. If the facility is new and not yet operating, check the box.
3. Provide a brief project description as on Form CS, Cover Sheet. This is useful in case any pages of the application are separated.

Facility information

4. Provide name of the *primary* person who should be contacted regarding this permit. Provide telephone number and e-mail address for the primary person.
5. Provide name of an *alternate* person who should be contacted if the person listed in 4 is not available. Provide telephone number and e-mail address for the alternate person.
6. Provide the mailing address where DEQ should mail the permit.
7. Provide the physical address where the equipment is located (if different than 6).
8. Indicate if the permitted equipment is portable by checking the appropriate box. If the permitted equipment is portable, complete and attach the Portable Equipment Relocation Form (PERF) to this application. The PERF is available from DEQ's website at http://www.deq.idaho.gov/media/576773-ptc_relocation.pdf or http://www.deq.idaho.gov/media/576769-ptc_relocation.doc (for Word format).
9. Provide the North American Industry Classification System (NAICS) code for your facility. NAICS codes can be found at http://www.census.gov/epcd/naics02/naicod02.htm.
10. Describe the primary activity and principal product of your business as it relates to the NAICS code listed in 9.
11. Identify and describe any other sources or equipment owned and operated by the primary facility that are located on contiguous or adjacent properties and the role the source or equipment plays in supporting the primary facility.
12. Check the box describing the type of permit application.

    Important note: If application is for a permit to construct (PTC), include the application fee of $1,000 when submitting the application. Per IDAPA 58.01.01.226.02, DEQ cannot process the application without the fee, which must be submitted with the application.

    For existing Tier I facilities that are applying for a PTC, the applicant must specify how the PTC will be incorporated into the Tier I permit (IDAPA 58.01.01.209.05). If you have questions, call the Air Permit Hotline at 1-877-573-7648.

Certification

13. Provide the name, title, address, telephone number, and e-mail of the facility's responsible official. Responsible official is defined in IDAPA 58.01.01.006.99. The responsible official must sign and date the application before it is submitted to DEQ.
14. Check this box to indicate that you want to review a draft before the final permit is issued.

Permit to Construct Modification

Sorrento Lactalis, Inc.
Facility ID No. 027-00071
Permit to Construct P-2007.0023

Consent Order Case No. E-2014.0007 & E-2015.0003

Table of Contents

		Page
1	Introduction	
	1.1 General	4
	1.2 Cheese Plant Process	5
	1.3 Whey Plant Process	10
	1.4 Wastewater Treatment Plant Process	15
	1.5 Fresh Mozzarella Plant Process	16
	1.6 Fire Pump House	16
	1.7 Summary	17
2	Applicable Requirements	
	2.1 Federal Requirements	19
	2.2 State Requirements	21
3	Potential to Emit/Emissions Estimates/Limitations on Potential to Emit	
	3.1 Emissions Estimates and Past Test Results	28
	3.2 Process Weight Rule	29
	3.3 Fuel-Burning Equipment – Particulate Matter	29
	3.4 Limitations on Potential to Emit	29
4	Facility Classification	30
5	Ambient Impact Assessment	31
Appendices		
	1. Plot Plan	
	2. Ambient Air Quality Dispersion Modeling Analysis Report	
	3. Emissions Inventory	
	4. Performance Test Results	
	a. TetraPak Whey Dryer Baghouse	
	b. TetraPak Whey Dryer Scrubber	
	c. Meyers-Sterner Whey Dryer Baghouse	
	5. 2009 PTC Application	
	6. DEQ Equipment Forms	

List of Figures

Figure 1	WPC (Meyers-Sterner) Dryer Process Flow Diagram	11
Figure 2	Permeate (TetraPak) Dryer Process Flow Diagram	13

List of Tables

Table 1	Donaldson Dust Collector PM Schedule	6
Table 2	Cheese Plant HVAC Units	7
Table 3	Boilers	8
Table 4	Whey Plant HVAC Units	14
Table 5	Fresh Mozzarella Plant HVAC Units	16
Table 6	Sorrento Lactalis Emission Points	17

able 7	Summary of Applicable Federal Requirements and Emission Points	21
Table 8	Summary of Emission Points and Applicable State Requirements	26
Table 9	Summary of Applicable State Requirements and Emission Points	27
Table 10	Performance Test Emissions	27
Table 11	Emissions from Natural Gas-Fired Combustion	29
Table 12	Process Limitations	30

1 Introduction

This document is a request for modification to the Permit to Construct P-2009.0023 for Sorrento Lactalis, Inc., Facility ID No. 027-0071. This modification is made in accordance with Consent Order Case Numbers E-2014.0007 and E-2015.0003. This application updates the application submittals for the following permits, the terms and conditions of which no longer apply:

- PTC P-2009.0023, issued May 1, 2015
- PTC P-2009.0023, issued March 13, 2014
- PTC P-2009.0023, issued August 28, 2009
- PTC No. 027-00071, issued July 20, 2001

The purpose of this application is to:

- Correct the heat input rating for the 600 boiler horsepower (HP) Cleaver Brooks Boiler from 20.1 to 24.5 million British thermal units per hour (MMBtu/hr).
- Reflect the 2014 replacement of the 600 HP burner in the Superior Boiler with an 800 HP burner. The old burner was rated at 20.1 MMBtu/hr. The 800 HP burner was rated at 31.5 MMBtu/hr, but was modified and down-rated by the manufacturer to 24.8 MMBtu/hr. Show that the derating met EPA's 4-factor test.
- Demonstrate compliance with ambient air quality standards (in particular, with the 1-hour NO_2 National Ambient Air Quality Standard (NAAQS) for natural gas combustion emissions from heaters/air handling units serving the entire facility and which were installed between the years 1999 and 2013.
- Revise the minimum average pressure drop for the TetraPak Whey Dryer Scrubber to 5.25 inches water gauge (" w.g.") and the minimum average scrubber liquid flow rate to 599 gallons per minute (gpm), as measured during the October 2, 2014 source test. Include permit conditions for periodic monitoring of both the scrubber pressure drop and liquid flow rate. Incorporate a requirement to conduct a performance test on the scrubber by October 1, 2017 to demonstrate compliance with the PM_{10} emissions rate limit listed in the revised (2016) PTC.

The increase in regulated facility-wide emissions associated with this permitting action is summarized in the Emissions Inventory (see Appendix 3).

1.1 General

Sorrento Lactalis' (Sorrento) Nampa facility produces natural cheese (SIC code 2022), dry whey products (SIC code 2023), and cultured cream cheese (SIC code 2026). Sorrento is located outside Nampa in southwest Idaho in a moderately populated area near Boise, Idaho. The facility current employs about 704 people. The Sorrento Lactalis facility consists of the following plants and operates in some fashion 24 hours/day, 365 days/year.

- Cheese Plant
- Whey Plant
- Wastewater Treatment Plant (WWTP)
- Fresh Mozzarella Plant

The facility includes auxiliary buildings such as the fire pump house that is used for the pump that pressurizes and provides water to the fire sprinkler systems in each of the plants

1.2 Cheese Plant Process

The Cheese Plant receives approximately 4 million pounds of cows' milk every day from local dairies. This milk is pasteurized and processed to yield slightly less than 200 million pounds of cheese every year. The process to produce cheese yields a product, whey, which is collected and transported to the Whey Plant for further processing. Slightly less than 100 million pounds of whey powder product is produced every year.

The cheese-making process requires pasteurized milk in a cheese vat to be brought to a specific temperature to promote the growth of bacteria that feed on lactose and ferments the lactose into lactic acid. These bacteria are typically added from a culture of starter bacteria. When sufficient lactic acid has developed, rennet is added to cause the casein (protein) to precipitate in the form of curd. As the curd is formed, milk fat is trapped within the casein matrix. Once the cheese curd is ready, the cheese whey is released to begin the partial dehydration of the curd. This whey is transported to the Whey Plant via pipeline. The curd/whey separation is accomplished by using long, blunt knives to cut the curd and turned to release the whey and followed by a process in which the curd it conveyed over a long semi-permeable belt that allows the whey to continue to drain off the curd. The curd is then piped to cookers then molds. The curds or cheese is then released from the molds into a brine flume. The brine cools the cheese and the salt in the brine adds flavor while it stops the fermentation process, preserving the cheese.

After curing or brining, the cheese product is packaged, boxed, and stored in a refrigerated warehouse until it is shipped. The Sorrento Lactalis Cheese Plant produces mozzarella cheese, a variety of string cheeses and mascarpone. In addition, the Cheese Plant receives other types of cheeses from other manufacturers and slices or shreds them, mixing them with Sorrento Lactalis cheeses in some cases. Shredded and sliced cheeses (referred to as cheese sticks) are packaged, boxed, and stored in a refrigerated warehouse until it is shipped. Shredded cheese is mixed with an anti-cake material consisting of cornstarch and rice flour to prevent the cheese from clumping. Most of the material that becomes airborne settles on the surface where it is washed to the drain to the WWTP, the finer particles are captured by a Donaldson Dust Collector with Dura-Life Filters. The Donaldson unit exhausts outside (P-40) and has emission test results of 0.0028 grains per dry standard cubic foot (gr/dscf), well below the EPA 0.05 gr/dscf requirement.

The Donaldson unit exhaust is monitored daily while in operation. The Preventive Maintenance schedule is per manufacturer recommendations and is provided in Table 1.

Table 1 – Donaldson Dust Collection PM Schedule

Donaldson® Torit® Preventative Maintenance Schedule for DF, DFT, DFO, TD, HP, PJ, Unicell, Maxcell Dust Collectors		
Item	**Frequency**	**Procedure**
Monitor Exhaust of Fan to ensure filter integrity.	Daily	Monitor exhaust from fan. The exhaust should remain visually clean. If a leak of dust develops, it will be noticed as a visual puff from the fan exhaust immediately after a cleaning pulse. If dust is visible consult Installation and Operation Manual for troubleshooting recommendations.
Dust Discharge Drums	Daily	Initially, monitor the level of dust in the dust pail or 55 gallon drums every day. The amount of dust will vary depending upon the amount of contaminant generated, and the frequency of collector pulse cleaning. Based upon this information, adjust PM schedule frequency as needed. Never allow dust in barrel to fill within 4-6 inches of top of barrel.
Hopper Discharge System (Rotary Airlocks, Screw Conveyors, etc.)	Weekly	Verify operation of the hopper discharge system. Discharge system must be operational when the dust collector and fan are operating to collect dust. Make sure that the hopper discharge openings are airtight. Consult Installation and Operation Manuals for troubleshooting recommendations.
Collector Filter Pressure Drop	Weekly	Visually inspect and record the operating pressure drop across each dust collector. It is normal for the pressure drop to fluctuate during operation as the collector passes through cleaning cycles, and as production schedules fluctuate form light to heavy. New filters may have a pressure drop of less than 1" w.g., however, as filters become seasoned, they will reach an equilibrium pressure drop. Generally 1-6" w.g. is considered normal. An excessively high pressure drop could be an indication of a malfunction of the cleaning mechanism, excessive airflow, plugged filters, or heavy dust loading conditions. Consult Installation and Operation Manuals for troubleshooting recommendations.
HEPA Afterfilter Pressure Drop	Weekly	Visually inspect and record the operating pressure drop across each afterfilter. A slight incremental increase in pressure drop is normal *(approximately 0.25" w.g. per month)*. An excessively faster pressure drop rise could be an indication of a dust collector filter failure.
Filter Pressure Drop Pneumatic Lines	Monthly	To ensure correct pressure drop indication, remove one line at a time from the pressure drop indicating gauge barb fitting. Using a minimum 20 psi compressed air, flow through the line back towards to dust collector. *(Do not use more than 25 psi to blow through clear poly tubing as damage may occur.)*
Compressed Air Supply	Monthly	Air dryers and automatic condense valves should be used prior to each dust collector. Inspect monthly to ensure proper operation, and that moisture is being removed from the compressed air supply. Troubleshoot, repair, or replace per the specific manufacturer's instructions. Consult the Installation and Operation Manual for correct pulse pressure recommendations for the dust collector.
Pulse Diaphragms	Quarterly	Apply electrical and pneumatic service to the pulse cleaning control. Activate the pulse cleaning sequence by placing the control in continuous cleaning mode. Approximately every ten (10) seconds an audible pulse should be heard. This process should be performed simultaneously with the solenoid check described below.
Electrical Solenoids	Quarterly	Activate the pulse cleaning sequence by placing the control in continuous cleaning mode. Approximately every ten (10) seconds an audible pulse should be heard. Additionally, each solenoid should be inspected manually by placing a large flat, light-weight surface *(cloth)* behind each solenoid enclosure. As each solenoid is activated, in that particular enclosure, visually inspect the test surface for movement. *When the solenoid is energized, compressed air is released from the diaphragm valves through the solenoid.)*

Verify Conditions of Filters	Semi-annually	If filter element pressure drop exceeds 6" w.g. verify proper system airflow according to original design recommendations. Remember that excessive airflow can increase pressure drop. Change filters if necessary. For best performance and life, use Donaldson superior filters.
Verify Operations of Pulse Cleaning System	Semi-annually	Inspect diaphragms, solenoids and time to ensure proper filter cleaning. Consult Installation and Operation Manuals for the correct On and Off times settings for Pulse cleaning intervals and duration.
Check Fan and Motor	Semi-annually	Check motor and fan for correct rotation by referencing the rotation sticker located on the motor mounting plate. Check for smoot operations of fan wheel and motor. Inspect for and tighten belts, nuts, bolts, and setscrews as needed. Consult Installation and Operation Manuals for troubleshooting recommendations as needed.
Adjust Exhaust Damper as needed.	Semi-annually	Airflow should be adjusted to match design recommendations. Excessive airflow can shorten filter life and cause fan motor failure.
Install Filters Correctly	During Filter Changes	Consult Installation and Operation Manuals for recommendations to correctly install new filters. Install new filters correctly and adequately tightened to prevent dust leakage. Improperly installed or inadequately tightened filters can allow dust to pass through the dust collector.
Adjust Exhaust Damper	Immediately after filter changes	Because the pressure drop or restriction to airflow through the filters will decrease when new filters are installed, airflow through the collector will increase. Because of this, it is necessary to adjust the fan damper to restrict the airflow through the collector to the recommended level immediately after installation of new filters. As the filters age and the pressure drop or restrictions to air increase, open the damper to reach design conditions.

Cheese or cheese products are produced and packaged for about 18 hours a day. Then the equipment and facility is sanitized prior to the next day's production. The sanitation process consists of the application of a number of food-safe chemicals (acids, bases and chlorinated compounds) in diluted form on all surfaces and interiors of equipment, rinsed, and air dried. These chemicals are stored in bulk tanks inside and outside and piped directly to equipment or other sanitizing components. Inside bulk tanks are vented into the building (inside). Toxic air pollutant (TAP) emissions from the sanitation process are below regulatory concern (BRC), as shown in Consent Orders E-2014.0007 & E.2015.0003.

Natural gas-fired heating, ventilating, air conditioning (HVAC) units are provided for the Cheese Plant for the sole purpose of air conditioning or heating the air for the comfort of building occupants. Three of these units are direct fired, meaning the exhaust from the burner is mixed with incoming air, fed indoors and does not exhaust outside except as fugitive emissions. All of these units are on the roof. Table 2 lists all of the Cheese Plant HVAC units with their capacity.

Table 2 – Cheese Plant HVAC Units

Point #	Unit ID	Area Served	Manufacturer	Model	Year	Input Max (Btu/hr)
P35	AC 01	Engineering	Carrier	48SS-03006031AA	2000	50400
P10	AC 02	Main Conf. Rm	Carrier	48TME004-A-501--	2007	74,000
P11	AC 03	Main Breakroom	Carrier	48TM3008-A-501--	2004	180,000
P12	AC 04	Office, East side	Carrier	48TFE007---511----	2004	115,000
P13	AC 05	Office,	Carrier	48TJE007---521--	2004	115,000

		West side				
--	AHU 9	Mascarpone	Reyco[1]		1999	3,000,000
--	AHU 7	Shred	Reyco[1]		1999	3,000,000
--	AHU 8	Mozzarella	Reyco[1]		1999	2,500,000
P37	AC 14	QA Offices	BDP	580DJV060115AAAA	2000	115,000
P14	AC 15	Micro Lab	Carrier	48HJE006-351	2004	115,000
P15	AC 16	Intake Breakroom	Carrier	48TJE005-611GA	2000	115,000
P16	AC 17	Main Lab	Carrier	48TFD009-611	2008	125,000
P17	AC 24	Warehouse	Carrier	48TCEA04A2A5A0A 0A0	2008	115,000

[1]*Direct fired units*

In addition to the cheese production and packaging areas, the Cheese Plant also includes a process control laboratory, dry warehouse, refrigerated warehouse, offices, breakroom, training and conference rooms, maintenance areas and the utilities support equipment including ammonia refrigeration and boilers for all the Cheese, Whey and Fresh Mozzarella Plants for cooling and heating as needed.

Boilers in the Cheese Plant provide steam to the Cheese Plant, Whey Plant, and Fresh Mozzarella Plant. This steam is used to heat water in each production area to use during sanitation. Table 3 provides a list of all boilers. The emissions points for these boilers are at the Cheese Plant.

Table 3 – Boilers

Boiler ID	**Manufacturer**	**Model**	**Year Installed**	**Input Max**	**Output Max**
				MMBtu/hr	
Boiler 1 P7	Cleaver Brooks 600 HP	CBLE 700-600	2001	24.49	19.6
Boiler 2 P8	Superior 800 HP	4-5-3005	2001 (mod. 2014, new burner)	24.8	20.1
Boiler 3 P9	Hurst 800 HP	54000-150-26	2007	33.6	26.79
Boiler 4 P6	Cleaver Brooks 1200 HP	CBL-700-1200-150 150SC	2009	49	39.19

600 HP Cleaver Brooks Boiler (P-8)
The 600 HP Cleaver Brooks Boiler (P-8) provides heat and steam to the Nampa Site as described above. The boiler has a rated heat input capacity of 24.49 MMBtu/hr and combusts natural gas exclusively. This boiler has a low NOx/FTR burner.

800 HP Hurst Boiler(P-9)
The 600 HP Cleaver Brooks Boiler (P-9) provides heat and steam to the Nampa Site as described above. The boiler has a rated heat input capacity of 33.6 MMBtu/hr and combusts natural gas exclusively

800 HP Superior Boiler (P-7)
The 800 HP Superior Boiler (P-7) provides heat and steam to the Nampa Site as described above. This boiler had a new burner replaced in 2014. Originally, the burner was rated 600 HP with a heat input capacity of 20.1 MMBtu/hr. This was replaced with an 800 HP burner rated at 31.5MMBtu/hr that was modified by the manufacturer and de-rated to a rated heat input capacity of 24.8 MMBtu/hr. It combusts natural gas exclusively.

The de-rating of the 800 HP burner meets EPA's 4-factor test because:

1. The modification is a permanent physical change which prevents the boiler from operating at a capacity greater than the de-rated value.

    a. *The 800 HP burner was de-rated by the manufacturer to fit the 30 foot 3" gas line provided. This line would have to be replaced with 4 "gas line (including valving) to allow it to operate at its full rating. The manufacturer supplied gas train (4") would have to be purchased and installed.*
    b. *A smaller "Spud" was installed inside the burner and would have to be replaced with a larger one (the spud regulates the exhaust or output capacity and increasing input capacity cannot be done without increasing output capacity), and*
    c. *The inlet connection and opening on the burner would have to be increased.*

2. The physical change cannot be easily undone.

    Reversing the modification would entail shutdown of the boiler, and therefore the entire plant, in order to remove the parts listed above, purchase and replace them with appropriately sized parts. The only other way to increase input capacity is to increase gas pressure; however the boiler will not operate at a higher pressure because of the high gas pressure switch. It will fault and not power up. Therefore, the integrated pressure regulator would have to be replaced to allow it to operate at the higher pressure.

3. A system shutdown was required to make this change and would be required to reverse it.

    On the day the burner was installed, production was down and the boiler was shutdown, locked and tagged out prior to commencing the work on the modification. As stated in #2, reversing this modification would entail a shutdown of the boiler and plant.

4. The modification is not a change only to the fuel feed systems.

   The physical modification to the boiler was certified by the boiler manufacturer who de-rated the boiler. This certification is attached with the U05 document for the Superior Boiler (Appendix 6). In order to increase the input of the new burner, the following would have to be done:

   a. *Approximately 30 feet of 3" piping would have to be resized and replaced, and*
   b. *The manufacturer gas train would have to be resized and replaced.*
   c. *The "Spud" inside the burner would have to be replaced with a larger one, and*
   d. *The inlet connection and opening on the burner would have to be increased, OR*
   e. *If increased pressure was used to accomplish this, the integrated pressure regulator would have to be replaced to operate the burner at a higher pressure.*

1200 HP Cleaver Brooks Boiler (P-6)
The 1200 HP Cleaver Brooks Boiler (P-6) provides heat and steam to the Nampa Site as described above. The boiler has a rated heat input capacity of 49 MMBtu/hr and combusts natural gas exclusively. This boiler has a low NOx/FTR burner.

1.3 Whey Plant Process

Whey is received from the Cheese Plant with a solids content of about 62 percent. This is filtered and the sugar (or lactose) and protein solids are separated from the remaining liquid. The solids are then dried in either of two whey driers, bagged, stacked, transported to an off-site warehouse and stored until shipped to customers or one of the other Lactalis facilities.

The protein recovered from whey is dried in the Meyers-Sterner Dryer in order to produce Whey Protein Concentrate (WPC). The liquid protein is fed into a high pressure pump, which sprays the product at

2,500 psi into a drying chamber at the rate of 3,200 lb/hr at 31% total solids. The product is atomized in the drying chamber and the rate of water removal from the atomization is 2,100 lb/hr. The dried powder is conveyed through the drying tube below the main chamber of the dryer and dropped into the main cyclone of the dryer. Air from the cyclone is sent to a baghouse prior to exhausting outside. Solids from this baghouse are sent to the sifter, then a hopper, followed finally by bagging. Solids from the cyclone are then sent to a sifter, then hopper, finally bagger. The air along the line to the sifter goes through a small baghouse unit in order to recover more product. Solids from this baghouse also go to the sifter, then the hopper, then bagger. Air from the smaller baghouse unit is sent to the larger baghouse, and then exhausted out. Both the cyclone and the smaller baghouse are considered "process equipment" rather than "control devices" for the purpose of air quality permitting. Figure 1 displays this process graphically.

600 HP Cleaver Brooks Boiler (P-8)
The 600 HP Cleaver Brooks Boiler (P-8) provides heat and steam to the Nampa Site as described above. The boiler has a rated heat input capacity of 24.49 MMBtu/hr and combusts natural gas exclusively. This boiler has a low NOx/FTR burner.

800 HP Hurst Boiler(P-9)
The 600 HP Cleaver Brooks Boiler (P-9) provides heat and steam to the Nampa Site as described above. The boiler has a rated heat input capacity of 33.6 MMBtu/hr and combusts natural gas exclusively

800 HP Superior Boiler (P-7)
The 800 HP Superior Boiler (P-7) provides heat and steam to the Nampa Site as described above. This boiler had a new burner replaced in 2014. Originally, the burner was rated 600 HP with a heat input capacity of 20.1 MMBtu/hr. This was replaced with an 800 HP burner rated at 31.5MMBtu/hr that was modified by the manufacturer and de-rated to a rated heat input capacity of 24.8 MMBtu/hr. It combusts natural gas exclusively.

The de-rating of the 800 HP burner meets EPA's 4-factor test because:

1. The modification is a permanent physical change which prevents the boiler from operating at a capacity greater than the de-rated value.

    a. *The 800 HP burner was de-rated by the manufacturer to fit the 30 foot 3" gas line provided. This line would have to be replaced with 4 "gas line (including valving) to allow it to operate at its full rating. The manufacturer supplied gas train (4") would have to be purchased and installed.*
    b. *A smaller "Spud" was installed inside the burner and would have to be replaced with a larger one (the spud regulates the exhaust or output capacity and increasing input capacity cannot be done without increasing output capacity), and*
    c. *The inlet connection and opening on the burner would have to be increased.*

2. The physical change cannot be easily undone.

    Reversing the modification would entail shutdown of the boiler, and therefore the entire plant, in order to remove the parts listed above, purchase and replace them with appropriately sized parts. The only other way to increase input capacity is to increase gas pressure; however the boiler will not operate at a higher pressure because of the high gas pressure switch. It will fault and not power up. Therefore, the integrated pressure regulator would have to be replaced to allow it to operate at the higher pressure.

3. A system shutdown was required to make this change and would be required to reverse it.

    On the day the burner was installed, production was down and the boiler was shutdown, locked and tagged out prior to commencing the work on the modification. As stated in #2, reversing this modification would entail a shutdown of the boiler and plant.

4. The modification is not a change only to the fuel feed systems.

   The physical modification to the boiler was certified by the boiler manufacturer who de-rated the boiler. This certification is attached with the U05 document for the Superior Boiler (Appendix 6). In order to increase the input of the new burner, the following would have to be done:

   a. *Approximately 30 feet of 3" piping would have to be resized and replaced, and*
   b. *The manufacturer gas train would have to be resized and replaced.*
   c. *The "Spud" inside the burner would have to be replaced with a larger one, and*
   d. *The inlet connection and opening on the burner would have to be increased, OR*
   e. *If increased pressure was used to accomplish this, the integrated pressure regulator would have to be replaced to operate the burner at a higher pressure.*

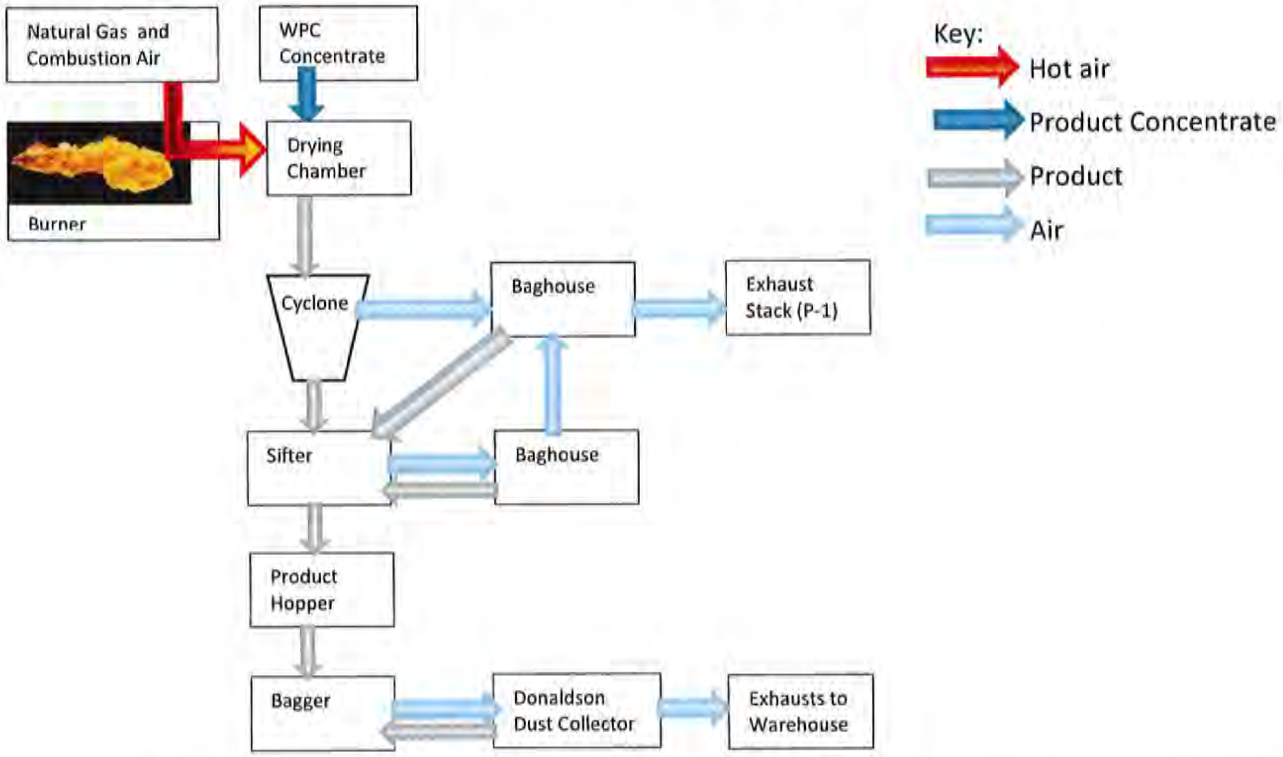
1200 HP Cleaver Brooks Boiler (P-6)
The 1200 HP Cleaver Brooks Boiler (P-6) provides heat and steam to the Nampa Site as described above. The boiler has a rated heat input capacity of 49 MMBtu/hr and combusts natural gas exclusively. This boiler has a low NOx/FTR burner.

1.3 Whey Plant Process

Whey is received from the Cheese Plant with a solids content of about 62 percent. This is filtered and the sugar (or lactose) and protein solids are separated from the remaining liquid. The solids are then dried in either of two whey driers, bagged, stacked, transported to an off-site warehouse and stored until shipped to customers or one of the other Lactalis facilities.

The protein recovered from whey is dried in the Meyers-Sterner Dryer in order to produce Whey Protein Concentrate (WPC). The liquid protein is fed into a high pressure pump, which sprays the product at 2,500 psi into a drying chamber at the rate of 3,200 lb/hr at 31% total solids. The product is atomized in the drying chamber and the rate of water removal from the atomization is 2,100 lb/hr. The dried powder is conveyed through the drying tube below the main chamber of the dryer and dropped into the main cyclone of the dryer. Air from the cyclone is sent to a baghouse prior to exhausting outside. Solids from this baghouse are sent to the sifter, then a hopper, followed finally by bagging. Solids from the cyclone are then sent to a sifter, then hopper, finally bagger. The air along the line to the sifter goes through a small baghouse unit in order to recover more product. Solids from this baghouse also go to the sifter, then the hopper, then bagger. Air from the smaller baghouse unit is sent to the larger baghouse, and then exhausted out. Both the cyclone and the smaller baghouse are considered "process equipment" rather than "control devices" for the purpose of air quality permitting. Figure 1 displays this process graphically.

Figure 1 – WPC (Meyers-Sterner) Dryer Process Flow Diagram



The WPC dryer exhaust is monitored daily for visible emissions while in operation. If visible solids emission is noted, the cause is identified and corrected immediately (e.g. broken bag). The next performance test of this dryer exhaust will be completed prior to February 18, 2018.

The WPC dryer combustion gases and process emissions are exhausted from the Meyers-Sterner baghouse stack (P-1).

The newest dryer, the permeate dryer, receives the lactose portion of the solids at a rate up to 619,176 pounds per day. This drying process consists of two 12.5 MMBtu/hr natural gas fired burners, a drying chamber and shaking beds. The two burners heat air that passes into the drying chamber to dry the whey permeate. The burners are indirect heating devices since the combustion gases do not come in contact with the heated air. Each burner has an exhaust stack (P-2 and P-3) that discharges natural gas combustion products. The heated air dries the whey concentrate as it flows through the drying chamber. The drying chamber exhausts to cyclones where product in air is recovered. The cyclones are considered as process equipment for this application. The purpose of this equipment is to recover solids suspended in air discharged from the dryer and the recovered solids are returned to the drying chamber. The exhaust from the first cyclone(s) passes through a venturi air scrubber (P-4) to control discharge of particulate matter from this process. The exhaust from the second cyclone passes through the main baghouse (P-5). Product from the drying chamber passes over a timing belt onto a shaking bed and then to into transport equipment that includes rotary valves, mills and sifters to break up large chunks of product. Exhaust from the shaking beds passes through a baghouse (P-5) to recover product and control discharge of particulate

matter to the air. Exhaust from the transport equipment passes through smaller baghouses and exhaust inside.

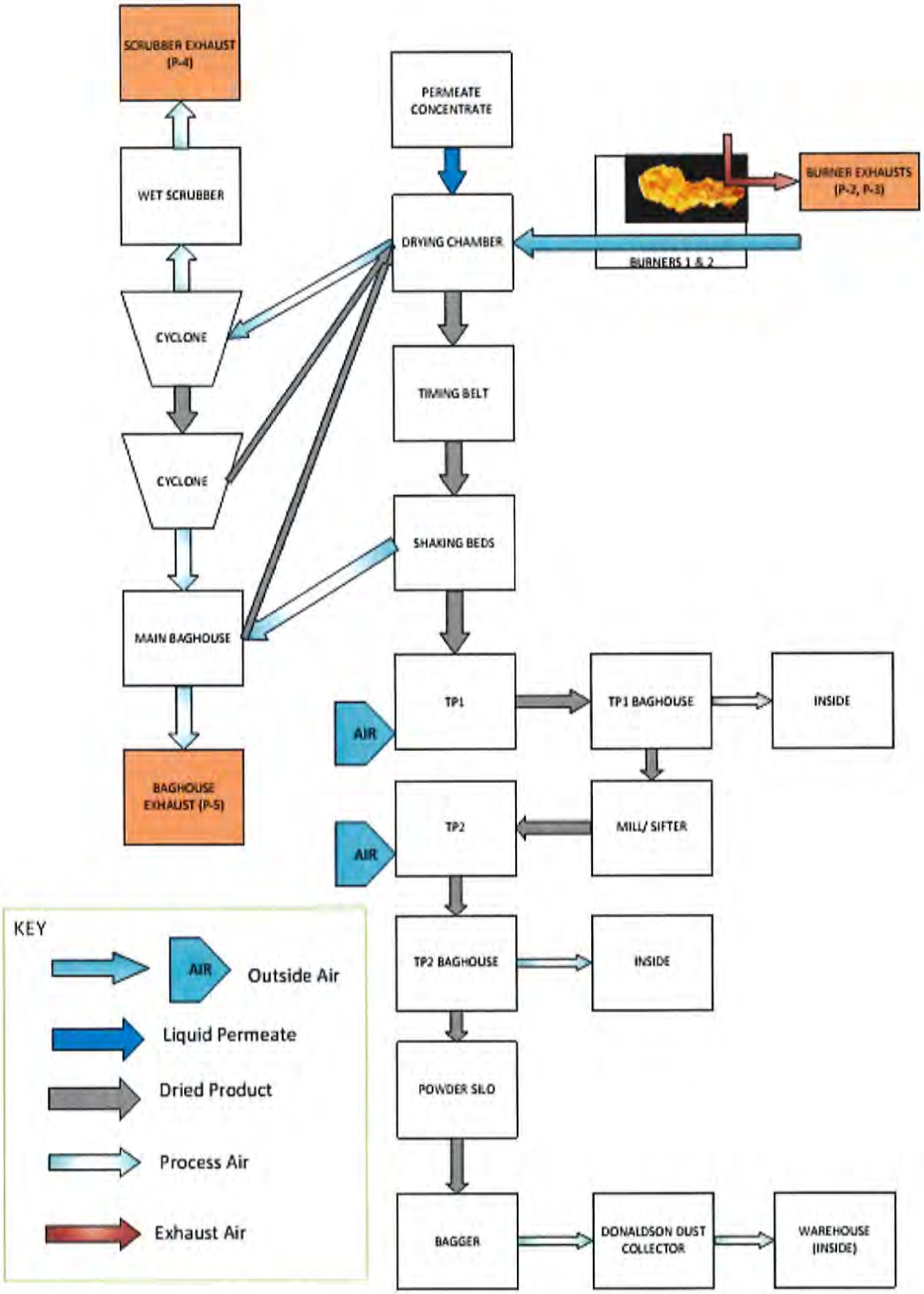
Both baghouse and scrubber exhaust stacks are monitored daily for visible emissions while in operation. If visual solid emissions are noted, the reason is identified and corrected immediately (e.g. broken bag or failed water pump).

Differential pressure transmitters are used to monitor the performance of the baghouse for the permeate dryer. Required maintenance involves cleaning of the baghouse at least once per year, and replacement of broken bags as needed. Complete bag replacement is done at the manufacturer's recommended frequency. The next stack performance test of this system for PM_{10} will be conducted before June 3, 2016.

The scrubber systems uses a density meter to monitor the solids levels in the circulating water as well as a differential pressure transmitter to monitor pressure drop across the unit. The pressure drop is monitored daily while in operation to verify the minimum of 5.25" w.g.. The liquid flow rate is also monitored daily to ensure the minimum rate of 599 gpm during operation. Periodic monitoring of both these parameters is conducted at least once a day. The scrubber system is also cleaned at the frequency recommended by the manufacturer. The next performance test of the scrubber will be completed before October 1, 2017.

The Permeate Dryer process is shown graphically in Figure 2.

Figure 2 – Permeate (TetraPak) Dryer Process Flow Diagram



During the bagging of both permeate and WCP products, a Donaldson dust collection unit is used to recover airborne particulate that is not deposited on surfaces. The Donaldson (with Dura-Life Filters) unit exhausts inside.

The Preventive Maintenance schedule for the Donaldson unit is conducted in conformance with manufacturer recommendations and is provided in Table 1. The particulate on surfaces is collected at the end of each shift and recovered for animal feed.

Natural gas-fired heating, ventilating, air conditioning (HVAC) units are provided for the Whey Plant for the sole purpose of air conditioning or heating the air for the comfort of building occupants. All of these units are on the rooftops (at different levels) of the Whey Plant. Table 4 lists all of the Whey Plant HVAC units with their capacity.

Table 4 – Whey Plant HVAC Units

Point #	Unit ID	Area Served	Manufacturer	Model	Year	Input Max (Btu/hr)
P18	MA 1	Crystallizer room	York/Johnson Controls	DF-200-GMFH-LH-B200R10LGGAA	2010	2,500,000
P19	MA 2	HTST room	York/Johnson Controls	DF-175-GMFH-LH-B175R10LGGAA	2010	2,187,000
P20	MA 3	Permeate dryer burner room	York/Johnson Controls	DF-175-GMFH-LH-B175R10LGGAA	2010	2,187,000
P21	MA 6	Permeate dryer cyclone room	York/Johnson Controls	DF-200-GMFH-LH-B200R10LGGAA	2010	2,500,000
P22	MA 7	Dungeon room	York/Johnson Controls	DF-150-GMFH-LH-B150R10LGGAA	2010	1,875,000
P23	AC-1	Packaging blower room	York/Johnson Controls	0EA700030101	2010	375,000
P24	AC-2	Powder silo room	York/Johnson Controls	DF-40-GMFH-LH-B40R10LGGAA	2010	500,000
P25	AC-3	Packaging bag room	York/Johnson Controls	DF-75-GMFH-LH-B75R10LGGAA	2010	937,000
P26	AC-4	Packaging bulk room	York/Johnson Controls	DF-100-GMFH-LH-B100R10LGGAA	2010	1,250,000
P27	AC-9	Offices	Carrier	D1NA048N090253		108,000
P28	AC-11	Lab	Carrier	J06ZHN10P4AZZ50005A	2010	120,000
P29	AC-12	Breakroom	Carrier	48TFD009-611	2000	125,000
--	AHU 10[1]	Membrane room	Industrial Commercial Equipment	DMA125X	2000	2,112,000
P30	MA 4		Greenheck	PVF350H	2010	700,000

[1] *Direct Fired Unit*

The sanitation process consists of the application of a number of food-safe chemicals (acids, bases and chlorinated compounds) in diluted form on all surfaces and interiors of equipment, rinsed, and air dried.

These chemicals are stored in bulk tanks inside and outside and piped directly to equipment or other sanitizing components. Toxic air pollutant (TAP) emissions from the sanitation process are below regulatory concern (BRC), as shown in Consent Orders E-2014.0007 & E.2015.0003.

1.4 Wastewater Treatment Plant (WWTP) Process

Non-hazardous process wastewater flows from each production facility to the WWTP via gravity sewers to a lift station. During normal operating conditions, process water is pumped from the lift station (T-100) to the equalization tank (T-250). All of the WWTP tanks are open-topped and do not contain hazardous materials.

A secondary 215,000 gallon diversion tank (T-200) is used to store high strength wastewater which can then be blended with other influent wastewater prior to discharging to downstream treatment units. Process wastewater can also be transferred from the lift station directly to one of two sequencing batch reactors (SBR) units, to truck load out, or to be land applied.

Wastewater is transferred from the equalization tanks to one of two SBR's (T-300 and T-350) for reduction of organics and nutrient removal. At the completion of each SBR cycle, wastewater is discharged by gravity via floating decanters to the SBR effluent equalization tank (T-400). Waste activated sludge (WAS) is wasted from the SBR units to maintain the desired mixed liquor concentration in the SBRs to achieve the required treatment. This WAS is piped to T-900. WAS is not a hazardous material and the dewatered form of it is sold as a soil amendment. The T-900 is continually recycled to prevent septic conditions from occurring and to mix the solids in suspension in the tank. The contents of T-900 are pumped to a belt press (BF-1200) to be dewatered, then directly to a contractor's truck for transport and use as compost.

From T-400, treated wastewater is pumped to the clarifier (T-500) for further solids liquid separation. The clarified wastewater overflows from the clarifier to the first of two, 2-staged sand filter units (SF 800, 805, 850, and 855, will be referred to as SF 800 for brevity). Solids removed by the clarifier are collected and discharged to T-700, which is then pumped to BF-1200 for dewatering and transport for use as compost.

Effluent from the SF 800 is re-aerated and ultraviolet (UV) treated prior to gravity discharge to the Purdam Drain under the control of NPDES Permit #ID-002803-7.

Depending on influent flow volume, sand filter reject or backwash water is collected and drained by gravity to the Dissolved Air Flotation (DAF) tank (SL-1000) or T-900 for further treatment or dewatering.

The DAF feeds clarified effluent to the DAF sand filters (SF1000) and sludge to BF-1200. The sand filter effluent is combined with the effluent from SF 800 for aeration and UV treatment before discharge as noted above. Reject water from SF1000 combines with that of SF800 to either SL-1000 or T-900. Filtrate, or run-off water, from BF-1200 is also pumped to the DAF for further treatment.

In the event the effluent does not meet NPDES Permit requirements, Sorrento is permitted to land apply non-hazardous industrial wastewater in compliance with its Idaho Department of Environmental Quality (IDEQ) Reuse Permit I-091-03 (formerly LA-000091-02).

Because none of the water is considered hazardous or relevant to the air permitting process, a flow diagram is not provided here but is on file at IDEQ.

1.5 Fresh Mozzarella Plant

The Fresh Mozzarella Plant makes fresh mozzarella cheese. This requires pasteurized milk in a long, open-top cheese vat (coagulator) to be brought to a specific temperature to promote the growth of bacteria that feed on lactose and ferments the lactose into lactic acid. Rennet is added to cause the casein (protein) to precipitate in the form of curd. As the curd is formed, milk fat is trapped within the casein matrix. Once the cheese curd is cut, the whey is released to begin the partial dehydration of the curd. This whey is transported to the Whey Plant via pipeline. The curd/whey separation is accomplished by using long, blunt knives to cut the curd and turned to release the whey and followed by a process in which the curd it conveyed over a long semi-permeable belt that allows the whey to continue to drain off the curd. The curd is then piped to cookers then molds. The curds or cheese is then released from the molds into a fresh water flume. This water cools the cheese and helps it hold its form. The product is then packaged, boxed, and stored in a refrigerated warehouse until it is shipped.

Fresh mozzarella is produced and packaged for about 18 hours a day. Then the equipment and facility is sanitized prior to the next day's production. The sanitation process consists of the application of a number of food-safe chemicals (acids, bases and chlorinated compounds) in diluted form on all surfaces and interiors of equipment, rinsed, and air dried. These chemicals are stored in bulk tanks inside and outside and piped directly to equipment or other sanitizing components. Toxic air pollutant (TAP) emissions from the sanitation process are below regulatory concern (BRC), as shown in Consent Orders E-2014.0007 & E.2015.0003.

Natural gas-fired heating, ventilating, air conditioning (HVAC) units are provided for the Fresh Mozzarella Plant for the sole purpose of air conditioning or heating the air for the comfort of building occupants. Both are on the roof of the Fresh Mozzarella Plant and exhaust to the atmosphere. Table 5 lists both of these HVAC units with their capacity.

Table 5 – Fresh Mozzarella Plant HVAC Units

Point #	Unit ID	Area Served	Manufacturer	Model	Year	Input Max (Btu/hr)
P31	AC 01	1st floor	Carrier	48TCEA07A2A5A0A0A0	2013	115,000
P32	AC 02	2nd floor	Carrier	48TCEA07A2A5A0A0A0	2013	115,000

1.6 Fire Pump House

A diesel pump is used to provide water to the fire sprinkler systems within each plant. The pump activates (automatically) only in emergencies or when being tested. The 235.9 brake horsepower (bhp) pump engine is a Peerless Model #JD/RG6081H132189 (horizontal) diesel pump rated for 2500 gallons per minute (GPM) water flow. The pump engine exhaust has been assigned Point No. P34. The engine was installed in June 2001 and fuel for the pump engine is limited to distillate fuel (No. 1 and/or No. 2 diesel) with a maximum sulfur content of 0.05 percent by weight.

1.7 Summary

Table 6 provides a summary of all emission sources at the Sorrento Lactalis, Nampa site.

Table 6 - Sorrento Lactalis Emission Points

Point #	*Source*	*PTC Version*	*Pollutant(s)*
P1	Meyers-Sterner Whey Dryer Baghouse	July 20, 2001	PM_{10}
P2	TetraPak Whey Dryer Burner #1	August 28, 2009 and after	Natural Gas Combustion Products
P3	TetraPak Whey Dryer Burner #2	August 28, 2009 and after	Natural Gas Combustion Products
P4	TetraPak Whey Dryer Scrubber	August 28, 2009 and after	PM_{10}
P5	TetraPak Whey Dryer Baghouse	August 28, 2009 and after	PM_{10}
P6	Cleaver Brooks 1200 HP	August 28, 2009 and after	Natural Gas Combustion Products
P7	Superior 800 HP	July 20, 2001	Natural Gas Combustion Products
P8	Cleaver Brooks 600 HP	July 20, 2001	Natural Gas Combustion Products
P9	Hurst 800 HP	N/A, NSPS notification only	Natural Gas Combustion Products
P10	Cheese Plant AC 02	N/A	Natural Gas Combustion Products
P11	Cheese Plant AC 03	N/A	Natural Gas Combustion Products
P12	Cheese Plant AC 04	N/A	Natural Gas Combustion Products
P13	Cheese Plant AC 05	N/A	Natural Gas Combustion Products
P14	Cheese Plant AC 15	N/A	Natural Gas Combustion Products
P15	Cheese Plant AC 16	N/A	Natural Gas Combustion Products
P16	Cheese Plant AC 17	N/A	Natural Gas Combustion Products
P17	Cheese Plant AC 24	N/A	Natural Gas Combustion Products
P18	Whey Plant MA 1	August 28, 2009 and after	Natural Gas Combustion Products
P19	Whey Plant MA 2	August 28, 2009 and after	Natural Gas Combustion Products
P20	Whey Plant MA 3	August 28, 2009 and after	Natural Gas Combustion Products
P21	Whey Plant MA 6	August 28, 2009 and	Natural Gas Combustion Products

		after	
P22	Whey Plant MA 7	August 28, 2009 and after	Natural Gas Combustion Products
P23	Whey Plant AC-1	August 28, 2009 and after	Natural Gas Combustion Products
P24	Whey Plant AC-2	August 28, 2009 and after	Natural Gas Combustion Products
P25	Whey Plant AC-3	August 28, 2009 and after	Natural Gas Combustion Products
P26	Whey Plant AC-4	August 28, 2009 and after	Natural Gas Combustion Products
P27	Whey Plant AC-9	August 28, 2009 and after	Natural Gas Combustion Products
P28	Whey Plant AC-11	August 28, 2009 and after	Natural Gas Combustion Products
P29	Whey Plant AC-12	N/A	Natural Gas Combustion Products
P30	Whey Plant MA 4	August 28, 2009 and after	Natural Gas Combustion Products
P31	Fresh Mozz AC 01	N/A	Natural Gas Combustion Products
P32	Fresh Mozz AC 02	N/A	Natural Gas Combustion Products
P34	Fire Pump	N/A	Diesel Fuel Combustion Products
P35	Cheese Plant AC 01	N/A	Natural Gas Combustion Products
P37	Cheese Plant AC 14	N/A	Natural Gas Combustion Products
P40	Cheese Plant Donaldson Dust Collection Unit	N/A	PM_{10}

2 Applicable Requirements

Air Pollution regulations applicable to the proposed facility are discussed in this section.

2.1 Federal Requirements

The following includes the Federal rules and regulations applicable to this PTC modification:

2.1.1 40 CFR 52 – Prevention of Significant Deterioration (PSD)

The facility is not a PDS major facility and does not belong to any designated source category; therefore PSD review is not applicable.

2.1.2 40 CFR 60 – New Source Performance Standards (NSPS)

40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

All four natural gas-fired boilers are subject to Subpart Dc because they are steam generating units with heat input capacity greater than 10 MMBtu/hr but less than 100 MMBtu/hr and were constructed or modified after June 9, 1989. Applicable requirements for these boilers are already reflected in the current permit, PTC P-2009.0023, DEQ Project No. 61510, issued May 1, 2015. Because the boilers will combust only natural gas, the facility is subject only to the reporting and recordkeeping requirements listed in §60.48c.

60.48c Reporting and recordkeeping requirements.

(a) Notification of the date of construction or reconstruction and actual startup. Provide heat input capacity of the facility and the identification of fuels to be combusted in the affected facility.

(g)(2) Record and maintain records of the amount of each fuel combust during each calendar month.

Records required under this section are to be maintained by the facility owners for two years.

The reporting period for the reports required under this subpart is each six-month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.

2.1.3 40 CFR 61 and 63– National Emission Standards for Hazardous Air Pollutants (NESHAPs)

The diesel fire pump engine is an affected source subject to 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary Reciprocating Internal Combustion Engines. The requirements listed below are applicable to

this pre-2005 diesel-fired emergency engine which is rated at less than 500 hp, located at an area source of HAPs emissions, and is not contractually obligated to be available for the purposes specified in Subpart ZZZZ, §6640(f)(2)(ii) and (iii) or §6640(f)(4)(ii).

- *No operating limitations.*
- *No fuel requirements.*
- *No performance testing requirements.*

Monitoring, Installation, Collection, Operation, and Maintenance Requirements

§63.6625(e)(3), Sorrento Lactalis must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop its own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.

§63.6625(f), Sorrento Lactalis must install a non-resettable hour meter if one is not already installed.

§63.6655(e)(2), Sorrento Lactalis must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan.

Table 2d No. 4:

a. *Change oil and filter every 500 hours of operation or annually, whichever comes first (see Note 1);*
b. *Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and*
c. *Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.*

Note 1. Sources have the option to utilize an oil analysis program as described in §63.6625(i) or (j) in order to extend the specified oil change requirement in Table 2d of this subpart.

– *No initial compliance requirements.*

Continuous Compliance

§63.6605(a) You must be incompliance with the emission limitations and operating limitations in this subpart that apply to you at all times.

§63.6605(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

§63.6640(a) You must demonstrate continuous compliance with each emission limitation and operating limitation in ...Table 2d to this subpart that apply to you according to the methods specified in Table 6 to this subpart [work management practices only].

– No notification requirements.

Table 7 summarizes the Federal Requirements and the emission source(s) they apply to:

Table 7 – Summary of Federal Requirements and Applicable Emission Point(s)

Federal Requirements	Emission Point(s) or Source (s)
40 CFR 52 – Prevention of Significant Deterioration (PSD)	None
40 CFR 60 – New Source Performance Standards Subpart Dc – Standards for Performance for Small Industrial-Commercial-Institutional Steam Generating Units	P-6, P-7, P-8, P-9 (Boilers)
40 CFR 61 – National Emission Standards for Hazardous Air Pollutants (NESHAPs)	None
40 CFR 63 – National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Source Categories, Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines	P-34 (Fire Pump Engine)

2.2 State Requirements

Applicable state requirements include the following. All citations refer to specific sections of IDAPA 58.01.01, Rules for the Control of Air Pollution in Idaho.

2.2.1 IDAPA 58.01.01.123 Certification of Documents.

All documents, including but not limited to, application forms for permits to construct, application forms for operating permits, progress reports, records, monitoring data, supporting information, testing reports or compliance certifications submitted to the Department shall contain a certification by a responsible official.

2.2.2 IDAPA 58.01.01.128 Confidential Information

Not applicable as no confidential information is being submitted.

2.2.3 IDAPA 58.01.01.201 Permit to Construct Required

A modification to the existing PTC is required to address the issues listed in Section 1 of this application. Affected units:

1. 600 HP Cleaver Brooks boiler
2. 800 HP Superior boiler
3. Natural gas-fired heaters/air handling units throughout the facility
4. TetraPak Whey Dryer scrubber

2.2.4 IDAPA 58.01.01.203 Permit Requirements for New and Modified Stationary Sources

1. The maximum heat input rating for the 600 HP Cleaver Brooks boiler must be changed from 20.1 MMBtu/hr to 24.5 MMBtu/hr.

2. The maximum heat input rating for the 800 HP Superior boiler must be changed from 20.1 MMBtu/hr to 24.8 MMBtu/hr.

3. The annual NO_2 NAAQS of 53 parts per billion (ppb) was promulgated in 1971. Compliance with the standard was demonstrated using the annual arithmetic average of the ambient impacts. It was very unusual for small source of NOx emissions to have any effect on the compliance determination for this annual standard. In accordance with normal practice and DEQ guidance at the time, the 2001 and 2009 PTC applications and compliance demonstrations did not include the natural gas-fired heating/air handling units installed throughout the facility.

   EPA promulgated the much more restrictive one-hour NO_2 standard of 100 ppb on February 9, 2010. Compliance with the standard was demonstrated using the 98th percentile value. This standard was not effective in Idaho until the state Legislature adjourned *sine die* on April 7, 2011.

   Construction of the Fresh Mozzarella plant in 2013 included installation of two natural gas-fired 0.115 MMBtu/hr air handling units (P-31 and P32). Even if these units had been presumed to operate continuously throughout the year (i.e., 8760 hr/yr), the total NOx emissions would have been 5.0 E-04 lb/hr (0.0005 lb/hr) and 2.2E-03 tons per year (T/yr, or 0.0022 T/yr). The annual emission rate was only 0.05 percent of the 4 T/yr threshold, and would have been considered below regulatory concern (BRC) in accordance with DEQ's 2013 modeling guideline. In addition, the hourly and annual emission rates were only 0.23 percent and 0.18 percent of DEQ's Level I modeling thresholds of 0.20 lb/hr and 1.2 T/yr, respectively. Dispersion modeling would not have been required to demonstrate compliance with the 1-hr NO_2 standard for the increase in NOx emissions as a result of adding these two small units, neither would this increase have triggered facility-wide modeling to include all existing NOx sources.

   The Superior Boiler was modified in 2014 to replace a 600 HP burner rated at 20.1 MMBtu/hr with an 800 HP burner rated at 31.5 MMBtu/hr, but modified and down-rated by the manufacturer to 24.8 MMBtu/hr. The boiler was and is operated exclusively on natural gas. The 4.7 MMBtu/hr increase in the burner rating to 24.8 MMBtu/hr would result in increasing NOx emissions by 0.46 lb/hr and 2.0 T/yr. This increase in emissions would have been considered BRC in accordance with DEQ's 2013 modeling guideline. Dispersion modeling would not have been required to demonstrate compliance with the 1-hr NO_2 standard for this burner modification, nor would this increase have triggered facility-wide modeling to include all existing NOx sources.

   Even if the increase in the burner rating was presumed to be 11.4 MMBtu/hr (i.e., increasing the burner rating from 20.1 to 31.5 MMBtu/hr), the increase in NOx emissions would be 1.12 lb/hr and 4.91 T/yr. In accordance with EPA guidance for the ambient ratio method (ARM), which allows presuming that 80 percent, rather than 100 percent, of NOx is converted to NO_2, the annual emission rate of NO_2 would be 3.9 T/yr. This is below the 4 T/yr threshold to have been considered BRC.

Dispersion modeling would not have been required to demonstrate compliance with the 1-hr NO_2 standard for this burner modification, nor would this increase have triggered facility-wide modeling to include all existing NOx sources.

Nevertheless, Sorrento Lactalis has agreed to demonstrate that emissions from heaters/air handling units at the facility do not cause a violation of any ambient air quality standard.

All of these HVAC units utilize natural gas for heating during the winter months, so operate less than half the year. Operation and maintenance are done according with manufacturer recommendations. Combustion emission rates will be determined based on maximum rated fire rates in 2885 hours per year (based on the heating-degree day data). The facility anticipates that the IDEQ will require permit conditions to the plant to protect the National Ambient Air Quality Standards (NAAQS) and to comply with the toxic air pollutant (TAP) standards by limiting the volume of natural gas the facility may consume per year to no more than 2333.33 MMscf/year.

4. Revise the minimum average pressure drop for the TetraPak Whey Dryer Scrubber to 5.25 inches water gauge (" w.g.") and the minimum average scrubber liquid flow rate to 599 gallons per minute (gpm), as measured during the October 2, 2014 source test. Include permit conditions for periodic monitoring of both the scrubber pressure drop and liquid flow rate. Incorporate a requirement to conduct a performance test on the scrubber by October 1, 2017 to demonstrate compliance with the PM10 emissions rate limit listed in the revised (2016) PTC.

2.2.5 IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards

210.01. Identification of Toxic Air Pollutants.

All TAP emitted by these emission units shall be identified and are listed in the Modeling Report in Appendix 2 and in the emission inventory included as Appendix 3.

210.02 Quantification of Emission Rates

Emission rates of all TAP shall be estimated using emission factors or periodic testing data. This analysis is included in the emission inventory included as Appendix 3.

210.03 Quantification of Ambient Concentrations

Modeling of facility-wide emissions was performed as described in the Modeling Report included as Appendix 2.

210.04. Preconstruction Compliance Demonstration is not applicable since this is not new construction.

2.2.6 IDAPA 58.01.01.213 – Pre-Permit Construction

213.01. Pre-Permit Construction Eligibility is not applicable since this is not new construction or modification to equipment.

2.2.7 IDAPA 58.01.01.220 General Exemption Criteria for Permit to Construct Exemptions

2.2.7.1 IDAPA 58.01.01.221 Category I Exemption

221.01 Below Regulatory Concern

The maximum capacity of the Cheese Plant Donaldson Dust Collection unit to emit an air pollutant under its physical and operational design considering limitations on emissions such as hours of operation is less than ten percent (10%) of the significant emission rates for particulate matter and was not installed as a part of a proposed new major facility or part of a proposed major modification.

2.2.7.2 IDAPA 58.01.01.222 Category II Exemption

222.01.d. Stationary internal combustion engines used exclusively for emergency purposes which are operated less than five hundred (500) hours per year and are fueled by natural gas, propane gas, liquefied petroleum gas, distillate fuel oils and diesel fuel; waste oil, gasoline, or refined gasoline will not be used.

The fire pump is used for emergency purposes (provides water during a fire) and is operated less than five hundred (500) hours per year. The fire pump is fueled by distillate diesel fuel with a maximum sulfur content of 0.05 percent

222.02.a Other Exempt Sources

Eleven of the Whey Plant HVAC units used for air conditioning or ventilating were installed as part of a proposed new major facility or part of a proposed major modification, but not designed to remove air pollutants generated by or released from equipment. None of the other HVAC units were installed as part of a proposed new major facility or part of a proposed major modification.

222.02.c Other Exempt Sources

The four boilers combust natural gas exclusively and are all rated at less than 50 MM Btu/hr of heat input. Boilers 1-3 were not installed as part of a proposed new major facility or part of a proposed major modification. Boiler 4 (P-6) was submitted in the application for the PTC version August 28, 2009.

2.2.8 IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants

Compliance with all applicable ambient air quality standards is discussed in Section 5 and in the Modeling Report included as Appendix 2.

2.2.9 IDAPA 58.01.01.578 Designation of Attainment, Unclassifiable, and Nonattainment Areas

Not applicable – designation of attainment, unclassifiable, and nonattainment areas is the responsibility of IDEQ. Current attainment status of the facility location is discussed in Section 4.

2.2.10IDAPA 58.01.01.585 Toxic Air Pollutants Non-Carcinogenic Increments

Compliance with AACs is addressed in Section 5 and in the Modeling Report included as Appendix 2.

2.2.11IDAPA 58.01.01.586 Toxic Air Pollutants Carcinogenic Increments

Compliance with AACCs is addressed in Sections 5 and in the Modeling Report included as Appendix 2.

2.2.12IDAPA 58.01.01.590. New Source Performance Standards

Each of the four boilers is subject to 40 CFR 60, Subpart Dc. See Section 2.1.2.

2.2.13IDAPA 58.01.01.591 National Emissions Standards for Hazardous Air Pollutants

The fire pump engine is subject to 40 CFR 63, Subpart ZZZZ. Compliance with NESHAPs is discussed in Section 2.1.

2.2.14IDAPA 58.01.01.625 Visible Emissions

A person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three (3) minutes in any sixty (6) minute period which is greater than twenty percent (20%) opacity as determined by this section (625).

625.02 Standards for Exempted Sources.

For sources exempted from provisions of this section, a person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three (3) minutes in any sixty (6) minute period which is greater than forty percent (40%) opacity as determined by this section (625).

2.2.15IDAPA 58.01.01.676 Standards for New Sources (Fuel Burning Equipment—Particulate Matter)

A person shall not discharge into the atmosphere from any fuel burning equipment with a maximum rated input of ten (10) million BTU's per hour or more, and commencing on or after October 1, 1979, particulate matter in excess of concentrations shown in the following table:

FUEL TYPE	ALLOWABLE PARTICULATE gr/dscf	EMISSIONS Oxygen
Gas	.015	3%

The effluent gas volume shall be corrected to the oxygen concentration shown.

2.2.16 IDAPA 58.01.01.679 Averaging Period.

For purposes of Sections 675 through 680, emissions shall be averaged according to the following, whichever is the lesser period of time:

01. One cycle. One (1) complete cycle of operation; or
02. One hour. One (1) hour of operation representing worst case conditions for the emissions of particulate matter.

2.2.17IDAPA 58.01.01.700. Particulate Matter – Process Weight Limitations

*01. **Particulate Matter Emission Limitations.** Notwithstanding the provisions of Sections 701 and 702, no source shall be required to meet an emission limit of less than one (1) pound per hour.*
*02. **Averaging Period.** For the purposes of Sections 701 through 703, emissions shall be averaged according to the following, whichever is the lesser period of time:*
a. One cycle. One (1) complete cycle of operation; or
b. One hour. One (1) hour of operation representing worst case conditions for the emissions of particulate matter

2.2.18 IDAPA 58.01.01.701. Particulate Matter - New Equipment Process Weight Limitations

*01. **General Restrictions**. No person shall emit into the atmosphere from any process or process equipment commencing operation on or after October 1, 1979, particulate matter in excess of the amount shown by the following equations, where E is the allowable emission from the entire source in pounds per hour, and PW is the process weight in pounds per hour.*
5.1.1 If PW is less than 9,250 pounds per hour, $E = 0.045(PW)^{0.60}$
5.1.2 If PW is equal to or greater than 9,250 pounds per hour, $E = 1.10(PW)^{0.25}$
02. Exemption. The provisions of Section 701 shall not apply to fuel burning equipment.

Compliance with process weight limitations was demonstrated in the 2009 application (see Appendix 5).

Summaries of emission sources and applicable State requirements are provided in Tables 8 and 9 :

Table 8 – Summary of Emission Point(s) and Applicable State Requirements

Emission Point(s) or Source (s)	State Requirements
P-1 – WPC Dryer Baghouse	IDAPA 58.01.01.123, 203, 210, 577, 585, 586, 591, 625, 676,679
P-2 – TetraPak Burner 1	IDAPA 58.01.01.123, 203, 210, 577, 585, 586, 591, 625, 676,679

P-3 – TetraPak Burner 2	IDAPA 58.01.01.123, 203, 210, 577, 585, 586, 591, 625, 676,679
P-4 – TetraPak Wet Scrubber	IDAPA 58.01.01.123, 203, 210, 577, 585, 586, 591, 625, 679
P-5 – TetraPak Baghouse	IDAPA 58.01.01.123, 203, 210, 577, 585, 586, 591, 625, 679
P-6 – 1200 HP Cleaver Brooks Boiler	IDAPA 58.01.01.123, 203, 210, 577, 585, 586, 591, 625, 676,679
P-7 – 800 HP Superior Boiler	IDAPA 58.01.01.123, 210, 222.02.c, 577, 585, 586, 591, 625.02
P-8 – 600 HP Cleaver Brooks Boiler	IDAPA 58.01.01.123, 210, 222.02.c, 577, 585, 586, 591, 625.02
P-9 – 800 HP Hurst Boiler	IDAPA 58.01.01.123,210, 222.02.c, 577, 585, 586, 591, 625.02
P-40 - Cheese Plant Donaldson Unit	IDAPA 58.01.01.123, 210, 221.01, 577, 585, 586, 591, 625.02
Cheese Plant HVAC Units	IDAPA 58.01.01.123, 210, 222.02.a, 577, 585, 586, 591, 625.02
Whey Plant HVAC Units AC-12	IDAPA 58.01.01.123, 210, 222.02.a, 577, 585, 586, 591625.02
Whey Plant HVAC Units MA 2, MA 3, MA 4, MA 6, MA 7, AC-1, AC-2, AC-3, AC-4, AC-9, AC-11	IDAPA 58.01.01.123, 210, 577, 585, 586, 591, 625.02
Fresh Mozzarella Plant HVAC Units	IDAPA 58.01.01.123, 210, 222.02.a, 577, 585, 586, 591, 625.02
P-34 - Fire Pump	IDAPA 58.01.01.123, 210, 222.01.d

Table 9 – Summary of Applicable State Requirements and Emission Point(s)

State Requirements	Emission Point(s) or Source (s)
IDAPA 58.01.01.123 – Certification of Documents	All points/sources
IDAPA 58.01.01.128 – Confidential Information	N/A
IDAPA 58.01.01.201 – Permit to Construct Required	N/A
IDAPA 58.01.01.203 – Permit Requirements for New and Modified Stationary Sources	P-1-6, and the following Whey Plant HVAC units: MA 1, MA 2, MA 3, MA 4, MA 6, MA 7, AC-1, AC-2, AC-3, AC-4, AC-9, AC-11
IDAPA 58.01.01.210 – Demonstration of Preconstruction Compliance with Toxic Standards.	All points/sources
IDAPA 58.01.01.213 – Pre-Permit Construction	N/A
IDAPA 58.01.01.220 – General Exemption Criteria for Permit to Construct Exemptions	
IDAPA 58.01.01.221.01 – Category 1 Exemption, Below Regulatory Concern	P-40
IDAHA 58.01.01.221.01.d – Category 1	P-34

Exemption, Emergency Stationary Internal Combustion Engines	
IDAPA 58.01.01.222.02.a – Category II Exemption, Other Exempt Sources, Air Conditioning or Ventilating Equipment	P-9; Cheese Plant HVAC Units AC 02, AC 03, AC 04, AC 05, AC 06, AC 14, AC 15, AC 16, AC 17, AC 24; Whey Plant HVAC Units AC-12; Fresh Mozzarella Plant HVAC Units AC 01, AC 02
IDAPA 58.01.01.222.02.c – Category II Exemption, Other Exempt Sources, Fuel Burning Equipment using Natural Gas and less than 50 Million Btu's/hr Input	P-7, P-8, P-9
IDAPA 58.01.01.223 - Exemption Criteria and Reporting Requirements for Toxic Air Pollutant Emissions	None
IDAPA 58.01.01.577 – Ambient Air Quality Standards for Specific Air Pollutants	All points/sources
IDAPA 58.01.01.578 – Designation of Attainment, Unclassifiable, and Nonattainment Areas	N/A
IDAPA 58.01.01.585 – Toxic Air Pollutants Non-Carcinogenic Increments	All points/sources
IDAPA 58.01.01.586 – Toxic Air Pollutants Carcinogenic Increments	All points/sources
IDAPA 58.01.01.590 – New Source Performance Standards	N/A
IDAPA 58.01.01.591 – National Emissions Standards for Hazardous Air Pollutants (NESHAPs)	All points/sources
IDAPA 58.01.01.625 – Visible Emissions	P-1-6
IDAPA 58.01.01.625.02 – Visible Emissions, Standards for Exempted Sources	P-40; P-9; Cheese Plant HVAC Units AC 02, AC 03, AC 04, AC 05, AC 06, AC 14, AC 15, !C 16, AC 17, AC 24; Whey Plant HVAC Units AC-12, AC-10; Fresh Mozzarella Plant HVAC Units AC 01, AC 02; P-7, P-8, P-9
IDAPA 58.01.01.676 – Standards for New Sources (Fuel-Burning Equipment-Particulate Matter)	P-1, P-2, P-3, P-6, P-7, P-8, P-9
IDAPA 58.01.01.679 – Averaging Period	P-1-6
IDAPA 58.01.01.700 – Particulate Matter – Process Weight Limitations	P-1-6

3 Potential to Emit/Emissions Estimates/Limitation on Potential to Emit

3.1 Emission Estimates and Past Test Results

Emissions for existing equipment that have been stack performance tested in accordance with past versions of this permit are provided here. Emissions are estimated for the remaining equipment as summarized in the Emissions Inventory (see Appendix 3).

Table 10 - Performance Test Emissions

Source	Test Date	Pollutant	gr/dscf	lb/hr
Meyers-Sterner Whey Dryer	2/18/2013	PM/PM_{10}	1.9E-3	0.24
TetraPak Wet Scrubber	10/2/2014	PM/PM_{10}	0.0031	1.3
TetraPak Baghouse	6/3/2011	PM/PM_{10}	N/A	1.22

Boilers (Cheese Plant), HVAC units, Whey Dryer Burner Stacks

Emissions from these sources were calculated by multiplying the boiler's heat input capacity times the emission factors for natural combustion found in EPA AP-42, Chapter 1.4 "Natural Gas Combustion". Emission rates were calculated for both criteria pollutants and toxic air pollutants (TAPs). The calculated emission rates represent the potential to emit based on maximum rated natural gas combustion, if all sources were operated 24 hrs/day, 365 days/year. The summary or total of those emissions (including the exempt Donaldson Dust Collection Unit) are shown in Table 10. Since all of the HVAC units would only be combusting natural gas during the cold months of the year, this is an overestimate of actual emissions. The emissions data that support this are provided in the Emissions Inventory (see Appendix 3.) An electronic file is provided with the Excel spreadsheets so that formulas may be verified.

Table 11 – Emissions from Natural Gas Combustion

Pollutant	Meyers-Sterner Whey Dryer w/ Cyclone/BH	TetraPak Whey Dryer - Burner 1	TetraPak Whey Dryer - Burner 2	Cleaver Brooks 600 HP	Superior 800 HP	Hurst 800 HP	Cleaver Brooks 1200 HP	Natural Gas-Fired Heaters @8760	TOTAL
PM	7.3	0.41	0.41	0.80	0.81	1.10	1.60	0.90	**13.3**
PM_{10}	7.3	0.41	0.41	0.80	0.81	1.10	1.60	0.90	**13.3**
$PM_{2.5}$	4.8	0.41	0.41	0.80	0.81	1.10	1.60	0.90	**10.9**
SO_2	0.02	0.03	0.03	0.06	0.06	0.09	0.13	0.07	**0.49**
NO_2	1.20	2.19	2.19	10.54	10.67	14.46	21.09	11.81	**74.1**
CO	9.81	17.05	17.05	8.85	8.96	12.15	17.71	9.92 *3.27*	**101.5** ***98.2******
VOCs	0.14	0.30	0.30	0.58	0.59	0.80	1.16	0.65	**4.5**
Lead	1.29E-05	2.69E-05	2.69E-05	5.27E-05	5.34E-05	7.23E-05	1.05E-04	5.91E-05	**4.10E-04**

*CO emissions from heaters operating 2,885 hours per year instead of 8,760 hours per year.

3.2 Fuel Burning Equipment – Particulate Matter

Fuel-burning equipment is defined in IDAPA 58.01.01.006 as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. Particulate matter emission limits for fuel-burning equipment are established in IDAPA 58.01.01.675. The limit for sources combusting natural gas and in operation after October 1, 1979 is 0.015 grains per dry standard cubic foot (dscf) corrected for 3% oxygen.

- All of the heaters/air handling units that provide indirect heat have rated heat input capacities less than 10 MMBtu/hr, and are therefore not subject to this standard.

- All four boilers and the two TetraPak Whey Dryer burners are subject to this standard. Demonstration of compliance with this standard was included in the 2009 application (See Appendix 5).

3.3 Limitations on Potential to Emit

The scrubber (P-4) and baghouses (P1 and P-5) are air control devices that are required to prevent exceedance of National Ambient Air Quality standards for PM_{10}. The following are the process limitations for the Dryers according to the PTC issued for them:

Table 12 - Process Limitations

Source	Process Limitations (lb/hr dried powder, 24 hour average)	PTC Version
Meyers-Sterner Whey Dryer	1496	March 13, 2014
TetraPak Whey Dryer	16,667	August 28, 2009
Fire Pump Engine	Limited to operating a maximum of 0.5 hr/day and 500 hr/yr.	2016

Combustion emission rates were determined based on maximum rated firing rates and therefore do not require any limitations on hours of operation.

The facility is considered a synthetic minor source since it relies on physical controls to prevent exceedance of the major source classification.

4 Facility Classification

The Sorrento Lactalis facility is located in Nampa, Canyon County, Idaho. This area is considered attainment or unclassified for all criteria pollutants.

The facility is not a designated facility as defined in IDAPA 58.01.01.006.30. The facility is not a major facility as defined in IDAPA 58.01.01.008.10. Calculations showing facility-wide emissions of hazardous air pollutants (HAPs), mercury, greenhouse gases (GHGs), and criteria pollutants are included in the emissions inventory (see Appendix 3).

The primary SIC Code for the facility is 2023 and the NAICS codes are 311513 and 311514.

APPENDIX 2. Ambient Air Quality Dispersion Modeling Analysis Report

1.0 Summary

The Sorrento Lactalis, Inc. (Sorrento) Nampa Cheese Plant is an existing facility producing natural cheese, dry whey products, and cultured cream cheese. The main process and support areas currently include the Cheese Plant, Whey Plant, Fresh Mozzarella Plant, and the Wastewater Treatment Plant (WWTP). In 2009, dispersion modeling addressed facility-wide emissions from the main process equipment, including dryers and boilers, but did not address emissions from existing natural gas-fired heaters, an existing fire pump engine, the installation of several natural gas-fired air handling units (AHUs) and heaters installed as part of this larger project in 2010.

In 2012-2013, the plant added the capacity to produce up to 100,000 pounds per day of fresh mozzarella cheese in a new 60,000 square foot building on the northeast side of then-existing plant buildings. Two new natural gas-fired AHUs were added with this project.

In 2014, the burner for the Superior Boiler was replaced. The existing burner was rated at 600 boiler horsepower (HP) with a maximum heat input capacity of 20.1 million British thermal units per hour (MMBtu/hr). This was replaced by an 800 HP burner de-rated by the manufacturer to a maximum heat input capacity of 24.8 MMBtu/hr.

In 2014, an inspection identified that the rated heat input capacity for the 600 HP Cleaver Brooks boiler was 24.5 MMBtu/hr instead of 20.1 MMBtu/hr. A review of records sent to DEQ in 2003 reveals that this boiler was reported with an input of 24.49 MMBtu/hr. Unfortunately, a error was made in the 2009 PTC application that identified the boiler as having an input capacity of 20.1 MMBtu/hr. The 2010 DEQ inspection did not identify this error. So this modification corrects the error made in 2009.

The purpose of this analysis is to demonstrate that facility-wide emissions from Sorrento's Nampa plant, including the increased emissions from the 800 HP Superior boiler and the 600 HP Cleaver Brooks boiler, combustion emissions from natural gas-fired AHUs and heaters, and the diesel-fired emergency fire pump engine do not cause or significantly contribute to a violation of any air quality standard and facility-wide emissions of CO do not equal or exceed 100 tons per year.

Robinson Environmental Consulting, LLC (REC) conducted full-impact atmospheric dispersion modeling for Sorrento's Nampa plant. Facility-wide emissions of CO, SO_2 and lead were below modeling thresholds. The ambient air quality impacts resulting from emissions of other criteria pollutants from the plant are summarized in Table 1-1, and demonstrate that these emissions, combined with appropriate background concentrations, do not equal or exceed any NAAQS.

Table 1-1. FULL-IMPACT MODELING RESULTS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Period	Modeled Ambient Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24-hr	24.7	70.2	94.9	150	63.3%
$PM_{2.5}$	24-hr	11.7	23.1	34.8	35	99.4%
	Annual	3.5	7.8	11.2	12	93.3%
CO	1-hr	---	1657	---	40,000	---
	8-hr	---	996	---	10,000	---
NO_2	1-hr	92.7	80.9	173.6	188	92.3%
	Annual		10.9		100	
SO_2	1-hr	---	---	---	196	---
	Annual	---	---	---	80	---

NSPS and the pump engine is subject to a NESHAP. Where the emissions from the whey dryer burners and space heaters exceeded an applicable EL, REC conducted dispersion modeling to ensure that the maximum ambient impacts did not equal or exceed the acceptable ambient concentration (AAC) increment for noncarcinogens or the acceptable ambient concentration for carcinogens (AACC) increment. TAPs modeling results are summarized in Table 1-2, and demonstrate that the ambient impacts from these TAPs emissions do not equal or exceed any AAC or AACC increment.

Table 1-2. MODELING RESULTS FOR TOXIC AIR POLLUTANTS

Toxic Air Pollutant	Averaging Period	Maximum Modeled Ambient Impact ($\mu g/m^3$)	AAC/AACC Increment ($\mu g/m^3$)	Percent of AAC/AACC Increment
Carcinogens				
Arsenic	Annual	2.14E-05	2.3E-04	9.3%
Cadmium	Annual	1.18E-04	5.6E-04	21%
Formaldehyde	Annual	8.07E-03	7.7E-02	10%
Nickel	Annual	2.26E-04	4.2E-03	5.4%

Compliance with the more stringent NAAQS that have been implemented since the previous dispersion modeling analyses were conducted in 2009 required changes shown in Table 1-3. The reduction in allowable emissions of $PM_{2.5}$ was necessary to demonstrate compliance with the 24-hour $PM_{2.5}$ standard. Because the boilers operate continuously, it was necessary to increase stack heights to demonstrate compliance with the 1-hour NO_2 standard.

Table 1-3. CHANGES TO EMISSION LIMITS AND STACK HEIGHTS (2016 PTC)

Source ID	Source	Permit Limit		Exhaust Height	
		2009-2015	2016[a]	2009-2015	2016
P1	Meyers-Sterner Whey Dryer (Baghouse Exhaust)	1.66 lb/hr PM_{10} ---	1.66 lb/hr PM_{10} **0.6 lb/hr $PM_{2.5}$**	78 ft	78 ft
P4	TetraPak Whey Dryer Scrubber	5.66 lb/hr PM_{10} ---	5.66 lb/hr PM_{10} **1.9 lb/hr $PM_{2.5}$**	136 ft	136 ft
P5	TetraPak Whey Dryer Baghouse	3.32 lb/hr PM_{10} ---	3.32 lb/hr PM_{10} 3.32 lb/hr $PM_{2.5}$	136 ft	136 ft
P6	Cleaver Brooks 1200 HP boiler	---	---	38 ft	**50 ft**
P7	Superior 800 HP boiler	---	---	35 ft	**50 ft**
P8	Cleaver Brooks 600 HP boiler	---	---	31 ft	**50 ft**
P9	Hurst 800 HP boiler	---	---	38 ft	**50 ft**

[a] Source Tests:

P1, February 18, 2013, Results: 0.0808 lb/hr (Method 5) and 0.1637 lb/hr (Method 202), PM_{10} = 0.24 lb/hr
P4, October 2, 2014, Results: 0.0011 lb/hr (Method 5) and 1.3 lb/hr (Method 202), PM_{10} = 1.31 lb/hr
P5, June 3, 2011, Results: 1.22 (Method 5 and 202) PM_{10} = 1.22 lb/hr

Facility-wide emissions of CO from combustion of natural gas and diesel will remain below 100 tons per year if the emergency fire pump engine is limited to 500 hours per year of operation and the facility-wide consumption of natural gas is limited to 2,333 MMscf (23.75 million therms) per year.

2.0 Project Description and Background as it Relates to Modeling Analyses

2.1 General Facility/Project Description

Sorrento's Nampa Cheese Plant produces a variety of cheese and dry whey products from milk. The purpose of this analysis is to demonstrate that facility-wide emissions from Sorrento's Nampa plant, including the increased emissions from the 800 HP Superior boiler and 600 HP Cleaver Brooks boiler, combustion emissions from natural gas-fired AHUs and heaters, and the diesel-fired emergency fire pump engine do not cause or significantly contribute to a violation of any air quality standard, and that facility-wide emissions of CO are below 100 tons per year.

2.2 Location of Project

__X__ A map showing the geographical location of the facility is provided in this section.

Sorrento's Swiss Village Cheese Plant is located in the western Snake River Plain in a wide valley defined by the Owyhee Mountains to the south and the Boise Front (Boise Foothills) to the north, as shown in Figure 2-1. The facility is located at 4912 E. Franklin Road just east of Nampa, Canyon County, Idaho. UTM coordinates at the approximate center of the facility are 541.0 kilometers (km) Easting and 4828.3 km Northing (datum WGS84) in UTM Zone 11.

Figure 2-1. SORRENTO LACTALIS' NAMPA CHEESE PLANT, AREA MAP

Sorrento's Nampa Cheese Plant is located on a 38.4-acre parcel at the intersection of E. Franklin Road and Star Road, just west of the boundary separating Canyon and Ada Counties, as shown in Figure 2-2. The I-84 freeway runs east-west about one mile south of the facility, with the Garrity Boulevard exit located about two miles to the south and west of the plant. Adjacent land uses currently are primarily agricultural and light industrial, with residential uses located about 0.3 miles (0.5 km) north of the main plant buildings. Rural dispersion coefficients were used in the modeling analyses.

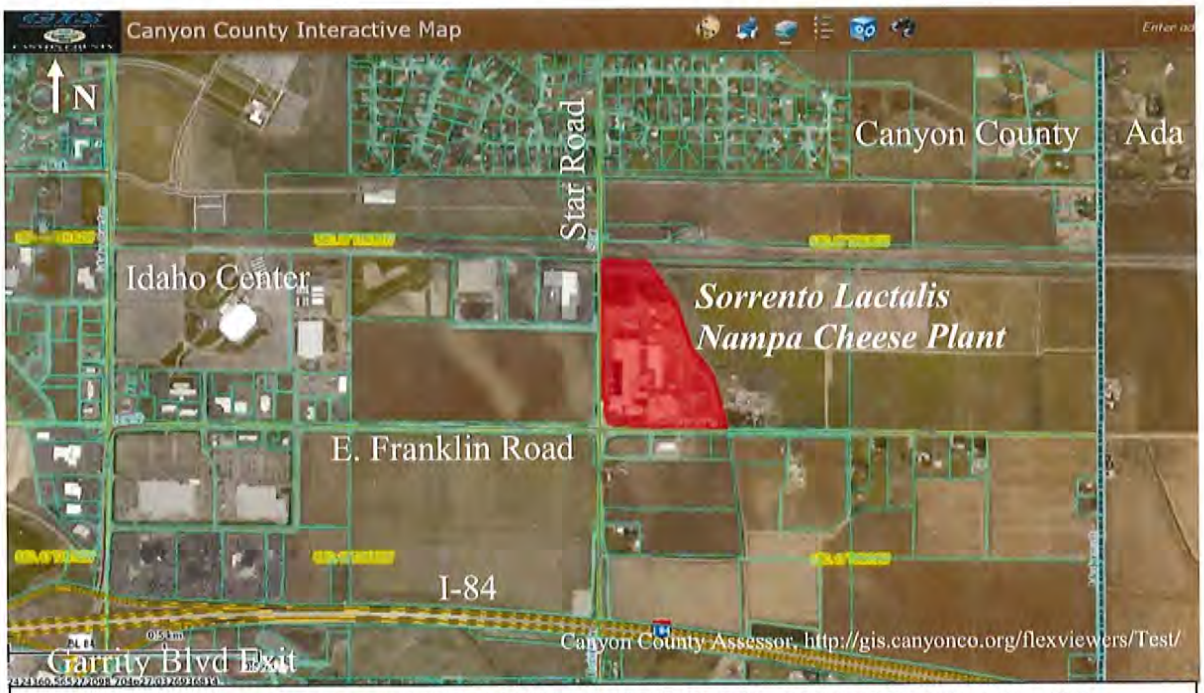


Figure 2-2. SORRENTO LACTALIS' NAMPA CHEESE PLANT – SURROUNDING LAND USES

2.3 Existing Permits and Modeling Analyses Performed

__X__ Any existing air quality permits are listed and described in this section, and any associated air quality modeling analyses have been described and referenced, and submitted if appropriate.

Permits that will be superseded by this permitting action are listed in Section 1, Introduction, of this application. Emissions and parameters for the Meyers-Sterner Whey Dryer (P-1) were taken from the 2009 application, which cited the 2001 application (PTC No. 027-00071, issued July 20, 2001).

The most recent dispersion modeling conducted for the plant was for installation of a new whey dryer and boiler in 2009 (PTC P-2009.0023, issued August 28, 2009). Full-impact dispersion modeling using AERMOD was conducted for emissions of PM_{10}, CO, and NOx from the Meyers-Sterner Whey Dryer, TetraPak Whey Dryer Burners 1 and 2, TetraPak Whey Dryer Scrubber, TetraPak Shaking Bed Baghouse, and four boilers: a 1200 HP Cleaver Brooks, 600 HP Superior, 600 HP Cleaver Brooks, and an 800 HP Hurst. These sources were assigned emission point numbers P-1 through P-9 in the 2009 analysis. The combustion sources were presumed to operate continuously, 8760 hours per year.

The 2009 analysis predated implementation of the NAAQS for 24-hour and annual $PM_{2.5}$ (PM_{10} was still being used as a surrogate), 1-hour NO_2, and 1-hour SO_2. The results of the full-impact analysis are shown in Table 2-1.

Table 2-1. RESULTS FOR 2009 CUMULATIVE IMPACT ANALYSIS

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24 hr	25.46	84	109	150	73
	Annual	7.94	27	35	50	70

Table 2-1. RESULTS FOR 2009 CUMULATIVE IMPACT ANALYSIS						
Pollutant	**Averaging Period**	**Maximum Modeled Concentration (µg/m³)**	**Background Concentration (µg/m³)**	**Total Ambient Impact (µg/m³)**	**NAAQS (µg/m³)**	**Percent of NAAQS**
Carbon monoxide (CO)	1-hour	308.8	10,200	10,509	40,000	26
	8-hour	137.9	3,400	3,538	10,000	35
Nitrogen dioxide (NO_2)	Annual	34.72	32	67	100	67

The location of modeled maximum impacts was consistent with the strong bimodal wind flow in the Treasure Valley. Meteorological data used for the 2009 analyses were drawn from surface and upper air data collected at the Boise Airport and at the National Weather Service office located near that airport. Maximum impacts occurred relatively close to the ambient air boundary (fence line), as shown in Figure 2-3.

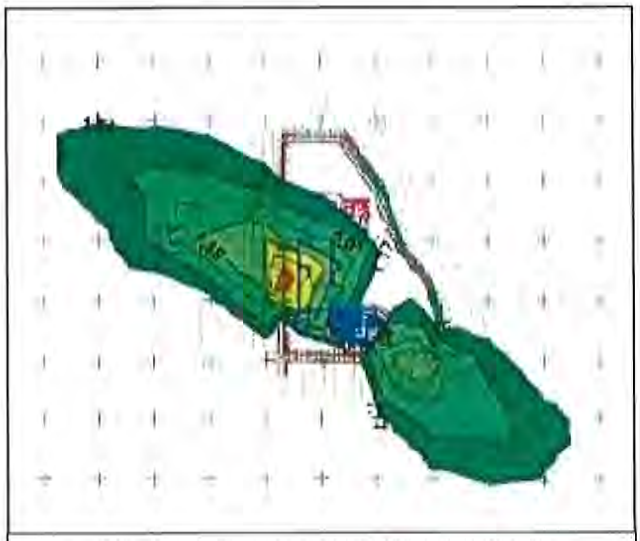


Figure 2-3. ANNUAL PM_{10} IMPACTS (2009)

Emissions of arsenic, cadmium, formaldehyde, and nickel were modeled from the Meyers-Sterner and TetraPak whey dryers and the four boilers, although only the TetraPak burners were new and the new boiler was subject to an NSPS. The results of the TAP analysis are shown in Table 2-2.

Table 2-2. RESULTS FOR 2009 TAPS ANALYSIS				
Pollutant	**Averaging Period**	**Maximum Modeled Concentration (µg/m³)**	**AAC/AACC Increment (µg/m³)**	**Percent of AAC/AACC Increment**
Arsenic	Annual	7.0E-05	2.3E-04	30
Cadmium	Annual	3.9E-04	5.6E-04	70
Formaldehyde	Annual	2.7E-02	7.7E-02	35
Nickel	Annual	7.5E-04	4.2E-03	18

3.0 Modeling Analyses Applicability and Protocol

3.1 Applicable Standards

Criteria pollutant National Ambient Air Quality Standards (NAAQS) are listed in Table 3-1, along with significant impact levels (SILs).

Table 3-1. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	75 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms/cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

TAPs emitted from the Sorrento Lactalis Nampa plant are the result of combustion of natural gas and diesel in facility equipment. These TAPs are listed in Table 3-2.

Table 3-2. Toxic Air Pollutant ELs and AACs/AACCs			
TAP	**Non-Carcinogen or Carcinogen**	**Screening Emissions Level (EL) (lb/hr)**	**AAC or AACC ($\mu g/m^3$)**
PAH HAPs			
2-Methylnaphthalene	Carcinogen	9.10E-05	
3-Methylchloranthrene	"	2.50E-06	
Acenaphthene	"	9.10E-05	
Acenaphthylene	"	9.10E-05	
Anthracene	"	9.10E-05	
Benzo(a)anthracene	"	9.10E-05	See POM
Benzo(a)pyrene	"	2.00E-06	See POM
Benzo(b)fluoranthene	"	9.10E-05	See POM
Benzo(g,h,i)perylene	"	9.10E-05	
Benzo(k)fluoranthene	"	9.10E-05	See POM
Chrysene	"	9.10E-05	See POM
Dibenzo(a,h)anthracene	"	9.10E-05	
Dichlorobenzene	"	9.10E-05	
Fluoranthene	"	9.10E-05	
Fluorene	"	9.10E-05	
Indeno(1,2,3-cd)pyrene	"	9.10E-05	See POM
Naphthalene	Noncarcinogen	3.33	
Naphthalene (as carcinogen)	Carcinogen	9.10E-05	
Phenanathrene	"	9.10E-05	
Pyrene	"	9.10E-05	
Polycyclic Organic Matter (POM) 7-PAH Group	"	2.00E-06	
Non-PAH HAPs			
Acetaldehyde	Carcinogen	3.00E-03	
Acrolein	Noncarcinogen	0.017	
Benzene	Carcinogen	8.00E-04	
1,3-Butadiene	"	2.40E-05	
Formaldehyde	"	**5.10E-04**	**7.7E-02**
Hexane	Noncarcinogen	12	
Toluene	"	25	
Xylene	"	29	
Non-HAP Organic Compounds			
Pentane	"	118	
Metals (HAPs)			
Arsenic	**Carcinogen**	**1.50E-06**	**2.3E-04**
Barium	Noncarcinogen	0.033	
Beryllium	Carcinogen	2.80E-05	
Cadmium	**Carcinogen**	**3.70E-06**	**5.6E-04**
Chromium	Noncarcinogen	0.033	
Cobalt	"	0.0033	
Copper	"	0.013	
Manganese	"	0.067	
Mercury	"	0.003	
Molybdenum	"	0.333	
Nickel	**Carcinogen**	**2.70E-05**	**4.2E-03**
Selenium	Noncarcinogen	0.013	
Vanadium	"	0.003	
Zinc	"	0.667	

3.2 Criteria Pollutant Modeling Applicability

__X__ Explanations/documentation why modeling was or was not performed for each criteria pollutant are provided in this section.

__X__ Emissions calculations that clearly show how the modeling applicability determination was performed are provided in this section.

The potential to emit (PTE) regulated pollutants was calculated in accordance with Section 006.88 of the Rules (2015 edition) as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable.

Emissions of criteria pollutants for the whey dryers, scrubber, baghouse, and the four boilers were taken from the 2009 modeling analysis, with the exception of $PM_{2.5}$ for process emissions. The ratio of $PM_{2.5}$ to PM_{10} for process emissions was determined based on the results from the most recent source tests available. These sources were presumed to operate continuously, 8760 hours per year. Calculations, assumptions, and manufacturer data for those sources are included in Appendix 5 to this application. Copies of the source test reports are included as Appendix 4 to this application.

Emissions of criteria pollutants from natural gas-fired space heaters were calculated using the maximum heat input rating for each unit and were modeled presuming these sources operate continuously, 8760 hours per year. The fire pump engine was presumed to operate no more than 30 minutes per week for routine testing and a maximum of 500 hours per year. $PM_{2.5}$ emissions were presumed to be equal to PM_{10} emissions for these combustion sources. Heat input ratings were provided by Sorrento based on a review of plant design manuals and field inspections. Calculations for space heater emissions are included in Appendix 3 to this application and in an Excel spreadsheet submitted with this application.

Modeling thresholds developed by DEQ are intended ensure that ambient impacts from project emissions would be less than significant. Because part of this analysis is a supplemental "look-back" for the 2009 project, a comparison of facility-wide emissions with DEQ's Level I modeling thresholds is shown in Table 3-2.

It could be argued that the "project" in this case is limited to the increase in emissions associated with the small rating increases for the 600 HP Cleaver Brooks and 800 HP Superior boilers (a total of 9.1 MMBtu/hr, emitting 0.75 lb/hr CO), emissions associated with natural gas heaters installed after the 1-hr NO_2 NAAQS became effective in Idaho (April 7, 2011) [emissions from all natural gas-fired heaters total 2.26 lb/hr], and emissions from the diesel fire pump engine (1.57 lb/hr), for a total increase in CO emissions of 3.83 lb/hr, which is considerably less than the Level I CO threshold of 15 lb/hr.

As shown in Table 2-1, 2009 modeling results demonstrated that ambient CO impacts from the dryers and all four boilers was only 26 and 35 percent of the 1-hr and 8-hr CO NAAQS, respectively.

As shown in the table, modeling was not required for emissions of SO_2, CO, or lead.

Table 3-2. COMPARISON OF FACILITY-WIDE EMISSIONS WITH MODELING THRESHOLDS

Pollutant	Averaging Period	Sources P-1 through P-9 (2009)		Natural Gas-Fired Heaters (2016)		Fire Pump Engine (2016)		Total		DEQ Level I Modeling Thresholds (2013)	
		(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
PM_{10}	24-hour	5.2		0.20		0.51		5.92		0.22	
$PM_{2.5}$	24-hour	5.0		0.20		0.51		5.75		0.054	
	Annual		22.4		0.90		0.13		23.4		0.35
SO_2	1-hour	0.10		0.016		0.086		**0.20**		**0.21**	
	Annual		0.42		0.07		0.02		**0.51**		**1.2**

Table 3-2. COMPARISON OF FACILITY-WIDE EMISSIONS WITH MODELING THRESHOLDS											
Pollutant	**Averaging Period**	**Sources P-1 through P-9 (2009)**		**Natural Gas-Fired Heaters (2016)**		**Fire Pump Engine (2016)**		**Total**		**DEQ Level I Modeling Thresholds (2013)**	
		(lb/hr)	**(T/yr)**	**(lb/hr)**	**(T/yr)**	**(lb/hr)**	**(T/yr)**	**(lb/hr)**	**(T/yr)**	**(lb/hr)**	**(T/yr)**
NO_x	1-hour	14.2		2.70		7.28		24.2		0.2	
	Annual		46.5		3.87		1.82		52.2		1.2
CO	1 hour, 8-hours	Δ =0.75 **20.9**		2.26		1.57		Δ =3.83 **24.7**		15 **(II, 175)**	
VOCs	Annual		3.86		0.65		0.15		**4.65**		**40**
Lead	Rolling 3-month average							**0.06** lb/mo		**14** lb/mo	

3.3 TAP Modeling Applicability

_X_ Explanation/documentation on why modeling was or was not performed for emissions of each TAP identified in the emissions inventory are provided in this section.

Controlled TAPs emissions from natural gas combustion were calculated in accordance with Section 210.02.b of the Rules using the maximum capacity of the source or modification under its physical and operational design without the effect of any physical or operational limitations. Emissions were calculated presuming each combustion source operates at its maximum rated heat input capacity 24 hours per day and 8,760 hours per year. Emissions from all sources were summed and compared to screening emission levels (ELs) listed in Sections 585 and 586 of the Rules.

Note that TAP emissions from operating the natural gas-fired boilers and the diesel emergency engine were excluded from this applicability review because the boilers are subject to an NSPS (Subpart Dc) and engine is subject to a NESHAP (Subpart ZZZZ). In accordance with Section 006.20.a and 20.b of the Rules, and the approved modeling protocol, no further procedures will be required for demonstrating preconstruction compliance for TAPs emissions regulated by an NSPS and/or a NESHAP, provided adequate provisions implementing the federal standard are appropriately addressed.

Calculations and a summary sheet for TAPs emissions from all sources are included in Appendix 3 to this application and in an Excel spreadsheet submitted with this application. As shown in Table 3-4, facility-wide emissions of formaldehyde, arsenic, cadmium and nickel exceeded the applicable ELs. Dispersion modeling for the controlled facility-wide emissions of these four carcinogenic pollutants was conducted.

Table 3-4. TAPS EXCEEDING SCREENING EMISSION LEVELS (LB/HR)							
Pollutant	**Meyers-Sterner Whey Dryer w/Cyclone & BH**	**TetraPak Whey Dryer – Burner 1**	**TetraPak Whey Dryer – Burner 2**	**Natural Gas-Fired Heaters**	**Total**	**EL**	**Modeling Required?**
Arsenic	1.18E-06	2.46E-06	2.46E-06	5.37E-06	**1.15E-05**	1.5E-06	Yes
Cadmium	6.48E-06	1.35E-05	1.35E-05	2.95E-05	**6.30E-05**	3.7E-06	Yes
Formaldehyde	4.42E-04	9.21E-04	9.21E-04	2.01E-03	**4.30E-03**	5.1E-04	Yes
Nickel	1.24E-05	2.58E-05	2.58E-05	5.64E-05	**1.20E-04**	2.7E-05	Yes

3.4 Modeling Protocol

REC submitted a modeling protocol to DEQ on January 26, 2016. DEQ issued a protocol approval letter with comments on February 16, 2016, and transmitted revised background concentrations for PM_{10} and $PM_{2.5}$ on February 27, 2016. Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the protocol and in the *Idaho Air Quality Modeling Guideline*.

REC submitted Addendum No. 1 to the protocol in an email to Kevin Schilling on March 7, 2016, requesting to use DEQ's Level II modeling threshold instead of the Level I threshold for CO emissions. DEQ recommended that the justification for using the Level II threshold for CO be included in this report (see Section 3.2).

__X__ The protocol and DEQ's conditional protocol approval notice are included in Appendix A to this modeling report.

__X__ Concerns identified by DEQ in the protocol approval notice have been addressed in the analyses performed and in this modeling report.

4.0 Modeled Emissions Sources

__X__ The modeling emissions inventory and the emissions inventory presented in other parts of the application are consistent, and if they are not identical numbers, it is clearly shown, with calculations submitted, how the modeled value was derived from the value provided in the emissions inventory.

4.1 Criteria Pollutants

Hourly emissions of PM_{10} from whey drying processes match the lb/hr emission limits in the current (2015) permit. New limits on emissions of $PM_{2.5}$ from whey drying processes were determined by the modeling analyses for this pollutant (recent source test results demonstrate compliance with these new limits). For all averaging periods, all combustion sources were presumed to operate 24 hours per day except for the fire pump engine. In accordance with DEQ's modeling guideline, the pump engine emissions were omitted from 1-hour NO_2 modeling. Emission rates for NO_x modeling from all other sources presumed 100 percent conversion of NOx to NO_2.

As recommended in DEQ's conditional protocol approval letter, weekly testing of the pump engine for 30 minutes was handled by spreading the emissions over daylight hours every day. "Daylight hours" for each month were determined based on the earliest sunrise and latest sunset for each month of the year (see Appendix 3 to this application). A set of factors was input into AERMOD using the month, hour-of-day, and day of week (MHRDOW) option in BEEST, to be applied to the lb/hr emissions rate for the fire pump for all pollutants and averaging times. The factors used for each month and hour-of-day are shown in Table 4-1.

Table 4-1. "DAYLIGHT HOUR" FACTORS APPLIED TO FIRE PUMP ENGINE EMISSIONS

Hour	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0.031	0.0294	0.0294	0	0	0	0	0
6	0	0	0	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0	0	0
7	0	0	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0
8	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
9	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
10	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
11	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
12	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
13	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
14	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045

Table 4-1. "DAYLIGHT HOUR" FACTORS APPLIED TO FIRE PUMP ENGINE EMISSIONS												
Hour	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
15	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
16	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
17	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
18	0.0455	0.045	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0.042	0.042	0.045
19	0	0	0.038	0.033	0.031	0.0294	0.0294	0.0333	0.0357	0	0	0
20	0	0	0	0.033	0.031	0.0294	0.0294	0.0333	0	0	0	0
21	0	0	0	0	0	0.0294	0.0294	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
	0.5/11	0.5/11	0.5/13	0.5/15	0.5/16	0.5/17	0.5/17	0.5/15	0.5/14	0.5/12	0.5/12	0.5/11

Full impact dispersion modeling was conducted for facility-wide emissions of PM_{10}, $PM_{2.5}$, and NOx. Modeled emission rates are shown in Table 4-2.

Table 4-2. MODELED EMISSION RATES – CRITERIA POLLUTANTS (LB/HR)					
Source ID	**Description**	**PM_{10} (24-hr)**	**$PM_{2.5}$ (24-hr & Annual)**	**NOx (1-hr)**	**NOx (Annual)**
P-1	Meyers-Sterner Whey Dryer w/ Cyclone/BH	1.66	0.6	0.27	0.27
P-2	TetraPak Whey Dryer - Burner 1	0.0933	0.0933	0.499	0.499
P-3	TetraPak Whey Dryer – Burner 2	0.0933	0.0933	0.499	0.499
P-4	TetraPak Whey Dryer Scrubber	5.66	1.9		
P-5	TetraPak Whey Dryer Baghouse	3.32	3.32		
P-6	Boiler 4, Cleaver Brooks 1200 HP	0.366	0.366	2.41	2.41
P-7	Boiler 2, Superior 800 HP	0.185	0.185	0.462	0.462
P-8	Boiler 1, Cleaver Brooks 600 HP	0.183	0.183	0.432	0.432
P-9	Boiler 3, Hurst 800 HP	0.251	0.251	3.3	3.3
P-35	CH-AC01, Cheese Plant, Engineering	3.76E-04	3.76E-04	1.09E-04	1.09E-04
P-10	CH-AC02, Cheese Plant, Main Conf. Rm	5.51E-04	5.51E-04	1.60E-04	1.60E-04
P-11	CH-AC03, Cheese Plant, Main Breakroom	1.34E-03	1.34E-03	3.88E-04	3.88E-04
P-12	CH-AC04, Cheese Plant, Office, East side	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-13	CH-AC05, Cheese Plant, Office, West side	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-37	CH-AC14, Cheese Plant, QA Offices	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-14	CH-AC15, Cheese Plant, Micro Lab	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-15	CH-AC16, Cheese Plant, Intake Breakroom	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-16	CH-AC17, Cheese Plant, Main Lab	9.31E-04	9.31E-04	2.70E-04	2.70E-04
P-17	CH-AC24, Cheese Plant, Warehouse	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-18	WH-MA01, Whey Plant, Crystallizer room	0.0186	0.0186	5.39E-03	5.39E-03
P-19	WH-MA02, Whey Plant, HTST room	0.0163	0.0163	4.72E-03	4.72E-03
P-20	WH-MA03, Whey Plant, Permeate dryer burner room	0.0163	0.0163	4.72E-03	4.72E-03
P-21	WH-MA06, Whey Plant, Permeate dryer cyclone room	0.0186	0.0186	5.39E-03	5.39E-03
P-22	WH-MA07, Whey Plant, Dungeon room	0.014	0.014	4.04E-03	4.04E-03
P-23	WH-AC01, Whey Plant, Packaging blower room	2.79E-03	2.79E-03	8.09E-04	8.09E-04
P-24	WH-AC02, Whey Plant, Powder silo room	3.73E-03	3.73E-03	1.08E-03	1.08E-03
P-25	WH-AC03, Whey Plant, Packaging bag room	6.98E-03	6.98E-03	2.02E-03	2.02E-03
P-26	WH-AC04, Whey Plant, Packaging bulk room	0.00931	0.00931	2.70E-03	2.70E-03
P-27	WH-AC09, Whey Plant, Offices	8.05E-04	8.05E-04	2.33E-04	2.33E-04

Table 4-2. MODELED EMISSION RATES – CRITERIA POLLUTANTS (LB/HR)					
Source ID	**Description**	**PM_{10} (24-hr)**	**$PM_{2.5}$ (24-hr & Annual)**	**NOx (1-hr)**	**NOx (Annual)**
P-28	WH-AC11, Whey Plant, Lab	8.94E-04	8.94E-04	2.59E-04	2.59E-04
P-29	WH-AC12, Whey Plant, Breakroom	9.31E-04	9.31E-04	2.70E-04	2.70E-04
P-30	WH-MA04, Whey Plant (Greenheck)	5.22E-03	5.22E-03	1.51E-03	1.51E-03
P-31	FM-AC01, Fresh Mozzarella Plant, 1st floor	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-32	FM-AC02, Fresh Mozzarella Plant, 2nd floor	8.57E-04	8.57E-04	2.48E-04	2.48E-04
P-34	Fire Pump Engine	0.512	0.512	---	7.28
P-40	Cheese Plant Donaldson Dust Collection Unit	3.82E-05	3.82E-05		
AHU 7/8	CH-AHU07 (Shred) and CH-AHU08(Mozzarella)	0.041	0.041	0.0119	0.0119
AHU 9	CH-AHU09 (Mascarpone)	0.0224	0.0224	6.47E-03	6.47E-03
AHU 10	WH-AHU10 (Membrane Room)	0.0157	0.0157	4.56E-03	4.56E-03

Four of the largest natural gas-fired heaters are direct-fired heaters located on the rooftops of the Cheese Plant (CH_AHU07 (Shred), 08 (Mozzarella), and 09 (Mascarpone)), and the Whey Plant (WH_AHU10 (Membrane Room)). Combustion gases are entrained in the air flow directed into large production spaces within the buildings, where they mix with—and are diluted by—building air. These diluted exhaust gases ultimately exit the building envelope as fugitive emissions through building vents and through any of several building exhaust fan vents. These emissions were included in the modeling analyses, presuming that emissions from AHU 7 and 8, AHU 9, and AHU 10 exhaust through a single roof vent located near the heaters. No dilution of the exhaust gases was presumed.

4.2 Toxic Air Pollutants

__X__ TAP emissions rates have been listed for each TAP that has project cumulative emissions exceeding the applicable EL.

__X__ Emissions rates in Table 4-3 are identical to those in the model input file for TAP analyses.

As described in Section 3.3 above, modeling was conducted only for emissions of four carcinogenic TAPs subject to an annual standard: arsenic, cadmium, formaldehyde, and nickel.

Modeled emission rates are shown in Table 4-3. Detailed emission inventory calculations are included in Appendix 3 to this application.

Table 4-3. MODELED EMISSION RATES – CARCINOGENIC TAPS					
		Carcinogenic TAPs			
Source ID	**Source Description**	**Arsenic (annual avg lb/hr)**	**Cadmium (annual avg lb/hr)**	**Formaldehyde (annual avg lb/hr)**	**Nickel (annual avg lb/hr)**
P-1	Meyers-Sterner Whey Dryer w/ Cyclone/BH	1.18	6.48	442	12.4
P-2	TetraPak Whey Dryer - Burner 1	2.46	13.5	921	25.8
P-3	TetraPak Whey Dryer – Burner 2	2.46	13.5	921	25.8
P-4	TetraPak Whey Dryer Scrubber	---	---	---	---
P-5	TetraPak Whey Dryer Baghouse	---	---	---	---
P-6	Boiler 4, Cleaver Brooks 1200 HP	---	---	---	---
P-7	Boiler 2, Superior 800 HP	---	---	---	---
P-8	Boiler 1, Cleaver Brooks 600 HP	---	---	---	---
P-9	Boiler 3, Hurst 800 HP	---	---	---	---
P-35	CH-AC01, Cheese Plant, Engineering	0.00988	0.0544	3.71	0.104

Table 4-3. MODELED EMISSION RATES – CARCINOGENIC TAPS					
		Carcinogenic TAPs			
Source ID	Source Description	Arsenic (annual avg lb/hr)	Cadmium (annual avg lb/hr)	Formaldehyde (annual avg lb/hr)	Nickel (annual avg lb/hr)
P-10	CH-AC02, Cheese Plant, Main Conf. Rm	0.0145	0.0798	5.44	0.152
P-11	CH-AC03, Cheese Plant, Main Breakroom	0.0353	0.194	13.2	0.371
P-12	CH-AC04, Cheese Plant, Office, East side	0.0225	0.124	8.46	0.237
P-13	CH-AC05, Cheese Plant, Office, West side	0.0225	0.124	8.46	0.237
P-37	CH-AC14, Cheese Plant, QA Offices	2.25E-08	0.124	8.46	0.237
P-14	CH-AC15, Cheese Plant, Micro Lab	2.25E-08	0.124	8.46	0.237
P-15	CH-AC16, Cheese Plant, Intake Breakroom	2.25E-08	0.124	8.46	0.237
P-16	CH-AC17, Cheese Plant, Main Lab	2.45E-08	0.135	9.19	0.257
P-17	CH-AC24, Cheese Plant, Warehouse	2.25E-08	0.124	8.46	0.237
P-18	WH-MA01, Whey Plant, Crystallizer room	0.49	2.7	184	5.15
P-19	WH-MA02, Whey Plant, HTST room	0.429	2.36	161	4.5
P-20	WH-MA03, Whey Plant, Permeate dryer burner room	0.429	2.36	161	4.5
P-21	WH-MA06, Whey Plant, Permeate dryer cyclone room	0.49	2.7	184	5.15
P-22	WH-MA07, Whey Plant, Dungeon room	0.368	2.02	138	3.86
P-23	WH-AC01, Whey Plant, Packaging blower room	0.0735	0.404	27.6	0.772
P-24	WH-AC02, Whey Plant, Powder silo room	0.098	0.539	36.8	1.03
P-25	WH-AC03, Whey Plant, Packaging bag room	0.184	1.01	68.9	1.93
P-26	WH-AC04, Whey Plant, Packaging bulk room	0.245	1.35	91.9	2.57
P-27	WH-AC09, Whey Plant, Offices	0.0212	0.116	7.94	0.222
P-28	WH-AC11, Whey Plant, Lab	0.0235	0.129	8.82	0.247
P-29	WH-AC12, Whey Plant, Breakroom	0.0245	0.135	9.19	0.257
P-30	WH-MA04, Whey Plant (Greenheck)	0.137	0.755	51.5	1.44
P-31	FM-AC01, Fresh Mozzarella Plant, 1st floor	0.0225	0.124	8.46	0.237
P-32	FM-AC02, Fresh Mozzarella Plant, 2nd floor	0.0225	0.124	8.46	0.237
P-34	Fire Pump Engine	---	---	---	---
P-40	Cheese Plant Donaldson Dust Collection Unit	---	---	---	---
AHU 7/8	CH-AHU07 (Shred) and CH-AHU08(Mozzarella)	1.08	5.93	404	11.3
AHU 9	CH-AHU09 (Mascarpone)	0.588	3.24	221	6.18
AHU 10	WH-AHU10 (Membrane Room)	0.414	2.28	155	4.35

4.3 Emissions Release Parameters

__X__ Thorough justification/documentation of release parameters for all modeled sources is provided in this section.

__X__ The specific methods used to determine/calculate given release parameters is described in this section.

__X__ The release orientation of existing point source stacks (horizontal, rain-capped, or uninterrupted vertical release) has been field-verified.

Table 4-4 lists stack parameters for modeled point sources. Exit velocities for capped and horizontal stacks were set at 0.001 m/s in accordance with EPA guidance. Stack location and exhaust configurations for natural gas-fired heaters, the fire pump engine, and the Donaldson baghouse were field-verified by

Wendy York, Safety and Environmental Manager for Sorrento. Exhaust temperatures for the heaters and the baghouse were determined by reviewing plant design documents. The exhaust temperature for the fire pump engine was set to 850°F, which is on the low end of typical temperatures for emergency engines.

Stack parameters for Sources P-1 through P-9 were taken from the 2009 modeling analyses. Justification for these parameters was provided in the 2009 documents included as Appendix 5 to this PTC application. The exit orientations for the four boiler stacks were changed from Default to "Capped" based on 2016 field verifications.

Table 4-4. POINT SOURCE STACK PARAMETERS

Source ID	UTM [a] Zone 11 (NAD83/WGS84)		Base Elev. (m) [b]	Stack or Exit Height (ft) [b]	Exit Temp. (°F) [c]	Exit Velocity (m/s) [d]	Stack Diameter (inches)	Exit Orientation
	Easting (m) [b]	Northing (m) [b]						
P-1	541064.9	4828191.2	766.85	78	160	11.59	38.04	Default [e]
P-2	541102.6	4828227.5	766.69	136	241	17.71	18.11	Default
P-3	541098.1	4828221.9	766.73	136	241	17.71	18.11	Default
P-4	541092.2	4828208.8	766.74	136	104	17.74	62.2	Default
P-5	541100.7	4828210.6	766.75	136	126	18.32	44.09	Default
P-6	540992.1	4828199.1	766.98	50	325	10.1	35.83	RAINCAP
P-7	541000.4	4828179.3	767.04	50	275	9.26	25.98	RAINCAP
P-8	540989.7	4828193.0	767.01	50	275	10.64	24.02	RAINCAP
P-9	540991.9	4828190.8	767.02	50	275	9.34	29.92	RAINCAP
P-35	540978.0	4828186.5	767.04	25.5	185	0.001	2.76	Horizontal
P-10	540968.6	4828185.5	767.05	25.5	185	0.001	2.76	Horizontal
P-11	540956.6	4828188.6	767.04	25.5	185	0.001	2.76	Horizontal
P-12	540943.2	4828188.9	767.09	25.5	185	0.001	2.76	Horizontal
P-13	540933.4	4828189.3	767.12	25.5	185	0.001	2.76	Horizontal
P-37	540971.1	4828283.3	766.76	40	185	0.001	2.76	Horizontal
P-14	540993.7	4828295.3	766.71	36.5	185	0.001	2.76	Horizontal
P-15	540991.0	4828299.9	766.72	36.5	185	0.001	2.76	Horizontal
P-16	540988.6	4828282.9	766.73	36.5	185	0.001	2.76	Horizontal
P-17	540920.9	4828271.1	766.86	32.5	185	0.001	2.76	Horizontal
P-18	541060.4	4828214.9	766.85	49.75	185	0.001	6	Capped
P-19	541037.0	4828210.4	766.88	46.75	185	0.001	6	Capped
P-20	541104.4	4828209.3	766.76	139.75	185	0.001	6	Capped
P-21	541099.1	4828202.5	766.75	42.6	185	0.001	6	Capped
P-22	541089.3	4828227.0	766.71	128.75	185	0.001	6	Capped
P-23	541083.9	4828235.9	766.67	42	185	0.001	56.05	Horizontal
P-24	541111.7	4828219.5	766.76	109	185	0.001	6	Capped
P-25	541112.0	4828212.4	766.77	71	185	0.001	6	Capped
P-26	541111.5	4828202.2	766.77	47.42	185	0.001	6	Capped
P-27	541045.0	4828175.0	766.91	22	185	0.001	2.59	Horizontal
P-28	541042.7	4828170.2	766.92	20.58	185	0.001	12	Horizontal
P-29	541054.5	4828173.7	766.89	22	185	0.001	4.51	Horizontal
P-30	541110.1	4828185.7	766.77	40	185	0.001	5.53	Horizontal
P-31	541028.8	4828341.4	766.5	38.5	185	0.001	2.59	Horizontal
P-32	541034.1	4828341.4	766.48	38.5	185	0.001	2.59	Horizontal
P-34	541080.6	4828351.1	766.34	8.33	850	0.001	4	Horizontal
P-40	540967.0	4828289.6	766.77	46	70	10	17	Default
AHU7/8	540967.7	4828265.1	766.8	41	70	5	36	Default
AHU 9	540964.1	4828199.3	767	25	70	5	36	Default
AHU10	541046.2	4828191.5	766.88	29	70	5	36	Default

[a.] Universal Transverse Mercator. [b.] Feet, meters [c.] Degrees Fahrenheit [d.] Meters per second. [e.] Default =Vertical uninterrupted

5.0 Modeling Methodology

Table 5-1 summarizes the key modeling parameters used in the impact analyses.

Table 5-1. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Canyon County	Attainment/Unclassifiable for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 15181
Meteorological Data	Boise 2011-2015 NWS surface data NWS upper air data	The meteorological model input files for this project were developed by DEQ. See Section 5.2 of this memorandum for additional details of the meteorological data.
Terrain	Considered	3-dimensional receptor coordinates were obtained from USGS National Elevation Dataset (NED) files and were used to establish elevation of ground level receptors. AERMAP version 15181 was used to determine each receptor elevation and hill height scale. Rural dispersion coefficients were used.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME v.04274 was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
NOx Chemistry	None	Modeled emissions presumed 100% conversion of NOx to NO_2.
Receptor Grid	**Full-Impact and TAPs Analyses**	
	Grid 1	25-meter (m) spacing along the ambient air boundary
	Grid 2	25-meter spacing from the fence line to a distance of 100 m.
	Grid 3	50-meter spacing from 100 to 300 m
	Grid 4	100-meter spacing from 300 to 500 m
	Grid 5	250-m spacing from 500 to 1000 m
	Grid 6	500-m spacing from 1000 to 3000 m (3 km)
	Grid 7	1000-m spacing from 3 to 10 km.

5.1 Model Selection

__X__ The current versions of all models and associated programs were used in analyses, or alternate versions were specifically approved by DEQ.

__*__ Any non-default model options used were approved by DEQ in advance.

The modeling analyses used Providence Engineering and Environmental Group's BEEST AERMOD suite, version 11.04. REC confirmed using information available on EPA's SCRAM website[1] that the versions of the modeling programs used in this BEEST version are the current approved versions.

*It was confirmed late in the project that all four boiler stacks were provided with rain caps rather than being vertical and unobstructed releases (as shown in the 2009 analyses). Given that the exhaust flows were known, each of the stacks was subject to downwash from adjacent structures, recent EPA guidance [2] recommending the use of the POINTCAP and POINTHOR beta options, and because the maximum 1-hr NOx impacts are due primarily to boiler emissions, the beta POINTCAP option was used for these four sources. Beta options were not used for the space heater or emergency engine exhaust points because the exhaust flows were not readily available.

[1] EPA, Support Center for Regulatory Atmospheric Modeling (SCRAM), accessed March 1, 2016 at http://www3.epa.gov/scram001/

[2] EPA Model Clearinghouse, February 10, 2016, accessed March 1, 2016 at https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=16-X-01

5.2 Meteorological Data

__X__ Meteorological data files are provided with the application.

_n/a_ If meteorological data used for modeling were not provided by DEQ, then a detailed discussion of the data is provided along with documentation of the processing steps.

An AERMOD-ready meteorological data set with surface and upper air data collected at or near the Boise Airport for the five-year period from 2011 through 2015 was recently provided by DEQ for another REC project. The files received from DEQ included a wind rose, wind class frequency profile graphic, and concatenated SFC and PFL files for the five-year period.

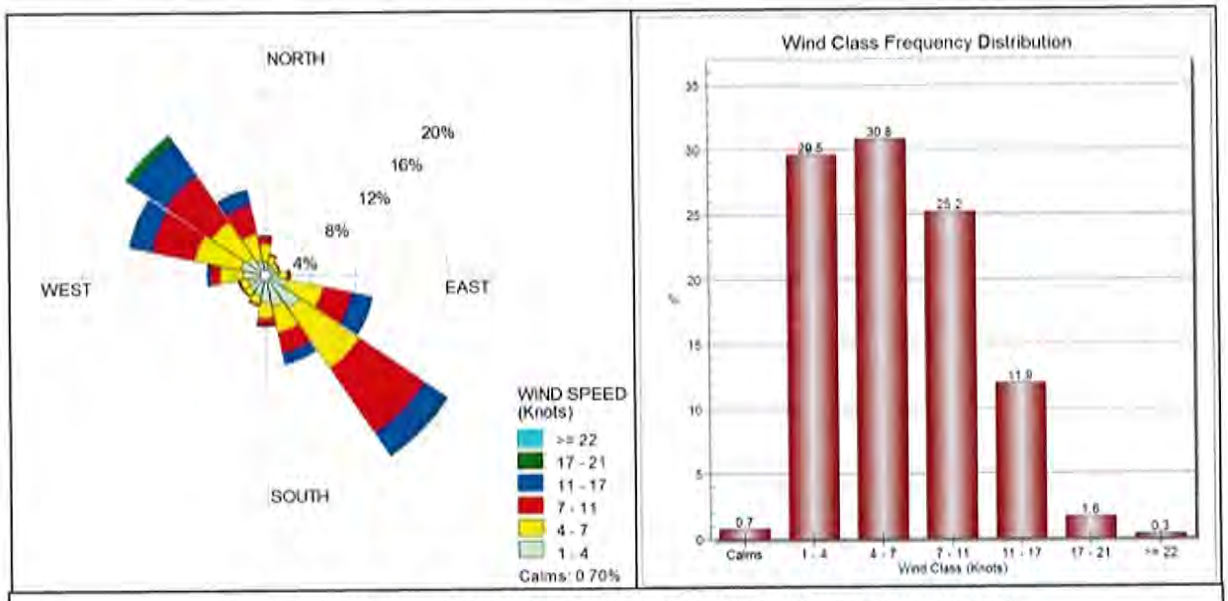


Figure 5-1. BOISE AIRPORT WIND ROSE AND WIND CLASS FREQUENCY

5.3 Effects of Terrain

__X__ The datum of terrain data, building corner locations, emissions sources, and the ambient air boundary are specified and are consistent such that the modeled plot plan accurately represents the facility and surroundings.

The terrain in the vicinity of the Sorrento Lactalis Nampa Plant is relatively flat but there are some nearby areas of slightly elevated terrain to the south. Digital terrain data were obtained from the National Elevation Database (NED) in datum WGS84 at a horizontal resolution of one arc-second (about 30 meters) for a domain calculated using an algorithm in the BEEST software package. The domain was calculated to ensure inclusion of all terrain features that penetrate a plane formed by a 10 percent slope extending from the approximate center of the facility. Terrain data was downloaded for the area between 116.250 and 116.750°W longitude and 43.500 and 43.750° N latitude.

5.4 Facility Layout

__X__ The facility layout plot plan is provided in this section that clearly and accurately depicts buildings, emissions points, and the ambient air boundary.

__X__ This section of the Modeling Report has thoroughly described how locations of emissions sources, building corners, and the ambient air boundary were determined, specifying the datum used.

A scaled facility plot plan is included as Appendix 1 to this application. The locations of the buildings, property boundary, and sources were confirmed by comparing the scaled plot plan with an overlay of the model input UTM coordinates on the scaled satellite image of the area in Google Earth.

As shown in Figure 5-2, there is considerable variability in the heights of tanks and structures at the Sorrento facility. Roof heights were determined from two sources: the 2009 modeling files and roof heights noted on a D-size engineering drawing provided by Sorrento (used to identify locations of space heater and fire pump exhaust points). The modeled building layout is shown in Figure 5-3.

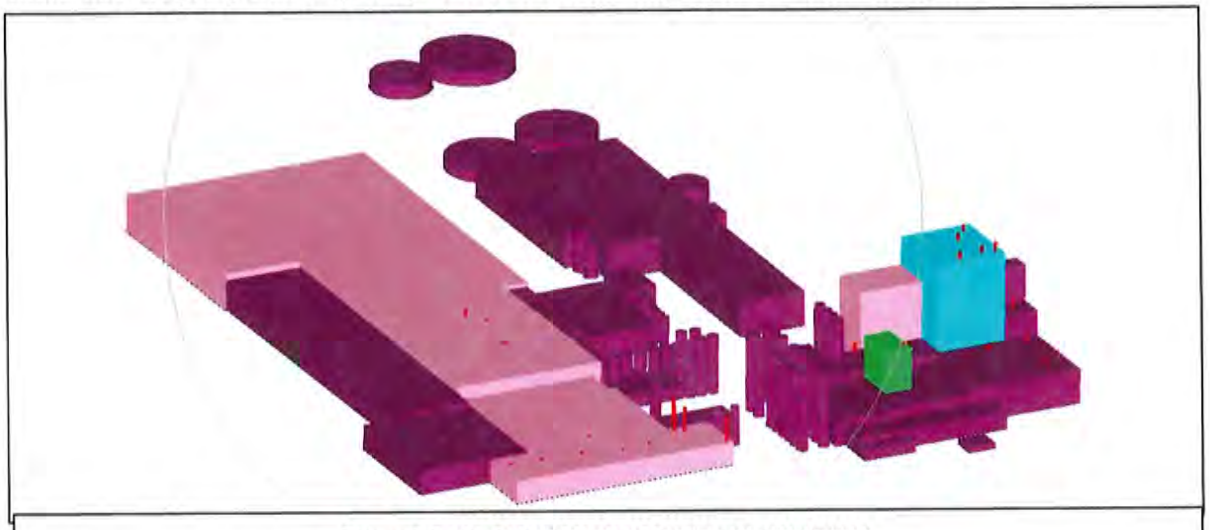


Figure 5-2. VARIATION IN ROOF/TANK HEIGHTS

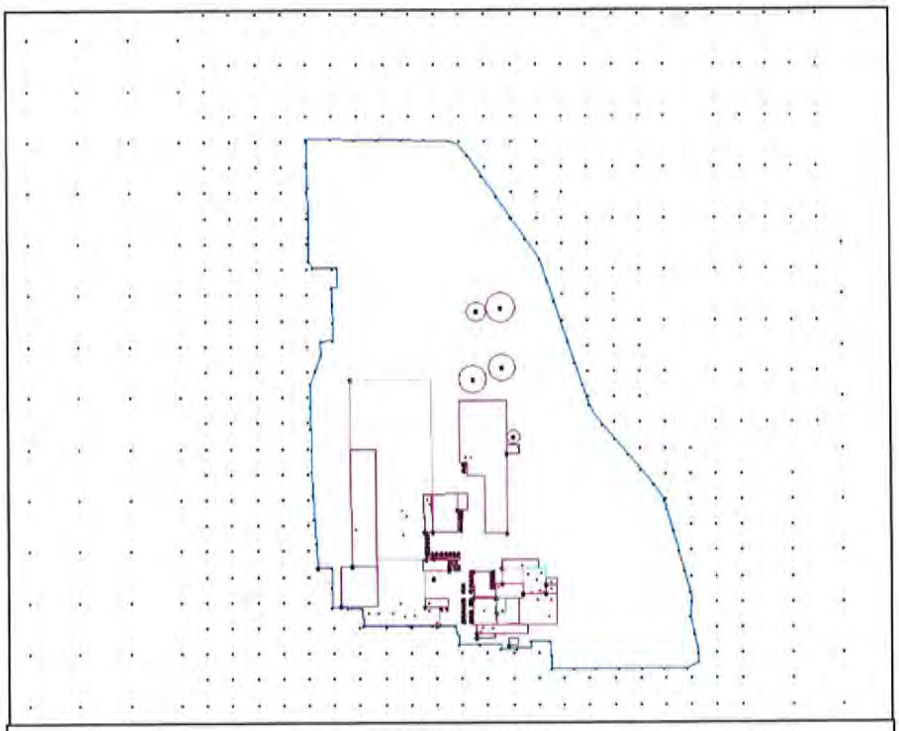


Figure 5-3. BUILDING LAYOUT AND AMBIENT AIR BOUNDARY

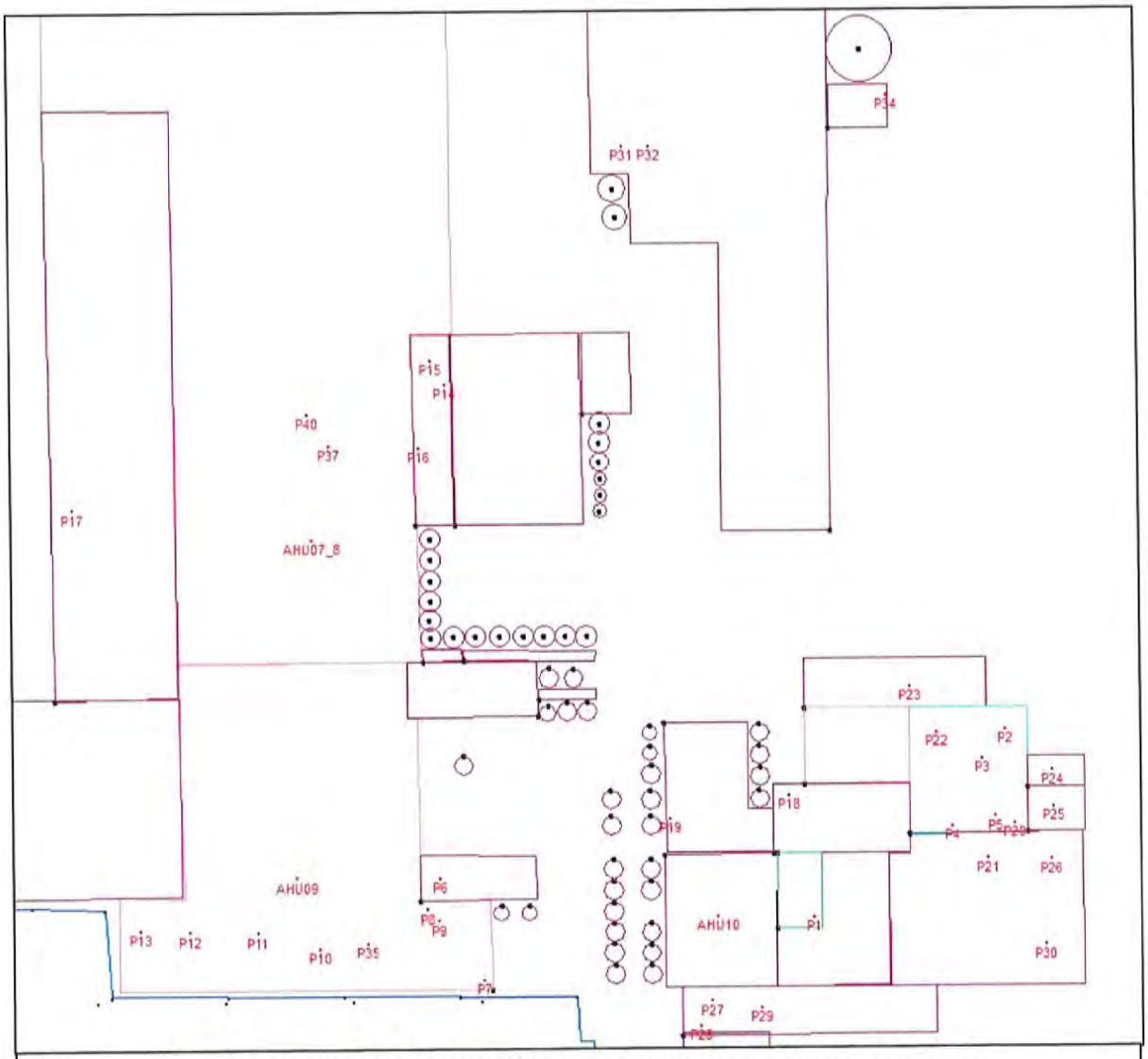


Figure 5-4. MODELED LAYOUT SHOWING BUILDINGS AND EXHAUST POINTS

5.5 Effects of Building Downwash

Building downwash was considered. Prior to running the modeling analyses, REC ran the Building Profile Input Program (BPIP) with the Plume Rise Model Enhancements (PRIME) algorithm, which calculates downwash values for input into AERMOD.

5.6 Ambient Air Boundary

__n/a__ If any of the following apply, the effect on areas excluded from ambient air is thoroughly described in this section: a river/stream bisecting the facility; the facility is on leased property or is leasing property to another entity; the facility is not completely fenced; there are right-of-way areas on the facility; the nature of business is such that the general public have access to part or all of the facility.

__X__ This section thoroughly describes how the facility can legally preclude public access (and practically preclude access) to areas excluded from ambient air in the modeling analyses.

The ambient air boundary is shown in Figure 5-3. Public access to the Sorrento Lactalis Nampa facility is precluded by a fence and posted signage on the west, north, and east boundaries and on a part of the southern property boundary. Buildings with secure entrances preclude unexpected access by members of the public along the remainder of the south side of the facility. Publicly accessible parking areas on the south side of the facility were considered ambient air. There are no streams or right-of-way easements through the Sorrento property.

5.7 Receptor Network

__X__ This section of the Modeling Report provides justification that receptor spacing used in the air impact analyses was adequate to reasonably resolve the maximum modeled concentrations to the point that NAAQS or TAP compliance is assured.

The full-impact receptor grid spacing extending to a distance of 10 kilometers is described in Table 5-1. Initial receptor spacing on the ambient air boundary and near-field spacing is shown in Figures 5-3 and 5-5. Modeling conducted in 2009 and initial modeling runs conducted in 2016 demonstrated that maximum ambient impacts occur at or near the ambient air boundary. Additional receptors were added as needed to ensure that maximum impacts had been fully resolved. To ensure that the maximum impact was resolved, the ambient impacts at receptors closest to the receptor with the reported maximum were reviewed. In general, the maximum impact was determined to be adequately resolved if the difference between the maximum reported impact and the impacts at nearby receptors was within about ten (10) percent of the reported maximum concentration. Where the differences were greater than about 10 percent, additional receptors were added and the model was run again.

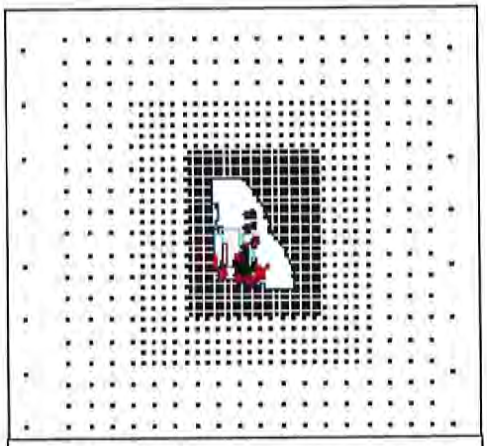


Figure 5-5. NEAR-FIELD RECEPTORS

5.8 Background Concentrations

__X__ Background concentrations have been thoroughly documented and justified for all criteria pollutants where a cumulative NAAQS impact analysis was performed.

In the modeling protocol approval letter, DEQ concurred with REC's proposed background concentrations taken from the Northwest Airquest Consortium's website,[3] based on latitude/longitude coordinates for the approximate center of the Sorrento Lactalis Nampa facility: 43.606710° N, 116.491747° W. These values were based on monitoring conducted between 2009 and 2011.

DEQ provided alternative background concentrations for PM_{10} and $PM_{2.5}$ based on more recent data collected in the Nampa area from 2010 through 2015 (with data from 2013 excluded). Those values are shown in bold text in Table 5-2.

Table 5-2. BACKGROUND CONCENTRATIONS

Parameter and Unit	NW AirQuest Results	MW	µg/m³
Lat_or_UTMN	43.607		
Lon_or_UTME	-116.492		
UTM_zone			
In_Washington_Oregon_or_Idaho	YES		
PM2.5_24hr_ugm3	25 **(23.1)**		
PM2.5_annual_ugm3	9.6 **(7.8)**		
NO2_1hr_ppb	43	46	80.9
NO2_annual_ppb	5.8	46	10.9
SO2_1hr_ppb	6.8	64	17.8
SO2_3hr_ppb	11	64	28.8
SO2_24hr_ppb	4.7	64	12.3
SO2_annual_ppb	1.4	64	3.66
CO_1hr_ppb	1447	28	1657
CO_8hr_ppb	870	28	996
PM10_24hr_ugm3	96		
PM10_no_extremes_24hr_ugm3	74 **(70.2)**		
	µg/m³ = (MW x ppb)/		24.45

5.9 NOx Chemistry

__n/a__ If OLM or PVMRM was used to address NOx chemistry, reasons for selecting one algorithm over the other are provided in this section.

Modeled emissions of NOx presumed 100 percent conversion of NOx to NO_2.

[3] Accessed January 21, 2016 at http://lar.wsu.edu/nw-airquest/lookup.html

6.0 Results and Discussion

6.1 Criteria Pollutant Impact Results

Full-impact modeling was conducted for emissions of PM_{10}, $PM_{2.5}$, and NOx. As shown in Table 6-1, dispersion modeling results demonstrate that the cumulative ambient impact (impacts from the facility combined with representative background concentrations) do not cause a violation of these air quality standards.

Table 6-1. FULL-IMPACT MODELING RESULTS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Period	Modeled Ambient Impact (µg/m³)	Background Concentration (µg/m³)	Total Ambient Impact (µg/m³)	NAAQS (µg/m³)	Percent of NAAQS	File
PM_{10}	24-hr	24.7	70.2	94.9	150	63.3%	Full Impact Final
$PM_{2.5}$	24-hr	11.7	23.1	34.8	35	99.4%	Full Impact FinalPM25
	Annual	3.5	7.8	11.2	12	93.3%	Full Impact FinalPM25ANN
CO	1-hr	---	1657	---	40,000	---	---
	8-hr	---	996	---	10,000	---	---
NO_2	1-hr	92.7	80.9	173.6	188	92.3%	Full Impact Final
	Annual		10.9		100		Full Impact FinalNO2_Year
SO_2	1-hr	---	---	---	188	---	---
	Annual	---	---	---	80	---	---

6.2 TAP Impact Analysis

As shown in Table 6-2, the modeling results demonstrate that the ambient air quality impacts from TAPs emissions are below the acceptable ambient concentration for carcinogens (AACC) listed in Section 586 of the Rules.

Table 6-2. MODELING RESULTS FOR TOXIC AIR POLLUTANTS

Toxic Air Pollutant	Averaging Period	Maximum Modeled Ambient Impact (µg/m³)	AAC.AACC Increment (µg/m³)	Percent of AAC/AACC Increment	File
Carcinogens					
Arsenic	Annual	2.14E-05	2.3E-04	9.3%	Full Impact Final
Cadmium	Annual	1.18E-04	5.6E-04	21%	Full Impact Final
Formaldehyde	Annual	8.07E-03	7.7E-02	10%	Full Impact Final
Nickel	Annual	2.26E-04	4.2E-03	5.4%	Full Impact Final

7.0 Quality Assurance/Control

To ensure that modeled emissions matched the emissions inventory, the emissions inventory spreadsheet was structured in a way that the emission rates could be copied and pasted directly into the AERMOD GUI (BEEST). Heater, pump engine, and baghouse exhaust points were field-verified by Sorrento staff. The ambient air boundary, model layout, and source locations (in plan view and in 3D) were compared against a base map taken from Google Earth, Google Earth street views, and engineering design drawings. The emissions inventory was developed in concert with Sorrento Lactalis' environmental staff.

REC

Robinson Environmental Consulting, LLC
3979 N. Oak Park Place, Boise, Idaho 83703
Tel: 208.473.0183 | www.robinsonenvironmental.us

January 26, 2016

Sent Via Email

Mr. Kevin Schilling, NSR Modeling Coordinator
Air Quality Division
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83706

Re: Facility ID 027-0071, Sorrento Lactalis, Inc., Cheese Plant, Nampa, Idaho
Consent Order Case Nos. E-2014.0007 and E-2015.0003, Modeling Protocol

Dear Kevin:

Robinson Environmental Consulting, LLC (REC) is assisting Sorrento Lactalis, Inc. (Sorrento) in preparing an application to modify their current permit to construct (PTC) to incorporate the following changes:

1. Define the minimum pressure drop and minimum liquid flow rate for the TetraPak whey dryer scrubber, based on the results of an October 2, 2014 source test for PM_{10} emissions. Describe periodic parametric monitoring to be conducted for these two parameters. The PM_{10} emissions limit for this scrubber in the current permit is 5.66 lb/hr.

   Modeled emissions of PM_{10} and $PM_{2.5}$ from the scrubber will be based on an emissions rate equal to at least 5.66 lb/hr.

2. Reflect the increase in emissions from the Superior boiler (P-7) associated with a September 2014 replacement of the 20.1 MMBtu/hr burner (600 boiler horsepower) with a 31.5 MMBtu/hr burner that had been down-rated by the manufacturer to 24.8 MMBtu/hr. The consent order notes that DEQ and Sorrento have not yet come to an agreement whether the burner had been de-rated such that it had undergone a permanent physical change that could not easily be undone (pursuant to EPA guidance).

   Modeled emissions of criteria pollutants from the Superior boiler will be based on a maximum heat input capacity equal to 31.5 MMBtu/hr. This boiler is subject to an NSPS (Subpart Dc or Subpart Db, depending on the final determination regarding the boiler derating). In accordance with Section 210.20 of the Idaho Air Rules, TAPs emissions from this source will not be modeled.

3. Reflect the increase in emissions from heating, ventilating and air conditioning (HVAC) units installed at the facility. The consent order notes that 13 of 28 existing natural gas-fired HVAC units were added with the installation of the Meyers-Sterner whey dryer plant (PTC No. P-000726, issued July 20, 2001), the TetraPak whey dryer plant (PTC No. P-2009.0023, issued August 28, 2009), and other expansions (e.g., the Fresh Mozzarella Cheese Plant in 2014, the Shredded Cheese Plant) without accounting for the HVAC units' emissions or impacts to ambient air quality.

   Modeling will include criteria pollutant and TAPs emissions from all natural gas-fired HVAC units at the facility, which were identified by Wendy York, Sorrento's Safety and Environmental

Manager in January 2016. Ms. York confirmed that all of the natural gas-fired heaters exhaust horizontally or are capped. The exit velocity for each of these sources will be set to 0.001 m/sec in accordance with EPA and DEQ modeling guidance.

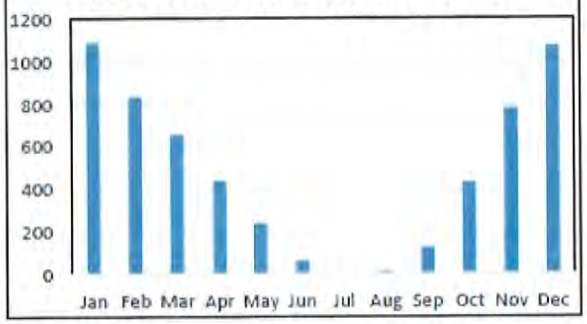
Burners in HVAC units do not typically run 100 percent of the time, but cycle on and off. HVAC burners will be presumed to run a maximum of 45 minutes out of each operating hour to account for cycling. In addition, there is substantial seasonal variation in the amount and timing of heating required to maintain the buildings at nominal temperatures. The timing of lower-temperature hours (typically in the early morning before dawn) and duration of operating hours for the heaters each month will be determined by:

- *Reviewing National Weather Service hourly temperature data collected at the Nampa Airport (KMAN) for the year 2012, downloaded in degrees Fahrenheit from the MesoWest site,[1] and*
- *Heating-degree-day (HDD) data collected at the nearby Amalgamated Sugar Plant for the years 1976 – 2010.[2] Heaters will be presumed to operate at maximum capacity for 24 hr/day during December and January, with hours and intensity for other months determined based on a ratio of the HDDs for that month compared to the highest monthly HDD in January.*

Table 1. TYPICAL MONTHLY HDD AT TASCO, 1976-2010

Month	HDD	Percent	HRS per day	Round Up HRS per day
Jan	1091	100.0%	24	24
Feb	836	76.6%	18.4	19
Mar	658	60.3%	14.5	15
Apr	440	40.3%	9.7	10
May	241	22.1%	5.3	6
Jun	65	5.96%	1.4	2
Jul	9	0.825%	0.2	1
Aug	**15**	**1.37%**	0.3	**1**
Sep	127	11.6%	2.8	3
Oct	432	39.6%	9.5	10
Nov	781	71.6%	17.2	18
Dec	1073	98.4%	23.6	24

Figure 1. TYPICAL MONTHLY HDDs AT TASCO



[1] University of Utah, Department of Atmospheric Sciences, Mesowest, http://mesowest.utah.edu/
[2] Western Regional Climate Center, Desert Research Institute, http://www.wrcc.dri.edu/htmlfiles/id/id.hdd.html

As an example, the hourly temperatures at the Nampa Airport for August 2012 are shown in Figure 2. Minimum temperature hours are shaded in blue, and hours at the maximum temperature for each day are shaded in red. For August of each year, REC proposes to model heaters operating during hours 5 through 7 local time (MST), at an intensity level of 0.33 for each hour (equivalent to operating one hour per day at maximum capacity).

GMT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
MST	18	19	20	21	22	23	24	1	2	3	4	5	6	7	8	9	10	11	NOON	13	14	15	16	17	MIN	MAX
AUG	93.2	93.2	82.4	75.2	82.4	77.0	73.4	71.6	71.6	69.8	68.0	66.2	64.4	68.0	71.6	75.2	78.8	82.4	86.0	87.8	91.4	91.4	93.2	93.2	64.4	93.2
2	93.2	91.4	84.2	999	71.6	66.2	68.0	68.0	999	68.0	68.0	66.2	68.0	66.2	68.0	73.4	77.0	80.6	999	86.0	87.8	89.6	91.4	89.6	68.0	91.4
3	87.8	87.8	82.4	78.8	75.2	73.4	71.6	68.0	68.0	68.0	66.2	64.4	64.4	66.2	68.0	71.6	75.2	77.0	80.6	84.2	84.2	84.2	86.0	86.0	64.4	87.8
4	86.0	84.2	80.6	77.0	73.4	73.4	68.0	66.2	64.4	62.6	62.6	63.6	63.8	68.0	66.2	68.0	75.2	78.8	82.4	86.0	87.8	91.4	91.4	91.4	61.8	91.4
5	89.6	87.8	84.2	75.2	80.2	84.4	62.6	68.0	57.2	57.2	55.4	57.2	55.4	62.6	68.0	75.2	82.4	86.0	91.4	91.4	93.2	91.2	95.0	95.0	55.4	95.0
6	93.2	91.4	89.6	89.6	84.2	86.0	82.4	82.4	82.4	77.0	71.6	75.2	68.0	71.6	77.0	84.2	86.0	89.6	91.4	93.2	96.0	96.8	96.8	96.0	68.0	96.8
7	91.4	91.4	82.4	999	75.2	68.0	68.0	66.2	68.0	66.2	62.6	60.8	62.6	69.8	73.4	80.6	86.0	89.6	96.0	100.4	100.4	102.2	102.2	102.2	60.8	102.2
8	98.6	96.8	93.2	89.6	75.2	71.6	69.8	68.0	73.4	68.0	68.0	66.2	64.4	64.4	73.4	80.6	82.4	84.2	87.8	89.6	93.2	96.0	96.0	93.2	64.4	98.6
9	91.4	89.6	80.6	75.2	75.2	77.0	73.4	71.6	71.6	71.6	68.0	64.4	62.6	62.6	68.0	75.2	78.8	82.4	86.0	89.6	91.4	93.2	95.0	93.2	62.6	95.0
10	93.2	91.4	86.0	73.2	71.6	73.4	68.0	71.6	66.2	64.4	71.6	71.6	69.8	66.2	73.4	73.4	75.2	71.2	80.6	84.2	89.6	89.6	91.4	91.4	64.4	93.2
11	91.4	89.6	80.6	80.6	80.6	75.2	73.4	71.6	71.6	66.2	66.2	60.8	66.4	69.0	68.0	73.4	77.0	81.4	82.4	86.0	87.8	999	999	999	60.8	91.4
12	999	86.0	75.2	71.6	68.0	69.0	69.0	69.0	67.2	63.6	61.8	66.4	63.3	66.4	60.8	68.0	77.0	71.8	84.2	86.0	89.6	89.6	91.4	91.4	60.8	91.4
13	91.4	86.0	78.8	75.2	66.2	66.2	62.6	69.0	60.8	68.0	69.0	66.4	61.3	60.8	66.2	71.6	77.0	81.8	84.2	89.6	91.4	93.2	95.0	95.0	60.8	95.0
14	93.2	89.6	78.8	80.6	69.8	68.0	62.6	60.8	59.0	57.2	55.4	53.6	53.6	57.2	64.4	71.6	78.8	82.4	86.0	89.6	91.4	93.2	999	999	53.6	93.2
15	91.4	87.8	78.8	73.4	75.2	68.0	66.2	64.4	57.2	57.2	57.2	53.6	55.4	999	64.4	71.6	78.8	82.4	86.0	89.6	91.4	93.2	93.2	95.0	53.6	95.0
16	93.2	91.4	84.2	78.8	71.6	69.8	75.2	71.6	69.8	71.6	69.8	60.8	58.3	62.6	68.0	73.4	77.0	80.6	82.4	86.0	87.8	89.6	91.4	91.4	58.3	93.2
17	91.4	86.0	77.0	73.4	66.2	64.4	64.4	64.4	66.2	64.4	62.6	59.0	59.0	59.0	66.2	73.4	75.2	71.6	84.2	86.0	89.6	91.4	91.4	93.2	59.0	93.2
18	91.4	86.0	82.4	82.4	69.8	68.0	68.0	71.6	999	68.0	62.6	64.4	57.2	60.8	64.4	71.6	80.6	82.4	86.0	89.6	91.4	93.2	93.2	93.2	56.4	93.2
19	91.4	89.6	86.0	77.0	73.4	71.6	66.2	66.2	66.2	64.2	62.6	60.8	58.3	62.6	68.0	73.4	82.4	84.2	86.0	84.2	86.0	84.2	87.8	82.4	60.8	91.4
20	78.8	78.8	75.2	77.0	75.2	75.2	73.4	66.2	64.4	62.6	62.6	57.2	59.0	57.2	64.4	71.6	75.2	80.6	82.4	86.0	87.8	89.6	91.4	91.4	57.2	91.4
21	91.4	89.6	78.8	75.2	71.6	71.6	66.2	64.4	64.4	66.2	62.6	62.6	60.8	62.6	75.4	80.6	77.0	84.2	86.0	86.0	87.8	91.4	91.4	91.4	60.8	91.4
22	91.4	86.0	75.2	73.4	77.0	66.2	71.6	71.6	71.6	68.0	66.2	62.6	62.6	62.6	68.0	64.4	75.2	77.0	80.6	82.4	84.2	86.0	86.0	87.8	62.6	91.4
23	87.8	84.2	75.2	71.6	64.4	64.4	64.4	57.2	59.0	53.6	51.8	54.8	53.3	51.8	62.6	68.0	71.6	71.2	78.8	84.2	86.0	87.8	87.8	89.6	51.8	89.6
24	87.8	84.2	80.6	71.6	75.2	71.6	68.0	66.2	64.4	62.6	60.8	59.0	57.2	57.2	59.0	62.6	64.4	64.2	69.8	75.2	77.0	77.0	80.6	80.6	57.2	87.8
25	78.8	77.0	71.6	66.2	55.0	53.6	51.8	49.2	48.2	44.6	44.6	41.0	39.2	42.8	53.6	59.8	66.2	73.4	77.0	80.6	82.4	86.0	87.8	86.0	39.2	87.8
26	84.2	82.4	73.4	68.0	66.2	59.0	61.0	57.2	57.2	55.4	53.6	59.0	57.2	57.2	59.0	68.8	77.0	82.4	80.6	86.0	91.4	91.4	91.4	91.4	53.6	91.4
27	91.4	86.0	82.4	77.0	77.0	73.4	71.8	71.4	68.0	68.0	66.2	66.2	64.4	69.0	71.6	75.2	78.8	80.6	82.4	84.2	86.0	87.8	87.8	89.6	64.4	91.4
28	89.6	86.0	80.6	73.4	66.2	62.6	59.0	59.0	59.0	55.4	57.2	53.6	53.6	55.4	60.8	69.8	77.0	80.6	82.4	84.2	87.8	89.6	91.4	91.4	53.6	91.4
29	91.4	84.2	75.2	66.2	66.2	62.6	66.2	66.2	64.4	62.6	62.6	60.8	59.0	57.2	60.8	62.6	64.4	68.8	71.6	73.4	75.2	77.0	78.8	78.8	57.2	91.4
30	78.8	75.2	75.4	68.0	62.6	64.4	57.2	62.6	57.2	53.6	50.0	46.2	46.4	46.4	53.6	58.8	64.4	68.8	73.4	75.2	78.8	82.4	82.4	84.2	46.4	84.2
31	84.2	82.4	75.2	66.2	62.6	62.6	57.2	56.4	51.8	51.8	53.6	53.6	51.8	53.6	60.8	68.8	73.4	77.0	75.2	78.8	80.6	82.4	82.4	999	51.8	84.2

Figure 2. TYPICAL HEATING HOURS FOR AUGUST: HOURS 5 THROUGH 7, MST

4. Reflect emissions from operation of the existing fire pump engine, which was installed in 2001. *In accordance with DEQ Rules, TAPs emissions will not be modeled for this engine, which is subject to a NESHAP: 40 CFR 63, Subpart ZZZZ. In accordance with DEQ's modeling guideline, engine emissions will also be excluded from modeling to demonstrate compliance with the 1-hr NO_2 NAAQS. Short-term emissions will be based on testing the pump engine for 30 minutes each week, during daylight hours. Annual emissions will be based on routine testing and emergency operations for a maximum of 100 hours per year.*

5. NO_2 impacts in the full impact analysis will be evaluated using a Tier 1 (100 percent conversion of NO_x to NO_2) or Tier 2 (ambient ratio method [ARM] or ambient ratio method 2 [ARM2]) approach, and will be conducted in accordance with the most recent EPA guidance issued September 30, 2014.[3] If a Tier 3 (PVMRM or OLM) approach is needed for full-impact NO_2 analyses, REC will submit an addendum to this modeling protocol describing proposed in-stack ratios and requesting DEQ recommendations for NO_2 and ozone data.

[3] Owen and Brode, Clarification on the Use of AERMOD Dispersion Modeling for Compliance with the NO_2 National Ambient Air Quality Standard, dated September 30, 2014, accessible at http://www.epa.gov/scram001/guidance/clarification/NO2_Clarification_Memo-20140930.pdf

REC's proposed approach for dispersion modeling to demonstrate compliance with applicable ambient air quality standards is summarized in Table 2.

Table 2. PROPOSED PARAMETERS FOR NEAR-FIELD DISPERSION MODELING		
Parameter	**Values**	**Description**
Model	AERMOD	The current version of AERMOD as of this date (v. 15181). If a newer version of AERMOD becomes available before final modeling analyses have been completed for this project, REC will use the most recently-released version.
Meteorological data	Boise Airport upper air and surface met data.	**REC requests that DEQ provide the most current AERMOD-ready meteorological data set with upper air soundings collected at the Boise NWS station and surface data collected at the Boise Airport.**
Land use	Rural	The cheese plant is located in a light industrial area east of the city of Nampa. **As shown in Figure 3 below**, the surrounding land use is predominantly agricultural, low- to medium-density residential, and commercial/light industrial. Urban heat-island effects on nighttime dispersion characteristics would not be expected in this area.
Terrain	AERMAP, 1-arc-second NED	The current version of AERMAP as of this date (v. 11103). If a newer version of AERMAP becomes available before final modeling analyses have been completed for this project, REC will use the most recently-released version. Terrain data with a minimum resolution of about 30 meters (1-arc-second) will be downloaded from the National Elevation Database (NED).
Datum	NAD83/WGS84	Locations of the ambient air boundary, structures, emission points, and receptors will be described in UTM coordinates (in meters) using datum NAD83/WGS84.
Modeling Domain	BEEST Domain Calculator	The modeling domain will be large enough so that the AERMOD receptor network will be both sufficiently detailed and extensive enough so as to fully represent the immediate surrounding terrain and the entire domain being modeled. The domain determination option available in Providence/Oris' BEEST graphical user interface for AERMOD will be used to facilitate this determination.
Building Downwash	BPIP-PRM	The current version (v. 04274) of the non-regulatory Building Profile Input Program for PRIME (BPIP-PRM) will be used to address building downwash.
Receptor Grid		As a starting point, the following receptor spacing is proposed: Fence line: 25-m spacing Fence line to 200 m: 50-m grid 200 m to 500 m: 100-m grid 500 m to 2,000 m (2 km): 250-m grid 2 km to 5 km: 500-m grid 5 km to 10 km: 1,000-m grid Additional receptors may be added to ensure that the maximum ambient impacts have been adequately resolved.

Figure 3. LAND USE WITHIN 3 KM OF SORRENTO'S NAMPA CHEESE PLANT

6. For full-impact analyses, REC proposes to use background concentrations taken from the Northwest Airquest Consortium's website,[4] based on latitude/longitude coordinates for the approximate center of the Sorrento Cheese Plant: 43.606710° N, 116.491747° W. Although the resulting concentrations shown in Table 2 are based on monitoring data collected during the three-year period from 2009 through 2011, REC believes these are the best representative data available at this time for this location. REC also believes that these values adequately represent contributions from Amalgamated Sugar's Nampa plant (TASCO) and the relatively small contributions from the Materne and Plexus plants to the west.

Table 2. PROPOSED BACKGROUND CONCENTRATIONS

Parameter and Unit	NW AirQuest Results	MW	µg/m³
Lat_or_UTMN	43.607		
Lon_or_UTME	-116.492		
UTM_zone			
In_Washington_Oregon_or_Idaho	YES		
PM2.5_24hr_ugm3	25		
PM2.5_annual_ugm3	9.6		
O3_daily_8hr_max_ppb	71		
O3_for_PVMRM_ppb	59		
NO2_1hr_ppb	43	46	80.9
NO2_annual_ppb	5.8	46	10.9

[4] Accessed January 21, 2016 at http://lar.wsu.edu/nw-airquest/lookup.html

Table 2. PROPOSED BACKGROUND CONCENTRATIONS			
Parameter and Unit	**NW AirQuest Results**	**MW**	**µg/m³**
SO2_1hr_ppb	6.8	64	17.8
SO2_3hr_ppb	11	64	28.8
SO2_24hr_ppb	4.7	64	12.3
SO2_annual_ppb	1.4	64	3.66
CO_1hr_ppb	1447	28	1657
CO_8hr_ppb	870	28	996
PM10_24hr_ugm3	96		
PM10_no_extremes_24hr_ugm3	74		
	µg/m³ = (MW x ppb)/		24.45

REC will provide a modeling report that complies with Section 6.12 of DEQ's September 2013 Modeling Guideline. Modeling assumptions will be clearly stated, sample calculations will be included, and justification for release parameters will be provided. The facility layout, configuration of structures, and release point configurations will be verified in the field by Sorrento where possible.

I look forward to working with you. If you have any questions, please do not hesitate to contact me at 208.473.0183 or by email at cheryl@robinsonenvironmental.us.

Best Regards,

Cheryl A. Robinson

Cheryl A. Robinson, P.E.
REC, Managing Member

ec: Kevin Schilling, NSR Modeling Coordinator, Kevin.Schilling@deq.idaho.gov
Wendy R. York, CSP, Safety & Environmental Manager, Sorrento Lactalis, Inc., wendy.york@lactalis.us
File

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
JOHN TIPPETS, DIRECTOR

February 16, 2016

Cheryl Robinson, P.E.
Robinson Environmental Consulting, LLC

RE: Modeling Protocol for the Sorrento Lactalis, Inc. Facility near Nampa, Idaho

Cheryl:

DEQ received your initial dispersion modeling protocol submitted to me via email on January 26, 2016. The modeling protocol was submitted on behalf of Sorrento Lactalis, Inc. (Sorrento). The modeling protocol proposes methods and data for use in the ambient impact analyses of a Permit to Construct application for proposed modifications to their Cheese Plant near Nampa, Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- **Comment 1: Project Scope**. The submitted application should thoroughly discuss the scope of the project, specifically addressing what is required by the consent order and how the submitted analyses meet that requirement. This will dictate how DEQ will review project, whether it is handled as a modification were only the emissions increase is evaluated or whether a rework of the previous permitting analyses is required. If the applicant elects to simply model facility-wide emissions to evaluate compliance with all NAAQS, then a detailed description of how the modeling approach satisfies the consent order may not be necessary.

- **Comment 2: Approach for Heaters**. The approach you outline for the heaters seems reasonable and conservative as an estimation of potential to emit for the source. However, the DEQ permit writer reviewing the application will be responsible for the review and approval of calculations of potential to emit.

- **Comment 3: Fire Pump Emissions**. The protocol correctly states that the fire pump can be excluded from modeling for 1-hour NO_2. For 24-hour standards, divide the 30 minutes of emissions evenly over the potential operational period (daytime hours in this case). Whether this operational condition is translated to a permit condition will be the decision of the permit writer. For annual emissions, I recommend using 500 hours. However, if showing compliance is difficult, DEQ would consider an argument that a shorter period represents potential to emit for the source.

- **Comment 4: NOx Chemistry**. Please consider that project-specific approval for Tier 3 methods (OLM or PVMRM) and Tier 2 ARM2 is needed from DEQ. To obtain approval, the applicant/consultant must provide justification for the specific method proposed as described in

available EPA guidance. ARM2 should be a reasonably easy justification if the default minimum NO_2/NOx ratio of 0.5 is used and the maximum NO_2/NOx ratio of 0.9 is used.

- **Comment 5: Stack Parameters for Capped and Horizontal Releases**. Use of the more refined and less conservative BETA option within AERMOD may be acceptable for capped stacks and horizontal releases. Since these are non-default options, specific DEQ approval is required for their use. This can be handled in a separate request to DEQ that identifies and describes the sources and provides justification for using the BETA option.

- **Comment 6: Meteorological Data**: DEQ strives to use the most representative meteorological data available. DEQ concurs that Boise meteorological data are reasonably representative for the application site. These data have recently been reprocessed and should have been provided to you at an earlier date.

- **Comment 7: Background Concentrations**: DEQ concurs that use of the NWAIRQUEST 2009-2011 design values of criteria pollutants lookup tool is appropriate for the site. These values were generated from regional-scale airshed modeling, with modeled results adjusted by monitored concentrations. However, there are more-recent monitoring data available and DEQ has determined it is appropriate to adjust NWAIRQUEST values for PM_{10} and $PM_{2.5}$ using these monitoring data.

  The NWAIRQUEST value for 24-hour PM at the Sorrento site is 96 $\mu g/m^3$ and 74 $\mu g/m^3$ with extreme values removed. Data collected in Nampa from 2011 through 2015 indicate the following upper level values (with exceptional events excluded): 2011: 108 $\mu g/m^3$, 68 $\mu g/m^3$, 68 $\mu g/m^3$; 2012: 151 $\mu g/m^3$, 133 $\mu g/m^3$, 133 $\mu g/m^3$; 2013: 97 $\mu g/m^3$, 90 $\mu g/m^3$, 77 $\mu g/m^3$, 75 $\mu g/m^3$; 2014: 62 $\mu g/m^3$, 61 $\mu g/m^3$, 59 $\mu g/m^3$, 58 $\mu g/m^3$; 2015: 81 $\mu g/m^3$, 68 $\mu g/m^3$, 68 $\mu g/m^3$, 64 $\mu g/m^3$. The PM_{10} design value is 90 $\mu g/m^3$, as determined by the 6th high value. The NWAIRQUEST value at the monitoring site is 77 $\mu g/m^3$. The adjusted background for the site is then obtained by multiplying the NWAIRQUEST value for the site by the ratio of the design value for the recent monitoring data to the NWAIRQUEST value given for the monitoring site:

$$\frac{74\ \mu g/m^3 \text{ NWAIRQUEST at site} \;\Big|\; 90\ \mu g/m^3 \text{ monitored value}}{\;\Big|\; 77\ \mu g/m^3 \text{ NWAIRQUEST at monitor}} = \underline{86.5\ \mu g/m^3}$$

  The NWAIRQUEST value for 24-hour $PM_{2.5}$ at the Sorrento site is 25 $\mu g/m^3$. Data collected in Nampa from 2011 through 2015 indicate the following design values for each year: 2011 = 23 $\mu g/m^3$; 2012 = 20 $\mu g/m^3$; 2013 = 50 $\mu g/m^3$; 2014 = 27 $\mu g/m^3$; 2015 = 26 $\mu g/m^3$. The 5-year average design value is 29.2 $\mu g/m^3$. The adjusted background for the site is then obtained by multiplying the NWAIRQUEST value for the site by the ratio of the design value for the recent monitoring data to the NWAIRQUEST value given for the monitoring site:

$$\frac{25\ \mu g/m^3 \text{ NWAIRQUEST at site} \;\Big|\; 29.2\ \mu g/m^3 \text{ monitored value}}{\;\Big|\; 24\ \mu g/m^3 \text{ NWAIRQUEST at monitor}} = \underline{30.4\ \mu g/m^3}$$

  The NWAIRQUEST value for annual $PM_{2.5}$ at the Sorrento site is 9.6 $\mu g/m^3$. Data collected in Nampa from 2011 through 2015 indicate the following design values for each year: 2011 = 5.97 $\mu g/m^3$; 2012 = 10.57 $\mu g/m^3$; 2013 = 12.86 $\mu g/m^3$; 2014 = 8.41 $\mu g/m^3$; 2015 = 8.70 $\mu g/m^3$. The 5-year average design value is 9.30 $\mu g/m^3$. The adjusted background for the site is then obtained by

multiplying the NWAIRQUEST value for the site by the ratio of the design value for the recent monitoring data to the NWAIRQUEST value given for the monitoring site:

$$\frac{9.6\ \mu g/m^3 \text{ NWAIRQUEST at site}}{} \left| \frac{9.3\ \mu g/m^3 \text{ monitored value}}{9.8\ \mu g/m^3 \text{ NWAIRQUEST at monitor}} \right. = \frac{9.1\ \mu g/m^3}{}$$

DEQ modeling staff considers the submitted dispersion modeling protocol, with consideration and resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

If air impact analyses are required for the proposed project, a modeling analysis report must be submitted with the application. DEQ has developed an Air Impact Modeling Analyses Report Template Form (available on the DEQ webpage) and requests that it be used to submit model results and detailed descriptions of the analyses and inputs to DEQ as part of the permit application process. DEQ modeling staff also request submission of electronic copies of all modeling input and output files (including BPIP and AERMAP input and output files) with the analysis report. If DEQ provided model-ready meteorological data files, then resubmission of these files to DEQ with the application is not required.

If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112
kevin.schilling@deq.idaho.gov

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
JOHN TIPPETS, DIRECTOR

February 20, 2016

Cheryl Robinson, P.E.
Robinson Environmental Consulting, LLC

RE: Revision to Modeling Protocol Approval for the Sorrento Lactalis, Inc. Facility near Nampa, Idaho

Cheryl:

DEQ provided a protocol approval notice on February 16, 2016 for the Sorrento Lactalis, Inc. facility. Since then, DEQ has determined that the 2013 monitoring data should be excluded from consideration in determination of background concentrations on the basis that conditions affecting pollutant dispersion in the region can be considered extraordinarily poor and resulting monitored pollutant concentrations cannot be considered to be reasonably representative of the area.

The following are revised background concentrations, and Comment 7 below should replace Comment 7 in DEQ's issued protocol approval.

- **Comment 7: Background Concentrations**: DEQ concurs that use of the NWAIRQUEST 2009-2011 design values of criteria pollutants lookup tool is appropriate for the site. These values were generated from regional-scale airshed modeling, with modeled results adjusted by monitored concentrations. However, there are more-recent monitoring data available and DEQ has determined it is appropriate to adjust NWAIRQUEST values for PM_{10} and $PM_{2.5}$ using these monitoring data.

  The NWAIRQUEST value for 24-hour PM_{10} at the Sorrento site is 96 $\mu g/m^3$ and 74 $\mu g/m^3$ with extreme values removed. Data collected in Nampa from 2010 through 2015, with 2013 excluded, indicate the following upper level values (with exceptional events excluded): 2011: 73 $\mu g/m^3$, 66 $\mu g/m^3$, 2011: 108 $\mu g/m^3$, 68 $\mu g/m^3$, 68 $\mu g/m^3$; 2012: 151 $\mu g/m^3$, 133 $\mu g/m^3$, 133 $\mu g/m^3$; 2013: excluded as an outlier; 2014: 62 $\mu g/m^3$, 61 $\mu g/m^3$, 59 $\mu g/m^3$, 58 $\mu g/m^3$; 2015: 81 $\mu g/m^3$, 68 $\mu g/m^3$, 68 $\mu g/m^3$, 64 $\mu g/m^3$. The PM_{10} design value is 73 $\mu g/m^3$, as determined by the 6th high value. The NWAIRQUEST value at the monitoring site is 77 $\mu g/m^3$. The adjusted background for the site is then obtained by multiplying the NWAIRQUEST value for the site by the ratio of the design value for the recent monitoring data to the NWAIRQUEST value given for the monitoring site:

$$\frac{74\ \mu g/m^3 \text{ NWAIRQUEST at site}}{} \left| \frac{73\ \mu g/m^3 \text{ monitored value}}{77\ \mu g/m^3 \text{ NWAIRQUEST at monitor}} \right. = \frac{70.2\ \mu g/m^3}{}$$

The NWAIRQUEST value for 24-hour $PM_{2.5}$ at the Sorrento site is 25 μg/m³. Data collected in Nampa from 2010 through 2015 indicate the following design values for each year: 2010 = 15 μg/m³, 2011 = 23 μg/m³; 2012 = 20 μg/m³; 2013 = none; 2014 = 27 μg/m³; 2015 = 26 μg/m³. The 5-year average design value is 22.2 μg/m³. The adjusted background for the site is then obtained by multiplying the NWAIRQUEST value for the site by the ratio of the design value for the recent monitoring data to the NWAIRQUEST value given for the monitoring site:

$$\frac{25\ \mu g/m^3 \text{ NWAIRQUEST at site} \quad 22.2\ \mu g/m^3 \text{ monitored value}}{24\ \mu g/m^3 \text{ NWAIRQUEST at monitor}} = \underline{23.1\ \mu g/m^3}$$

The NWAIRQUEST value for annual $PM_{2.5}$ at the Sorrento site is 9.6 μg/m³. Data collected in Nampa from 2011 through 2015 indicate the following design values for each year: 2011 = 5.97 μg/m³; 2012 = 10.57 μg/m³; 2013 = 12.86 μg/m³; 2014 = 8.41 μg/m³; 2015 = 8.70 μg/m³. The 5-year average design value is 9.30 μg/m³. The adjusted background for the site is then obtained by multiplying the NWAIRQUEST value for the site by the ratio of the design value for the recent monitoring data to the NWAIRQUEST value given for the monitoring site:

$$\frac{9.6\ \mu g/m^3 \text{ NWAIRQUEST at site} \quad 7.9\ \mu g/m^3 \text{ monitored value}}{9.8\ \mu g/m^3 \text{ NWAIRQUEST at monitor}} = \underline{7.8\ \mu g/m^3}$$

If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112
kevin.schilling@deq.idaho.gov

APPENDIX 3. EMISSIONS INVENTORY *(Refer to Sandisk Flash Drive in Appendix 4 for electronic files: 2016 REC Sorrento Emissions Files and Full Impact Records)*

1. References for Emissions
2. Input & Common Factors
3. Facility Classification – Total HAPs, Mercury, and GHGs
4. Facility Classification – Total Criteria Pollutants (T/yr) and (lb/hr)
5. Total TAPs Emissions (lb/hr)

1. REFERENCES FOR EMISSIONS

1 Heat Content of Gas Delivered to Consumers (Btu/scf)

State	2009	2010	2011	2012	2013	2014	Average
Alaska	1,005	1,005	1,013	1,012	1,002	1,001	**1,006**
California	1,027	1,023	1,020	1,022	1,028	1,030	**1,025**
Idaho	1,022	1,021	1,017	1,015	1,015	1,017	**1,018**
Montana	1,011	1,012	1,016	1,025	1,028	1,025	**1,020**
Oregon	1,024	1,015	1,021	1,022	1,015	1,029	**1,021**
Utah	1,044	1,045	1,038	1,043	1,047	1,040	**1,043**
Washingto	1,030	1,032	1,029	1,028	1,030	1,044	**1,032**
Wyoming	1,031	1,031	1,034	1,034	1,041	1,040	**1,035**

U.S. Energy Information Administration (EIA). Heat Content of Natural Gas Consumed
http://www.eia.gov/dnav/ng/ng_cons_heat_a_epg0_vgth_btucf_a.htm

2 Natural Gas Combustion in Space Heaters

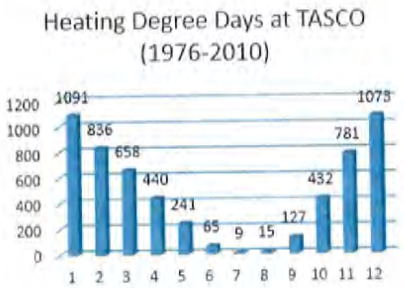
Presume that heaters operate 24 hours per day during the month with the greatest number of Heating Degree Days (HDD)
Reduce daily operating hours for other months based on a ratio of HDDs
Heating units cycle on and off rather than running continuously. Presume natural gas combustion for 45 min/hour.

http://www.wrcc.dri.edu/htmlfiles/id/id.hdd.html

IDAHO **MONTHLY AVERAGE HEATING DEGREE DAYS (BASE 65 DEG F)**

NAMPA SUGAR FACTORY | 1976-2010 | 1091 836 658 440 241 65 9 15 127 432 781 1073 5769

Month	HDD	Percent	Hr/day	NG Comb. (hr/day)	Days/Mo.	NG Comb. (hr/mo)
Jan	1091	100.0%	24	18	31	558
Feb	836	76.6%	18.4	13.8	28	386
Mar	658	60.3%	14.5	10.9	31	337
Apr	440	40.3%	9.68	7.26	30	218
May	241	22.1%	5.30	3.98	31	123
Jun	65	5.96%	1.43	1.07	30	32.2
Jul	9	0.825%	0.198	0.148	31	4.60
Aug	15	1.37%	0.330	0.247	31	7.67
Sep	127	11.6%	2.79	2.10	30	62.9
Oct	432	39.6%	9.50	7.13	31	221
Nov	781	71.6%	17.2	12.9	30	387
Dec	1073	98.4%	23.6	17.7	31	549



3 Greenhouse Gas Global Warming Potential (GWP)

GHG	GWP (100-yr)	
	4th	5th
CO2 (carbon dioxide)	1	1
N2O (nitrous oxide)	298	265
CH4 (methane)	25	28

4th = IPCC Fourth Assessment Report, 2007 (AR4), Section 2.10.2, Direct Global Warming Potentials,
accessed July 7, 2015 at https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html
5th = IPCC Fifth Assessment Report, 2014 (AR5),
adapted GWP values taken from http://ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values.pdf

2. INPUT & COMMON FACTORS

Natural Gas Heating Value	1018	MMBtu/MMscf

This was set to 1000 in 2009

Addressed in PTC	Emissions	Stack ID	Unit ID	Description	Mfr/Make	Model	Mfr/ Install Year	Input Heat Capacity (Btu/hr)	Input Heat Capacity (MMBtu/hr)	Max Hrly Fuel Use (MMscf/hr)	Operating Hrs/Day	Operating Hr/Yr
7/20/2001	PM	P-01	WHDRYBH	Meyers-Sterner Whey Dryer w/ Cyclone/BH	Meyers-Sterner	**Production rate = 1496 lb/day**	2001		**6.0**	0.0059	24	8760
8/28/2009	PM	P-04	WHTETRSC	TetraPak Whey Dryer Scrubber	Fisher Klosterman, Inc.	MS-1200 Scrubber, SS316 **16,667 lb/hr**	4/1/2009					
8/28/2009	PM	P-05	WHTETRBH	TetraPak Whey Dryer Baghouse	TetraPak	13-243-14; **16,667 lb/hr**	4/1/2009					
2016	PM	P-40	CH-DONBH	Cheese Plant Donaldson Dust Collection Unit	Donaldson							

Addressed in PTC	Emissions	Stack ID	Unit ID	Description	Mfr/Make	Model	Mfr/ Install Year	Input Heat Capacity (Btu/hr)	Input Heat Capacity (MMBtu/	Max Hrly Fuel Use (MMscf/hr)	Operating Hrs/Day	Operating Hr/Yr
8/28/2009	NG Combustion Products	P-02	WHDRY01	TetraPak Whey Dryer - Burner 1	Eclipse, Inc.	Winnox WX1000	4/1/2009		12.5	0.0123	24	8760
8/28/2009	"	P-03	WHDRY02	TetraPak Whey Dryer - Burner 2	Eclipse, Inc.	Winnox WX1000	4/1/2009		12.5	0.0123	24	8760
8/28/2009	NG Combustion Products	P-06	BLR4	Boiler 4, Low NOx (FGR)	Cleaver Brooks 1200 HP	CBL-700-1200-150 150SC	4/1/2009		49	0.0481	24	8760
7/20/2001	"	P-07	BLR2	Boiler 2, new 800 burner & downrated in 2014	Superior 800 HP	4-05-3005	2001		24.8	0.0244	24	8760
7/20/2001	"	P-08	BLR1	Boiler 1, Low NOx (FGR)	Cleaver Brooks 600 HP	CBLE 700-600	2001		24.49	0.0241	24	8760
8/28/2009	"	P-09	BLR3	Boiler 3, exempt from PTC action when installed in 2007	Hurst 800 HP	54000-150-26	2007		33.6	0.0330	24	8760
2016	"	P-35	CH-AC01	Cheese Plant, Engineering	Carrier	48SS-03006031AA	2000	50,400	0.0504	4.95E-05	**24**	**8760**
2016	"	P-10	CH-AC02	Cheese Plant, Main Conf. Rm	Carrier	48TME004-A-501	2007	74,000	0.074	7.27E-05	24	8760
2016	"	P-11	CH-AC03	Cheese Plant, Main Breakroom	Carrier	48TM3008-A-501	2004	180,000	0.180	1.77E-04	24	8760
2016	"	P-12	CH-AC04	Cheese Plant, Office, East side	Carrier	448TFE007-511	2004	115,000	0.115	1.13E-04	24	8760
2016	"	P-13	CH-AC05	Cheese Plant, Office, West side	Carrier	48TJE007---521--	2004	115,000	0.115	1.13E-04	24	8760
2016	"	P-38	CH-AC06					0	0.000	0.00E+00	24	8760
2016	"	P-14	CH-AC15	Cheese Plant, Micro Lab	Carrier	48HJE006-351	2004	115,000	0.115	1.13E-04	24	8760
2016	"	P-15	CH-AC16	Cheese Plant, Intake Breakroom	Carrier	48TJE005-611GA	2000	115,000	0.115	1.13E-04	24	8760
2016	"	P-16	CH-AC17	Cheese Plant, Main Lab	Carrier	48TFD009-611	2008	125,000	0.125	1.23E-04	24	8760
2016	"	P-17	CH-AC24	Cheese Plant, Warehouse	Carrier	48TCEA04A2A5A0A0A0	2008	115,000	0.115	1.13E-04	24	8760

2. INPUT & COMMON FACTORS, continued

Addressed in PTC	Emissions	Stack ID	Unit ID	Description	Mfr/Make	Model	Mfr/ Install Year	Input Heat Capacity (Btu/hr)	Input Heat Capacity (MMBtu/	Max Hrly Fuel Use (MMscf/ hr)	Operating Hrs/Day	Operating Hr/Yr
2016	"	CH_AHU09	CH-AHU09	Cheese Plant, Mascarpone	Reyco[1]		1999	3,000,000	3.00	2.95E-03	24	8760
2016	"	CH_AHU07	CH-AHU07	Cheese Plant, Shred	Reyco[1]		1999	3,000,000	3.00	2.95E-03	24	8760
2016	"	CH_AHU08	CH-AHU08	Cheese Plant, Mozzarella	Reyco[1]		1999	2,500,000	2.50	2.46E-03	24	8760
2016	"	P-37	CH-AC14	Cheese Plant, QA Offices	BDP	580DJV060115AAAA	2000	115,000	0.115	1.13E-04	24	8760
2016	"	P-18	WH-MA01	Whey Plant, Crystallizer room	York/Johnson Controls	DF-200-GMFH-LH-B200R10LGGAA	2010	2,500,000	2.500	2.46E-03	24	8760
2016	"	P-19	WH-MA02	Whey Plant, HTST room	York/Johnson Controls	DF-175-GMFH-LH-B175R10LGGAA	2010	2,187,000	2.187	2.15E-03	24	8760
2016	"	P-20	WH-MA03	Whey Plant, Permeate dryer burner room	York/Johnson Controls	DF-175-GMFH-LH-B175R10LGGAA	2010	2,187,000	2.187	2.15E-03	24	8760
2016		P-30	WH-MA04	Whey Plant	Greenheck	PVF350H	2010	700,000	0.700	6.88E-04	24	8760
2016	"	P-21	WH-MA06	Whey Plant, Permeate dryer cyclone room	York/Johnson Controls	DF-200-GMFH-LH-B200R10LGGAA	2010	2,500,000	2.500	2.46E-03	24	8760
2016	"	P-22	WH-MA07	Whey Plant, Dungeon room	York/Johnson Controls	DF-150-GMFH-LH-B150R10LGGAA	2010	1,875,000	1.875	1.84E-03	24	8760
2016	"	P-23	WH-AC01	Whey Plant, Packaging blower room	York/Johnson Controls	0EA700030101	2010	375,000	0.375	3.68E-04	24	8760
2016	"	P-24	WH-AC02	Whey Plant, Powder silo room	York/Johnson Controls	DF-40-GMFH-LH-B40R10LGGAA	2010	500,000	0.500	4.91E-04	24	8760
2016	"	P-25	WH-AC03	Whey Plant, Packaging bag room	York/Johnson Controls	DF-75-GMFH-LH-B75R10LGGAA	2010	937,000	0.937	9.21E-04	24	8760
2016	"	P-26	WH-AC04	Whey Plant, Packaging bulk room	York/Johnson Controls	DF-100-GMFH-LH-B100R10LGGAA	2010	1,250,000	1.250	1.23E-03	24	8760
2016	"	P-27	WH-AC09	Whey Plant, Offices	Carrier	D1NA048N090253	unknown	108,000	0.108	1.06E-04	24	8760
2016	"	P-28	WH-AC11	Whey Plant, Lab	Carrier	J06ZHN10P4AZZ50005A	2010	120,000	0.120	1.18E-04	24	8760
2016	"	P-29	WH-AC12	Whey Plant, Breakroom	Carrier	48TFD009-611	2000	125,000	0.125	1.23E-04	24	8760
2016	"	WH_AHU10	WH-AHU10	Whey Plant, Membrane room	Industrial Commercial Equipment	DMA125X	2000	2,112,000	2.112	2.07E-03	24	8760
2016	"	P-31	FM-AC01	Fresh Mozzarella Plant, 1st floor	Carrier	48TCEA07A2A5A0A0A0	2013	115,000	0.115	1.13E-04	24	8760
2016	"	P-32	FM-AC02	Fresh Mozzarella Plant, 2nd floor	Carrier	48TCEA07A2A5A0A0A0	2013	115,000	0.115	1.13E-04	24	8760
							TOTAL, NG Heaters		27.33			

Addressed in PTC	Emissions	Stack ID	Unit ID	Description	Mfr/Make	Model	Mfr/ Install Year	Engine Rating (bhp)	Fuel Sulfur Content (%)	Annual Flow Test (hrs)	Weekly Test (Hrs)	Operating Hr/Yr
2016	ULSD Combustion Products	P-34	FPUMP	Diesel Fire Pump	Peerless	Model = JD/RG6081H132189 (horizontal)	2001	235.9	0.05	2	0.5	500

3. FACILITY CLASSIFICATION

TOTAL HAPs and MERCURY EMISSIONS (Tons per Year) @8760 @500 hr/yr

	Meyers-Sterner Whey Dryer w/ Cyclone/BH	TetraPak Whey Dryer - Burner 1	TetraPak Whey Dryer - Burner 2	Cleaver Brooks 600 HP	Superior 800 HP	Hurst 800 HP	Cleaver Brooks 1200 HP	Natural Gas-Fired Heaters	Fire Pump Engine	TOTAL
MMscf/yr	51.64	107.58	107.58	210.77	213.44	289.18	421.72	235.18		1637
MMBtu/yr									825.65	825.7
Mercury, lb/MMscf:	2.60E-04	2.60E-04	2.60E-04	2.60E-04	2.60E-04	2.60E-04	2.60E-04	2.60E-04		
Total HAPs, lb/MMscf:	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93		
Total HAPs, lb/MMBtu:									3.87E-03	
Mercury, lbs/yr	1.34E-02	2.80E-02	2.80E-02	5.48E-02	5.55E-02	7.52E-02	1.10E-01	6.11E-02		**0.43**
HAPs, lbs/yr	99.44	207.16	207.16	405.86	411.00	556.84	812.06	452.85	3.20	**3156**
HAPs, Tons/yr	**4.97E-02**	**1.04E-01**	**1.04E-01**	**2.03E-01**	**2.06E-01**	**2.78E-01**	**4.06E-01**	**2.26E-01**	**1.60E-03**	**1.58**

NOT a major facility: *Does not emit or have the potential to emit >* *10 TPY of any HAP*
Does not emit or have the potential to emit > *25 TPY of all HAPs, combined*
Does not emit or have the potential to emit > *25 lbs/yr of Mercury*

TOTAL GHG EMISSIONS (Tons per Year) @8760 @500 hr/yr

	Meyers-Sterner Whey Dryer w/ Cyclone/BH	TetraPak Whey Dryer - Burner 1	TetraPak Whey Dryer - Burner 2	Cleaver Brooks 600 HP	Superior 800 HP	Hurst 800 HP	Cleaver Brooks 1200 HP	Natural Gas-Fired Heaters	Fire Pump Engine	TOTAL
CO2, Tons/yr	3,098	6,455	6,455	12,646	12,806	17,351	25,303	14,111	67.70	**98,293**
CO2e, Tons/yr	3,115	6,467	6,467	12,715	12,876	17,444	25,440	14,187	67.70	**98,779**

NOT a major facility: *Does not emit or have the potential to emit >* *100 TPY of CO2*
Does not emit or have the potential to emit > *100 TPY of CO2e*

4. FACILITY CLASSIFICATION

TOTAL CRITERIA POLLUTANT EMISSIONS (Tons per Year) @ 2885 @500 hr/yr

Pollutant	Meyers-Sterner Whey Dryer w/ Cyclone/BH	TetraPak Whey Dryer - Burner 1	TetraPak Whey Dryer - Burner 2	Cleaver Brooks 600 HP	Superior 800 HP	Hurst 800 HP	Cleaver Brooks 1200 HP	Natural Gas-Fired Heaters	Fire Pump Engine	TetraPak Wet Scrubber	TetraPak BH	S&S Donaldson BH	TOTAL
PM	7.3	0.41	0.41	0.80	0.81	1.10	1.60	0.29	0.13	24.79	14.54	0.335	**52.49**
PM10	7.3	0.41	0.41	0.80	0.81	1.10	1.60	0.29	0.13	24.79	14.54	0.335	**52.49**
PM2.5	2.6	0.41	0.41	0.80	0.81	1.10	1.60	0.29	0.13	24.79	14.54	0.335	**47.85**
SO2	0.02	0.03	0.03	0.06	0.06	0.09	0.13	0.02	0.02				**0.47**
NOx	1.20	2.19	2.19	5.27	10.67	14.46	10.54	3.87	1.82				**52.21**
CO	9.81	17.05	17.05	8.85	8.96	12.15	17.71	3.25	0.39				**95.23**
VOCs	0.14	0.30	0.30	0.58	0.59	0.80	1.16	0.21	0.15				**4.22**
Lead	1.29E-05	2.69E-05	2.69E-05	5.27E-05	5.34E-05	7.23E-05	1.05E-04	1.94E-05					3.70E-04
												Lead, lb/month =	**0.06**

"INCREASE" IN REGULATED POLLUTANTS (Tons per Year) @8760 @ 2885 @500 hr/yr @8760

Change:	Meyers-Sterner Whey Dryer w/ Cyclone/BH	TetraPak Whey Dryer - Burner 1	TetraPak Whey Dryer - Burner 2	Cleaver Brooks 600 HP	Superior 800 HP	Hurst 800 HP	Cleaver Brooks 1200 HP	Natural Gas-Fired Heaters	Fire Pump Engine	TetraPak Wet Scrubber	TetraPak BH	S&S Donaldson BH	TOTAL
				4.4 MMBtu/hr	4.7 MMBtu/hr								
PM				0.30				0.29	0.13			0.335	**1.05**
PM10				0.30				0.29	0.13			0.335	**1.05**
PM2.5				0.30				0.29	0.13			0.335	**1.05**
SO2				0.023				0.023	0.021				**0.07**
NOx				3.92				3.87	1.82				**9.61**
CO				3.29				3.25	0.39				**6.94**
VOCs				0.22				0.21	0.15				**0.58**
Lead				1.96E-05				1.94E-05					**3.89E-05**
HAPs				7.54E-02				7.25E-02					**0.15**
													20.50

5.TOTAL TAPs EMISSIONS (lb/hr)

	Meyers-Sterner Whey Dryer w/ Cyclone/BH	TetraPak Whey Dryer - Burner 1	TetraPak Whey Dryer - Burner 2	Cleaver Brooks 600 HP	Superior 800 HP	Hurst 800 HP	Cleaver Brooks 1200 HP	Natural Gas-Fired Heaters	Fire Pump Engine	TOTAL	EL (lb/hr)	Exceeds EL/ Modeling Required ?
Subject to NSPS or NESHAP?	No	No	No	Yes: Dc	Yes: Dc	Yes: Dc	Yes: Dc	No	Yes: ZZZZ			
PAH HAPs												
2-Methylnaphthalene	1.41E-07	2.95E-07	2.95E-07	5.77E-07	5.85E-07	7.92E-07	1.16E-06	6.47E-07		1.38E-06	9.10E-05	
3-Methylchloranthrene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08		1.03E-07	2.50E-06	No
Acenaphthene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08	1.34E-07	1.03E-07	9.10E-05	No
Acenaphthylene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08	4.77E-07	1.03E-07	9.10E-05	No
Anthracene	1.41E-08	2.95E-08	2.95E-08	5.77E-08	5.85E-08	7.92E-08	1.16E-07	6.47E-08	1.76E-07	1.38E-07	9.10E-05	No
Benzo(a)anthracene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08	1.58E-07	1.03E-07	9.10E-05	See POM
Benzo(a)pyrene	7.07E-09	1.47E-08	1.47E-08	2.89E-08	2.92E-08	3.96E-08	5.78E-08	3.24E-08	1.77E-08	6.89E-08	2.00E-06	See POM
Benzo(b)fluoranthene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08	9.34E-09	1.03E-07		See POM
Benzo(g,h,i)perylene	7.07E-09	1.47E-08	1.47E-08	2.89E-08	2.92E-08	3.96E-08	5.78E-08	3.24E-08	4.61E-08	6.89E-08	9.10E-05	No
Benzo(k)fluoranthene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08	1.46E-08	1.03E-07		See POM
Chrysene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08	3.33E-08	1.03E-07		See POM
Dibenzo(a,h)anthracene	7.07E-09	1.47E-08	1.47E-08	2.89E-08	2.92E-08	3.96E-08	5.78E-08	3.24E-08	5.49E-08	6.89E-08		See POM
Dichlorobenzene	7.07E-06	1.47E-05	1.47E-05	2.89E-05	2.92E-05	3.96E-05	5.78E-05	3.24E-05		6.89E-05	9.10E-05	No
Fluoranthene	1.77E-08	3.68E-08	3.68E-08	7.22E-08	7.31E-08	9.90E-08	1.44E-07	8.09E-08	7.17E-07	1.72E-07	9.10E-05	No
Fluorene	1.65E-08	3.44E-08	3.44E-08	6.74E-08	6.82E-08	9.24E-08	1.35E-07	7.55E-08	2.75E-06	1.61E-07	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.06E-08	2.21E-08	2.21E-08	4.33E-08	4.39E-08	5.94E-08	8.67E-08	4.85E-08	3.53E-08	1.03E-07		See POM
Naphthalene	3.60E-06	7.49E-06	7.49E-06	1.47E-05	1.49E-05	2.01E-05	2.94E-05	1.64E-05	7.99E-06	3.50E-05	3.33	No
Naphthalene (as carcinogen)	3.60E-06	7.49E-06	7.49E-06	1.47E-05	1.49E-05	2.01E-05	2.94E-05	1.64E-05	7.99E-06	3.50E-05	9.10E-05	No
Phenanathrene	1.00E-07	2.09E-07	2.09E-07	4.09E-07	4.14E-07	5.61E-07	8.18E-07	4.58E-07	2.77E-06	9.76E-07	9.10E-05	No
Pyrene	2.95E-08	6.14E-08	6.14E-08	1.20E-07	1.22E-07	1.65E-07	2.41E-07	1.35E-07	4.51E-07	2.87E-07	9.10E-05	No
Polycyclic Organic Matter (POM) 7-PAH Group	6.72E-08	1.40E-07	1.40E-07	2.74E-07	2.78E-07	3.76E-07	5.49E-07	3.07E-07	3.24E-07	6.55E-07	2.00E-06	No
Non-PAH HAPs												
Acetaldehyde									7.23E-05	0.00E+00	3.00E-03	No
Acrolein									3.18E-06	0.00E+00	0.017	No
Benzene	1.24E-05	2.58E-05	2.58E-05	5.05E-05	5.12E-05	6.93E-05	1.01E-04	5.66E-05	8.79E-05	1.21E-04	8.00E-04	No
1,3-Butadiene									3.69E-06	0.00E+00	2.40E-05	No
Formaldehyde	4.42E-04	9.21E-04	9.21E-04	1.80E-03	1.83E-03	2.48E-03	3.61E-03	2.02E-03	1.11E-04	4.31E-03	5.10E-04	**YES**
Hexane	1.06E-02	2.21E-02	2.21E-02	4.33E-02	4.39E-02	5.94E-02	8.67E-02	4.85E-02		1.03E-01	12	No
Toluene	2.00E-05	4.18E-05	4.18E-05	8.18E-05	8.28E-05	1.12E-04	1.64E-04	9.17E-05	1.41E-05	1.95E-04	25	No
Xylene									9.80E-06	0.00E+00	29	No
Non-HAP Organic Compounds												
7,12-Dimethylbenz(a)anthracene	9.43E-08	1.96E-07	1.96E-07	3.85E-07	3.90E-07	5.28E-07	7.70E-07	4.31E-07		9.19E-07		
Butane	1.24E-02	2.58E-02	2.58E-02	5.05E-02	5.12E-02	6.93E-02	1.01E-01	5.66E-02		1.08E-01		
Ethane	1.83E-02	3.81E-02	3.81E-02	7.46E-02	7.55E-02	1.02E-01	1.49E-01	8.36E-02		1.60E-01		
Pentane	1.53E-02	3.19E-02	3.19E-02	6.26E-02	6.34E-02	8.58E-02	1.25E-01	7.01E-02		1.34E-01	118	No
Propane	9.43E-03	1.96E-02	1.96E-02	3.85E-02	3.90E-02	5.28E-02	7.70E-02	4.31E-02		8.24E-02		
Metals (HAPs)										0.00E+00		
Arsenic	1.18E-06	2.46E-06	2.46E-06	4.81E-06	4.87E-06	6.60E-06	9.63E-06	5.39E-06		1.03E-05	1.50E-06	**YES**
Barium	2.59E-05	5.40E-05	5.40E-05	1.06E-04	1.07E-04	1.45E-04	2.12E-04	1.19E-04		2.27E-04	0.033	No
Beryllium	7.07E-08	1.47E-07	1.47E-07	2.89E-07	2.92E-07	3.96E-07	5.78E-07	3.24E-07		6.18E-07	2.80E-05	No
Cadmium	6.48E-06	1.35E-05	1.35E-05	2.65E-05	2.68E-05	3.63E-05	5.30E-05	2.97E-05		5.67E-05	3.70E-06	**YES**
Chromium	8.25E-06	1.72E-05	1.72E-05	3.37E-05	3.41E-05	4.62E-05	6.74E-05	3.78E-05		7.21E-05	0.033	No
Cobalt	4.95E-07	1.03E-06	1.03E-06	2.02E-06	2.05E-06	2.77E-06	4.04E-06	2.27E-06		4.33E-06	0.0033	No
Copper	5.01E-06	1.04E-05	1.04E-05	2.05E-05	2.07E-05	2.81E-05	4.09E-05	2.29E-05		4.38E-05	0.013	No
Manganese	2.24E-06	4.67E-06	4.67E-06	9.14E-06	9.26E-06	1.25E-05	1.83E-05	1.02E-05		1.96E-05	0.067	No
Mercury	1.53E-06	3.19E-06	3.19E-06	6.26E-06	6.34E-06	8.58E-06	1.25E-05	7.01E-06		1.34E-05	0.003	No
Molybdenum	6.48E-06	1.35E-05	1.35E-05	2.65E-05	2.68E-05	3.63E-05	5.30E-05	2.97E-05		5.67E-05	0.333	No
Nickel	1.24E-05	2.58E-05	2.58E-05	5.05E-05	5.12E-05	6.93E-05	1.01E-04	5.66E-05		1.08E-04	2.70E-05	**YES**
Selenium	1.41E-07	2.95E-07	2.95E-07	5.77E-07	5.85E-07	7.92E-07	1.16E-06	6.47E-07		1.24E-06	0.013	No
Vanadium	1.36E-05	2.82E-05	2.82E-05	5.53E-05	5.60E-05	7.59E-05	1.11E-04	6.20E-05		1.19E-04	0.003	No
Zinc	1.71E-04	3.56E-04	3.56E-04	6.98E-04	7.07E-04	9.57E-04	1.40E-03	7.82E-04		1.49E-03	0.667	No

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

Reference enclosed SanDisk USB Flash Drive for the following highlighted documents:

	FILE NAME	DESCRIPTION
	2016 Modeling Files and EI	2016 REC Sorrento Emissions Files and Full Impact Records
2011 TetraPak Baghouse Source Test Results	2011 TetraPak Baghouse Source Test final	Appendix 4 - 2011 TetraPak Baghouse Source Test Report
	2011 TetraPak Baghouse Source Test	Appendix 4 - 2011 TetraPak Baghouse Source Test Protocol
2013 Meyers Sterner Baghouse Source Test Results	2013 Meyers Sterner Baghouse Source Test Protocol	Appendix 4 - 2013 Meyers Sterner Baghouse Source Test Protocol
	2013 Meyers Sterner Baghouse Source Test	Appendix 4 - 2013 Meyers Sterner Baghouse Source Test Report
	DEQ Review of 2013 Meyers Sterner Baghouse Source Test	Appendix 4 - DEQ Review of 2013 Meyers Sterner Baghouse Source Test
2014 TetraPak Wet Scrubber Source Test Results	DEQ Review of October 2014 TetraPak Wet Scrubber Source Test	Appendix 4 - DEQ Review of October 2014 TetraPak Wet Scrubber Source Test
	DEQ Review of TetraPak Wet Scrubber Test Protocol	Appendix 4 - DEQ Review of TetraPak Wet Scrubber Test Protocol
	Final Sorrento Lactalis Wet Scrubber Test Report October 2014	Appendix 4 - October 2014 TetraPak Wet Scrubber Test Report
2009 PTC Application	PTC APP P-2009.0023.APP.Sorrento Lactalis Part 1.02-27-2009	Appendix 5 - Part 1 of the 2009 PTC Application
	PTC APP P-2009.0023.APP.Sorrento Lactalis Part 2.02-27-2009	Appendix 5 - Part 2 of the 2009 PTC Application

Reference enclosed SanDisk USB Flash Drive (same drive as Appendix 4) for the following documents:

	FILE NAME	DESCRIPTION
	2016 Modeling Files and EI	2016 REC Sorrento Emissions Files and Full Impact Records
2011 TetraPak Baghouse Source Test Results	2011 TetraPak Baghouse Source Test final	Appendix 4 - 2011 TetraPak Baghouse Source Test Report
	2011 TetraPak Baghouse Source Test	Appendix 4 - 2011 TetraPak Baghouse Source Test Protocol
2013 Meyers Sterner Baghouse Source Test Results	2013 Meyers Sterner Baghouse Source Test Protocol	Appendix 4 - 2013 Meyers Sterner Baghouse Source Test Protocol
	2013 Meyers Sterner Baghouse Source Test	Appendix 4 - 2013 Meyers Sterner Baghouse Source Test Report
	DEQ Review of 2013 Meyers Sterner Baghouse Source Test	Appendix 4 - DEQ Review of 2013 Meyers Sterner Baghouse Source Test
2014 TetraPak Wet Scrubber Source Test Results	DEQ Review of October 2014 TetraPak Wet Scrubber Source Test	Appendix 4 - DEQ Review of October 2014 TetraPak Wet Scrubber Source Test
	DEQ Review of TetraPak Wet Scrubber Test Protocol	Appendix 4 - DEQ Review of TetraPak Wet Scrubber Test Protocol
	Final Sorrento Lactalis Wet Scrubber Test Report October 2014	Appendix 4 - October 2014 TetraPak Wet Scrubber Test Report
2009 PTC Application	PTC APP P-2009.0023.APP.Sorrento Lactalis Part 1.02-27-2009	Appendix 5 - Part 1 of the 2009 PTC Application
	PTC APP P-2009.0023.APP.Sorrento Lactalis Part 2.02-27-2009	Appendix 5 - Part 2 of the 2009 PTC Application

Point #	Source
P1	Meyers-Sterner Whey Dryer Baghouse
P2	TetraPak Whey Dryer Burner #1
P3	TetraPak Whey Dryer Burner #2
P4	TetraPak Whey Dryer Scrubber
P5	TetraPak Whey Dryer Baghouse
P6	Cleaver Brooks 1200 HP
P7	Superior 800 HP
P8	Cleaver Brooks 600 HP
P9	Hurst 800 HP
P10	Cheese Plant AC 02
P11	Cheese Plant AC 03
P12	Cheese Plant AC 04
P13	Cheese Plant AC 05
P14	Cheese Plant AC 15
P15	Cheese Plant AC 16
P16	Cheese Plant AC 17
P17	Cheese Plant AC 24
P18	Whey Plant MA 1
P19	Whey Plant MA 2
P20	Whey Plant MA 3
P21	Whey Plant MA 6
P22	Whey Plant MA 7
P23	Whey Plant AC-1
P24	Whey Plant AC-2
P25	Whey Plant AC-3
P26	Whey Plant AC-4
P27	Whey Plant AC-9
P28	Whey Plant AC-11
P29	Whey Plant AC-12
P30	Whey Plant MA 4
P31	Fresh Mozz AC 01
P32	Fresh Mozz AC 02
P34	Fire Pump
P35	Cheese Plant AC 01
P37	Cheese Plant AC 14
P40	Cheese Plant Donaldson Dust Collection Unit

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Baghouse Control Equipment **Form BCE**
Revision 6
2/18/10

Complete this form for each baghouse. Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name	2. Facility Name:
SORRENTO LACTALIS	SORRENTO LACTALIS

3. Brief Project Description: MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003

BAGHOUSE INFORMATION

4. Baghouse Manufacturer: MEYERS STERNER	5. Baghouse Model: N/A	6. Baghouse Equipment ID: P-1

7 (a). Baghouse particulate matter emission concentration. **Note: Provide information in 7(a)-(c) or answer question #8 below.**	_____ gr/dscf	*Manufacturers typically provide guarantees in grains per dry standard cubic foot (gr/dscf). Provide a copy of the guarantee, or other documentation, with the application along with a description of the types of bags that must be used to achieve the emission concentration.* ***Emission concentrations less than 0.01 gr/dscf will receive additional scrutiny by DEQ and a source test of the baghouse may be required.*** *If a guarantee is not provided then you must document how you obtained the emission concentration. Without documentation the application is not complete.*
7 (b). Percentage PM_{10} Or Provide PM_{10} Emission Concentration	_____ % _____ gr/dscf	*What percentage of the PM concentration listed in question #7(a) is PM_{10}. You must provide documentation as to how the percentage was determined (i.e per the baghouse manufacturer). Without documentation the application is not complete.*
7 (c). Baghouse flow rate	_____ dscfm	*Provide the baghouse flow rate in dry standard cubic feet per minute. Actual cubic feet per minute may be given in lieu of dscfm* ***if it is documented*** *that moisture content is insignificant. You must provide documentation as to how this flow rate was determined (i.e. per the exhaust fan manufacturer, combustion evaluation, etc.). Without documentation the application is not complete.*
8. Baghouse particulate matter control efficiency. **Note: Not needed if section #7 is completed.**	98 % PM control _____ % PM_{10} control	*Applicant's providing the control efficiency of the baghouse must provide control efficiency for both PM and PM_{10}. Provide a copy of the control efficiency documentation with the application. Documentation must include a description of the types of bags that must be used to achieve the control efficiency. Without documentation the application is not complete.*
9. Is the baghouse equipped with a bag leak detector?	☐ Yes ☒ No	*If a bag leak detector is installed provide documentation on the leak detector, including; how the leak detector functions and what level of the output signal indicates that a bag is leaking. Without documentation the application is not complete.*

Instructions for Form BCE

1 – 3. Provide the same company name, facility name, and brief project description as on the application cover sheet Form CS**. This is useful if application pages are separated.

USE ATTACHMENT IF ADDITIONAL SPACE IS REQUIRED.

Baghouse Information:

4-5. Provide the baghouse manufacturer name and the model number.

6. Provide an identification number for the baghouse stack. This number is assigned by the applicant and must be provided on any other application materials which are submitted that include baghouse information.

7-9. Follow the instructions in the form. All documentation provided must be sufficient so that DEQ can verify the validity of the information provided. Provide the Baghouse Equipment ID number on all submitted documentation. If documentation is not provided the application is incomplete.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	TETRAPAK WHEY DRYER BURNER 1 (P-2)
6. EU ID Number:	P-2
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	TETRAPAK.
9. Model:	ECLIPSE WINNOX 1000
10.. Maximum Capacity:	12.5 MMBTU/HR
11. Date of Construction:	4-1-09
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

5. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

☐ Operation Hour Limit(s):	
☒ Production Limit(s):	Production Limit: 16,667 lb/hr averaged over 24 h
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	

_5. Rationale for Requesting the Limit(s): NO CHANGES TO CURRENT LIMIT

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	TETRAPAK WHEY DRYER BURNER 2 (P-3)
6. EU ID Number:	P-3
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	TETRAPAK.
9. Model:	ECLIPSE WINNOX 1000
10.. Maximum Capacity:	12.5 MMBTU/HR
11. Date of Construction:	4-1-09
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

☐ Operation Hour Limit(s):	
☒ Production Limit(s):	PRODUCTION LIMIT: 16,667 LB/HR AVERAGED OVER 24 H
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	

25. Rationale for Requesting the Limit(s): NO CHANGE TO CURRENT PERMIT LIMITS

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Scrubber Control Equipment - **Form SCE**
Revision 6
6/11/15

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name	2. Facility Name:
SORRENTO LACTALIS	SORRENTO LACTALIS
3. Emissions Unit ID (unit being controlled by the scrubber)	**4. Exhaust Stack ID of the Scrubber:**
P-4	P-4

5. Project Description	MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003

EQUIPMENT DESCRIPTION

Equipment	6. Manufacturer: FISTER KLOSTERMAN, INC	7. Model.: MS-1200 SCRUBBER SS316		
Scrubber Type	8. ☒ Wet Scrubber (indicate type)	☒ Venturi	☐ Packed Bed	☐ Condensation Scrubbing
		☐ Tray/Plate	☐ Orifice	☐ Spray Chamber
	9. ☐ Dry Scrubber			
	10. ☐ Other (please provide details):			
Operation	**Packed Bed (if applicable)**	11. Type of Packing Material:		
	Venturi (if applicable)	12. Pressure Drop Across Throat: 5.25" in w.g.		
	Spray Chamber (if applicable)	13. Pressure in Spray Nozzles: in psi		
	14. Operating Pressure Range (all scrubber types): 5.25 to 10 in w.g.			
	15. Other Operating Parameters (if neccessary):			
Scrubbing Media (as required)	16. Recirculation Rate: min. 599 gpm	17. Flow Meter? ☒ Yes ☐ No		
	18. pH of Scrubbing Media (range): to	19. pH Meter? ☐ Yes ☐ No		
	20. ORP of Scrubbing Media (range): to mv	21. ORP Meter? ☐ Yes ☐ No		
Pollutant (being removed)	22. ☒ Particulates (PM_{10}/$PM_{2.5}$)	23. ☐ VOC		
	24. ☐ SO_2	25. ☐ H_2S		
	26. ☐ Odor	27. ☐ Inorganic Fumes		
	28. Other:			

	Pollutant	Control Efficiency %	Source of Data
Emissions Data	29. Particulates (PM_{10})	99	37. ☒ Manufacturer's Specifications
	30. Particulates ($PM_{2.5}$)		38. ☒ Emissions Source Test (provide source test report)
	31. VOC		39. ☐ AP-42 Section
	32. SO_2		40. ☐ Other
	33. H_2S		*Note: Supporting documentation must be provided.*
	34. Odor		*"Supporting documentation must be provided" in this section means the following information shall be available for DEQ staff review:*
	35. Inorganic Fume		• *Control equipment manufacturer guarantees (if applicable),*
	36. Other		• *Source test reports (if applicable)*
			• *All sources of emissions factors used to perform emissions calculations (i.e. continuous emissions monitoring system (CEMS) data, source testing, and/or US EPA's AP-42), and*
			• *All assumptions used to perform emissions calculations.*

Instructions for Form SCE

1 – 5. Provide the company name, facility name (if different), the ID number of the unit being controlled by the scrubber, the exhaust stack ID of the scrubber, and a brief project description.

USE ATTACHMENTS IF ADDITIONAL SPACE IS REQUIRED.

Equipment:

6 – 7. Identify the manufacturer and model of the scrubber proposed to be installed.

Scrubber Type:

8 - 10. Identify the type of scrubber proposed to be installed.

Components:

11. Identify the type of packing material to be used in the proposed packed bed scrubber (if applicable).
12. Specify the pressure drop across the throat of the proposed wet scrubber (if applicable).
13. Specify the operating pressure of the nozzles in the proposed spray chamber scrubber (if applicable).
14. Identify the operating pressure range of the scrubber (applicable to all types).
15. Identify any other operating parameters of the scrubber (if necessary).

Scrubbing Media:

16. Specify the recirculation rate of the scrubber media (if applicable).
17. Specify whether a flow meter is present (if applicable).
18. Specify the pH operating range of the scrubbing media (if applicable).
19. Specify whether a pH meter is present (if applicable).
20. Specify the ORP (Oxidation-Reduction Potential) operating range of the scrubbing media (if applicable).
21. Specify whether an ORP meter is present (if applicable).

Pollutant (being removed):

22 - 28. Identify the pollutant being removed by the proposed scrubber.

Emissions Data:

29 - 36. Identify the control efficiency for the appropriate pollutant of the scrubber proposed to be installed.

37 - 40. Specify the source (or sources) of the control efficiency.

"Supporting documentation must be provided" in this section means the following information shall be available for DEQ staff review:

- Control equipment manufacturer guarantees (if applicable),
- Source test reports (if applicable)
- All sources of emissions factors used to perform emissions calculations (i.e. continuous emissions monitoring system (CEMS) data, source testing, and/or US EPA's AP-42), and
- All assumptions used to perform emissions calculations.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Venturi Scrubber Control Equipment - **Form VSCE**
Revision 2
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	SORRENTO LACTALIS	2. Facility Name:	SORRENTO LACTALIS	3. Facility ID No.:	027-00071
4. Brief Project Description:	MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003				

EMISSION UNIT ID				SCRUBBER						
5.	6.	7.	8.	9.	10.	11.	12.	13	14.	15.
Emission Unit	EU ID No.	CE ID No.	Stack ID No.	Manufacturer Name	Model No.	Efficiency (PM_{10}@70%, SO_2@50%, etc.)	Basis for Efficiency (i.e., guarantee, source test, etc.)	Design Scrubbing Liquid Flow (gpm)	Design Pressure Drop (in H_2O)	Design pH (for acid gas control)
TETRAPAK SCRUBBER	P-4	P-4	P-4	FISHER KLOSTERMAN	MS-1200 SCRUBBER SS316	PM @ 99%	VENDOR CALCULATION	599 (MINIMUM)	5.25 (MINIMUM)	NA

Describe the maintenance required to assure the scrubber operates as designed (i.e. frequency of inspection, nozzle inspection, nozzle cleaning, etc.). (Provide an attachment if necessary.)

Instructions for Form VSCE

This information is used by DEQ to identify the scrubber control equipment in this permit application.

1 – 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS. This is useful in case any pages of the application are separated.

Provide the following:

5. The name of the emissions unit, exactly the same as it appears on Form EU0.
6. The emissions unit ID No., exactly the same as it appears on Form EU0.
7. Control equipment ID No., exactly the same as it appears on Form EU0.
8. Stack ID No.
9. Name of the scrubber manufacturer.
10. Model number of the scrubber.
11. Give scrubber control efficiency and pollutant controlled (i.e., PM_{10}@70%, SO_2@50%, etc.). For particulate matter, give efficiency for PM_{10} and for total PM.
12. The basis for stated efficiency must be documented. Attach supporting documentation such as manufacturer guarantees, source tests, design calculations, or other means of substantiating control efficiency.
13. Give the design scrubbing media flowrate in gpm to achieve stated control efficiency.*
14. Give the design pressure drop in inches of water column to achieve stated control efficiency.*
15. For acid gas scrubbers, give the design scrubbing liquid pH.*

* These parameters will become operating standards in a permit.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Baghouse Control Equipment **Form BCE**
Revision 6
2/18/10

Complete this form for each baghouse. Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name	2. Facility Name:
SORRENTO LACTALIS	SORRENTO LACTALIS

3. Brief Project Description: MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003

BAGHOUSE INFORMATION

4. Baghouse Manufacturer: TETRAPAK CPS	5. Baghouse Model: 13-243-14	6. Baghouse Equipment ID: P-5

7 (a). Baghouse particulate matter emission concentration. **Note: Provide information in 7(a)-(c) or answer question #8 below.**	___ gr/dscf	*Manufacturers typically provide guarantees in grains per dry standard cubic foot (gr/dscf). Provide a copy of the guarantee, or other documentation, with the application along with a description of the types of bags that must be used to achieve the emission concentration.* ***Emission concentrations less than 0.01 gr/dscf will receive additional scrutiny by DEQ and a source test of the baghouse may be required.*** *If a guarantee is not provided then you must document how you obtained the emission concentration. Without documentation the application is not complete.*
7 (b). Percentage PM_{10} Or Provide PM_{10} Emission Concentration	_____ % _____ gr/dscf	*What percentage of the PM concentration listed in question #7(a) is PM_{10}. You must provide documentation as to how the percentage was determined (i.e per the baghouse manufacturer). Without documentation the application is not complete.*
7 (c). Baghouse flow rate	_ dscfm	*Provide the baghouse flow rate in dry standard cubic feet per minute. Actual cubic feet per minute may be given in lieu of dscfm* ***if it is documented*** *that moisture content is insignificant. You must provide documentation as to how this flow rate was determined (i.e. per the exhaust fan manufacturer, combustion evaluation, etc.). Without documentation the application is not complete.*
8. Baghouse particulate matter control efficiency. **Note: Not needed if section #7 is completed.**	99.9 % PM control 99.9 % PM_{10} control	*Applicant's providing the control efficiency of the baghouse must provide control efficiency for both PM and PM_{10}. Provide a copy of the control efficiency documentation with the application. Documentation must include a description of the types of bags that must be used to achieve the control efficiency. Without documentation the application is not complete.*
9. Is the baghouse equipped with a bag leak detector?	☐ Yes ☒ No	*If a bag leak detector is installed provide documentation on the leak detector, including; how the leak detector functions and what level of the output signal indicates that a bag is leaking. Without documentation the application is not complete.*

Instructions for Form BCE

1 – 3. Provide the same company name, facility name, and brief project description as on the application cover sheet Form CS**. This is useful if application pages are separated.

USE ATTACHMENT IF ADDITIONAL SPACE IS REQUIRED.

Baghouse Information:

4-5. Provide the baghouse manufacturer name and the model number.

6. Provide an identification number for the baghouse stack. This number is assigned by the applicant and must be provided on any other application materials which are submitted that include baghouse information.

7-9. Follow the instructions in the form. All documentation provided must be sufficient so that DEQ can verify the validity of the information provided. Provide the Baghouse Equipment ID number on all submitted documentation. If documentation is not provided the application is incomplete.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3 Facility ID No:
SORRENTO LACTALIS	SORRENTO LACTALIS	027-00071

4. Brief Project Description: MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: ☐ New Unit ☐ Unpermitted Existing Unit ☒ Modification to a Unit with Permit #:P-2009.0023

6. Use of Boiler: ☒ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%

7. Boiler ID Number: 1	8. Rated Capacity: ☒ 24.5 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 2001	10. Manufacturer: CLEAVER BROOKS	11. Model: CBLE 700-600
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		24.49 MMBTU/HR		
17. Actual Consumption Rate		24.49 MMBTU/HR		
18. Fuel Heat Content (Btu/unit, LHV)		1018 BTU/SCF		
19. Sulfur Content wt%				
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	N/A
26. Operating Schedule (hours/day, months/year, etc.):	24 HR/DAY, 365 DAYS/YR
27. NSPS Applicability: ☐ Yes ☐ No	If Yes, which subpart:

Instructions for Form EU5

Please refer to IDAPA 58.01.01.222 for a list of industrial boilers which are exempt from the Permit to Construct requirements.

1 – 4. Provide the same company name, facility name (if different), and facility ID number as on Form CS. This is useful in case any pages of the application are separated.

Boiler Description and Specification:

5. Indicate whether the unit is new, existing but unpermitted, or being modified.

6. Indicate the percentage of the steam used for process, space heat, generating electricity, or others.

7. Provide the boiler identification (ID) number. Each boiler in the application must have its own number. If boilers included in this permit application are not identical in make and model, fill out a separate EU5 form for each boiler. If the boilers are identical, attach a separate sheet labeled EU5A listing them by ID number and date of construction or modification. The boiler ID numbers should match the boiler ID numbers used on other construction permit applications and within this application. It can be any number. However, if you submitted an operating permit application, the numbers used for identification purposes in this application should be consistent with the ID numbers used in your operating permit application.

8. The boiler's rated capacity should be read from the boiler's nameplate or from the manufacturer's literature.

9. The date of construction of the emission unit is the date, month, and year in which construction or modification begins as defined in EU0 Form Instruction item 7.

10. Provide the name of the manufacturer of the boiler.

11. Provide the model number of the boiler. This number should be available from the nameplate of the boiler.

12. If the boiler has been or will be modified, give the date, month and year of the most recent or future modification.

13. Provide the manufacturer's serial number for this boiler, if available.

14. Provide the control device name and number if a pollution control device is attached to this emission unit. The name and number of the control device should be consistent with control equipment forms throughout the application. **Note: a separate control equipment form(s) should be attached for all applicable control equipment serving this unit.**

Fuel Description and Specifications:

15. Indicate the fuel type used by the boiler. If diesel fuel is used, you need to indicate the ranking number. If the boiler is a dual-fuel engine, please check all appropriate fuel type boxes in this row.

16. The full-load consumption rate is the fuel consumption rate at the boiler's rated capacity.

17. The actual consumption rate is the fuel consumption rate (usually daily average) under typical operational conditions.

18. Provide fuel net or lower heating value (LHV).

19. Provide the weight percentage of the sulfur content in the fuel.

20. Provide the weight percentage of the ash content in the fuel. For gaseous fuel, this information is not required.

Steam Description and Specifications:

21. Provide the steam heat content. This information is not required for gaseous or liquid fuel.

22. Provide the steam temperature in °F. This information is not required for gaseous or liquid fuel.

23. Provide the steam pressure in pound per square inch (psi). This information is not required for gaseous or liquid fuel.

24. Provide the steam type (i.e. saturated or superheated). This information is not required for gaseous or liquid fuel.

Operation Limits:

25. If any, indicate the operating limits you imposed on this boiler in the units of operating hours per year, or gallons fuel per hour, per year, etc.

26. Indicate your operation schedule for the projected maximum operation of the engine.

27. Provide NSPS (new source performance standards) applicability determination and, if applicable, subpart reference.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3 Facility ID No:
Sorrento Lactalis	Nampa Facility	027-00071
4. Brief Project Description:	MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: ☐ New Unit ☐ Unpermitted Existing Unit ☒ Modification to a Unit with Permit #:P-2009.0023

6. Use of Boiler: ☒ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%

7. Boiler ID Number: Boiler 2	8. Rated Capacity: ☒ 24.8 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 2001	10. Manufacturer: Superior	11. Model: 4-5-3004
12. Date of Modification (if applicable): September 2014	13. Serial Number (if available): 4-5-3005	14. Control Device (if any): none **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		24.8 MMBTU/HR		
17. Actual Consumption Rate		24.8 MMBTU/HR		
18. Fuel Heat Content (Btu/unit, LHV)		1018 BTU/SCF		
19. Sulfur Content wt%		N/A		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	N/A
26. Operating Schedule (hours/day, months/year, etc.):	24 hrs/day, 365 days/yr
27. NSPS Applicability: ☐ Yes ☐ No	If Yes, which subpart:

Instructions for Form EU5

Please refer to IDAPA 58.01.01.222 for a list of industrial boilers which are exempt from the Permit to Construct requirements.

1 – 4. Provide the same company name, facility name (if different), and facility ID number as on Form CS. This is useful in case any pages of the application are separated.

Boiler Description and Specification:

5. Indicate whether the unit is new, existing but unpermitted, or being modified.

6. Indicate the percentage of the steam used for process, space heat, generating electricity, or others.

7. Provide the boiler identification (ID) number. Each boiler in the application must have its own number. If boilers included in this permit application are not identical in make and model, fill out a separate EU5 form for each boiler. If the boilers are identical, attach a separate sheet labeled EU5A listing them by ID number and date of construction or modification. The boiler ID numbers should match the boiler ID numbers used on other construction permit applications and within this application. It can be any number. However, if you submitted an operating permit application, the numbers used for identification purposes in this application should be consistent with the ID numbers used in your operating permit application.

8. The boiler's rated capacity should be read from the boiler's nameplate or from the manufacturer's literature.

9. The date of construction of the emission unit is the date, month, and year in which construction or modification begins as defined in EU0 Form Instruction item 7.

10. Provide the name of the manufacturer of the boiler.

11. Provide the model number of the boiler. This number should be available from the nameplate of the boiler.

12. If the boiler has been or will be modified, give the date, month and year of the most recent or future modification.

13. Provide the manufacturer's serial number for this boiler, if available.

14. Provide the control device name and number if a pollution control device is attached to this emission unit. The name and number of the control device should be consistent with control equipment forms throughout the application. **Note: a separate control equipment form(s) should be attached for all applicable control equipment serving this unit.**

Fuel Description and Specifications:

15. Indicate the fuel type used by the boiler. If diesel fuel is used, you need to indicate the ranking number. If the boiler is a dual-fuel engine, please check all appropriate fuel type boxes in this row.

16. The full-load consumption rate is the fuel consumption rate at the boiler's rated capacity.

17. The actual consumption rate is the fuel consumption rate (usually daily average) under typical operational conditions.

18. Provide fuel net or lower heating value (LHV).

19. Provide the weight percentage of the sulfur content in the fuel.

20. Provide the weight percentage of the ash content in the fuel. For gaseous fuel, this information is not required.

Steam Description and Specifications:

21. Provide the steam heat content. This information is not required for gaseous or liquid fuel.

22. Provide the steam temperature in °F. This information is not required for gaseous or liquid fuel.

23. Provide the steam pressure in pound per square inch (psi). This information is not required for gaseous or liquid fuel.

24. Provide the steam type (i.e. saturated or superheated). This information is not required for gaseous or liquid fuel.

Operation Limits:

25. If any, indicate the operating limits you imposed on this boiler in the units of operating hours per year, or gallons fuel per hour, per year, etc.

26. Indicate your operation schedule for the projected maximum operation of the engine.

27. Provide NSPS (new source performance standards) applicability determination and, if applicable, subpart reference.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3 Facility ID No:
SORRENTO LACTALIS	SORRENTO LACTALIS	027-00071
4. Brief Project Description:	MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: ☐ New Unit ☐ Unpermitted Existing Unit ☒ Modification to a Unit with Permit #:P-2009.0023

6. Use of Boiler: ☒ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%

7. Boiler ID Number: 3	8. Rated Capacity: ☒ 33.6 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 2007	10. Manufacturer: HURST	11. Model: 54000-150-26
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		33.6 MMBTU/HR		
17. Actual Consumption Rate		33.6 MMBTU/HR		
18. Fuel Heat Content (Btu/unit, LHV)		1018 BTU/SCFF		
19. Sulfur Content wt%				
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	N/A
26. Operating Schedule (hours/day, months/year, etc.):	24 HR/DAY, 365 DAYS/YR
27. NSPS Applicability: ☐ Yes ☐ No	If Yes, which subpart:

Instructions for Form EU5

Please refer to IDAPA 58.01.01.222 for a list of industrial boilers which are exempt from the Permit to Construct requirements.

1 – 4. Provide the same company name, facility name (if different), and facility ID number as on Form CS. This is useful in case any pages of the application are separated.

Boiler Description and Specification:

5. Indicate whether the unit is new, existing but unpermitted, or being modified.

6. Indicate the percentage of the steam used for process, space heat, generating electricity, or others.

7. Provide the boiler identification (ID) number. Each boiler in the application must have its own number. If boilers included in this permit application are not identical in make and model, fill out a separate EU5 form for each boiler. If the boilers are identical, attach a separate sheet labeled EU5A listing them by ID number and date of construction or modification. The boiler ID numbers should match the boiler ID numbers used on other construction permit applications and within this application. It can be any number. However, if you submitted an operating permit application, the numbers used for identification purposes in this application should be consistent with the ID numbers used in your operating permit application.

8. The boiler's rated capacity should be read from the boiler's nameplate or from the manufacturer's literature.

9. The date of construction of the emission unit is the date, month, and year in which construction or modification begins as defined in EU0 Form Instruction item 7.

10. Provide the name of the manufacturer of the boiler.

11. Provide the model number of the boiler. This number should be available from the nameplate of the boiler.

12. If the boiler has been or will be modified, give the date, month and year of the most recent or future modification.

13. Provide the manufacturer's serial number for this boiler, if available.

14. Provide the control device name and number if a pollution control device is attached to this emission unit. The name and number of the control device should be consistent with control equipment forms throughout the application. **Note: a separate control equipment form(s) should be attached for all applicable control equipment serving this unit.**

Fuel Description and Specifications:

15. Indicate the fuel type used by the boiler. If diesel fuel is used, you need to indicate the ranking number. If the boiler is a dual-fuel engine, please check all appropriate fuel type boxes in this row.

16. The full-load consumption rate is the fuel consumption rate at the boiler's rated capacity.

17. The actual consumption rate is the fuel consumption rate (usually daily average) under typical operational conditions.

18. Provide fuel net or lower heating value (LHV).

19. Provide the weight percentage of the sulfur content in the fuel.

20. Provide the weight percentage of the ash content in the fuel. For gaseous fuel, this information is not required.

Steam Description and Specifications:

21. Provide the steam heat content. This information is not required for gaseous or liquid fuel.

22. Provide the steam temperature in °F. This information is not required for gaseous or liquid fuel.

23. Provide the steam pressure in pound per square inch (psi). This information is not required for gaseous or liquid fuel.

24. Provide the steam type (i.e. saturated or superheated). This information is not required for gaseous or liquid fuel.

Operation Limits:

25. If any, indicate the operating limits you imposed on this boiler in the units of operating hours per year, or gallons fuel per hour, per year, etc.

26. Indicate your operation schedule for the projected maximum operation of the engine.

27. Provide NSPS (new source performance standards) applicability determination and, if applicable, subpart reference.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-02 (P-10)
6. EU ID Number:	P-10
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48TME004-A-501--
10.. Maximum Capacity:	74,000 BTU/HR
11. Date of Construction:	2007
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

5. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

_5. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071
4. Brief Project Description:	Modification per Consent Orders E-2014.0007 & E-2015.0003	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-03 (P-11)
6.	EU ID Number:	P-11
7.	EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8.	Manufacturer:	CARRIER
9.	Model:	48TNE008-A-501--
10..	Maximum Capacity:	180,000 BTU/HR
11.	Date of Construction:	2004
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HR/YR
23.	Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-04 (P-12)
6.	EU ID Number:	P-12
7.	EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8.	Manufacturer:	CARRIER
9.	Model:	48TFE007----521---
10..	Maximum Capacity:	115,000 BTU/HR
11.	Date of Construction:	2004
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HR/YR
23.	Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-05 (P-13)
6. EU ID Number:	P-13
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48TJE007---521--
10.. Maximum Capacity:	115,000 BTU/HR
11. Date of Construction:	2004
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-17 (P-16)
6. EU ID Number:	P-16
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48TFD009---611
10.. Maximum Capacity:	125,000 BTU/HR
11. Date of Construction:	2008
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-15 (P-14)
6. EU ID Number:	P-14
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48HJE006---351--
10.. Maximum Capacity:	115,000 BTU/HR
11. Date of Construction:	2004
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-16 (P-15)
6. EU ID Number:	P-15
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48TJE005---611GA
10.. Maximum Capacity:	115,000 BTU/HR
11. Date of Construction:	2000
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-24 (P-17)
6. EU ID Number:	P-17
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48TCEA04A2A5A0A0A0
10.. Maximum Capacity:	115,000 BTU/HR
11. Date of Construction:	2008
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

.5. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC MA 1 (P-18)
6. EU ID Number:	P-18
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-200-GMFH-LH-B200R10LGGAA
10.. Maximum Capacity:	2,500,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

5. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

☐ Operation Hour Limit(s):

☐ Production Limit(s):

☐ Material Usage Limit(s):

☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports

☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC MA 2 (P-19)
6. EU ID Number:	P-19
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-175-GMFH-LH-B175R10LGGAA
10.. Maximum Capacity:	2,187,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC MA 3 (P-20)
6. EU ID Number:	P-20
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-175-GMFH-LH-B175R10LGGAA
10.. Maximum Capacity:	2,187,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC MA 6 (P-21)
6. EU ID Number:	P-21
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-200-GMFH-LH-B200R10LGGAA
10.. Maximum Capacity:	2,500,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC MA 7 (P-22)
6. EU ID Number:	P-22
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-150-GMFH-LH-B150R10LGGAA
10.. Maximum Capacity:	1,875,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC AC-1 (P-23)
6. EU ID Number:	P-23
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	OEA700030101
10.. Maximum Capacity:	375,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC AC-2 (P-24)
6. EU ID Number:	P-24
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-40-GMFH-RH-B040R10RGGAA
10.. Maximum Capacity:	500,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC AC-3 (P-25)
6. EU ID Number:	P-25
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-75-GMFH-RH-B075R10RGGAA
10.. Maximum Capacity:	937,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC AC-4 (P-26)
6. EU ID Number:	P-26
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	YORK/JOHNSON CONTROLS
9. Model:	DF-100-GMFH-LH-B100R10LGAA
10.. Maximum Capacity:	1,250,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC AC-9 (P-27)
6. EU ID Number:	P-27
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	D1NA048N09025C
10.. Maximum Capacity:	108,000 BTU/HR
11. Date of Construction:	
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC AC-11 (P-28)
6. EU ID Number:	P-28
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	J06ZHN10P4AZZ50005A
10.. Maximum Capacity:	120,000 BTU/HR
11. Date of Construction:	2010
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	WHEY PLANT HVAC AC-12 (P-29)
6. EU ID Number:	P-29
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48TFD009---611--
10.. Maximum Capacity:	125,000 BTU/HR
11. Date of Construction:	2000
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:	
15. Date of Installation:	16. Date of Modification (if any):
17. Manufacturer and Model Number:	
18. ID(s) of Emission Unit Controlled:	
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☐ No
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, indicate all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	
25. Rationale for Requesting the Limit(s):	

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	WHEY PLANT HVAC MA 4 (P-30)
6.	EU ID Number:	P-30
7.	EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8.	Manufacturer:	GREENHECK
9.	Model:	PVF350H
10..	Maximum Capacity:	700,000 BTU/HR
11.	Date of Construction:	2010
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HR/YR
23.	Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	FM PLANT HVAC AC 01(P-31)
6. EU ID Number:	P-31
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48TCEA07A2A6A0A0A0
10.. Maximum Capacity:	115,000 BTU/HR
11. Date of Construction:	2013
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	FM PLANT HVAC AC 02(P-32)
6.	EU ID Number:	P-32
7.	EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8.	Manufacturer:	CARRIER
9.	Model:	48TCEA07A2A6A0A0A0
10..	Maximum Capacity:	115,000 BTU/HR
11.	Date of Construction:	2013
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HR/YR
23.	Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units Industrial IC Engine Information - **Form EU1**
Revision 9
10/23/13

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name	2. Facility Name:
SORRENTO LACTALIS	SORRENTO LACTALIS

3. Brief Project Description: MODIFICATION OF PTC PER CONSENT ORDERS E-2014.0007 & E-2015.0003

IC ENGINE DESCRIPTION AND SPECIFICATIONS

4. Type of unit:
- ☐ New unit ☒ Unpermitted existing unit ☐ Modification to an existing permitted unit? Permit number: _____
- ☐ Full-time operation (non-emergency standby use)?
- ☒ Emergency standby use only (operation limited to 100 hrs/yr for maintenance and testing and emergency use only)?
- ☒ Emergency fire pump use only?
- ☐ Stationary test cell/stand operation only (as defined in NSPS Subpart ZZZZ)?
- ☐ National security operation only (as defined in NSPS Subpart ZZZZ)?
- ☐ Institutional emergency standby IC engine (as defined in NSPS Subpart ZZZZ)?

IC ENGINE SPECIFICATIONS

Questions 5 through 15 apply to **all IC engines.**

5. IC Engine Manufacturer: PEERLESS 6. Model: JD/RG6081H133189 7. Date manufactured: ≤2001 8. Model year: _____

9. Date of installation (if an existing IC engine): June 2001 10. IC Engine cylinder displacement: <30 liters per cylinder

1. Maximum rated horsepower (per the data plate/manufacturer specifications): 235.9 hp/rpm, max 2100 rpm bhp

12. EPA Certification: Tier certification number _____ or ☒ None/not tier certified

13. Ignition type: ☐ Spark ☒ Compression

14. Fuel combusted in the IC engine? ☒ Distillate fuel oil ☐ Natural gas/LNG ☐ LPG/propane
If distillate fuel oil (#1, #2, or a mixture) is used, what is the maximum sulfur content? ☐ 15 ppm (0.0015% by weight) ☒ 500 ppm (0.05% by weight)

15. IC engine exhaust stack parameters: Diameter 4 inches Height 8 feet Temperature 850 °F Flow rate .001 m/sec acfm

IC ENGINE EMISSIONS PARAMETERS

Questions 16 through 27 apply to **full-time** non-Tier certified IC engines or Tier certified IC engines manufactured prior to July 11, 2005. If you are proposing a Tier certified IC engine manufactured on and after July 11, 2005 or an emergency standby IC engine do not answer questions 17 through 27.

16. Testing schedule (for emergency standby IC engines only): 1.4 hrs/day 42.7 hrs/mon 125 hrs/qtr 500 hrs/yr

17. Maximum daily operation: _____ hrs/day 18. Maximum annual operation: _____ hrs/yr **Note:** These operational limits will be placed in the permit.

19. Will CO emissions be limited to a specific ppmvd (i.e. 49 or 23 ppmvd)? ☐ Yes ☐ No 20. What will the CO emissions limit be? _____ ppmvd

21. Will CO emissions be reduced by 70% or more? ☐ Yes ☐ No

22. Will a CEMS (Continuous Emissions Monitoring System) be used to measure pollutants in the IC engine exhaust stream? ☐ Yes ☐ No

23. Will a CPMS (Continuous Parameters Monitoring System) be used to measure parameters of the IC engine exhaust stream? ☐ Yes ☐ No

24. Will the IC engine be equipped with an oxidation catalyst? ☐ Yes ☐ No

25. If applicable, will the oxidation catalyst be equipped with a temperature measurement system to ensure it is operating properly? ☐ Yes ☐ No

26. Will the IC engine be equipped with a diesel particulate filter? ☐ Yes ☐ No

27. If applicable, will the diesel particulate filter be equipped with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached? ☐ Yes ☐ No

Instructions for Form EU1

Please refer to IDAPA 58.01.01.220 for a list of the general exemption criteria for Permit to Construct exemptions

1 – 3. Provide the same company name, facility name (if different), and brief project description as on Form GI. This is useful if the application pages are separated.

USE ATTACHMENT IF ADDITIONAL SPACE IS REQUIRED.

General Information:

4. Indicate whether the IC engine is a new unit, unpermitted existing unit, being modified, and whether it will be permitted to operate full-time or for emergency use only.

IC Engine Specifications:

5-8. Provide the IC engine manufacturer, model, date the IC engine was manufactured, and the model year (used for EPA certification purposes) of the IC engine.

9. Provide the date of installation of the IC engine.

10. Provide the IC engine cylinder displacement (i.e. 12 liter engine with 8 cylinders = 1.5 liters per cylinder).

11. Provide the maximum horsepower of the IC engine (per the data plate) in bhp.

12. Provide the EPA Tier certification number of the IC engine (i.e. 1, 2, 3, or 4).

13. Provide the IC engine ignition type.

14. Check which fuel is combusted in the IC engine. If distillate fuel oil is combusted, check the maximum proposed sulfur content of the fuel.

15. Provide the IC engine exhaust stack parameters. The temperature and flow rate should be per the IC engine manufacturer. If the stack height is very tall, provide a justification for the exhaust gas temperature.

IC Engine Emissions Parameters:

Questions 16 through 27 apply to **full-time** non-Tier certified IC engines or Tier certified IC engines manufactured prior to July 11, 2005. If you are proposing a Tier certified IC engine manufactured on and after July 11, 2005 or an emergency standby IC engine do not answer questions 17 through 27.

16. For emergency IC engines only, propose a testing schedule.

17. Propose a maximum daily IC engine hourly limit. **Note:** Unless it is 24 hours per day of operation, this proposed daily hourly limit will be placed in the permit.

18. Propose a maximum annual IC engine hourly limit. **Note:** Unless it is 8,760 hours per year of operation, this proposed annual hourly limit will be placed in the permit.

19-21. Subpart ZZZZ requires that CO emissions in the exhaust from existing non-Tier certified IC engines are either limited to a specific concentration, 49 ppmvd for engines rated at 300 bhp to ≤ 500 bhp or 23 ppmvd for engines rated at > 500 bhp, or are to reduce the CO concentration by 70% or more. Therefore, "yes" should only be answered to one of these two questions.

22-23. Subpart ZZZZ requires that, for IC engines rated at > 500 bhp, Applicants either install a CEMS (Continuous Emissions Monitoring System) or a CPMS (Continuous Parameters Monitoring System) in the exhaust stream to demonstrate compliance with the emissions limitations. Therefore, "yes" should only be answered to one of these two questions.

24. Specify if the IC engine is equipped, or will need to be equipped, with an oxidation catalyst to comply with the emissions limitations of Subpart ZZZZ.

25. Specify if the oxidation catalyst will be equipped with a temperature measurement system to ensure that is operating properly to comply with the emissions limitations of Subpart ZZZZ.

26. Specify if the IC engine is equipped, or will need to be equipped, with a diesel particulate filter to comply with the emissions limitations of Subpart ZZZZ.

27. Specify if the diesel particulate filter will be equipped with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5. Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-1 (P-35)
6. EU ID Number:	P-35
7. EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8. Manufacturer:	CARRIER
9. Model:	48SS-03006031AA
10.. Maximum Capacity:	56,800 BTU/HR
11. Date of Construction:	2000
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:	
15. Date of Installation:	16. Date of Modification (if any):
17. Manufacturer and Model Number:	
18. ID(s) of Emission Unit Controlled:	
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☐ No
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22. Actual Operation:	8760 HR/YR
23. Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, indicate all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	
25. Rationale for Requesting the Limit(s):	NO LIMIT REQUIRED, EXEMPT SOURCE

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis	Sorrento Lactalis	027-00071

4. Brief Project Description: Modification per Consent Orders E-2014.0007 & E-2015.0003

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	CHEESE PLANT CARRIER HVAC AC-14 (P-37)
6.	EU ID Number:	P-37
7.	EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #:P-2009.0023 Date Issued: 5/1/15
8.	Manufacturer:	BDP
9.	Model:	580DJV060115AAAA
10..	Maximum Capacity:	115,000 BTU/HR
11.	Date of Construction:	2000
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HR/YR
23.	Maximum Operation:	8760 HR/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

Instructions for Form EU0

This form provides DEQ with information about an emissions unit. An emissions unit is the equipment or process that generates emissions of regulated air pollutant(s). This form is used by the permit writer to become familiar with the emissions unit (EU). This form is also used by DEQ to identify the control equipment and the emission point (stack or vent) used for the emission unit(s) proposed in this permit application. This form also asks for supporting documents to verify stated control efficiencies and details about the emission point. Additional information may be requested.

1 - 4. Provide the same company name, facility name (if different), facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

5. Provide the name of the emissions unit (EU), such as "Union boiler," etc. A separate EU0 form is required for each emissions unit.

6. Provide the identification (ID) number of the EU. It can be any unique identifier you choose; however, this ID number should be unique to this EU and should be used consistently throughout this application and any other air quality permit application(s) (e.g., operating permit application) to identify this EU.

7. Indicate the type of EU by checking the appropriate box (e.g., a new source to be constructed, an unpermitted existing source (as-built) applying for the first time, or an existing permitted source to be modified). If the EU is being modified, indicate on the form the most recent permit issued for the EU.

8. Provide the manufacturer's name for the EU. If the EU is custom-designed or homemade, indicate so.

9. Provide the model number of the EU. If the EU is custom-designed or homemade, indicate so.

10. Provide the maximum capacity of the EU. For example, a boiler's rated capacity may be modified in units of MMBtu/hr in terms of heat input of natural gas; an assembly line capacity may be in parts produced per day. Capacity should be based on a rated nameplate or as stated in the manufacturer's literature.

11. The date of construction is the month, day, and year in which construction or modification was commenced.

Definitions:

Construction fabrication, erection, or installation of an affected facility.

Commenced an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Modification any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted to the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) to the atmosphere not previously emitted.

12. If the EU has been or will be modified, provide the month, day, and year of the most recent or future modification as defined in IDAPA 58.01.01.006.

13. Indicate if emissions from the EU are controlled by air pollution control equipment. If the answer is yes, complete the next section. If the answer is no, go to line 18.

14. Provide the name of the air pollution control equipment (e.g., wet scrubber) and the control equipment's identification number. This identification number should be unique to this air pollution control equipment and should be used consistently throughout this and all other air quality permit applications (e.g., operating permit application) to identify this air pollution control equipment.

15. Provide the date the air pollution control equipment was installed.

16. If the air pollution control equipment has been modified, provide the date of the modification.

17. Provide the name of the manufacturer and the model number for the air pollution control equipment.

18. If this air pollution control equipment controls emissions from more than this EU, provide the identification number(s) of the other EU(s).

19. Indicate if this air pollution control equipment operates on a schedule different from the EU(s) it controls.

20. Indicate if the air pollution control manufacturer guarantees the control efficiency of the control equipment. If the answer is yes, attach the manufacturer's guarantee and label it with the air pollution control equipment identification number. Indicate the control efficiency for the target pollutant(s).

21. If the control efficiency of the air pollution control equipment is not guaranteed, attach the design specifications and any performance data to support the control efficiency stated in part 16. Label the supporting documentation with the air pollution control equipment identification number.

22. Provide the projected actual operating schedule for the emission unit in hours/day, hours/year, or other.

23. Provide the maximum operating schedule for the emission unit in hours/day, hours/year, or other.

24. If you are requesting to have limits placed on this EU, mark "Yes." Then, check the applicable requested limit(s) and provide the limit(s). For example, production limits may be in terms of parts produced per year, material usage limits may be in gallons per day.

25. Please provide the reason you are requesting limits, if any. This helps DEQ and the applicant determine whether the limits are necessary, and if they will accomplish the desired purpose. Provide supporting documentation (calculations, modeling assessment, regulatory review, etc.) for each limit requested.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Baghouse Control Equipment **Form BCE**
Revision 6
2/18/10

Complete this form for each baghouse. Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name	2. Facility Name:
SORRENTO LACTALIS	SORRENTO LACTALIS

3. Brief Project Description: MODIFY PERMIT PER CONSENT ORDERS E-2014.0007 & E-2015.0003

BAGHOUSE INFORMATION

4. Baghouse Manufacturer: Donaldson	5. Baghouse Model: Torit Dalmatic DLMC	6. Baghouse Equipment ID: P-40

7 (a). Baghouse particulate matter emission concentration. **Note: Provide information in 7(a)-(c) or answer question #8 below.**	.0028 gr/dscf	*Manufacturers typically provide guarantees in grains per dry standard cubic foot (gr/dscf). Provide a copy of the guarantee, or other documentation, with the application along with a description of the types of bags that must be used to achieve the emission concentration.* ***Emission concentrations less than 0.01 gr/dscf will receive additional scrutiny by DEQ and a source test of the baghouse may be required.*** *If a guarantee is not provided then you must document how you obtained the emission concentration. Without documentation the application is not complete.*
7 (b). Percentage PM_{10} Or Provide PM_{10} Emission Concentration	99.97 % _____ gr/dscf	*What percentage of the PM concentration listed in question #7(a) is PM_{10}. You must provide documentation as to how the percentage was determined (i.e per the baghouse manufacturer). Without documentation the application is not complete.*
7 (c). Baghouse flow rate	8000 cfn dscfm	*Provide the baghouse flow rate in dry standard cubic feet per minute. Actual cubic feet per minute may be given in lieu of dscfm* ***if it is documented*** *that moisture content is insignificant. You must provide documentation as to how this flow rate was determined (i.e. per the exhaust fan manufacturer, combustion evaluation, etc.). Without documentation the application is not complete.*
8. Baghouse particulate matter control efficiency. **Note: Not needed if section #7 is completed.**	99.97 % PM control _____ % PM_{10} control	*Applicant's providing the control efficiency of the baghouse must provide control efficiency for both PM and PM_{10}. Provide a copy of the control efficiency documentation with the application. Documentation must include a description of the types of bags that must be used to achieve the control efficiency. Without documentation the application is not complete.*
9. Is the baghouse equipped with a bag leak detector?	☐ Yes ☒ No	*If a bag leak detector is installed provide documentation on the leak detector, including; how the leak detector functions and what level of the output signal indicates that a bag is leaking. Without documentation the application is not complete.*

Instructions for Form BCE

1 – 3. Provide the same company name, facility name, and brief project description as on the application cover sheet Form CS**. This is useful if application pages are separated.

USE ATTACHMENT IF ADDITIONAL SPACE IS REQUIRED.

Baghouse Information:

4-5. Provide the baghouse manufacturer name and the model number.

6. Provide an identification number for the baghouse stack. This number is assigned by the applicant and must be provided on any other application materials which are submitted that include baghouse information.

7-9. Follow the instructions in the form. All documentation provided must be sufficient so that DEQ can verify the validity of the information provided. Provide the Baghouse Equipment ID number on all submitted documentation. If documentation is not provided the application is incomplete.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

November 10, 2011

Ms. Wendy York
Safety and Environmental Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Ave
Nampa, ID 83653-1230

Re: Review of the Tetrapak Whey Dryer Particulate Matter Performance Tests Conducted by Sorrento Lactalis, Inc., on June 3, 2011; Facility ID No. 027-00071

Dear Ms. York:

On July 8, 2011, the Department of Environmental Quality (DEQ) received a performance test report, prepared by Bighorn Environmental Air Quality, LLC, for the Tetrapak whey dryer operated by Sorrento Lactalis, Inc., in Nampa, Idaho. The performance tests were conducted on June 3, 2011. The purpose of the tests was to demonstrate compliance with the requirements of Permit to Construct No. P-2009.0023 issued August 28, 2009.

On May 2, 2011, DEQ received a test protocol, and DEQ conditionally approved the protocol in a letter dated May 17, 2011. DEQ did not observe the test.

Based on a review of the submitted test report, DEQ has determined that the particulate matter tests on the Tetrapak whey dryer scrubber and shaking bed baghouse demonstrated compliance with the emission limits listed in Permit to Construct No. P-2009.0023 during the test period. A summary of the test results is provided in Table 1. The highest 3-minute aggregated opacity was 15% on the whey dryer scrubber.

Table 1. Tetrapak Whey Dryer Test Results

Source	Measured PM_{10} emission rate (lb/hr)	PM_{10} Emissions Limit (lb/hr)	Measured emissions as % of emissions standard	Measured Opacity	Opacity Standard
Whey dryer scrubber	4.36[a]	5.66	77%	15%	20%
Shaking bed baghouse	1.22[b]	3.32	37%	0%	20%

a) PM10 emissions are reported as a sum of EPA Methods 5 and 202 because the scrubber exhaust had entrained moisture droplets that precluded the use of Method 201A.
b) PM10 emissions are reported as a sum of EPA Methods 201A and 202.

Permit Condition 3.11.3 states:

If the PM_{10} emissions measured in the performance test is less than or equal to 75 percent of the permitted PM_{10} emission limits in this permit, a source test shall be required every five years. If the PM_{10} emissions

> measured during the performance test is greater than 75 percent, but less than or equal to 90 percent of the permitted PM_{10} emission limit in this permit, a source test shall be required every three years after issuance of this permit. If the PM_{10} emissions measured during the performance test is greater than 90 percent of the permitted PM_{10} emission limit in this permit, the permittee shall conduct a performance test annually.

In accordance with Permit Condition 3.11.3, the Tetrapak whey dryer scrubber stack shall be tested within three years. Therefore, the next test on the Tetrapak whey dryer scrubber shall be conducted no later than June 3, 2014. The next test on the Tetrapak shaking bed baghouse shall be conducted within 5 years or no later than June 3, 2016.

The average production rate of whey powder during shaking bed baghouse emission testing was ~14,660 pounds per hour, and the average pressure drop across the shaking bed baghouse was 3.3 inches of water. The average production rate of whey powder during the whey dryer scrubber emission testing was ~14,800 pounds per hour, and the average water pressure from the scrubber pump was ~95 psi.

Please call me at (208) 373-0550 or Zach Klotovich at (208) 373-0295, if you have any questions regarding this performance test review.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer

ec: Zach Klotovich, Technical Services Division
Marilyn Seymore, Air Quality Division

SORRENTO LACTALIS
TETRAPAK WHEY DRYER
COMPLIANCE TEST

NAMPA, IDAHO
FACILITY
JUNE 3, 2011

June 29, 2011

Prepared by:

TIM HOMER
AIR EMISSIONS LABORATORY MANAGER

BIGHORN ENVIRONMENTAL AIR QUALITY, LLC
1324 N LIBERTY LAKE RD • LIBERTY LAKE, WA 99019 • (541) 726-2689 • FAX(888) 559-5624

EXECUTIVE SUMMARY

The results from the Tetrapak Whey Dryer compliance test are summarized below.

Tetrapak Whey Dryer PM_{10} Results

Source	gr/dscf	lb/hr
EPA Method 5/202*		
Whey Dryer Scrubber	0.010	4.36
EPA Method 201A/202		
Shaking Bed Baghouse	0.0048	1.22

*All PM counted as PM_{10}.

Detailed discussions and results from this emissions test project are included in the body of this report.

CONTENTS

EXECUTIVE SUMMARY i

1.0 SOURCE INFORMATION AND TEST DATES 1

2.0 PROCESS DESCRIPTION 1

3.0 PRODUCTION RATES 2

4.0 POLLUTANTS AND TEST METHODS 2

5.0 SOURCE SAMPLING EQUIPMENT 4

6.0 RESULTS 5

7.0 CALIBRATION DATA 6

8.0 QUALITY ASSURANCE 6

APPENDIX A CEMS DESCRIPTIONS AND SPECIFICATIONS

APPENDIX B FIELD DATA

APPENDIX C FLOW RATE SPREADSHEETS

APPENDIX D CALCULATED EMISSION RATES

APPENDIX E CALCULATIONS

APPENDIX F FIELD CALIBRATION DATA

APPENDIX G QUALITY RECORDS

APPENDIX H PRODUCTION DATA

APPENDIX I IDEQ CORRESPONDENCE

1.0 SOURCE INFORMATION AND TEST DATE

Sorrento Lactalis hired Bighorn Environmental to perform source testing on the new Tetrapak Whey Dryer, at its Nampa, ID facility to quantify its emissions. This was done to satisfy testing condition 3.11 as outlined in Sorrento Lactalis's PTC #2009.0023. Bighorn conducted the source test on June 3, 2011.

Sorrento Lactalis' Wendy York coordinated this project. Ms. York also represented Sorrento Lactalis during the test. Bighorn's Mike Keating and Tim Homer conducted the source test. A copy of the source test plan submitted to DEQ along with their approval letter can be found in Appendix I.

The testing consisted of three runs for particulate matter on each source. Table 1 lists sources, test dates, and times.

TABLE 1. SOURCE TEST DATES AND TIMES

Emission Unit	2011 Date	Time
Whey Dryer Scrubber	June 3	14:20-15:34; 15:58-17:12; 17:43-18:58
Shaking Baghouse	June 3	14:19-15:52; 16:24-18:02; 18:14-19:50

2.0 PROCESS DESCRIPTION

Dried whey powder will be manufactured in the TetraPak whey dryer process equipment. Up to 400,000 lb/day of (95.5 percent total solid) dried whey powder will be produced in this drying process. The TetraPak whey dryer will receive whey concentrate at a rate up to 619,176 pounds per day (lb/day), assuming 62% solids content, from a new evaporator at the plant. The TetraPak whey drying process consists of two 12.5 MMBtu/hr natural gas fired burners, a drying chamber, and shaking beds. The two burners heat air that passes into the drying chamber to dry Whey. The burners are considered indirect heating devices because the combustion gases do not come in contact with the heated air. Each burner has an exhaust stack (P-2 and P-3) that discharges natural gas combustion products. The heated air dries the whey concentrate as it flows through the drying chamber. The drying chamber exhausts to cyclones where product in air is recovered. The cyclones are considered as process equipment for this application. The purpose of this equipment is to recover solids suspended in air discharged from the dryer, the recovered solids are returned to the process line. The exhaust from the cyclones passes through a venturi air scrubber (P-4) to control discharge of particulate matter from this process. Product from the drying chamber passes over a conditioning belt onto a shaking

baghouse (P-5) to recover product and control discharge of particulate matter to the air. The natural gas-fired dryer burners (P-2 and P-3) combust natural gas exclusively and are rated at less than 50 MMBtu/hr of heat input. Therefore, the dryer burners are exempt from State of Idaho air permit requirements per IDAPA 58.01.01.222.02.c.

3.0 PRODUCTION RATES

Bighorn tested the Whey Dryer and Shaking Bed while the dryer was operated at maximum throughput rates as shown in Table 2. Appendix H includes production data and pollution control parameters provided by Sorrento Lactalis for each test period.

TABLE 2. ACTUAL PRODUCTION DATA

RUN NUMBER	lbs Whey/hr	Baghouse Diff (in H_20)
1	23,724	3.35
2	22,779	3.28
3	22,377	3.22

62%
14,709
14,123
13,874
14,235.2

4.0 POLLUTANTS AND TEST METHODS

Bighorn used its isokinetic particulate testing equipment for this project.

Bighorn performed velocity traverses on the sources to calculate flow rates and convert analytical results to mass emissions. Opacity readings were conducted concurrently with each particulate run.

Because the scrubber baghouse stack was saturated a Method 201A test could not be conducted, therefore an EPA Method 5 test was conducted and all PM recovered is counted as PM_{10}. Table 3 outlines the test methods Bighorn used during testing.

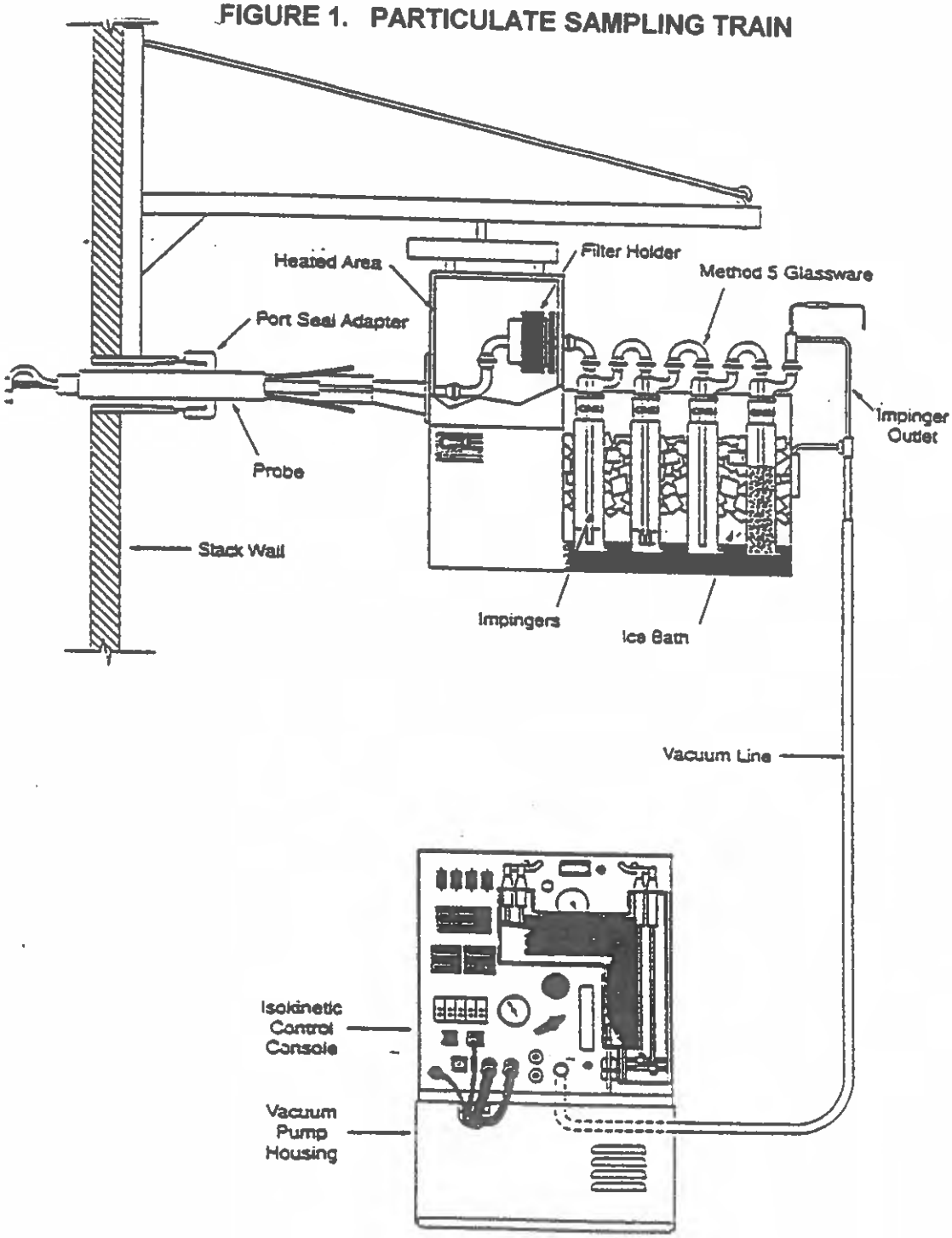
TABLE 3. TEST METHODS

PARAMETER	TEST METHODS
Velocity & Flow	EPA Methods 1 & 2
Moisture Content	EPA Method 4
Particulate Matter	EPA Method 5 and 202
PM 10	EPA Method 201A and 202
Opacity	EPA Method 9

5.0 SOURCE SAMPLING EQUIPMENT

Figure 1 is a diagram of Bighorn's Particulate Sampling Train.

FIGURE 1. PARTICULATE SAMPLING TRAIN



Field data sheets, flow rate information, calculated emissions data, and calculations are contained in Appendices A-E.

7.0 CALIBRATION DATA

Appendix F contains calibration field sheets while Appendix G has required support equipment quality control records.

8.0 QUALITY ASSURANCE

Bighorn's QA procedures follow EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. III, Stationary Source Specific Methods* September 1994 as revised and amended (#EPA-600/R-94/038c). Bighorn used EPA method specific quality assurance procedures. The following *July 1, 2009 40 CFR 60* sections were referenced for this project:

Appendix A - Methods 1, 2, 4, 5, 9, 201A and 202.

Bighorn Environmental is zealous in our commitment to thorough quality practices. We conduct stringent quality assurance and quality control (QA and QC) procedures on all reference CEMS and support equipment.

Bighorn employs the latest CAI 600 Series, J.U.M. and API Model 100 AH CEMS. These CEMS are considered state-of-the-art by environmental professionals. We've designed an effective primary sample conditioner that works in concert with Horiba's secondary conditioners. Together, they provide dry, clean sample gas to Bighorn's CEMS (Figure 1).

EPA Protocol No. 1 QA standards allow Bighorn to challenge equipment and methods to ensure that data is valid for determining monitor accuracy and precision. Before each test, Bighorn challenges its monitors and then entire system at the probe which simulates actual sampling. QA standards introduced at the sample probe traverse through all sample lines, conditioning chambers, and monitors to determine initial system integrity or bias. Following each run, Bighorn conducts QA of the entire monitoring system to determine final system bias and test calibration drift

Bighorn's Mobile Air Emissions Laboratory contains two APC 1400 uninterruptible power supplies (UPS) to compliment our QA/QC commitment. These QC devices continuously regulate and condition client-supplied 120 VAC power so Bighorn's electronic analyzers receive a consistent clean 115 $\pm$ 5 VAC signal. Chronic brownout and over-voltage conditions are eliminated thereby reducing hardware failures and data errors. Also, temporary power outages do not shut down our CEMS nor jeopardize data quality because the UPS will generate a consistent pure sine wave signal for up to one hour with its built in battery.

Cross checks such as manual calculations of Bighorn's automated DAS computer generated results allow test results verification. Bighorn files manufacturers' accuracy certificates and interference tables for CEMS, flow controllers, gases, etc. Additionally dry gas meters, pitot tubes, thermocouples, gas dividers, etc. are certified as per EPA requirements and frequencies. Where EPA frequencies are not specified, Bighorn has established those based on state regulatory criteria.

Thorough chain-of-custody procedures and documentation provide proof of our QA/QC efforts. Relevant QA/QC documentation is included in this final report's Appendices for results support and regulatory review.

APPENDIX A
EQUIPMENT DESCRIPTIONS AND SPECIFICATIONS

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

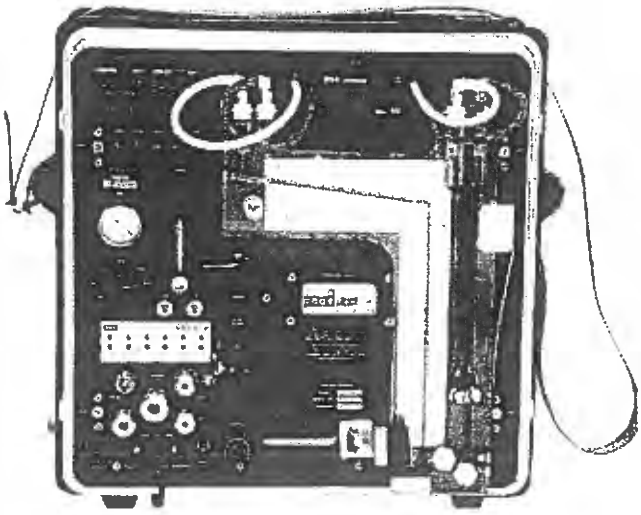
XC-500 SERIES SOURCE SAMPLER CONSOLES

XC-500 Series Source Sampler Consoles are rugged, lightweight metering consoles used to extract gas samples in accordance with US EPA Method 5 for determining source emissions for dust and fumes. The Apex Isokinetic Source Sampler allows the operator to monitor gas velocities, temperatures, pressures and adjust sample flow rates to maintain isokinetic sampling conditions. Comes with digital temperature controllers, a choice between digital or liquid manometers, digital temperature displays and external pump connections. Stainless steel fittings and quick connects are standard. Units in the XC-500 Series are available in Standard or Metric units, 110V or 220VAC, optional internal orsat pump. XC-500 Series Sampling Console features a molded, rugged X-case with side handles for attaching the easy carry strap. The X-case allows for rear door access. Apex Instrument's Isokinetic Sampling Consoles are manufactured to conform to the construction design criteria and specifications cited in U.S. EPA Method 5, Code of Federal Regulations (40 CFR Part 60) and APTD-0581 documents. All Apex consoles are calibrated prior to shipping.

XC-572 Manual Source Sampling Console

The XC-572 Source Sampling Console is the metric version of the XC-522. It is a full featured, compact, and lightweight Isokinetic Source Sampler. It has all the great features you want and the reliability you need. Field set up is easy with non-reversible external pump connections and the industry standard 4-pin electrical connector. (External sample pump sold separately). Console allows operators to monitor gas velocities, temperatures, pressures, and sample flow rates for maintaining isokinetic sampling conditions.

Method 5



Features:

- Precision gas meter with leak check indicator
- Low Cost - Manual Console
- Easy Operation and Maintenance
- Rugged, Lightweight, Stackable Case
- Removable 19" Front Panel
- Carry Strap for Easy Transport
- Non-Reversible Sample Pump Connections
- Color Coded Thermocouple Jacks
- Bright, Easy-to-Read Temperature Displays
- Easy-Leveling Dual Column Manometer
- Stainless Steel Quick Connects & Fittings
- Convenient Layout for Manual Data Recording

XC-572 Metric Units

Model	Description
XC-572	XC-572 Isokinetic Meter Console, Metric, 120V/60Hz
XC-572-V	XC-572 Isokinetic Meter Console, Metric, 240 V/50 Hz
XC-572-O	XC-572 Isokinetic Meter Console, Metric, with optional Orsat Pump Assembly, 120V/60Hz
XC-572-OV	XC-572 Isokinetic Meter Console, Metric, with optional Orsat Pump Assembly, 240 V/50 Hz

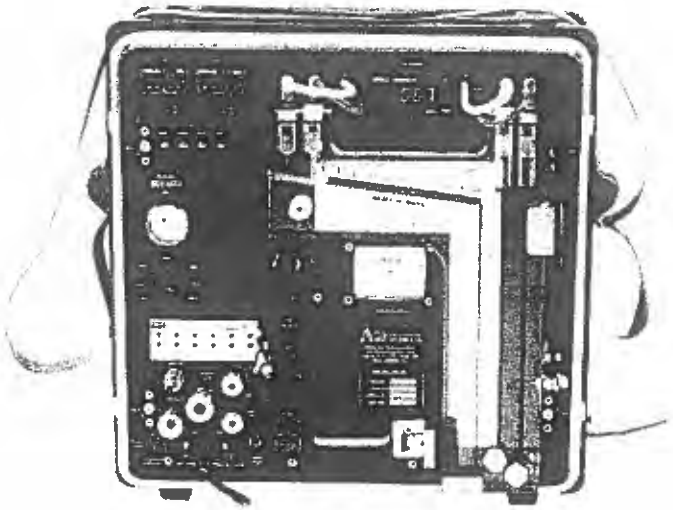
ISOKINETIC SOURCE SAMPLER CONSOLES

Apex Instruments offers a choice of different Source Sampler Consoles configured to meet your needs. Consoles feature a new custom rotationally molded rugged X-Case with side handles and rear door access, digital temperature controllers, dual column manometer, digital temperature displays and external pump assembly. Standard with stainless steel fittings and quick connects. English or metric units.

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

XC-522 Manual Source Sampling Console

Method 5



The Apex Instruments Model XC-522 is a full featured manual meter console. The Apex Isokinetic Source Sampling Console allows the operator to monitor gas velocities, temperatures, pressures and adjust sample flow rates to maintain isokinetic sampling conditions. Designed with convenient display layout for manual data recording. The Apex Instruments Isokinetic Source Sampling Consoles are manufactured to conform to the construction design criteria and specifications cited in U.S. EPA Method 5, Code of Federal Regulations (40 CFR Part 60) and APTD-0581 documents.

Features:

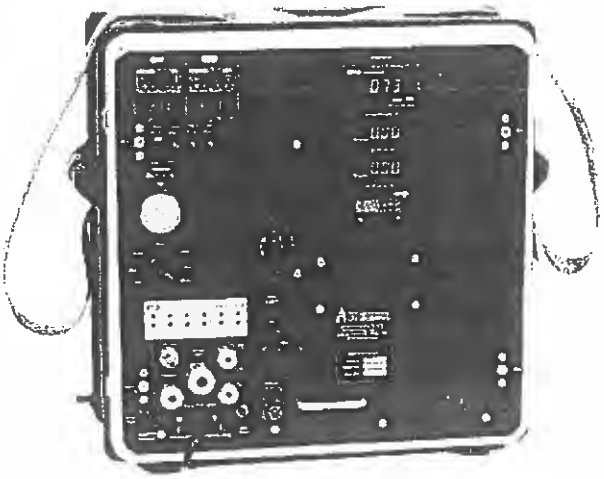
- Low Cost - Manual Console
- Easy to Operate and Maintain
- Rugged, Lightweight, Stackable Case
- Removable 19" Front Panel
- Carry Strap for Easy Transport
- Non-Reversible Sample Pump Connections
- Color Coded Thermocouple Jacks
- Bright, Easy-to-Read Temperature Displays
- Easy-Leveling Dual Column Manometers
- Dry Gas Meter with direct read index
- Stainless Steel Quick Connects & Fittings

XC-522 English Units (Cubic Feet, ^{o}F)

Model	Description
XC-522	English Meter Console, 120 V/60 Hz
XC-522-V	English Meter Console, 240 V/50 Hz
XC-522-O	English Meter Console with optional Orsat Pump Assembly, 120 V/60 Hz
XC-522-OV	English Meter Console with optional Orsat Pump Assembly, 240 V/50 H

XC-563 Digital Source Sampling Console

Method 5



Apex Instruments Model 563 Source Sampling Console is the digital equivalent to the XC-522 and XC-572; featuring an AP25 Dry Gas Meter with optical encoder and digital totalizer. The console also features differential pressure transducers for ΔP and Δ H. The temperature controllers, thermometer and timer all have digital displays.

Features

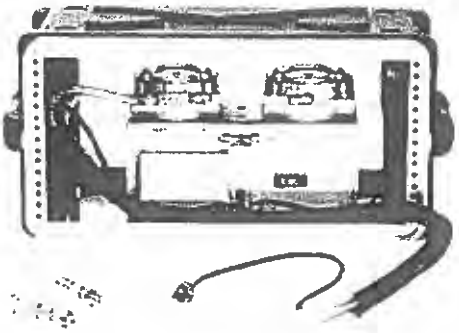
- Precision Gas Meter with LCD Totalizer
- Module with Dual Pressure Transducers
- Digital Probe Temperature Control/Display
- Vacuum Gauge (Dual Scale)
- Stainless Steel Quick Connects and Control Valves
- Digital Temperature Display (^{o}F or ^{o}C) with up to 6 Type-K Inputs
- Non-Reversible External Pump Connections
- Removable Front Lid and Back Panel
- Digital Display for Δ P Velocity Pressure, and Δ H Orifice Pressure
- No Messy Manometer Fluid
- Digital Elapsed Timer
- Lightweight

XC-563 Source Sampler Console

Model	Description
XC-563	XC-563 Meter Console, 120V/60Hz
XC-563-V	XC-563 Meter Console, 240V/50Hz
XC-563-O	XC-563 Meter Console, with optional Orsat Pump Assembly, 120V/60Hz
XC-563-OV	XC-563 Meter Console, with optional Orsat Pump Assembly, 240V/50Hz

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

SAMPLE PUMP ASSEMBLIES



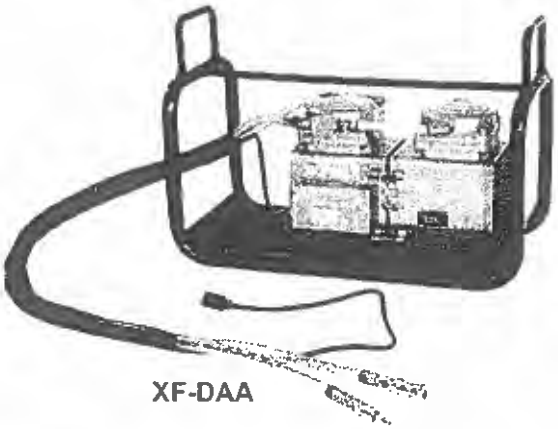
XE-DAA

XE-DAA DOUBLE HEADED DIAPHRAGM PUMPS

Specifications:

Motor: $^1/_2$ hp, 120V/240V, 60/50Hz, 5 $^1/_2$ Amp
Flow: 3.6 cfm (Open); 1.4cfm@15" HG
Maximum Vacuum: 26.5" HG
Weight: 36 lbs. (16 kg.)
Dimensions: 22.5" W x 11" H x 12.5" D

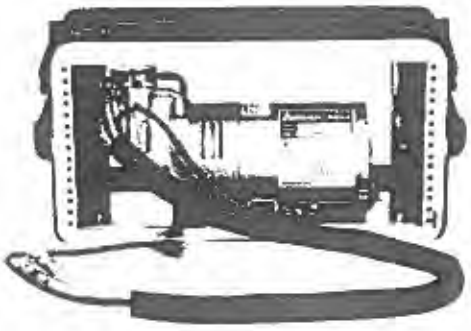
Model	Pump
XE-DAA	Double Headed Diaphragm Pump in a Molded X-Case, 110V/60Hz
XE-DAA-V	Double Headed Diaphragm Pump in a Molded X-Case, 220V/50Hz



XF-DAA

XF-DAA DIAPHRAGM PUMPS

Model	Pump
XF-DAA	Double Headed Diaphragm Pump in Tubular Steel Frame, 110V/60Hz
XF-DAA-V	Double Headed Diaphram Pump in Tubular Steel Frame, 220V/50Hz



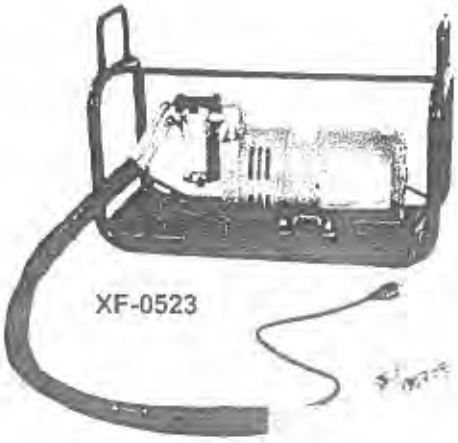
XE-0523

MODEL XE-0523 LUBRICATED ROTARY VANE PUMPS

Specifications:

Motor: $^1/_4$ hp,120/240V, 60/50Hz, 4.6/2.3 Amp, RPM 1725/1425
Flow: 4.5 cfm (Open); 1.5cfm@15" HG
Lubricator: Adjustable wick-style
Maximum Vacuum: 25" HG
Weight: 41 lbs. (18 kg.)
Dimensions: 22.5" W x 11" H x 12.5" D

Model	Description
XE-0523	Rotary Vane Pump in a Molded X-Case (120V/ 60 Hz)
XE-0523-V	Rotary Vane Pump in a Molded X-Case (240V/ 50Hz)



XF-0523

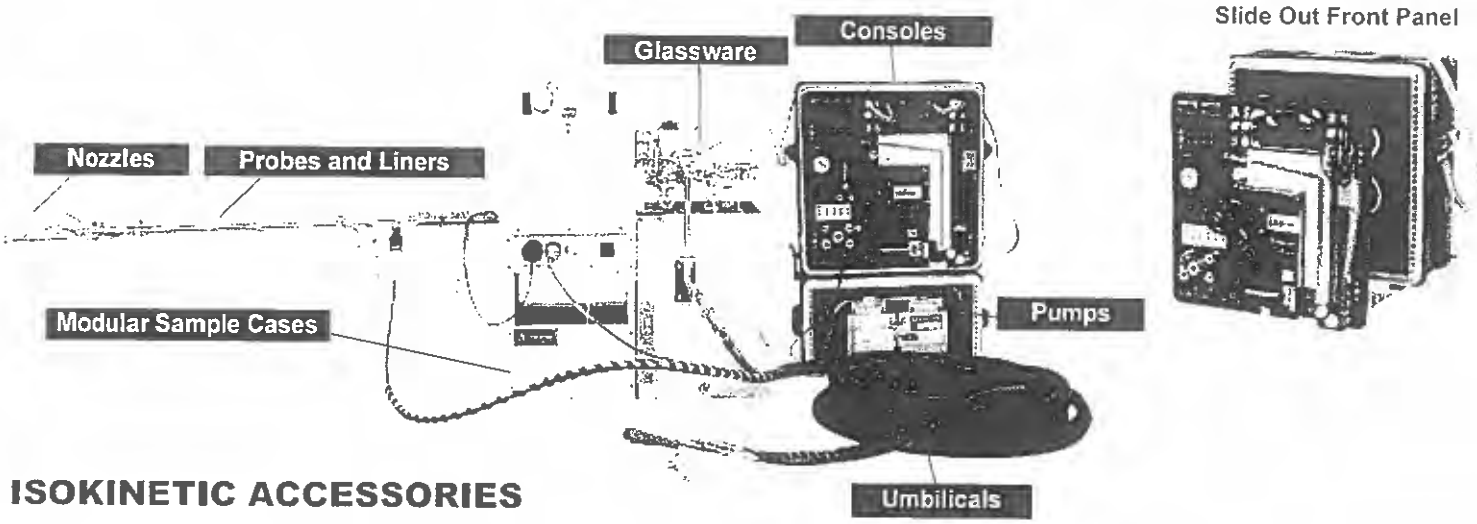
XF-0523 ROTARY VANE PUMPS

Model	Description
XF-0523	Rotary Vane Pump in Tubular Steel Frame (120V / 60 Hz)
XF-0523-V	Rotary Vane Pump in Tubular Steel Frame (240V / 50Hz)

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

VERSATILE SYSTEM DESIGNS

Due to often complex and challenging stack testing locations, we offer versatile Source Sampling Systems, such as our Flexible Method 5 Train and the Compact Method 5 Train. Please visit our website at www.apexinst.com for a complete listing of all our systems.



ISOKINETIC ACCESSORIES

UMBILICAL CABLES

Umbilical Cables are available for both rigid and flexible sampling arrangements. Standard cables feature high quality instrumentation quick-connect fittings, standard thermocouple connectors, stranded Type "K" wire and overbraid sleeve.

METHOD 5 PUMP ASSEMBLIES

The XE-0523 and the XE-DAA both feature the rugged, weather resistant, custom designed UHMW X-case pump enclosure. Choose between diaphragm or vane pumps. Alternative pumps available upon special request.

DELUXE METHOD 5 GLASSWARE SET

The Deluxe Method 5 Glassware Set with Transport Case contains all the glassware for two runs, plus spares. Four filter assemblies cover three sampling runs plus one as a spare. Two full sets of impingers and U-tubes permit a second run before recovering the first run results. The deluxe glassware set includes spare impingers, U-tubes and double "L" adapters. the glassware set fits easily into foam lined custom pockets. The sturdy transport case is lockable for secure chain-of-custody.

METHOD 5 PROBE ASSEMBLIES

Includes stainless steel probe sheath, heater, liner, Type "S" pitot tubes and thermocouple. A wide variety of liner and sheath materials are available. Ask about optional oversheaths.

NOZZLES FOR ISOKINETIC SAMPLING

Isokinetic nozzles and accessories are available from a variety of materials in a full range of sizes.

MODULAR SAMPLE CASES

Versatile, lightweight Modular Sample Case Assemblies are available in a variety of configurations. Offered are two different filter ovens and two different risers, that can attach to the bottom of both ovens. We also offer four types of impinger cases which all slide on and off for easy changing of the impingers between test runs. Several standard assemblies are available.

Distributed by:

APPENDIX B
FIELD DATA

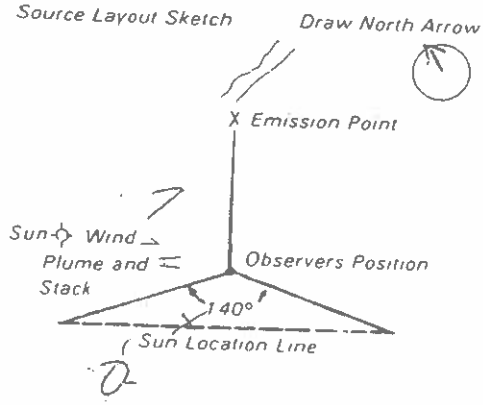
Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Whey Scrubber
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START Round stack STOP Round stack
HEIGHT ABOVE GROUND LEVEL	START 15' STOP 15'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 24' STOP 24'
DIRECTION FROM OBSERVER	START N.E STOP N.E.
DESCRIBE EMISSIONS	START White P.M. STOP White PM
EMISSION COLOR	START White STOP White
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 60' above Rim STOP 60' above Rim
DESCRIBE BACKGROUND	START SKY STOP SKY
BACKGROUND COLOR	START Blue STOP Blue
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S.E. STOP S.E.
AMBIENT TEMP	START 71 STOP 71
WET BULB TEMP	
RH.percent	

OBSERVATION DATE	START TIME	STOP TIME
6/3/11	17:50	17:56

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	15	15	15	15	31				
2	15	10	15	15	32				
3	15	15	15	10	33				
4	15	15	15	15	34				
5	15	10	10	15	35				
6	15	15	10	15	36				
7					37				
8					38				
9		13.96%			39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch — Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD	15
NUMBER OF READINGS ABOVE % WERE	
RANGE OF OPACITY READINGS	10 MINIMUM 15 MAXIMUM
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/3/11
ORGANIZATION	Bigham Environmental
CERTIFIED BY	Smoke School Inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Nice Day out Sunny overcast

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

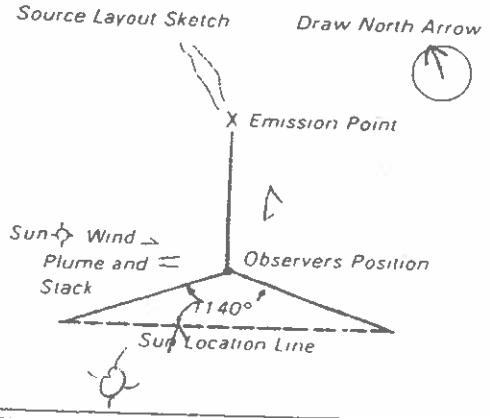
SIGNATURE

TITLE DATE

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Whey Separator
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START End of Molar Plume STOP End of Molar Plume
HEIGHT ABOVE GROUND LEVEL	START 5' STOP 5'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 24 STOP 24
DIRECTION FROM OBSERVER	START N.E. STOP N.E.
DESCRIBE EMISSIONS	START white P.M. STOP white P.M.
EMISSION COLOR	START white STOP white
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 60' out STOP 60' out
DESCRIBE BACKGROUND	START Blue Sky STOP Blue Sky
BACKGROUND COLOR	START Sky STOP Sky
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S. STOP S.
AMBIENT TEMP	START 71 STOP 71
WET BULB TEMP	
RH,percent	

Source Layout Sketch



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	15:05	15:11

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	10	15	10	10	31				
2	15	10	10	10	32				
3	10	15	15	15	33				
4	15	10	15	15	34				
5	15	10	10	15	35				
6	15	10	15	15	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12		12.71%			42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	15
NUMBER OF READINGS ABOVE % WERE	
RANGE OF OPACITY READINGS	10 MINIMUM 15 MAXIMUM
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/3/11
ORGANIZATION	Bighorn Environmental
CERTIFIED BY	Smoke School Inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Nice Day! Some clouds but mostly clear.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

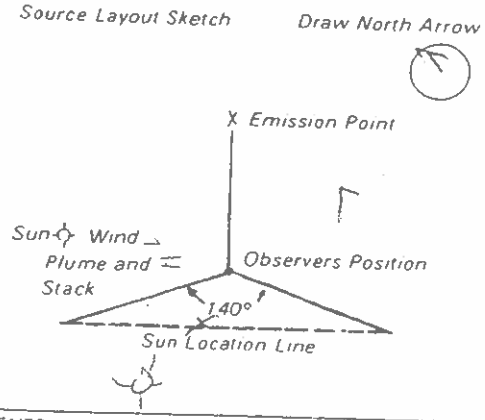
SIGNATURE

TITLE DATE

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	~~Whey scrubber~~
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Scrubber Whey
OPERATING MODE	Normal
CONTROL EQUIPMENT	Scrubber
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START Roof stack STOP Roof stack
HEIGHT ABOVE GROUND LEVEL	START 15 STOP 15'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 24' STOP 24'
DIRECTION FROM OBSERVER	START N.E. STOP N.E.
DESCRIBE EMISSIONS	START White P.M. STOP White P.M.
EMISSION COLOR	START White STOP White
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 60' above Rim STOP 60' above Rim
DESCRIBE BACKGROUND	START Blue sky STOP Blue sky
BACKGROUND COLOR	START Blue STOP Blue
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S. STOP S.
AMBIENT TEMP	START 72 STOP 72
WET BULB TEMP	
RH, percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	17:04	17:10

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	15	15	10	10	31				
2	10	10	15	15	32				
3	15	15	10	10	33				
4	15	15	15	15	34				
5	15	15	15	15	35				
6	15	15	15	15	36				
7					37				
8					38				
9					39				
10					40				
11		13:75%			41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	15
NUMBER OF READINGS ABOVE % WERE	
RANGE OF OPACITY READINGS	10 MINIMUM 15 MAXIMUM
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/3/11
ORGANIZATION	Brighton Environmental
CERTIFIED BY	Smith school INC
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Clear day, nice cut!

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE DATE

Method 5 Data Form

Client:	Sorrento Lactalis	Source:	tetrapak Whey scrubber	Date:	6/3/2011
RUN 1	**Probe Rinse**				**Filter**
Final Wt. 1:	120.06590				0.36440
Final Wt. 2:	120.06550				0.36440
Final Wt. Avg:	120.06570				0.36440
Tare:	120.06420				0.33420
Gross Wt.:	0.00150				0.03020
Less Blank:	0.00009				0.00000
Net Wt.:	**0.00141**				**0.03020**
Volume:	34.00000				n/a
Total Front:	0.00141				
RUN 2	**Probe Rinse**				**Filter**
Final Wt. 1:	118.53390				0.36280
Final Wt. 2:	118.53350				0.36280
Final Wt. Avg:	118.53370				0.36280
Tare:	118.53240				0.33360
Gross Wt.:	0.00130				0.02920
Less Blank:	0.00011				0.00000
Net Wt.:	**0.00119**				**0.02920**
Volume:	44.00000				n/a
Total Front:	0.00119				
RUN 3	**Probe Rinse**				**Filter**
Final Wt. 1:	88.64810				0.36300
Final Wt. 2:	88.64790				0.36300
Final Wt. Avg:	88.64800				0.36300
Tare:	88.64700				0.33600
Gross Wt.:	0.00100				0.02700
Less Blank:	0.00011				0.00000
Net Wt.:	0.00089				0.02700
Volume:	42.00000				n/a
Total Front:	0.00089				

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: Nampa, ID
Source: whey scrubber

Run #:: 1
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	16:38	.3644	.5003	68	49	MK	
Filter ID: 333								
Tare Wt.: .3342								N/A
Date/Time into dessicator:								
6/22/11 / 09:52								
Acetone	6/23/11	16:40	120.0659	100.0115	68	49	MK	
Beaker ID: 9-3P	6/27/11	09:50	120.0655	100.0115	67	49	MK	Yes
Tare Wt.: 120.0642								
Volume: 34								
Date/Time into dessicator:								No
6/22/11 / 09:52								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel Dry Wt. 217 Wet Wt. 226 Wt. Gain 9

Bighorn Environmental Method 5 Data Analysis Form

Client: Simplot
Location: NAMPA, ID
Source: Whey Scrubber

Run #:: 2
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	16:44	.3628	.5003	68	49		N/A
Filter ID: 334								
Tare Wt.: .3336								
Date/Time into dessicator:								
6/22/11/09:52								
Acetone	6/23/11	16:47	118.5339	100.0115	68	49	MK	Yes
Beaker ID: 11A	6/27/11	09:51	118.5335	100.0115	67	49	MK	
Tare Wt.: 118.5324								
Volume: 44								
Date/Time into dessicator:								No
6/22/11/09:52								
BACK HALF:								
Acetone:								Yes
Beaker ID:								
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								Yes
Beaker ID:								
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								Yes
Beaker ID:								
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	241	250	9

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: Whey Scrubber

Run #:: 3
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	16:50	.3630	.5003	68	49	MK	
Filter ID: 336								
Tare Wt.: .3360								N/A
Date/Time into dessicator:								
6/22/11/09:52								
Acetone	6/23/11	16:52	88.6481	100.0115	68	49	MK	
Beaker ID: 14	6/27/11	09:53	88.6479	100.0115	67	49	MK	Yes
Tare Wt.: 88.6470								
Volume: 42								
Date/Time into dessicator:								No
6/22/11/09:52								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID								Yes
Tare Wt.								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	237	247	10

Visible Emission Observation Form

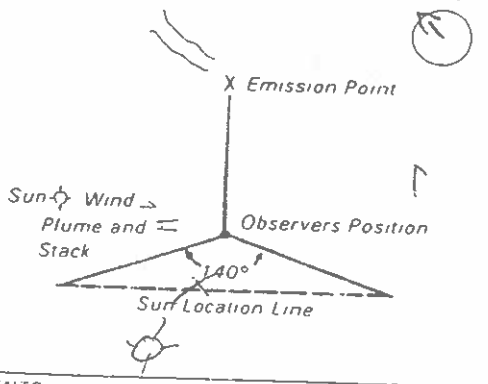
SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Shaking ~~Screen~~ Mat BED
OPERATING MODE	Natural
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START Round stack STOP Round stack
HEIGHT ABOVE GROUND LEVEL	START 15' STOP 15'
HEIGHT RELATIVE TO OBSERVER	START 15' STOP 15'
DISTANCE FROM OBSERVER	START 18' STOP 18'
DIRECTION FROM OBSERVER	START N.E STOP N.E
DESCRIBE EMISSIONS	START white / clear STOP clear
EMISSION COLOR	START clear STOP clear
PLUME TYPE	CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 14" above rim STOP 14" above rim
DESCRIBE BACKGROUND	START sky STOP sky
BACKGROUND COLOR	START Blue sky STOP Blue sky
SKY CONDITIONS	START clear STOP clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S. STOP S.
AMBIENT TEMP	START 72 STOP 72
WET BULB TEMP	
RH, percent	

OBSERVATION DATE	START TIME	STOP TIME
~~10/4/82~~ 6/3/11	14:26	14:42

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch

Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE % WERE	0 / 0
RANGE OF OPACITY READINGS	0 MINIMUM 0 MAXIMUM
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/3/11
ORGANIZATION	Bighorn Environmental
CERTIFIED BY	Smoke School Inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS

Clear Nice DAY, Slight breeze

Good DAY,

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

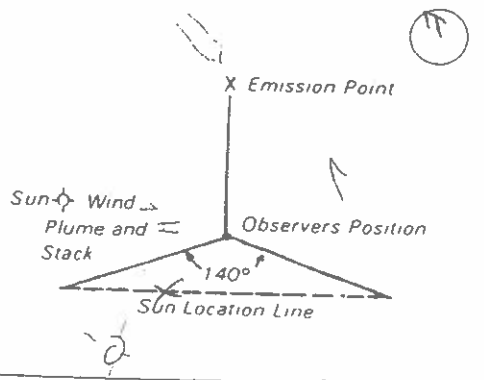
TITLE

DATE

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Shaking ~~Scrubber~~ Bed
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT START	Round stack
STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	15'
STOP	15'
HEIGHT RELATIVE TO OBSERVER START	10'
STOP	10'
DISTANCE FROM OBSERVER START	18'
STOP	18'
DIRECTION FROM OBSERVER START	N.E.
STOP	N.E.
DESCRIBE EMISSIONS START	Clear Plume
STOP	Clear Plume
EMISSION COLOR START	Clear
STOP	Clear
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	14" Above Rim
STOP	14" Above Rim
DESCRIBE BACKGROUND START	Sky
STOP	Sky
BACKGROUND COLOR START	Blue
STOP	Blue
SKY CONDITIONS START	Clear
STOP	Clear
WIND SPEED START	0-5
STOP	0-5
WIND DIRECTION START	S.E.
STOP	S.E.
AMBIENT TEMP START	70
STOP	70
WET BULB TEMP	
RH.percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	16:48	16:54

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE % WERE	0
RANGE OF OPACITY READINGS MINIMUM	0
MAXIMUM	0
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/3/11
ORGANIZATION	Bighorn Environmental
CERTIFIED BY	Smoke School Inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Sunny and warm and calm out, for once.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

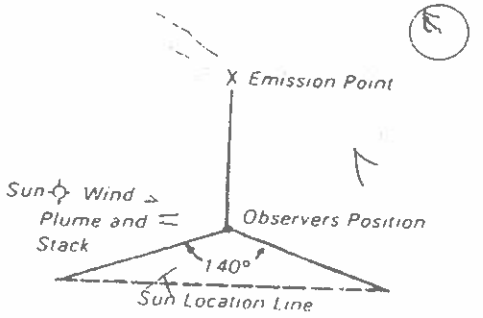
SIGNATURE

TITLE | DATE

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Shaking Bed
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT START	Round stack
DESCRIBE EMISSION POINT STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	15'
HEIGHT ABOVE GROUND LEVEL STOP	15
HEIGHT RELATIVE TO OBSERVER START	10'
HEIGHT RELATIVE TO OBSERVER STOP	10'
DISTANCE FROM OBSERVER START	19'
DISTANCE FROM OBSERVER STOP	19'
DIRECTION FROM OBSERVER START	N.E.
DIRECTION FROM OBSERVER STOP	N.E.
DESCRIBE EMISSIONS START	Clear Plume
DESCRIBE EMISSIONS STOP	Clear Plume
EMISSION COLOR START	Clear
EMISSION COLOR STOP	Clear
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	15' Above lip
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED STOP	15' above lip
DESCRIBE BACKGROUND START	Sky
DESCRIBE BACKGROUND STOP	Sky
BACKGROUND COLOR START	Blue
BACKGROUND COLOR STOP	Blue
SKY CONDITIONS START	Clear
SKY CONDITIONS STOP	Clear
WIND SPEED START	0-5
WIND SPEED STOP	0-5
WIND DIRECTION START	S.
WIND DIRECTION STOP	S.
AMBIENT TEMP START	64
AMBIENT TEMP STOP	64
WET BULB TEMP	
RH.percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	~~17:30~~ 19:30	~~17:36~~ 19:36

incorrect 24 time format 7:30pm

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE % WERE	0
RANGE OF OPACITY READINGS MINIMUM	0
MAXIMUM	0
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/7/11
ORGANIZATION	Bighorn Environmental
CERTIFIED BY	Smoke school inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Nice DAY, CALM and DRY.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE DATE

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento			Date	06/03/11
Sampling Location	Shaking bed			Project #	
Operator				# of Ports Used	2
Stack Type	Circular			Pitot Identification	
Pitot Leak Check	☐	PreTest	☐ PostTest	Pitot Coefficient (C_p)	

Stack Dimensions			
Diameter or Length of Stack	(D)	43.50	in
Width of Stack	(W)		in
Area of Stack	(A_s)	10.32	ft^2

Pressures			
Barometric Pressure	(P_b)		in Hg
Static Pressure	(P_{static})		in H_2O
Absolute Stack Pressure	(P_s)		in Hg

Stack Gas Composition			
Composition Data:	Actual ☐	Estimated ☐	
Carbon Dioxide Concentration	($\%CO_2$)		%
Oxygen Concentration	($\%O_2$)		%
Carbon Monoxide Concentration	(%CO)		%
Nitrogen Concentration	($\%N_2$)		%
Stack Moisture Content	(B_{ws})		
Stack Dry Molecular Weight	(M_d)		lb/lb-mole
Stack Wet Molecular Weight	(M_s)		lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)		ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})		ascf/min

Stack Cross Section Schematic

Velocity Traverse Data				
Run Number			V1	
Run Time				
Traverse Point	Velocity Head (Δp) in H_2O	Stack Temp (t_s) °F	Null Angle ~~Mt~~ deg ~~40~~	~~Local Velocity (v_s) ft/sec~~
A-1	~~34~~ .48		40	
A-2	.98		20	
A-3	1.1		5	
A-4	1.1		3	
A-5	1.2		3	
A-6	1.3		2	
B-1	.96		12	
B-2	.94		6	
B-3	1.05		6	
B-4	1.0		4	
B-5	.94		2	
B-6	1.0		4	
$(\Delta p)^{1/2}_{avg}$ [1]				

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Wet Bulb/Dry Bulb Estimate				
Wet Bulb Temp		Stack Vapor Pressure	-1.69	in Hg
Dry Bulb Temp		Stack Moisture Content	#VALUE!	%H2O

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

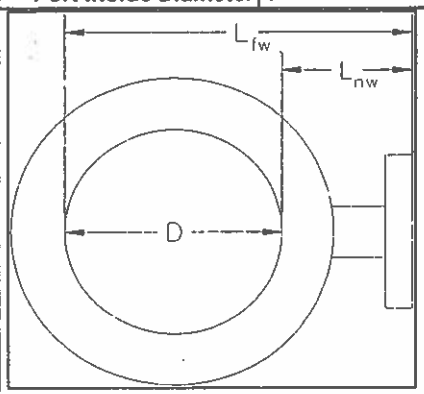
where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

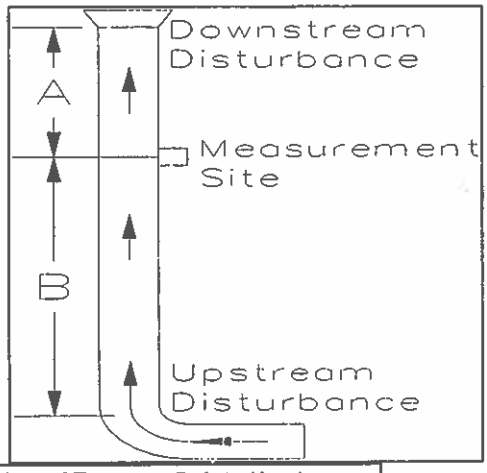
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Shaking bed	Project #	
Operator		# of Ports Available	2
Stack Type	Circular	# of Ports Used	2
Stack Size	Large	Port Inside Diameter	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	44.75	in
Distance to Near Wall of Stack	(L_{nw})	1.25	in
(=Lfw - Lnw) Diameter of Stack	(D)	43.50	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	10.32	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	180.00	in
(=B/D) Diameters Upstream	(B_D)	4.14	diameters
Distance Downstream	(A)	68.00	in
(=A/D) Diameters Downstream	(A_D)	1.56	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		16	12
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	6	Across
12	Pts Used	24	Required
☑	Particulate	☐	Velocity

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
10					.974	.882
11						.933
12						.979

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.044	1 7/8	3 1/8
2	0.146	6 3/8	7 5/8
3	0.296	12 7/8	14 1/8
4	0.704	30 5/8	31 7/8
5	0.854	37 1/8	38 3/8
6	0.956	41 5/8	42 7/8
7			
8			
9			
10			
11			
12			

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: SHAKING BED

Run #:: 1
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter Filter ID: 44 Tare Wt.: .3320 Date/Time into dessicator: 6/22/11/09:52	6/23/11	16:55	.3405	.5003	68	49	MK	N/A
Acetone Beaker ID: 1 Tare Wt.: 91.0816 Volume: 46 Date/Time into dessicator: 6/22/11/09:52	6/23/11	16:57	91.0824	100.0115	68	49	MK	Yes PM <10 +Rinse No
	6/27/11	09:38	91.0821	100.0115	67	49	MK	
~~BACK HALF:~~								
Acetone: Beaker ID: 2-2P Tare Wt.: 119.7584 Volume: 52 Date/Time into dessicator: 6/22/11/09:52	6/23/11	16:58	119.7614	100.0115	68	49	MK	Yes PM >10 No
	6/27/11	09:39	119.7611	100.0115	67	49	MK	
BH Water: Beaker ID: Tare Wt.: Volume: Date/Time into dessicator:								Yes No
DCM extract: Beaker ID: Tare Wt.: Volume: Date/Time into dessicator:								Yes No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel Dry Wt. 244 Wet Wt. 252 Wt. Gain 8

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: Shaking Bed

Run #:: 2
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter Filter ID: 335 Tare Wt.: .3347 Date/Time into dessicator: 6/22/11 / 09:52	6/23/11	17:00	.3350	.5003	68	49	MK	N/A
Acetone Beaker ID: 13 Tare Wt.: 89.8040 Volume: 38 Date/Time into dessicator: 6/22/11 / 09:52	6/23/11	17:02	89.8052	100.0115	68	49	MK	Yes PM <10 +Rinse No
	6/27/11	09:41	89.8050	100.0115	67	49	MK	
~~**BACK HALF:**~~								
Acetone: Beaker ID: 8-2P Tare Wt.: 112.8738 Volume: 46 Date/Time into dessicator: 6/22/11 / 09:52	6/23/11	17:04	112.8754	100.0115	68	49	MK	Yes PM >10 No
	6/27/11	09:43	112.8748	100.0115	67	49	MK	
	6/27/11	15:50	112.8747	100.0115	68	49	MK	
BH Water: Beaker ID: Tare Wt.: Volume: Date/Time into dessicator:								Yes No
DCM extract: Beaker ID: Tare Wt.: Volume: Date/Time into dessicator:								Yes No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	221	230	9

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: Shaking Bed

Run #:: 3
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	17:05	.3331	.5003	68	49	MK	
Filter ID: 337								
Tare Wt.: .3332								N/A
Date/Time into dessicator:								
6/22/11 / 09:52								
Acetone	6/23/11	17:07	114.9708	100.0115	68	49	MK	
Beaker ID: 6	6/27/11	09:45	114.9705	100.0115	67	49	MK	Yes
Tare Wt.: 114.9693								PM
Volume: 41								<10
Date/Time into dessicator:								+Rinse
6/22/11 / 09:52								(No)
~~**BACK HALF:**~~								
Acetone:	6/23/11	17:09	90.3782	100.0115	68	49	MK	
Beaker ID: 9	6/27/11	09:47	90.3778	100.0115	67	49	MK	Yes
Tare Wt.: 90.3767								PM
Volume: 58								>10
Date/Time into dessicator:								(No)
6/22/11 / 09:52								
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	251	259	8

BIGHORN ENVIRONMENTAL

CLIENT # B019
REPORT # 11-242

SUBMITTED BY:
CHESTER LabNet
12242 S.W. GARDEN PLACE
TIGARD, OR 97223
(503)624-2183/FAX (503)624-2653
www.ChesterLab.Net

CHESTER LabNet

12242 SW Garden Place ❖ Tigard, OR 97223-8246 ❖ USA
Telephone 503-624-2183 ❖ Fax 503-624-2653 ❖ www.chesterlab.net

Case Narrative

Date: June 28, 2011

General Information

Client:	Bighorn Environmental
Client Number:	B019
Report Number:	11-219
Sample Description:	Impinger Solutions
Sample Numbers:	11-M550 – 11-M556

Analysis

Analytes:	Particulate Mass
Analytical Protocols:	EPA Method 202 (12/2010 version)
Analytical Notes:	No problems were encountered during the analyses. Results have **not** been blank corrected.
QA/QC Review:	All of the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds the minimum requirements for acceptability.
Comments:	If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.
Disclaimer:	This report shall not be reproduced, except in full, without the written approval of the laboratory. The results only represent that of the samples as received into the laboratory.

Paul Duda 6/28/11

Project Manager Date
Paul Duda

Bighorn Environmental
Sorrento Method 202 Data

Sample ID	Client ID	Sample Date	Net Weight (mg) Aqueous Phase	Net Weight (mg) Organic Phase	Comments
Prep_Blk			0.8	1.1	
Lab_Blk			-0.1	0.5	
11-M550	Whey Scrubber Run 1	6/3/11	4.6	5.2 7.8	
11-M551	Whey Scrubber Run 2	6/3/11	3.9	4.6 6.5	
11-M552	Whey Scrubber Run 3	6/3/11	4.7	6.3 9.0	
11-M553	Shaking Bed Run 1	6/3/11	3.0	6.2 7.2	
11-M554	Shaking Bed Run 2	6/3/11	3.3	5.6 6.9	
11-M555	Shaking Bed Run 3	6/3/11	3.1	5.8 6.9	
11-M556	Field Train Recovery Blank	6/3/11	3.6	4.2	

Analysis performed by: *CHESTER LabNet*
12242 SW Garden Place ♦ Tigard, OR 97223
(503) 624-2183 ♦ www.chesterlab.net

CHESTER LABNET
SOURCE SAMPLE RECEIPT CHECKLIST

Client: Bighorn Date: 6-13-11

Runs: 6 + blank Time: 1530

Custody Seals Inspected, If Present	—	
Chain-of-Custody Form Inspected		
CoC present with samples?	✓	*
CoC indicate analytical methodology to be used? (eg M29 etc)	✓	!!
CoC indicate if compliance testing? (esp. M26)	—	!!
M26 samples have Thiosulfate added in field?	—	!!
M29 indicate FH/BH separate or combined?	—	!!
Has Form Been Signed?	✓	
Have Date and Time Custody Released Been Noted on Form?	✓	
All Sample Containers Inspected		
Does Number of Samples Match Number on CoC Form?	✓	!!
Do All Sample ID Numbers Match Those on the CoC Form?	✓	!!
Did client mark sample volumes prior to shipment?	no	*
If required by method, did client vent samples prior to shipment?	—	
Are the Sample Containers Intact?	✓	!!
Are signs of leakage present?	no	*
Chain-of-Custody Form Signed and Dated by CLN	✓	
Corrective Actions		
Client Contacted Due to Mismatching Sample ID Numbers		
Client Contacted Due to Broken Sample Container(s)		
Client Contacted Due to Leaking Sample Container(s)		
Client contacted for verification of methodology?		
Corrective Actions Documented?		
Corrective Actions Accomplished?		

*Items marked !! shall be addressed **prior to any analytical work being started**.*
*Items marked * shall be **noted in case narrative** upon reporting of results to client.*

Signed: [illegible]

Notes: SI's hand delivered

N-242
B019

Company Name: Bughorn		
Contact: Tim Hemer	Phone:	
E-Mail Address:	Fax:	
Report Address: 1324 N LL Rd		
City: LL	State: Mt	Zip: 99019
Billing Address: Same		
City:	State:	Zip:
PO #:	Project: Sorrento	

CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Turn Around Time
☒ Standard
☐ Rush _____ Specify

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m^3)	Particle Size	Analysis Requested: OPM-MZW	Remarks
Whey Scrubber		6/3/11	Run 1, 2, 3				Filter, H2O Rinse, Acetone/Hexane Rinse
Shaking Bed		6/3/11	Run 1, 2, 3				
AM550	Whey Run 1						
551		2					
552		3					
553	Shaking Run 1						
554		2					
555		3					
556	Recovery Blank						

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
[signature] 6/13/11 1530	[signature] 6-13-11 1530
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes:
Plus train blank, no proof blank needed

All masses in grams (g)

"New" M202: Bighorn

Aqueous Phase

Sx ID	Tare	Tare QC	Tare - QC	average Tare	Gross	Gross QC	Gross - QC	average Gross	*net (g)	net (mg)**
date/init:	6/15/2011 TMM	06/16/11 SH			06/27/11 JH	06/27/11 JH			(total mass liq)	less NH3
time:	1729	0720			1025	1639				
Rel. Humidity	0.50%	0.50%			0.50%	2.90%				
3.0000g QC	3.0000	3.0000			3.0000	3.0000				
Lab Blank	1.8941	1.8943	-0.0002	1.8942	1.8940	1.8943	-0.0003	1.8942	-0.0001	-0.1
Prep Blank	1.8904	1.8907	-0.0003	1.8906	1.8913	1.8917	-0.0004	1.8915	0.0009	0.8
11M 550	1.8838	1.8839	-0.0001	1.8839	1.8885	1.8887	-0.0002	1.8886	0.0047	4.6
11M 551	1.8903	1.8904	-0.0001	1.8904	1.8943	1.8945	-0.0002	1.8944	0.0040	3.9
11M 552	1.8800	1.8801	-0.0001	1.8801	1.8848	1.8848	0.0000	1.8848	0.0048	4.7
11M 553	1.8946	1.8949	-0.0003	1.8948	1.8978	1.8977	0.0001	1.8978	0.0032	3.0
11M 554	1.8963	1.8964	-0.0001	1.8964	1.8997	1.8998	-0.0001	1.8998	0.0034	3.3
11M 555	1.8821	1.8823	-0.0002	1.8822	1.8853	1.8855	-0.0002	1.8854	0.0032	3.1
11M 556	1.8857	1.8857	0.0000	1.8857	1.8894	1.8895	-0.0001	1.8895	0.0037	3.6

*net mass = tare - gross

**corrected net mass = net mass - (Normality NH4OH x mL NH4OH x 17.03 mg NH3/mmol)

Organic Phase

Sx ID	Tare	Tare QC	Tare - QC	average Tare	Gross	Gross QC	Gross - QC	average Gross	*net (g)	net (mg)
date/init	06/15/11 TMM	06/16/11 SH			06/23/11 JH	06/24/11 JH				
time:	1729	0720			1644	1421			(total mass liq)	
Rel. Humidity	0.50%	0.50%			0.60%	4.00%				
3.0000g QC	3.0000	3.0000			3.0000	3.0000				
Lab Blank	1.8809	1.8810	-0.0001	1.8810	1.8814	1.8814	0.0000	1.8814	0.0005	0.5
Prep Blank	1.8872	1.8875	-0.0003	1.8874	1.8883	1.8885	-0.0002	1.8884	0.0011	1.1
11M 550	1.8907	1.8908	-0.0001	1.8908	1.8959	1.8959	0.0000	1.8959	0.0052	5.2
11M 551	1.8886	1.8887	-0.0001	1.8887	1.8932	1.8933	-0.0001	1.8933	0.0046	4.6
11M 552	1.9071	1.9073	-0.0002	1.9072	1.9134	1.9136	-0.0002	1.9135	0.0063	6.3
11M 553	1.8883	1.8885	-0.0002	1.8884	1.8945	1.8946	-0.0001	1.8946	0.0062	6.2
11M 554	1.8979	1.8980	-0.0001	1.8980	1.9035	1.9035	0.0000	1.9035	0.0056	5.6
11M 555	1.8852	1.8855	-0.0003	1.8854	1.8910	1.8911	-0.0001	1.8911	0.0058	5.8
11M 556	1.8849	1.8852	-0.0003	1.8851	1.8891	1.8892	-0.0001	1.8892	0.0042	4.2

*net mass = tare - gross

90 DATE SUBJECT Bighorn 202 PROJECT NO.

										Gross								Gross
Tare in	6.14.11	JH	@	1635	7.42	Org in:	6.20.11	JH	@	1465	0.6%	Aq in:	6.25.11	JH	@	1530	0.6%
Tare 1	6.15.11	JH	@	1729	0.5%	Org 1:	6.23.11	JH	@	1667	0.6%	Aq 1:	6.27.11	JH	@	1625	0.5%
Tare 2	6.16.11	JH	@	720	0.5%	Org 2:	6.24.11	JH	@	1421	4.0%	Aq 2:	6.27.11	JH	@	1639	0.9%

Aqueous

Sx ID	Tare 1	Tare 2	Gross 1	Gross 2
3g	3.0000	3.0000 JH 6.6.11	3.0000	3.0000
Lab BLK	1.8941	~~1.8907~~ 1.8943	1.8940	1.8943
Prep BLK	1.8904	1.8907	1.8913	1.8917
11M550	1.8838	1.8839	1.8885	1.8887
551	1.8903	1.8904	1.8943	1.8945
552	1.8800	1.8801	1.8848	1.8848
553	1.8946	1.8949	1.8978	1.8977
554	1.8967	1.8964	1.8997	1.8998
555	1.8821	1.8823	1.8853	1.8855
556	1.8857	1.8857	1.8894	1.8895

Organic

Sx ID	Tare 1	Tare 2	Gross 1	Gross 2
3g	3.0000	3.0000	3.0000	3.0000
Lab BLK	1.8809	1.8810	JH 6.27.11 ~~1.8883~~ 1.8814	1.8814
Prep BLK	1.8872	1.8875	1.8883	1.8885
11M550	1.8907	1.8908	1.8959	1.8959
551	1.8886	1.8887	1.8932	1.8933
552	1.9071	1.9073	1.9134	1.9136
553	1.8883	1.8885	1.8945	1.8946
554	1.8979	1.8980	1.9035	1.9035
555	1.8852	1.8855	JH 6.27.11 ~~1.8897~~ 1.8916	1.8916
556	1.8849	1.8852	1.8891	1.8892

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

			"New" M202: Bighorn			
date/init:	06/23/11-06/24/11 JH					
		pH-start	pH-end	mL NH4OH	mass NH3 (mg)	
	Prep Blank	6.616	7.009	0.050	0.09	
	11M 550	5.731	7.010	0.050	0.09	
	11M 551	6.184	7.009	0.075	0.13	
	11M 552	6.281	7.055	0.075	0.13	
	11M 553	5.157	7.029	0.100	0.17	
	11M 554	6.189	7.026	0.050	0.09	
	11M 555	6.236	7.012	0.050	0.09	
	11M 556	6.493	7.067	0.075	0.13	
	mass NH3 = 0.1N NH4OH x mL NH4OH x 17.03 mg NH3/mmol					
	QC:					
	% Nernst slo	98.2				
	pH 4.000	3.991				
	pH 7.000	7.014				
	pH 7.000	7.017				
	pH 7.000	7.026				
	QC:					
	% Nernst slo	98.7				
	pH 4.000	3.991				
	pH 7.000	7.009				
	pH 7.000	6.998				

pH 7 Buffer: CP lot 0327-20 x 11.30.12
pH 4 Buffer: CP lot 0334-02 x 12.2.12
0.1 N NH_4OH Titrate Rcky Mnt Reagent 10-0074 x 12.29

6.23.11 – 6/24.2011 /JH

6.23.11 % Nernst: 98.2%
QC4: 3.991
QC7: 7.014

6.24.11 % Nernst: 98.7%
QC4: 3.991
QC7: 7.009

Sx ID	start pH	End pH	mL 0.1N NH_4OH
QC7	7.017		
Prep Blk	6.616	7.009	0.05
11M550	5.731	7.010	0.05
551	6.184	7.009	0.075
552	6.281	7.055	0.075
553	5.157	7.029	0.100
554	6.189	7.026	0.050
~~555~~	JH 6.27.11		
~~556~~	JH 6.27.11		
QC7	7.026		
6.24.11			
QC7	6.998		
11M555	6.236	7.012	0.050
556	6.493	7.067	0.075
QC7	7.024		

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

6.0 RESULTS

Tables 4 and 5 summarize the results from the Whey Dryer Scrubber and Shaking Baghouse respectively.

TABLE 4. WHEY DRYER SCRUBBER EMISSION RESULTS

Parameter/Pollutant	Run 1	Run 2	Run 3	Average
PM_{10} (EPA Method 5 and 202):				
-(gr/dscf)	0.010	0.010	0.010	0.010
-(lbs/hr)	4.46	4.37	4.24	4.36
Stack Parameters:				
Stack Gas Moisture (%)	6.47	6.93	6.71	6.70
Stack Temperature (°F)	108	106	106	107
Stack Gas Velocity (ft/min)	3,036	3,070	3,003	3,038
Actual Gas Flow (ft^3/min)	64,276	64,894	63,472	64,214
Dry Std. Gas Flow (ft^3/min)	51,181	51,578	50,632	51,131
Opacity (%)	14	13	14	14
Isokinetics (%)	100.7	96.1	99.2	98.7

TABLE 5. SHAKING BAGHOUSE EMISSION RESULTS

Parameter/Pollutant	Run 1	Run 2	Run 3	Average
PM_{10} (EPA Method 201A and 202):				
-(gr/dscf)	0.0074	0.0036	0.0035	0.0048
-(lbs/hr)	1.84	0.92	0.90	1.22
Stack Parameters:				
Stack Gas Moisture (%)	3.0	4.2	4.3	3.8
Stack Temperature (°F)	132	133	135	133
Stack Gas Velocity (ft/min)	3,531	3,744	3,723	3,666
Actual Gas Flow (ft^3/min)	36,440	38,638	38,421	37833
Dry Std. Gas Flow (ft^3/min)	28,892	30,183	29,887	29654
Opacity (%)	0	0	0	0
Isokinetics (%)	107.9	102.0	104.9	104.9

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sonneborn
Location: Nampa, ID
Personnel: Howe / Keeting
Date: 6/3/11
Source: Inlet Scrubber
Run #: 1
Ambient Temp: 67
Barometric Press.: 27.42
Assumed Moisture: 4
Start Time: 1420

Meter Box ID: 610022
Meter Box Y: .945
Meter Box Δ H@: 1.894
Probe ID: BH6'-#1
Probe Cp: .84
Filter #: 333
Static Pressure (in. H2O): -.21
Nozzle ID: Bill'A'-6
Probe/Filter Settings (F): 250
End Time: 1534

Leak Check Results

Sample Train
Pre @ 15 in Hg.: Ø cfm
Post @ 15 in Hg.: Ø cfm
DGM Start: 183.685 DGM End: 183.685
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	Silica
End (ml):	71	9	99	

Color/Odor: +50 ml added for purge

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	Inlet Temp (°F) BH-Filter	Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	6.0	112.9	71	81	.43	1.6	110	256	61	246	
2		7.5	115.24	79	81	.58	2.1	111	281	55	247	
3		8.0	117.92	80	81	.63	2.3	110	253	55	247	
4		8.0	120.68	82	81	.60	2.2	109	257	55	247	
5		8.0	123.5	82	81	.57	2.1	108	256	53	247	
6		8.0	126.23	83	80	.55	2.0	108	257	53	248	
7		8.5	128.91	83	80	.64	2.4	109	257	52	247	
8		9.5	131.88	84	80	.74	2.7	109	254	52	248	
9		10.5	134.87	86	80	.82	3.0	108	250	52	247	
10		12.0	138.11	83	80	.88	3.3	108	248	52	246	
11		13.0	141.50	83	80	.91	3.4	108	249	52	247	
12		13.0	144.95	82	80	.93	3.5	108	249	52	247	
13		6.5	148.41	79	82	.42	1.6	106	245	57	249	
14		7.5	150.75	82	83	.60	2.2	107	247	53	246	
15		9.0	153.40	84	81	.75	2.7	107	246	52	245	
16		10.5	156.38	82	84	.81	3.0	107	248	53	247	
17		10.5	159.61	79	85	.80	3.0	106	248	53	247	
18		10.0	162.86	81	86	.68	2.5	107	247	52	248	
19		10.0	165.86	82	86	.70	2.5	107	250	52	247	
20		10.0	168.82	83	88	.66	2.4	108	246	50	246	
21		10.0	171.72	82	89	.68	2.5	108	245	51	246	
22		10.0	174.78	81	89	.72	2.6	108	246	50	248	
23		10.5	177.67	83	90	.71	2.6	108	248	50	247	
24		10.5	180.64	85	91	.66	2.3	108	247	50	248	
		Final DGM	183.56									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes:

JPW 6/13

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorento
Location: Nampa, ID
Personnel: Homer/Keeting
Date: 6/3/14
Source: Wing Scrubber
Run #: 2
Ambient Temp: 74
Barometric Press.: 27.42
Assumed Moisture: 5
Start Time: 1558

Meter Box ID: 610022
Meter Box Y: .945
Meter Box Δ H@: 1.894
Probe ID: BH' - H1
Probe Cp: .84
Filter #: 334
Static Pressure (in. H2O): -.20
Nozzle ID: BH 1/4" - 6
Probe/Filter Settings (F): 250
End Time: 1712

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0 cfm
Post @ 15 in Hg.: 0 cfm
DGM Start: 257.93 DGM End: 257.93

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	SO_2
End (ml):	65	14	103	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	~~Inlet Temp~~ AH Filter (°F)	Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	7.0	185.1	71	89	.60	2.2	105	241	62	245	
2		7.5	187.88	80	89	.62	2.3	106	242	60	245	
3		8.5	190.59	81	89	.68	2.5	106	240	59	246	
4		10.0	193.70	75	91	.71	2.6	106	241	55	247	
5		9.0	196.66	75	91	.69	2.5	105	240	52	246	
6 1.5		8.5	199.55	76	91	.64	2.3	106	241	52	247	
7 1.5		9.5	202.39	77	92	.70	2.6	106	242	53	248	
8 2.1		10.5	205.45	77	92	.79	3.0	107	243	53	249	
9		10.5	208.51	78	93	.82	3.0	106	245	52	240	
10		11.0	211.93	77	94	.84	3.1	105	246	51	242	
11		11.0	missed	78	94	.80	2.9	106	245	52	243	
12		11.0	218.53	76	94	.76	2.8	107	246	52	246	
13		11.0	221.79	79	95	~~.48~~	~~2.9~~ 1.8	106	247	48	247	
14		8.5	224.37	83	95	.59	2.2	106	250	48	247	
15		8.0	227.14	81	96	.53	2.0	107	251	49	250	
16		8.0	229.83	81	96	.52	2.0	107	251	49	251	
17		8.0	232.53	80	96	.56	2.1	108	252	51	249	
18		8.0	235.22	78	96	.50	1.9	106	249	51	446	
19		9.5	237.87	79	95	.76	2.8	106	246	52	445	
20		10.0	240.98	80	95	.78	2.9	106	247	51	446	
21		10.5	244.30	81	96	.81	3.0	107	247	53	251	
22		10.5	247.58	81	95	.86	3.2	107	246	55	252	
23		11.0	250.95	82	95	.86	3.2	108	245	56	251	
24		11.0	254.32	80	96	.89	3.2	107	240	58	250	
		Final DGM	257.65									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes: Impact 6/13

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento
Location: Nampa, ID
Personnel: Homer/Keating
Date: 6/3/11
Source: Whey Scrubber
Run #: 3
Ambient Temp: 74
Barometric Press.: 27.42
Assumed Moisture: 5
Start Time: 1743

Meter Box ID: 610022
Meter Box Y: .945
Meter Box Δ H@: 1.894
Probe ID: BH 6' - #2
Probe Cp: .84
Filter #: 336
Static Pressure (in. H2O): -.22
Nozzle ID: BH 1/4" - G
Probe/Filter Settings (F): 250
End Time: 1858

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0 cfm
Post @ 15 in Hg.: 0.01 cfm
DGM Start: 328.74 DGM End: 328.75
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	5.02
End (ml):	49	17	11.3	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	BH Filter Inlet Temp (°F)	BH Filter Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	11.0	258.1	81	96	.85	3.2	105	245	60	247	
2		11.0	261.39	83	96	.87	3.2	106	247	60	248	
3		11.5	264.74	81	96	.89	3.3	106	244	60	249	
4		11.0	268.13	82	95	.82	3.0	106	249	58	249	
5		11.0	271.40	80	95	.80	2.9	106	245	58	250	
6		11.0	274.61	81	96	.77	2.8	107	246	56	247	
7		7.0	277.74	82	96	.51	1.8	108	247	55	248	
8		7.0	280.35	83	95	.50	1.8	107	246	54	247	
9		7.0	282.92	80	95	.48	1.7	106	246	55	249	
10		7.0	285.38	82	96	.47	1.7	105	247	53	249	
11		7.0	287.83	83	95	.46	1.6	105	248	54	247	
12		7.0	290.23	80	96	.47	1.6	106	247	55	245	
13		9.0	292.59	82	95	.63	2.3	106	246	56	248	
14		9.0	295.37	80	95	.66	2.4	107	245	52	247	
15		9.0	298.28	82	96	.65	2.4	106	246	53	251	
16		9.5	301.18	83	96	.65	2.4	106	249	54	247	
17		9.5	304.12	80	95	.67	2.5	105	250	52	248	
18		10.0	306.98	78	96	.64	2.3	104	251	53	249	
19		10.0	310.04	79	95	.68	2.5	104	246	52	247	
20		10.5	313.05	81	95	.72	2.6	104	247	53	244	
21		11.0	316.08	81	94	.74	2.7	104	246	55	243	
22		11.5	319.21	82	94	.78	2.9	105	244	56	247	
23		11.5	322.40	83	94	.79	2.9	105	244	57	248	
24		10.0	325.65	83	94	.63	2.3	105	246	59	248	
		Final DGM	328.43									

QA/QC Checks: Completeness: Legibility:

Notes: Input on 6/13

Signature:

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento			Date	06/03/11
Sampling Location	Whey Dryer Scubber			Project #	PM/CPM test
Operator	Homer/Keating			# of Ports Used	2
Stack Type	Circular			Pitot Identification	BH 6'-#1
Pitot Leak Check	☐	PreTest	☐ PostTest	Pitot Coefficient (C_p)	0.84

Stack Dimensions			
Diameter or Length of Stack	(D)	62.25	in
Width of Stack	(W)		in
Area of Stack	(A_s)	21.14	ft^2

Pressures			
Barometric Pressure	(P_b)	27.25	in Hg
Static Pressure	(P_{static})	-0.24	in H_2O
Absolute Stack Pressure	(P_s)	27.23	in Hg

Stack Gas Composition				
Composition Data:	Actual	☐	Estimated	☐
Carbon Dioxide Concentration		(%CO_2)	0.0	%
Oxygen Concentration		(%O_2)	20.9	%
Carbon Monoxide Concentration		(%CO)	0.0	%
Nitrogen Concentration		(%N_2)	79.1	%
Stack Moisture Content		(B_{ws})	5.000	
Stack Dry Molecular Weight		(M_d)	28.84	lb/lb-mole
Stack Wet Molecular Weight		(M_s)	28.30	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)		ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})		ascf/min

Stack Cross Section Schematic

Velocity Traverse Data				
Run Number			V1	
Run Time				
Traverse Point	Velocity Head (Δp)	Stack Temp (t_s)	Null Angle deg	~~Local Velocity~~ (v_s)[1]
	in H_2O	°F		ft/sec
A-1	.41		0	
A-2	.63		0	
A-3	.71		3	
A-4	.70		4	
A-5	.66		2	
A-6	.68		0	
A-7	.52		2	
A-8	.54		1	
A-9	.48		6	
A-10	.55		4	
A-11	.45		5	
A-12	.42		3	
B-1	.36		3	
B-2	.44		3	
B-3	.47		5	
B-4	.41		5	
B-5	.42		2	
B-6	.48		3	
B-7	.71		4	
B-8	.75		6	
B-9	.83		7	
B-10	.84		3	
B-11	.80		7	
B-12	.82		4	
$(\Delta p)^{1/2}_{avg}$ [1]				

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Wet Bulb/Dry Bulb Estimate				
Wet Bulb Temp	91	Stack Vapor Pressure	1.46	in Hg
Dry Bulb Temp	91	Stack Moisture Content	5.35	%H2O

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

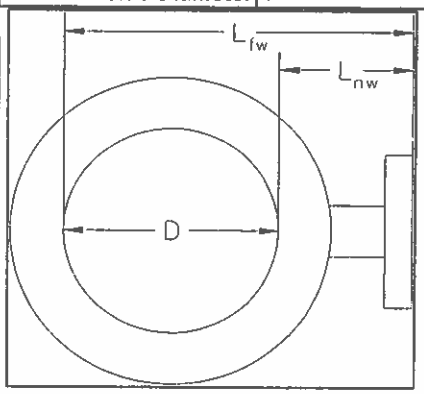
where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

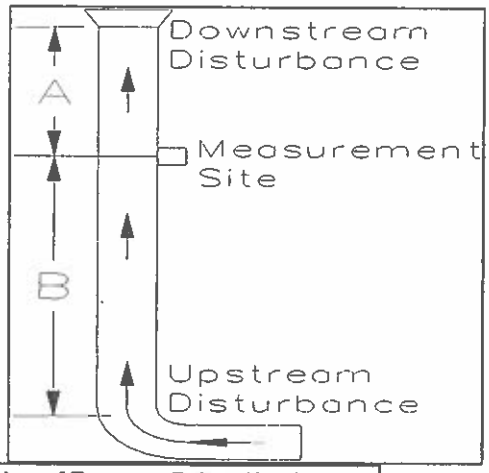
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	# of Ports Available	2
Stack Type	Circular	# of Ports Used	2
Stack Size	Large	Port Inside Diameter	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	63.50	in
Distance to Near Wall of Stack	(L_{nw})	1.25	in
(=Lfw - Lnw) Diameter of Stack	(D)	62.25	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	21.14	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	210.00	in
(=B/D) Diameters Upstream	(B_D)	3.37	diameters
Distance Downstream	(A)	54.00	in
(=A/D) Diameters Downstream	(A_D)	0.87	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	12	Across
24	Pts Used	24	Required
☑	Particulate	☐	Velocity

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
10					.974	.882
11						.933
12						.979

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.021	1 2/8	2 4/8
2	0.067	4 1/8	5 3/8
3	0.118	7 3/8	8 5/8
4	0.177	11	12 2/8
5	0.250	15 5/8	16 7/8
6	0.356	22 1/8	23 3/8
7	0.644	40 1/8	41 3/8
8	0.750	46 6/8	48
9	0.823	51 2/8	52 4/8
10	0.882	54 7/8	56 1/8
11	0.933	58 1/8	59 3/8
12	0.979	61	62 2/8

Bighorn Environmental Method 5 Field Data Sheet 11/2014/202

Client/Plant Name: Sorrento
Location: Nampa, ID
Personnel: Homer/Keating
Date: 6/3/11
Source: Sloping 3&0
Run #: 1
Ambient Temp:
Barometric Press.: 27.42
Assumed Moisture: 4
Start Time: 14:19

Meter Box ID: 906017
Meter Box Y: .995
Meter Box Δ H@: 1.843
Probe ID: 8H5'
Probe Cp: .84
Filter #: 44
Static Pressure (in. H2O): -.55
Nozzle ID: #2
Probe/Filter Settings (F): 250
End Time: 15:52

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0 cfm
Post @ 15 in Hg.: 0 cfm
DGM Start: 928.76 DGM End: 928.76

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	Silica
End (ml):	1	1	112	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	8.50	1.0	840.80	78	76	1.2	.49	131	249	65	251	
2	17.50	1.0	844.47	77	77	1.1	.49	132	248	63	250	
3	26.00	1.0	897.79	77	78	1.1	.49	132	249	61	252	
4	35.00	1.0	901.23	78	78	1.2	.49	131	247	62	250	
5	43.00	1.0	905.03	77	77	1.11	.49	132	248	63	251	
6	48.75	1.0	908.24	79	78	.51	.49	132	249	64	249	
7	51.25	1.0	910.58	81	79	.09	.49	131	248	62	251	
8	54.25	1.0	911.62	83	81	.97	.49	132	248	61	248	
9	67.75	1.0	915.03	80	82	1.1	.49	131	249	62	250	
10	76.00	1.0	918.56	81	82	1.0	.49	132	250	64	251	
11	84.00	1.0	922.09	83	81	.48	.49	131	249	60	252	
12	92.00	1.0	925.2600	81	81	.46	.49	132	250	62	251	
13												
14			928.49									
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
		Final DGM	928.49									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes: No H2O collected in Imp 1-2, no purge required

Signom Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento
Location: NAMPA, ID
Personnel: Homer / Keating
Date: ~~6/9/11~~ 6/3/11
Source: shaking Bed
Run #: 2
Ambient Temp: 73
Barometric Press.: 27.42
Assumed Moisture: 4%
Start Time: 16:24

Meter Box ID: 906017
Meter Box Y: .995
Meter Box Δ H@: 1.843
Probe ID: BH#1-5'
Probe Cp: .84
Filter #: 333
Static Pressure (in. H2O): -.57
Nozzle ID: #2
Probe/Filter Settings (F): 250
End Time: ~~18:02~~ 18:02

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0 cfm
Post @ 15 in Hg.: 0 cfm
DGM Start: 968.81 DGM End: 968.81
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	~~40~~ 0	0	100	562
End (ml):	1	1	113	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	~~DGM Inlet Temp~~ BH (°F)	Filter	Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	9.25	1.0	929.20	84		77	1.3	.49	132	249	66	251	
2	17.75	1.0	932.40	81		76	~~1.1~~ 1.1	.49	132	248	62	251	
3	26.25	1.0	936.23	80		76	1.1	.49	131	249	58	250	
4	34.50	1.0	939.57	78		76	1.0	.49	133	247	58	248	
5	42.50	1.0	~~944~~ 942.87	79		76	0.97	.49	132	248	59	249	
6	48.50	1.0	946.11	81		76	.55	.49	132	249	60	250	
7	56.50	1.0	948.51	83		77	.95	.49	133	250	61	248	
8	64.70	1.0	951.77	80		77	1.0	.49	132	251	62	249	
9	73.00	1.0	955.03	78		78	1.0	.49	133	249	62	251	
10	81.00	1.0	958.43	79		78	1.1	.49	134	250	63	250	
11	90.00	1.0	962.02	80		78	.97	.49	135	248	65	251	
12	98.00	1.0	965.48	82		78	.94	.49	135	247	64	249	
13													
14													
15			968.69										
16													
17													
18													
19													
20													
21													
22													
23													
24													
		Final DGM	968.69										

QA/QC Checks: Completeness: Legibility: Signature:

Notes: No H2O collected in Imp. 1-2 No purge required

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento
Location: Nampa, ID
Personnel: Howell/Kotunga
Date: 6/3/11
Source: SKAKing BeO
Run #: 3
Ambient Temp: 70
Barometric Press.: 27.42
Assumed Moisture: 4%
Start Time: 18:14

Meter Box ID: 906017
Meter Box Y: .995
Meter Box Δ H@: 1.843
Probe ID: ~~184~~ 3H45'
Probe Cp: .84
Filter #: 537
Static Pressure (in. H2O): -.54
Nozzle ID: #2
Probe/Filter Settings (F): 250
End Time: 19:50

Leak Check Results

Sample Train
Pre @ 15 in Hg.: Ø cfm
Post @ 15 in Hg.: Ø cfm
DGM Start: 9.52 ✓ DGM End: 9.52 ✓
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	—	—	100	510 g
End (ml):	4	0	117	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	~~Inlet Temp~~ Bff (°F)	Filter	Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	9.0	1.0	969.20	81		82	1.2	.49	135	248	67	252	
2	17.50	1.0	973.03	82		81	1.1	.49	135	249	64	251	
3	25.75	1.0	976.49	84		81	1.0	.49	135	247	60	252	
4	33.75	1.0	979.89	80		81	.99	.49	134	248	58	251	
5	41.75	1.0	983.28	77		81	.96	.49	135	247	59	250	
6	48.00	1.0	986.55	78		82	.58	.49	135	248	59	251	
7	56.00	1.0	989.12	80		82	.97	.49	135	249	60	253	
8	64.25	1.0	992.36	81		83	1.0	.49	135	250	60	254	
9	72.75	1.0	995.70	82		83	1.1	.49	134	251	61	251	
10	80.75	1.0	999.21	82		83	.98	.49	135	250	62	250	
11	88.75	1.0	1002.62	83		83	.96	.49	134	251	62	251	
12	96.75	1.0	1005.89	84		83	.94	.49	135	249	63	252	
13													
14			1009.29										
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
		Final DGM	1009.29										

QA/QC Checks: Completeness: Legibility:

Signature:

Notes:

SOURCE SAMPLING TITLE PAGE

ALARMS EXIST !!! - Check Alarm Sheet

Source Information				
Plant Name	Sorrento			
Sampling Location	Whey Dryer Scubber			
Fuel or Source Type				
Fuel F-Factor				

Test Information			
Starting Test Date		06/03/11	
Project #		PM/CPM test	
Operator		Homer/Keating	
Standard Temperature			°F
Standard Pressure			in Hg
Minimum required sample vol.			scf
Run Duration		72	Minutes
Base Run Number			
# of Ports Available		2	
# of Ports Used		2	
Port Inside Diameter		4.00	in
Circular Stack?		☑	
Rectangular Stack?		☐	

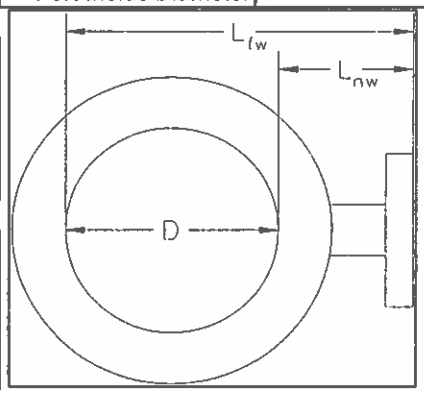
Test Equipment Information			
Meter Box Number		610022	
Meter Calibration Factor	(Y)	0.945	
Orifice Meter Coefficient	($\Delta H_@$)	1.894	in H_2O
Pitot Identification		BH 6'-#1	
Pitot Tube Coefficient	(C_p)	0.840	
Orsat Identification		NA	
Nozzle Number			
Nozzle Diameter	(D_n)	0.2500	in
Probe Number		72	
Probe Length		72.00	in
(SS, Glass ....) Liner Material		Glass	
Sample Case / Oven Number			
Impinger Case Number			
Acetone Lot Number			

Testing Company Information	
Company Name	Bighorn Environmental
Address	1324 N Liberty Lake Rd
City, State Country Zip	Liberty Lake, WA 99019
Project Manager	Tim Homer
Phone Number	541-954-4697
Fax Number	888-559-5624

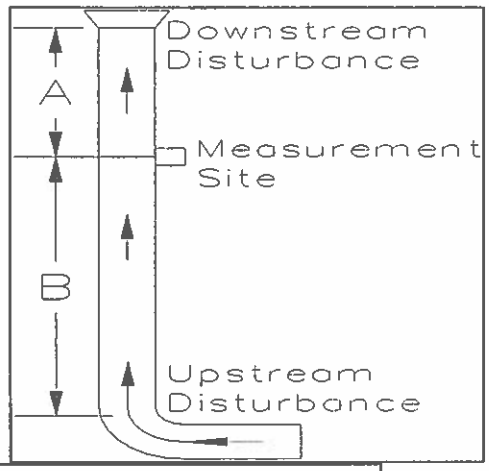
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	# of Ports Available	2
Stack Type	Circular	# of Ports Used	2
Stack Size	Large	Port Inside Diameter	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	63.50	in
Distance to Near Wall of Stack	(L_{nw})	1.25	in
(=Lfw - Lnw) Diameter of Stack	(D)	62.25	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	21.14	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	210.00	in
(=B/D) Diameters Upstream	(B_D)	3.37	diameters
Distance Downstream	(A)	54.00	in
(=A/D) Diameters Downstream	(A_D)	0.87	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	12	Across
24	Pts Used	24	Required
☑	Particulate	☐	Velocity

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
10					.974	.882
11						.933
12						.979

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.021	1 2/8	2 4/8
2	0.067	4 1/8	5 3/8
3	0.118	7 3/8	8 5/8
4	0.177	11	12 2/8
5	0.250	15 5/8	16 7/8
6	0.356	22 1/8	23 3/8
7	0.644	40 1/8	41 3/8
8	0.750	46 6/8	48
9	0.823	51 2/8	52 4/8
10	0.882	54 7/8	56 1/8
11	0.933	58 1/8	59 3/8
12	0.979	61	62 2/8

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	# of Ports Used	2
Stack Type	Circular	Pitot Identification	BH 6'-#1
Pitot Leak Check	☐ PreTest ☐ PostTest	Pitot Coefficient (C_p)	0.84

Stack Dimensions			
Diameter or Length of Stack	(D)	62.25	in
Width of Stack	(W)		in
Area of Stack	(A_s)	21.14	ft^2

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Static Pressure	(P_{static})	-0.21	in H_2O
Absolute Stack Pressure	(P_s)	27.40	in Hg

Stack Gas Composition			
Composition Data:	Actual ☐	Estimated ☐	
Carbon Dioxide Concentration	($\%CO_2$)	0.0	%
Oxygen Concentration	($\%O_2$)	20.9	%
Carbon Monoxide Concentration	(%CO)	0.0	%
Nitrogen Concentration	($\%N_2$)	79.1	%
Stack Moisture Content	(B_{ws})	5.000	
Stack Dry Molecular Weight	(M_d)	28.84	lb/lb-mole
Stack Wet Molecular Weight	(M_s)	28.30	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	46.8	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	2867259	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	47788	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	59289	ascf/min

Stack Cross Section Schematic

Velocity Traverse Data

Run Number	V1			
Run Time				
Traverse Point	Velocity Head (Δp)	Stack Temp (t_s)	Null Angle deg	Local Velocity $(v_s)_i$
	in H_2O	°F		ft/sec
A-1	0.41	110	0	39.4
A-2	0.63	110	0	48.9
A-3	0.71	110	3	51.9
A-4	0.70	110	4	51.5
A-5	0.66	110	2	50.0
A-6	0.68	110	0	50.8
A-7	0.52	110	2	44.4
A-8	0.54	110	1	45.2
A-9	0.48	110	6	42.7
A-10	0.55	110	4	45.7
A-11	0.45	110	5	41.3
A-12	0.42	110	3	39.9
B-1	0.36	110	3	36.9
B-2	0.44	110	3	40.8
B-3	0.47	110	5	42.2
B-4	0.41	110	5	39.4
B-5	0.42	110	2	39.9
B-6	0.48	110	3	42.7
B-7	0.71	110	4	51.9
B-8	0.75	110	6	53.3
B-9	0.83	110	7	56.1
B-10	0.84	110	3	56.4
B-11	0.80	110	7	55.1
B-12	0.82	110	4	55.7
$(\Delta p)^{1/2}_{avg}$ [1]	0.76	110		

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Wet Bulb/Dry Bulb Estimate

Wet Bulb Temp	110	Stack Vapor Pressure	2.57	in Hg
Dry Bulb Temp	110	Stack Moisture Content	9.39	%H2O

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}\,(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Sorrento				Date	06/03/11
Sampling Location	Whey Dryer Scubber				Project #	PM/CPM test
Operator	Homer/Keating				# of Ports Used	2
Stack Type	Circular				Meter Box Number	610022
Train Leak Check	☐	PreTest	☐	PostTest	Meter Cal Factor (Y)	0.945

Moisture Content Data								
Run Number	1		Run Start Time		14:20	Run Stop Time		15:32
Total Meter Volume	(V_m)	70.660	dcf	Barometric Press.		(P_b)	27.25	in Hg
Avg Meter Temp	$(t_m)_{avg}$	83	°F	Stack Static Press.		(P_{static})	-0.21	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	108	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.52	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	g	g	g	ml
Contents		empty	empty	H2O			Silica	
Final Value	$(V_f),(W_f)$	71.00	9.00	99.00			245.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			234.00	
Net Value	$(V_n),(W_n)$	71.0	9.0	-1.0			11.0	
Results								
Total Volume	(V_t)	79.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.719	scf
Total Weight	(W_t)	11.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.519	scf
Std Meter Volume	$(V_{m(std)})$	59.510	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	9.0	%
Calc Moisture Content	$(B_{ws(calc)})$	6.6	%	Final Moisture Content		(B_{ws})	6.6	%

Moisture Content Data								
Run Number	2		Run Start Time		15:58	Run Stop Time		17:10
Total Meter Volume	(V_m)	69.220	dcf	Barometric Press.		(P_b)	27.42	in Hg
Avg Meter Temp	$(t_m)_{avg}$	94	°F	Stack Static Press.		(P_{static})	-0.20	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	106	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.59	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	ml	ml	g	ml
Contents		empty	empty	H2O			Silica	
Final Value	$(V_f),(W_f)$	65.00	14.00	103.00			238.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			230.00	
Net Value	$(V_n),(W_n)$	65.0	14.0	3.0			8.0	
Results								
Total Volume	(V_t)	82.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.860	scf
Total Weight	(W_t)	8.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.377	scf
Std Meter Volume	$(V_{m(std)})$	57.578	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	8.5	%
Calc Moisture Content	(B_{ws})	6.9	%	Final Moisture Content		(B_{ws})	6.9	%

Moisture Content Data								
Run Number	3		Run Start Time		17:43	Run Stop Time		18:55
Total Meter Volume	(V_m)	70.330	dcf	Barometric Press.		(P_b)	27.42	in Hg
Avg Meter Temp	$(t_m)_{avg}$	95	°F	Stack Static Press.		(P_{static})	-0.22	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	106	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.45	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	ml	ml	g	ml
Contents		empty	empty	H2O			Silica	
Final Value	$(V_f),(W_f)$	49.00	17.00	113.00			248.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			239.00	
Net Value	$(V_n),(W_n)$	49.0	17.0	13.0			9.0	
Results								
Total Volume	(V_t)	79.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.719	scf
Total Weight	(W_t)	9.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.424	scf
Std Meter Volume	$(V_{m(std)})$	58.300	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	8.3	%
Calc Moisture Content	(B_{ws})	6.6	%	Final Moisture Content		(B_{ws})	6.6	%

PRELIMINARY TEST DATA SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:		RUN No.	1
Date:	3-Jun-2011	End Time:		JOB No.	

STACK DATA

% Moisture:	4	% est.	$\%CO_2$:	0.03	%
Barometric:	27.42	in Hg	$\%O_2$:	20.90	%
Static Press:	-0.55	in H_2O	$\%N_2/CO$:	79.07	%
Stack Press:	27.38	in Hg	M_d:	28.84	lb/lb-mole
Stack Area:	10.32	ft^2	Est. M_w:	28.41	lb/lb-mole
Stack Area:	1486.1	in^2			

STANDARD CONDITIONS			
	T_{std}:	68	°F
	P_{std}:	29.92	inches Hg

PRE-TEST CALCULATIONS

Viscocity μ_s:	193.28	mpoise
Cunningham:	1.0809	
D_{50LL}:	10.33	µm
[N_{re}>3162] D_{50LL}:	-	µm
D_{50T}:	10.66	µm
Estimated Q_s:	0.4589	acfm
Estimated N_{re}:	2761	
Estimated ΔH:	0.466	in H_2O

EQUIPMENT

METER BOX:	906107	
Y:	0.99	
ΔH@:	1.843	in H_2O
Estimated T_m:	50	°F
Cp':	0.840	S/N
Cp:	0.840	S/N
Nozzle Dia:	0.149	inches
Nozzle Area:	0.00012	ft^2

PRELIMINARY TRAVERSE

Sample Point	Cyclonic Flow Check Null Angle °	Preliminary ΔP (in. H_2O) ΔP_m	ΔP_s	ΔP_{s2}	Stack Temperature (°F)
1	0.0	0.730	0.730	-	118.0
2	0.0	0.930	0.930	-	118.0
3	0.0	0.840	0.840	-	118.0
4	0.0	0.810	0.810	-	118.0
5	0.0	1.050	1.050	-	118.0
6	0.0	1.400	1.400	-	118.0
7	0.0	1.200	1.200	-	118.0
8	0.0	1.200	1.200	-	118.0
9	0.0	0.930	0.930	-	118.0
10	0.0	0.910	0.910	-	118.0
11	0.0	0.860	0.860	-	118.0
12	0.0	0.870	0.870	-	118.0
13			-	-	
14			-	-	
15			-	-	
16			-	-	
17			-	-	
18			-	-	
19			-	-	
20			-	-	
21			-	-	
22			-	-	
23			-	-	
24			-	-	
	0.0	0.978	0.978	-	118.000
	(absolute °)				

NOZZLE SELECTION

Nozzle S/N	Diam. Dn (in)	Vn (fps)	V_{min} (fps)	V_{max} (fps)	ΔP_{min} (inches H_2O)	ΔP_{max}
1	0.131	81.72	61.83	100.52	1.00	2.64
2	***0.149***	63.17	46.42	78.57	***0.56***	***1.61***
3	0.170	48.53	33.97	61.34	0.30	0.98
4	0.180	43.28	29.38	55.21	0.23	0.80
5	0.194	37.26	23.94	48.20	0.150	0.61
6	0.213	30.91	17.79	40.85	0.08	0.44
7	0.226	27.46	14.03	36.89	0.05	0.36
8	0.266	19.82	9.91	28.21	0.03	0.21
9	0.303	15.28	7.64	22.91	0.02	0.14
10	0.345	11.78	5.89	17.67	0.01	0.08
11	0.396	8.94	4.47	13.41	0.01	0.05
12		#####	-	-	-	-

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company Inc.

APPENDIX C
FLOW RATE SPREADSHEETS

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento	Date	6/3/2011
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	Run #	1
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	110	°F
Avg Gas Meter Temp	(t_m)	81	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.89	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.55	in H_2O
Stack Moisture Content	(B_{ws})	7.0	%
Stack Dry Molecular Weight	(M_{ds})	28.84	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	3.72	

Sampling Equipment			
Meter #	610022		
Meterbox Cal. Factor	(Y)	0.945	
Nozzle #			
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{nl})	0.2387	in
Probe # / Length	72	72.00	ft
Liner Material	Glass		
Sample Case / Oven #			
Impinger Case #			

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.21	in H_2O
Absolute Stack Pressure	(P_s)	27.40	in Hg
Absolute Meter Pressure	(P_m)	27.56	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?		☑	Orsat OK?		☐

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	14:20:00	112.900	0.430	1.599	1.600	110	246	81	256	61	6.0
A-2	3.0	14:23:00	115.240	0.580	2.157	2.100	111	247	81	254	55	7.5
A-3	6.0	14:26:00	117.920	0.630	2.343	2.300	110	247	81	253	55	8.0
A-4	9.0	14:29:00	120.680	0.600	2.231	2.200	109	247	81	257	55	8.0
A-5	12.0	14:32:00	123.500	0.570	2.120	2.100	108	247	81	256	55	8.0
A-6	15.0	14:35:00	126.230	0.550	2.046	2.000	108	248	80	257	53	8.0
A-7	18.0	14:38:00	128.910	0.640	2.380	2.400	108	247	80	257	52	8.5
A-8	21.0	14:41:00	131.880	0.740	2.752	2.700	109	248	80	254	52	9.5
A-9	24.0	14:44:00	134.870	0.820	3.050	3.000	108	247	80	250	52	10.5
A-10	27.0	14:47:00	138.110	0.880	3.273	3.300	108	246	80	248	52	12.0
A-11	30.0	14:50:00	141.500	0.910	3.384	3.400	108	247	80	249	52	13.0
A-12	33.0	14:53:00	144.950	0.930	3.459	3.500	108	247	80	249	52	13.0
B-1	36.0	14:56:00	148.410	0.420	1.562	1.600	106	249	82	245	57	6.5
B-2	39.0	14:59:00	150.750	0.600	2.231	2.200	107	246	83	247	53	7.5
B-3	42.0	15:02:00	153.400	0.750	2.789	2.700	107	245	81	246	52	9.0
B-4	45.0	15:05:00	156.380	0.810	3.012	3.000	107	247	84	248	53	10.5
B-5	48.0	15:08:00	159.610	0.800	2.975	3.000	107	247	85	248	53	10.5
B-6	51.0	15:11:00	162.860	0.680	2.529	2.500	107	248	86	247	52	10.0
B-7	54.0	15:14:00	165.860	0.700	2.603	2.500	107	247	86	250	52	10.0
B-8	57.0	15:17:00	168.820	0.660	2.455	2.400	108	246	88	246	50	10.0
B-9	60.0	15:20:00	171.720	0.680	2.529	2.500	108	246	88	245	51	10.0
B-10	63.0	15:23:00	174.780	0.720	2.678	2.600	108	248	89	246	50	10.0
B-11	66.0	15:26:00	177.670	0.710	2.641	2.600	108	247	90	248	50	10.5
B-12	69.0	15:29:00	180.640	0.660	2.455	2.300	108	248	91	247	50	10.5
Last Pt	72.0	15:32:00	183.560									
Last Pt	72.0	15:32:00	183.560						Maximum Vacuum			13.0
Average Values				0.69		2.52	108	247	83	250	53	

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento	Date	6/3/2011
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	Run #	2
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	108	°F
Avg Gas Meter Temp	(t_m)	78	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.89	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	7.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.9814	acfm
DP to DH Isokinetic Factor	(K)	3.71	

Sampling Equipment			
Meter #	610022		
Meterbox Cal. Factor	(Y)	0.945	
Nozzle #			
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{ni})	0.2680	in
Probe # / Length	72	72.00	ft
Liner Material	Glass		
Sample Case / Oven #			
Impinger Case #			

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.20	in H_2O
Absolute Stack Pressure	(P_s)	27.41	in Hg
Absolute Meter Pressure	(P_m)	27.56	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?		☑	Orsat OK?		☐

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	15:58:00	185.100	0.600	2.228	2.200	105	245	89	241	62	7.0
A-2	3.0	16:01:00	187.880	0.620	2.302	2.300	106	245	89	242	60	7.5
A-3	6.0	16:04:00	190.590	0.680	2.525	2.500	106	246	89	240	59	8.5
A-4	9.0	16:07:00	193.700	0.710	2.636	2.600	106	247	91	241	55	10.0
A-5	12.0	16:10:00	196.660	0.690	2.562	2.500	105	246	91	240	52	9.0
A-6	15.0	16:13:00	199.550	0.640	2.376	2.300	106	247	91	241	52	8.5
A-7	18.0	16:16:00	202.390	0.700	2.599	2.600	106	248	92	242	53	9.5
A-8	21.0	16:19:00	205.450	0.790	2.933	3.000	107	249	92	243	53	10.5
A-9	24.0	16:22:00	208.510	0.820	3.044	3.000	106	240	93	245	52	10.5
A-10	27.0	16:25:00	211.930	0.840	3.119	3.100	105	242	94	246	51	11.0
A-11	30.0	16:28:00		0.800	2.970	2.900	106	243	94	245	52	11.0
A-12	33.0	16:31:00	218.530	0.760	2.822	2.800	107	246	94	246	52	11.0
B-1	36.0	16:34:00	221.790	0.480	1.782	1.800	106	247	95	247	48	11.0
B-2	39.0	16:37:00	224.370	0.590	2.190	2.200	106	247	95	250	48	8.5
B-3	42.0	16:40:00	227.140	0.530	1.968	2.000	107	250	96	251	49	8.0
B-4	45.0	16:43:00	229.830	0.520	1.931	2.000	107	251	96	251	49	8.0
B-5	48.0	16:46:00	232.530	0.560	2.079	2.100	108	249	96	252	51	8.0
B-6	51.0	16:49:00	235.220	0.500	1.856	1.900	106	246	96	249	51	8.0
B-7	54.0	16:52:00	237.870	0.760	2.822	2.800	106	245	95	246	52	9.5
B-8	57.0	16:55:00	240.980	0.780	2.896	2.900	106	246	95	247	51	10.0
B-9	60.0	16:58:00	244.300	0.810	3.007	3.000	107	251	96	247	53	10.5
B-10	63.0	17:01:00	247.580	0.860	3.193	3.200	107	252	95	246	55	10.5
B-11	66.0	17:04:00	250.950	0.860	3.193	3.200	108	251	95	245	56	11.0
B-12	69.0	17:07:00	254.320	0.890	3.304	3.200	107	250	96	240	58	11.0
Last Pt	72.0	17:10:00	257.650									
Final Values	72.0	17:10:00	254.320						Maximum Vacuum			11.0
Average Values				0.70		2.59	106	247	94	245	53	
								170				

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento	Date	6/3/2011
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	Run #	3
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	107	°F
Avg Gas Meter Temp	(t_m)	95	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.89	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	7.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.9614	acfm
DP to DH Isokinetic Factor	(K)	3.84	

Sampling Equipment			
Meter #	610022		
Meterbox Cal. Factor	(Y)	0.945	
Nozzle #			
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{ni})	0.2611	in
Probe # / Length	72	72.00	ft
Liner Material	Glass		
Sample Case / Oven #			
Impinger Case #			

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.22	in H_2O
Absolute Stack Pressure	(P_s)	27.40	in Hg
Absolute Meter Pressure	(P_m)	27.56	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid		ft^3/min	@		in Hg
Post	0.01	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?		☑	Orsat OK?		☐

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	17:43:00	258.100	0.85	3.26	3.20	105	247	96	245	60	11.0
A-2	3.0	17:46:00	261.390	0.87	3.34	3.20	106	248	96	247	60	11.0
A-3	6.0	17:49:00	264.740	0.89	3.41	3.30	106	249	96	244	60	1.5
A-4	9.0	17:52:00	268.130	0.82	3.15	3.00	106	249	95	249	58	11.0
A-5	12.0	17:55:00	271.400	0.80	3.07	2.90	106	250	95	245	58	11.0
A-6	15.0	17:58:00	274.610	0.77	2.95	2.80	107	247	96	246	56	11.0
A-7	18.0	18:01:00	277.740	0.51	1.96	1.80	108	248	96	247	55	7.0
A-8	21.0	18:04:00	280.350	0.50	1.92	1.80	107	247	95	246	54	7.0
A-9	24.0	18:07:00	282.920	0.48	1.84	1.70	106	249	95	246	55	7.0
A-10	27.0	18:10:00	285.380	0.47	1.80	1.70	105	249	96	247	53	7.0
A-11	30.0	18:13:00	287.830	0.46	1.76	1.60	105	247	95	248	54	7.0
A-12	33.0	18:16:00	290.230	0.47	1.80	1.60	106	245	96	247	55	7.0
B-1	36.0	18:19:00	292.590	0.63	2.42	2.30	106	248	95	246	56	9.0
B-2	39.0	18:22:00	295.370	0.66	2.53	2.40	107	247	95	245	52	9.0
B-3	42.0	18:25:00	298.280	0.65	2.49	2.40	106	251	96	246	53	9.0
B-4	45.0	18:28:00	301.180	0.65	2.49	2.40	106	247	96	249	54	9.5
B-5	48.0	18:31:00	304.120	0.67	2.57	2.50	105	248	95	250	52	9.5
B-6	51.0	18:34:00	306.980	0.64	2.46	2.30	104	249	96	251	53	10.0
B-7	54.0	18:37:00	310.040	0.68	2.61	2.50	104	247	95	246	52	10.0
B-8	57.0	18:40:00	313.050	0.72	2.76	2.60	104	244	95	247	53	10.5
B-9	60.0	18:43:00	316.080	0.74	2.84	2.70	104	243	94	246	55	11.0
B-10	63.0	18:46:00	319.210	0.78	2.99	2.90	105	247	94	244	56	11.5
B-11	66.0	18:49:00	322.400	0.79	3.03	2.90	105	248	94	244	57	11.5
B-12	69.0	18:52:00	325.650	0.63	2.42	2.30	105	248	94	246	59	10.0
Last Pt	72.0	18:55:00	328.430									
Final Value	72.0	18:55:00	328.430						Maximum Vacuum			11.5
Average Values				0.67		2.45	106	248	95	247	55	
								171				

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST DATA SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	14:19:00	RUN No.	1
Date:	3-Jun-2011	End Time:	15:52:00	JOB No.	

STACK DATA			EQUIPMENT			ESTIMATES				+/- 50°F ΔH			
% Moisture:	4	% est.	METER BOX:	906107		Ts (°F):	118	Tm (°F):	50	Ts-50°	68	Ts+50°	168
Barometric:	27.42	in Hg	Y:	0.995		Est. Qs:	0.4589	cfm		Est. Qs:	0.4891	Est. Qs:	0.5148
Static Press:	-0.55	in H_2O	ΔH@:	1.843	in H_2O	Est. μ_s:	193.28	mpoise		Est. μ_s:	169.48	Est. μ_s:	193.52
Stack Press:	27.38	in Hg	Cp':	0.840	S/N -	Est. ΔH:	0.466	("H_2O)		Est. ΔH:	0.559	Est. ΔH:	0.395
$\%CO_2$:	0.03	%	Cp:	0.840	S/N -								
$\%O_2$:	20.90	%	Nozzle Dia:	0.1490	inches								
$\%N_2/CO$:	79.07	%	Stack Area:	10.3	ft^2								
M_d:	28.84	lb/lb-mole	# of Points:	12	points								
Est. M_w:	28.41	lb/lb-mole	Run Time:	96.00	min								
T_{std}:	528	°R	P_{std}:	29.92	in Hg								

LEAK CHECKS			
DGM initial	0	0	cf
DGM final	0	0	cf
Time	1	1	min.
Leak Rate	0.0000	0.0000	cfm
Vacuum	15	8	in. Hg

Sample Point	Clock Time (min)	Dry Gas Meter Reading (ft^3)	Pitot ΔP ("H_2O)	Gas Temperatures (°F) DGM Inlet	DGM Outlet	Stack	Orifice Press. ΔH (in H_2O) Ideal	Actual	Pump Vac. (in Hg)	Gas Temps (°F) Probe	Filter	Imp. Exit	Qs (acfm)	D_{50} (10 µm)	D_{50} (2.5 µm)
1	9.00	890.8000	1.200	76.0	76.0	131	0.469	0.490	1	251	249	65	0.4664	10.71	2.41
2	17.50	894.4700	1.100	77.0	77.0	132	0.468	0.490	1	250	248	63	0.4466	**11.06**	2.55
3	26.00	897.7900	1.100	78.0	78.0	132	0.469	0.490	1	252	249	61	0.4619	10.80	2.45
4	35.00	901.2300	1.200	78.0	78.0	131	0.471	0.490	1	250	247	62	0.4811	10.48	2.32
5	43.00	905.0300	0.990	77.0	77.0	132	0.468	0.490	1	251	248	63	0.4588	10.85	2.47
6	48.75	908.2400	0.510	78.0	78.0	131	0.471	0.490	1	249	249	64	0.4637	10.76	2.43
7	51.25	910.5800	0.090	79.0	79.0	131	0.471	0.490	1	251	248	62	0.4731	10.60	2.37
8	59.25	911.6200	0.970	81.0	81.0	132	0.472	0.490	1	248	248	61	0.4838	10.45	2.31
9	67.75	915.0300	1.100	82.0	82.0	131	0.474	0.490	1	250	249	62	0.4697	10.66	2.39
10	76.00	918.5600	1.000	82.0	82.0	132	0.472	0.490	1	251	250	64	0.4848	10.43	2.31
11	84.00	922.0900	0.980	81.0	81.0	131	0.473	0.490	1	252	249	60	0.4490	**11.00**	2.53
12	92.00	925.2600	0.960	81.0	81.0	132	0.472	0.490	1	251	250	62	0.4583	10.86	2.47
13	-	928.4900					-						-	-	-
14	-						-						-	-	-
15	-						-						-	-	-
16	-						-						-	-	-
17	-						-						-	-	-
18	-						-						-	-	-
19	-						-						-	-	-
20	-						-						-	-	-
21	-						-						-	-	-
22	-						-						-	-	-
23	-						-						-	-	-
24	-						-						-	-	-

Actual Run Time	V_m	ΔP (avg)	$T_{m\,(avg)}$	$T_{s\,(avg)}$	Max Vac.	ΔH (avg)	$V_{s\,(avg)}$
			538.8 °R	591.2 °R			
92.00 min	37.690 cf	0.933 in H_2O	79.2 °F	131.5 °F	1	0.490 in H_2O	58.961 fps

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 by Environmental Supply Company, Inc.

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST DATA SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	16:24:00	RUN No.	2
Date:	10-Mar-2011	End Time:	18:02:00	JOB No.	

STACK DATA			EQUIPMENT			ESTIMATES				+/- 50°F ΔH			
% Moisture:	4	% est.	METER BOX:	906107		Ts (°F):	118	Tm (°F):	50	Ts-50°	81.17	Ts+50°	181.17
Barometric:	27.42	in Hg	Y:	0.995		Est. Qs:	0.4589	cfm		Est. Qs:	0.4927	Est. Qs:	0.5180
Static Press:	-0.57	in H_2O	ΔH@:	1.843	in H_2O	Est. μ_s:	193.28	mpoise		Est. μ_s:	172.66	Est. μ_s:	196.65
Stack Press:	27.38	in Hg	Cp':	0.840	S/N -	Est. ΔH:	0.466	("H_2O)		Est. ΔH:	0.532	Est. ΔH:	0.379
$\%CO_2$:	0.03	%	Cp:	0.840	S/N -								
$\%O_2$:	20.90	%	Nozzle Dia:	0.1490	inches								
$\%N_2/CO$:	79.07	%	Stack Area:	10.3	ft^2								
M_d:	28.84	lb/lb-mole	# of Points:	12	points								
Est. M_w:	28.41	lb/lb-mole	Run Time:	96.00	min								
T_{std}:	528	°R	P_{std}:	29.92	in Hg								

LEAK CHECKS		
DGM initial		cf
DGM final		cf
Time		min.
Leak Rate	-	- cfm
Vacuum		in. Hg

Sample Point	Clock Time (min)	Dry Gas Meter Reading (ft^3)	Pitot ΔP ("H_2O)	Gas Temperatures (°F) DGM Inlet	DGM Outlet	Stack	Orifice Press. ΔH (in H_2O) Ideal	Actual	Pump Vac. (in Hg)	Gas Temps (°F) Probe	Filter	Imp. Exit	Qs (acfm)	D_{50} [10 µm]	D_{50} [2.5 µm]
1	9.25	929.2000	1.300	77.0	77.0	132	0.468	0.490	1	251	249	66	0.4574	10.87	2.48
2	17.75	932.9000	1.100	76.0	76.0	132	0.468	0.490	1	251	248	62	0.4488	11.02	2.54
3	26.25	936.2300	1.100	76.0	76.0	131	0.467	0.490	1	250	249	58	0.4494	11.00	2.53
4	34.50	939.5700	1.000	76.0	76.0	133	0.469	0.490	1	248	247	58	0.4591	10.86	2.48
5	42.50	942.8700	0.970	76.0	76.0	132	0.466	0.490	1	249	248	59	0.4640	10.76	2.44
6	48.50	946.1100	0.550	76.0	76.0	132	0.467	0.490	1	250	249	60	0.4583	10.86	2.47
7	56.50	948.5100	0.950	77.0	77.0	133	0.467	0.490	1	248	250	61	0.4668	10.73	2.43
8	64.75	951.7700	1.000	77.0	77.0	132	0.466	0.490	1	249	251	62	0.4519	10.97	2.52
9	73.00	955.0300	1.000	78.0	78.0	133	0.468	0.490	1	251	249	62	0.4712	10.66	2.40
10	81.50	958.4300	1.100	78.0	78.0	134	0.467	0.490	1	250	250	63	0.4837	10.48	2.33
11	90.00	962.0200	0.970	78.0	78.0	135	0.466	0.490	1	251	248	65	0.4670	10.75	2.44
12	98.00	965.4800	0.940	78.0	78.0	135	0.464	0.490	1	249	247	64	0.4603	10.86	2.48
13	-	968.6900					0.464						-	-	-
14	-						-						-	-	-
15	-						-						-	-	-
16	-						-						-	-	-
17	-						-						-	-	-
18	-						-						-	-	-
19	-						-						-	-	-
20	-						-						-	-	-
21	-						-						-	-	-
22	-						-						-	-	-
23	-						-						-	-	-
24	-						-						-	-	-

Actual Run Time	V_m	ΔP (avg)	$T_{m\,(avg)}$	$T_{s\,(avg)}$	Max Vac.	ΔH (avg)	$V_{s\,(avg)}$
98.00 min	39.490 cf	0.998 in H_2O	536.6 °R 76.9 °F	592.5 °R 132.8 °F	1	0.490 in H_2O	62.377 fps

Test Personnel (signature/date)

Project Leader (signature/date)

Pump tripped off line at 3:56:55 into test, test stopped at that point, with 2 min left in test.

Copyright 2009 by Environmental Supply Company, Inc.

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST DATA SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	18:14:00	RUN No.	3
Date:	10-Mar-2011	End Time:	19:50:00	JOB No.	

STACK DATA			EQUIPMENT			ESTIMATES				+/- 50°F ΔH			
% Moisture:	4	% est.	METER BOX:	906107		Ts (°F):	118	Tm (°F):	50	Ts-50°	82.503	Ts+50°	182.5
Barometric:	27.42	in Hg	Y:	0.993		Est. Qs:	0.4589	cfm		Est. Qs:	0.4931	Est. Qs:	0.5183
Static Press:	-0.54	in H_2O	ΔH@:	1.843	in H_2O	Est. μ_s:	193.28	mpoise		Est. μ_s:	172.98	Est. μ_s:	196.96
Stack Press:	27.38	in Hg	Cp':	0.840	S/N -	Est. ΔH:	0.466	("H_2O)		Est. ΔH:	0.529	Est. ΔH:	0.377
$\%CO_2$:	0.03	%	Cp:	0.840	S/N -	LEAK CHECKS							
$\%O_2$:	20.90	%	Nozzle Dia:	0.1490	inches	DGM initial	0		0	cf			
$\%N_2/CO$:	79.07	%	Stack Area:	10.3	ft^2	DGM final	0		0	cf			
M_d:	28.84	lb/lb-mole	# of Points:	12	points	Time	1		1	min.			
Est. M_w:	28.41	lb/lb-mole	Run Time:	96.00	min	Leak Rate	0.0000		0.0000	cfm			
T_{std}:	528	°R	P_{std}:	29.92	in Hg	Vacuum	15		4	in. Hg			

Sample Point	Clock Time (min)	Dry Gas Meter Reading (ft^3)	Pitot ΔP ("H_2O)	Gas Temperatures (°F) DGM Inlet	DGM Outlet	Stack	Orifice Press. ΔH (in H_2O) Ideal	Actual	Pump Vac. (in Hg)	Gas Temps (°F) Probe	Filter	Imp. Exit	Qs (acfm)	D_{50} [10 μm]	D_{50} [2.5 μm]
1	9.00	969.2000	1.200	82.0	82.0	135	0.468	0.490	1	252	248	67	0.4846	10.48	2.33
2	17.50	973.0300	1.100	81.0	81.0	135	0.468	0.490	1	251	249	64	0.4644	10.80	2.45
3	25.75	976.4900	1.000	81.0	81.0	135	0.467	0.490	1	252	247	60	0.4701	10.70	2.42
4	33.75	979.8900	0.990	81.0	81.0	134	0.467	0.490	1	251	248	58	0.4826	10.49	2.33
5	41.75	983.2800	0.960	81.0	81.0	135	0.468	0.490	1	250	247	59	0.4663	10.77	2.44
6	48.00	986.5500	0.580	82.0	82.0	135	0.467	0.490	1	251	248	59	0.4682	10.73	2.43
7	56.00	989.1200	0.970	82.0	82.0	135	0.468	0.490	1	253	249	60	0.4612	10.85	2.47
8	64.25	992.3600	1.000	83.0	83.0	135	0.468	0.490	1	254	250	60	0.4601	10.87	2.48
9	72.75	995.7000	1.100	83.0	83.0	134	0.469	0.490	1	251	251	61	0.4685	10.72	2.42
10	80.75	999.2100	0.980	83.0	83.0	135	0.470	0.490	1	250	250	62	0.4845	10.48	2.33
11	88.75	1002.6200	0.960	83.0	83.0	134	0.469	0.490	1	251	251	62	0.4638	10.79	2.45
12	96.75	1005.8900	0.940	83.0	83.0	135	0.470	0.490	1	252	249	63	0.4830	10.50	2.34
13	-	1009.2900					0.469						-	-	-
14	-						-						-	-	-
15	-						-						-	-	-
16	-						-						-	-	-
17	-						-						-	-	-
18	-						-						-	-	-
19	-						-						-	-	-
20	-						-						-	-	-
21	-						-						-	-	-
22	-						-						-	-	-
23	-						-						-	-	-
24	-						-						-	-	-

Actual Run Time	V_m	ΔP (avg)	$T_{m\,(avg)}$	$T_{s\,(avg)}$	Max Vac.	ΔH (avg)	$V_{s\,(avg)}$
96.75 min	40.090 cf	0.982 in H_2O	541.8 °R 82.1 °F	594.4 °R 134.8 °F	1	0.490 in H_2O	fps

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 by Environmental Supply Company, Inc.

APPENDIX D
CALCULATED EMISSION RATES

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	Stack Type	Circular

Historical Data						
Run Number		1	2	3	Average	
Run Start Time		14:20	15:58	17:43		hh:mm
Run Stop Time		15:32	17:10	18:55		hh:mm
Meter Calibration Factor	(Y)	0.945	0.945	0.945		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	$(V_m)_i$	112.900	185.100	258.100		ft^3
Final Meter Volume	$(V_m)_f$	183.560	254.320	328.430		ft^3
Total Meter Volume	(V_m)	70.660	69.220	70.330	70.070	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	$(t_m)_{avg}$	83.3	93.5	95.3	90.7	°F
Average Stack Temperature	$(t_s)_{avg}$	108.0	106.3	105.6	106.7	°F
Barometric Pressure	(P_b)	27.42	27.42	27.42	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.21	-0.20	-0.22	-0.21	in H_2O
Absolute Stack Pressure	(P_s)	27.40	27.41	27.40	27.40	in Hg
Average Orifice Pressure Drop	$(\Delta H)_{avg}$	2.52	2.59	2.45	2.52	in H_2O
Absolute Meter Pressure	(P_m)	27.61	27.61	27.60	27.61	in Hg
Avg Square Root Pitot Pressure	$(\Delta p^{1/2})_{avg}$	0.8246	0.8330	0.8156	0.8244	$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	79.0	82.0	79.0	80.0	ml
Impinger Weight Gain	(W_n)	9.0	9.0	10.0	9.3	g
Total Water Volume Collected	(V_{lc})	88.0	91.0	89.0	89.4	ml
Standard Water Vapor Volume	$(V_w)_{std}$	4.143	4.284	4.190	4.206	scf
Standard Meter Volume	$(V_m)_{std}$	59.879	57.578	58.300	58.585	dscf
Calculated Stack Moisture	$(B_{ws(calc)})$	6.47	6.93	6.71	6.70	%
Saturated Stack Moisture	$(B_{ws(svp)})$	8.94	8.50	8.32	8.59	%
Reported Stack Moisture Content	(B_{ws})	6.47	6.93	6.71	6.70	%
Gas Analysis Data						
Carbon Dioxide Percentage	($\%CO_2$)					%
Oxygen Percentage	($\%O_2$)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	($\%N_2$)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.29	28.24	28.26	28.26	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	50.69	51.17	50.05	50.64	ft/sec
Stack Cross-Sectional Area	(A_s)	21.14	21.14	21.14		ft^2
Actual Stack Flow Rate	(Q_{sw})	64276	64894	63472	64214	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	3283	3325	3256	3288	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	51181	51578	50632	51131	dscfm
Percent of Isokinetic Rate	(I)	100.7	96.1	99.2	98.7	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	30.20	29.20	27.00	28.80	mg
Mass of Particulate in Acetone	(m_a')	1.41	1.19	0.89	1.16	mg
Mass due to Acetone Blank	(W_a)	0.00	0.00	0.00	0.00	mg
Total Back Half PM (blank corrected)	(m_{bh})	7.80	6.50	9.00	7.77	mg
Total Mass of Particulates	(m_n)	39.41	36.89	36.89	37.73	mg
Stack Particulate Concentration	(c_s)	0.001	0.001	0.001	0.001	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.010	0.010	0.010	0.010	gr/dscf
Particulate Emission Rate	(E)	2.02	1.98	1.92	1.98	kg/hr
	(E)	4.456	4.371	4.238	4.355	lbs/hr
	(E)					lbs/mmBtu
(Pt 75 App F Sect 5.2.1) Heat Input	(HI)					mmBtu/Hr

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST RESULTS and DATA ANALYSIS SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	14:19:00	RUN No.	1
Date:	3-Jun-2011	End Time:	15:52:00	JOB No.	

STACK DATA			Molecular Weight			EQUIPMENT			AVERAGE TEST DATA		
% Moisture:	4	% est.	%CO2:	0.03	%	METER BOX:	906107		Average ΔP:	0.93	in H_2O
Barometric:	27.42	in Hg	%O2:	20.90	%	Y:	0.993		Average T_m:	538.8	°R
Static Press:	-0.55	in H_2O	%N2/CO:	79.07	%	ΔH@:	1.843	in H_2O	Average T_s:	591.2	°R
Stack Press:	27.38	in Hg	Md:	28.84	lb/lb-mole	Cp':	0.840	S/N -	Average ΔH:	0.49	in H_2O
Stack Area:	10.3	ft^2	Actual Mw:	28.52	lb/lb-mole	Cp:	0.840	S/N -	T_{std}:	528.00	°R
# of Points:	12	points	Run Time:	92.00	min	Nozzle Dia:	0.1490	inches	P_{std}:	29.92	in Hg

<$PM_{2.5}$ Filter Analysis			<$PM_{2.5}$ Recovery Analysis			Moisture Analysis		
Container 1:	340.5	mg	Container 4:	0	mg	Container 5:	252	g
C1 + Filter Tare:	332	mg	Cont. 4 Tare:	0	mg	Silica Gel Tare:	244	g
Acetone V_{aw1}:	0	ml	Acetone V_{aw4}:	0	ml	M_{sg}:	8	g
Acetone W_{a1}:	0	mg	Acetone W_{a4}:	0	mg	$V_{wsg(std)}$:	0.377	scf
(Filter) M_1:	8.500	mg	($PM_{2.5}$) M_4:	0.000	mg	Container 6:	14	ml
>PM_{10} Recovery Analysis			$PM_{2.5-10}$ Recovery Analysis			$V_{wc(std)}$:	0.659	scf
Container 2:	119761.1	mg	Container 3:	91082.1	mg			
Cont. 2 Tare:	119758.4	mg	Cont. 3 Tare:	91081.6	mg	V_{ws}:	1.036	scf
Acetone V_{aw2}:	52	ml	Acetone V_{aw3}:	46	ml	B_{ws}:	0.030	H_2O
Acetone W_{a2}:	0.13	mg	Acetone W_{a3}:	0.115	mg	Actual % H_2O:	3.0	%
($PM_{2.5}$) M_2:	2.700	mg	($PM_{10-2.5}$) M_3:	0.500	mg			

Acetone Blank Analysis		
Container 7:	117486.6	mg
Container 7 Tare:	117486.1	mg
Acetone Density ρ_a:	0.785	mg/ml
Blank Volume V_{aw}:	200	ml
Blank Conc.C_a:	0.003184713	mg_r/mg_v

CALCULATIONS AND DATA ANALYSIS

V_m:	37.6900	acf - [Actual Sample Volume]			
V_{ms}:	33.6534	dscf - [Corrected Sample Volume (std)]			
V_{ws}:	1.0355	scf - [Volume of Water Vapor]	μ:	197.451	mpoise - [Actual Gas Viscosity]
Q_{Sst}:	0.36580	dscfm - [Corrected Dry Sampling Rate (std)]	C:	1.0764	[Cunningham Correction Factor]
Q_s:	0.46133	acfm - [Actual Final Sampling Rate]	D_{50}:	10.827	μmeter - D50 for Cyclone 1
I:	107.905	% - [Percent Isokinetic Sampling]	D_{50IV}:	2.457	μmeter - D50 for Cyclone IV
N_{re}:	2666	[Actual Reynolds Number]	$Q_{sd(stack)}$:	1,733,522.26	dscf/hr - [Dry Stack Flow Rate (std)]
$V_{s(avg)}$:	58.85	fps - [Avgerage Stack Velocity]	$Q_{sw(stack)}$:	1,786,864.10	scf/hr - [Wet Stack Flow Rate (std)]

Concentrations			Emission Rates			3 run avg
$PM_{2.5}$:		gr/dscf	$PM_{2.5}$:	-	lb/hr	
PM_{10}:	0.00413	gr/dscf	PM_{10}:	1.0220	lb/hr	
Total PM:	0.00536	gr/dscf	Total PM:	1.3286	lb/hr	
CPM	7.2	mg				
Total PM10 + CPM:	0.007428	gr/dscf	Total PM10 + CPM:	1.8394	lb/hr	.004824 gr/dscf
CPM	0.003301	gr/dscf	CPM	0.8175	lb/hr	1.2227 lb/hr

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company, Inc.

TEST RESULTS and DATA ANALYSIS SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	16:24:00	RUN No.	2
Date:	10-Mar-2011	End Time:	18:02:00	JOB No.	

STACK DATA			Molecular Weight			EQUIPMENT			AVERAGE TEST DATA		
% Moisture:	4	% est.	%CO2:	0.03	%	METER BOX:	906107				
Barometric:	27.42	in Hg	%O2:	20.90	%	Y:	0.993		Average ΔP:	1.00	in H_2O
Static Press:	-0.57	in H_2O	%N2/CO:	79.07	%	ΔH@:	1.843	in H_2O	Average T_m:	536.6	°R
Stack Press:	27.38	in Hg	Md:	28.84	lb/lb-mole	Cp':	0.840	S/N -	Average T_s:	592.5	°R
Stack Area:	10.3	ft^2	Actual Mw:	28.39	lb/lb-mole	Cp:	0.840	S/N -	Average ΔH:	0.49	in H_2O
# of Points:	-	points	Run Time:	98.00	min	Nozzle Dia:	0.1490	inches	T_{std}:	528.00	°R
									P_{std}:	29.92	in Hg

<$PM_{2.5}$ Filter Analysis			<$PM_{2.5}$ Recovery Analysis			Moisture Analysis		
Container 1:	335	mg	Container 4:	0	mg	Container 5:	258	g
C1 + Filter Tare:	334.7	mg	Cont. 4 Tare:	0	mg	Silica Gel Tare:	240	g
Acetone V_{aw1}:	0	ml	Acetone V_{aw4}:	0	ml	M_{sg}:	18	g
Acetone W_{a1}:	0	mg	Acetone W_{a4}:	0	mg	$V_{wsg(std)}$:	0.847	scf
(Filter) M_1:	0.300	mg	($PM_{2.5}$) M_4:	0.000	mg	Container 6:	15	ml
>PM_{10} Recovery Analysis			$PM_{2.5-10}$ Recovery Analysis			$V_{wc(std)}$:	0.706	scf
Container 2:	112874.7	mg	Container 3:	89805	mg			
Cont. 2 Tare:	112873.8	mg	Cont. 3 Tare:	89804	mg	V_{ws}:	1.553	scf
Acetone V_{aw2}:	46	ml	Acetone V_{aw3}:	38	ml	B_{ws}:	0.042	H_20
Acetone W_{a2}:	0.115	mg	Acetone W_{a3}:	0.095	mg	Actual % H_2O:	4.2	%
($PM_{2.5}$) M_2:	0.900	mg	($PM_{10-2.5}$) M_3:	1.000	mg			

Acetone Blank Analysis		
Container 7:	117486.6	mg
Container 7 Tare:	117486.1	mg
Acetone Density ρ_a:	0.785	mg/ml
Blank Volume V_{aw}:	200	ml
Blank Conc.C_a:	0.003184713	mg_r/mg_v

CALCULATIONS AND DATA ANALYSIS

V_m:	39.4900	acf - [Actual Sample Volume]			
V_{ms}:	35.4084	dscf - [Corrected Sample Volume (std)]			
V_{ws}:	1.5533	scf - [Volume of Water Vapor]	μ:	196.566	mpoise - [Actual Gas Viscosity]
Q_{Sst}:	0.36131	dscfm - [Corrected Dry Sampling Rate (std)]	C:	1.0767	[Cunningham Correction Factor]
Q_s:	0.46253	acfm - [Actual Final Sampling Rate]	D_{50}:	10.789	μmeter - D50 for Cyclone 1
I:	102.022	% - [Percent Isokinetic Sampling]	D_{50IV}:	2.448	μmeter - D50 for Cyclone IV
N_{re}:	2667	[Actual Reynolds Number]	$Q_{sd(stack)}$:	1,810,993.35	dscf/hr - [Dry Stack Flow Rate (std)]
$V_{s(avg)}$:	62.40	fps - [Avgerage Stack Velocity]	$Q_{sw(stack)}$:	1,890,438.69	scf/hr - [Wet Stack Flow Rate (std)]

Concentrations			Emission Rates		
$PM_{2.5}$:		gr/dscf	$PM_{2.5}$:	-	lb/hr
PM_{10}:	0.00057	gr/dscf	PM_{10}:	0.1466	lb/hr
Total PM:	0.00096	gr/dscf	Total PM:	0.2480	lb/hr
CPM	6.9	mg			
Total PM10 + CPM:	0.003573	gr/dscf	Total PM10 + CPM:	0.9244	lb/hr
CPM	0.003007	gr/dscf	CPM	0.7779	lb/hr

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company, Inc.

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST RESULTS and DATA ANALYSIS SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	14:19:00	RUN No.	3
Date:	3-Jun-2011	End Time:	15:52:00	JOB No.	

STACK DATA			Molecular Weight			EQUIPMENT			AVERAGE TEST DATA		
% Moisture:	4	% est.	%CO2:	0.03	%	METER BOX:	906107				
Barometric:	27.42	in Hg	%O2:	20.90	%	Y:	0.993		Average ΔP:	0.98	in H_2O
Static Press:	-0.54	in H_2O	%N2/CO:	79.07	%	ΔH@:	1.843	in H_2O	Average T_m:	541.8	°R
Stack Press:	27.38	in Hg	Md:	28.84	lb/lb-mole	Cp':	0.840	S/N -	Average T_s:	594.4	°R
Stack Area:	10.3	ft^2	Actual Mw:	28.37	lb/lb-mole	Cp:	0.840	S/N -	Average ΔH:	0.49	in H_2O
# of Points:	12	points	Run Time:	96.75	min	Nozzle Dia:	0.1490	inches	T_{std}:	528.00	°R
									P_{std}:	29.92	in Hg

<$PM_{2.5}$ Filter Analysis			<$PM_{2.5}$ Recovery Analysis			Moisture Analysis		
Container 1:	333.1	mg	Container 4:	0	mg	Container 5:	223	g
C1 + Filter Tare:	333.2	mg	Cont. 4 Tare:	0	mg	Silica Gel Tare:	210	g
Acetone V_{aw1}:	0	ml	Acetone V_{aw4}:	0	ml	M_{sg}:	13	g
Acetone W_{a1}:	0	mg	Acetone W_{a4}:	0	mg	$V_{wsg(std)}$:	0.612	scf
(Filter) M_1:	0.000	mg	($PM_{2.5}$) M_4:	0.000	mg	Container 6:	21	ml
>PM_{10} Recovery Analysis			$PM_{2.5-10}$ Recovery Analysis			$V_{wc(std)}$:	0.988	scf
Container 2:	90377.8	mg	Container 3:	114970.5	mg			
Cont. 2 Tare:	90376.7	mg	Cont. 3 Tare:	114969.3	mg	V_{ws}:	1.600	scf
Acetone V_{aw2}:	58	ml	Acetone V_{aw3}:	41	ml	B_{ws}:	0.043	H_20
Acetone W_{a2}:	0.145	mg	Acetone W_{a3}:	0.1025	mg	Actual % H_2O:	4.3	%
($PM_{2.5}$) M_2:	1.100	mg	($PM_{10-2.5}$) M_3:	1.200	mg			

Acetone Blank Analysis		
Container 7:	117486.6	mg
Container 7 Tare:	117486.1	mg
Acetone Density ρ_a:	0.785	mg/ml
Blank Volume V_{aw}:	200	ml
Blank Conc.C_a:	0.003184713	mg_r/mg_v

CALCULATIONS AND DATA ANALYSIS

V_m:	40.0900	acf - [Actual Sample Volume]
V_{ms}:	35.6036	dscf - [Corrected Sample Volume (std)]
V_{ws}:	1.6004	scf - [Volume of Water Vapor]
Q_{Sst}:	0.36800	dscfm - [Corrected Dry Sampling Rate (std)]
Q_s:	0.47307	acfm - [Actual Final Sampling Rate]
I:	104.940	% - [Percent Isokinetic Sampling]
N_{re}:	2713	[Actual Reynolds Number]
$V_{s(avg)}$:	62.05	fps - [Avgerage Stack Velocity]

μ:	196.928	mpoise - [Actual Gas Viscosity]
C:	1.0787	[Cunningham Correction Factor]
D_{50}:	10.639	μmeter - D50 for Cyclone 1
D_{50IV}:	2.392	μmeter - D50 for Cyclone IV
$Q_{sd(stack)}$:	1,793,208.55	dscf/hr - [Dry Stack Flow Rate (std)]
$Q_{sw(stack)}$:	1,873,813.21	scf/hr - [Wet Stack Flow Rate (std)]

Concentrations			Emission Rates		
$PM_{2.5}$:	0.00000	gr/dscf	$PM_{2.5}$:	0.0000	lb/hr
PM_{10}:	0.00052	gr/dscf	PM_{10}:	0.1332	lb/hr
Total PM:	0.00100	gr/dscf	Total PM:	0.2553	lb/hr
CPM	6.9	mg			
Total PM10 + CPM:	0.003530	gr/dscf	Total PM10 + CPM:	0.9042	lb/hr
CPM	0.002990	gr/dscf	CPM	0.7660	lb/hr

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company, Inc.

APPENDIX E
CALCULATIONS

CALCULATIONS

FLOW RATES:

A = Vent pipe cross-sectional area (ft^2) = πr^2

P_{bar} = Barometric pressure at measurement site (in Hg)

P_g = Stack static pressure (in Hg) = in. H_2O ÷ 13.6 in H_2O/in. Hg

P_s = Absolute stack gas pressure (in. Hg) = $P_{bar} + P_g$

t_d = Temperature dry bulb (°F)

t_w = Temperature wet bulb (°F)

e" = Stack vapor pressure (in. Hg)
$= (0.00000608746 \times t_w^3)-(0.00100431 \times t_w^2)+(0.0756026 \times t_w)-1.69343$

$\%H_2O = [e'' - (P_s - e'')x(t_d - t_w)) \div (2800 - (1.3 \times t_w)] \div P_s \times 100$

MD = Molecular Density = $(100 - \%H_2O) \div 100$

M_d = Molecular weight of dry stack gas (lb/lb-mole)
$= (\%CO_2 \times 0.44) + (\%O_2 \times 0.32) + [(\%CO + \%N_2) \times 0.28]$

FLOW RATES (cont.):

M_s = Molecular weight of wet stack gas (lb/lb-mole)
$= M_d \times (MD) + 18 lb/lb\text{-}mole \times (1-MD)$

C_p = Pitot tube coefficient

$(\sqrt{\square p})_{avg}$ = Average square root velocity head of stack gas (in. H_2O)

T_s = Absolute stack temperature (°R) = $460 + t_d$

V_s = Average stack gas velocity (ft^3/min.)
$= 85.49 \text{ ft/sec} \times 60 \text{ sec/min} \times C_p \times (\sqrt{\square p})_{avg} \times \text{sqrt}(T_s \sqrt{(P_s \times M_s)})$

Q_{sd} = Stack gas dry molecular flow rate corrected to standard conditions

$(dscfm) = MD \times V_s \times A \times (528°R \div T_s) \times (P_s \div 29.92'' \text{ Hg})$

Q_{ac} = Stack gas flow rate at actual conditions (acfm) = V_s x A

EMISSIONS:

C = Average gas concentration indicated by gas analyzer, dry basis (ppm)

C_o = Average of initial and final system cal bias check responses for the zero gas (ppm)

C_m = Average of initial and final system bias check responses for the upscale calibration gas (ppm)

C_{ma} = Actual concentration of the upscale calibration gas (ppm)

C_{gas} = effluent gas concentration (ppm) = $(C - C_o) \times [C_{ma} \div (C_m - C_o)]$

EMISSION RATES:

gr/dscf = $m_n * 15.43/V_{m(std)}$

lb/hr PM = gr/dscf*Q_{sd}*60/7000

Sorrento Whey Scrubber Run 1

MANUAL METHOD 5 CALCULATIONS

Y (DGM CALIBRATION FACTOR):	.945	
C_p (PITOT TUBE COEFFICIENT):	.84	
NOZZLE DIAMETER:	.25	in.
STACK DIMENSION:	62.25	in.
BAROMETRIC PRESSURE P_b:	27.42	in. Hg.
STACK STATIC PRESSURE:	-.21	in. H_2O
OXYGEN CONTENT:	—	%
CARBON DIOXIDE CONTENT:	—	%
CARBON MONOXIDE CONTENT:	—	%
POST RUN LEAK RATE:	0	cfm
SAMPLING TIME:	72	min.
AVG. DGM VACUUM:	13.0	in. Hg.
AVG. STACK TEMPERATURE:	108.0	°F
AVG. SQ. ROOT OF □P:	.8246	
AVG. ORIFICE PRESS. (□H):	2.52	in. H_2O
GAS SAMPLE VOLUME V_m:	70.66	dscf
AVG. DRY GAS METER TEMP:	83.3	°F
FIBERGLASS FILTER WEIGHT:	.0302	gms
PROBE & NOZZLE WASHINGS:	.00141	gms
IMPINGER (BACK HALF) WEIGHT:	.009	gms
ACETONE WASH BLANK:		gms
IMPINGER MOISTURE VOLUME:	79	mls
SILICA GEL WEIGHT INCREASE:	11	gms
PRODUCTION RATE:		#/hr
BTU HEAT INPUT:		mmBTU/hr

CONSTANTS & CALCULATIONS

T_s (Absolute average stack gas temperature) = 460 + T_s = 460 + 108 = 568 °R

T_m (Absolute average DGM temperature) = 460 + Avg. DGM Temp. = 460 + 83.3 = 543.3 °R

T_{std} (Standard absolute temperature) = 528 °R

P_s (Absolute stack gas pressure) = P_b + (P static÷13.6 in H_2O/in Hg) = 27.42 + (-.21 ÷13.6) = 27.405 in Hg

P_{std} (Standard absolute pressure) = 29.92 in Hg

40CFR 60 APP. A, Method 5, Sect. 6.3 Eq. 5-1

DGM $V_{m(std)}$ = V_m x Y x T_{std}/T_m x (P_m/P_{std}) = 70.66 x .945 x528÷543.3 x(27.605 ÷29.92) = 59.872 dscf

V_{lc} (Total volume of liquid collected) = impingers + silica gel = 79 + 11 = 90 mls

K_2 (water constant for density, ideal gas, molecular weight, etc.) = .04707

40CFR 60 APP. A, Method 5, Sect. 6.4 Eq. 5-2

V_w (std) (Water vapor volume corrected to std. conditions) = V_{lc} x K_2 = 90 x .04707 = 4.236 scf

40CFR 60 APP. A, Method 5, Sect. 6.5 Eq. 5-3

B_{ws} (Water vapor in gas proportioned by volume) = $V_w \div (V_{m(std)} + V_w)$ = 4.236 ÷ (4.236 + 59.472) = .06608

MOISTURE CONTENT OF STACK GAS = (100 x B_{ws}) = 100 x .06608 = 6.608 %H_2O

~~N2% = 100 - %O2 - %CO2 - %CO~~ = 100 - _____ - _____ - _____ = _____ %

MW_{dry} = 0.44 x CO_2% + 0.32 x O_2% + 0.28(N_2% + CO%)
= 0.44 x _____ + 0.32 x _____ + 0.28 x (_____ + _____) = 29 lb/lb-mole

MW_{wet} = MW_{dry} x(1- B_{ws}) + 18 lb/lb-mole x B_{ws} = 29 x (1 - .06608) + 18 x .06608 = 28.273 lb/lb-mole

40CFR 60 APP. A, Method 2, Sect. 5.3 Eq. 2-10

V_s (stack velocity) = K_p x 60 sec/min x C_p x $(\sqrt{\Delta P})_{avg}$ x $\sqrt{[T_s \div (P_s \times MW_{wet})]}$
where K_p = 85.49 fps x [(lb/lb-mole) x (in. Hg) ÷ (°R) x (in. H_2O)]$^{1/2}$
= 85.49 x 60 x .84 x .8246 x $\sqrt{[568 \div (27.405 \times 28.273)]}$ = 3642.02 fpm

A_{stack} = π x Dia.^{2} ÷ 4 ÷ 144 = 3.14159 x 62.25^2 ÷ 4 ÷ 144 = 21.135 ft^2

Q_a (Actual volumetric stack gas flow rate) = A_{stack} x V_s = 21.135 x 3042.02 = 64293.6 acfpm

Q_{sd} (Dry standard volumetric stack gas flow rate) = (1-B_{ws}) x Q_a x (528 ÷ T_s) x (P_s ÷ 29.92) =
= (1 - .06608) x 64293.6 x (528 ÷ 568) x (27.405 ÷ 29.92) = 51,124.8 acfpm

A_n (Area of stack sampling nozzle) = π x (Dia_{nozzle} ÷ 12)^2 ÷ 4 = 3.14159 x (.25 ÷ 12)^2 ÷ 4 = .0003409 ft^2

40CFR 60 APP. A, Method 5, Sect. 6.11.1 Eq. 5-7

ISOKINETIC VARIATION = 100xT_sx(K_3xV_{lc}+(V_mxY÷T_m)x(P_b+ΔH÷13.6))÷(Time xV_sxP_sxA_n):
where K_3 = 0.002669 in Hg-ft^3/ml-°R

= 100x 568 x [0.002669 x 90 + (70.66 x .945 ÷ 543.3) x
(27.42 + 2.52 ÷ 13.6)] ÷ (.72 x 3042.02 x 27.405 x .0003409) = 100.85 %
27.605 2046.12

$W_{total\ Particulate}$ = Fiberglass Filter Weight + Probe and Nozzle Washing + Impinger (Back Half) +
Acetone Wash Blank = .0302 + .00141 + .0078 + _____ = .03941 gms

40CFR 60 APP. A, Method 5, Sect. 6.9 Eq. 5A-5

PARTICULATE CONCENTRATION = $W_{Total\ Part.}$ x K_1 ÷ $V_{m\ (std)}$: where K_1 = 15.43 grains/ft^3 ÷ 1 g/ft^3

= .003941 x 15.43 ÷ 59.872 = .01016 gr/dscf

PARTICULATE EMISSIONS RATE = 60 min/hr x Part Con. x Q_{sd} ÷ K_4 : where K_4 = 7000 grains/lb

= 60 x .01016 x 51,124.8 ÷ 7000 = 4.451 lb/hr

40CFR 60.284(c)3

PARTICULATE CONCENTRATION @ 15% O2 = Part Con. x(20.9-15) ÷(20.19-O2%)

= _____ x (20.9-15) ÷ (20.9 - _____) = _____ gr/dscf

APPENDIX F
FIELD CALIBRATION DATA

LEFT INTENTIONALLY BLANK

APPENDIX G
QUALITY RECORDS

4-Mar-11

DRY GAS METER

Model:	522						522					
Serial #:	906017 Box #2						610022 Box #1					
Location:	Spokane						GEG					
Date	3/4/2011	3/4/2011	3/4/2011	3/4/2011	3/4/2011		3/4/2011	3/4/2011	3/4/2011	3/4/2011	3/4/2011	
Console leak check (cfm)	0	0	0	0	0		0	0	0	0	0	
Orifice setting (^h)	0.5	1	2	3	3.5		0.5	1	2	3	3.5	
Barometric pressure (in. Hg)	27.745	27.745	27.745	27.745	27.745		27.745	27.745	27.745	27.745	27.745	
Volume												
beginning reading	828.3	832.41	838.09	845.93	855.73		325.8	339.48	345.41	353.54	363.83	
ending reading	832.41	838.09	845.93	855.73	866.18		329.85	345.41	353.54	363.83	374.96	
Total Volume (Vd) ft3	4.11	5.68	7.84	9.8	10.45		4.05	5.93	8.13	10.29	11.13	
Temperature (deg F)												
beginning inlet												
ending inlet												
beginning outlet	54	57	58	60	62		51	53	56	57	59	
ending outlet	57	58	60	61	62		53	56	57	59	60	
average outlet temp (Tmo)	55.5	57.5	59	60.5	62		52	54.5	56.5	58	59.5	
average temp (Tm)	55.5	57.5	59	60.5	62		52	54.5	56.5	58	59.5	

CALIBRATION METER

Yc	**0.999**	**0.999**	**0.999**	**0.999**	**0.999**		**0.999**	**0.999**	**0.999**	**0.999**	**0.999**	
Volume												
beginning reading	785.280	789.330	795.000	802.82	812.56		738.000	750.920	756.500	764.22	773.97	
ending reading	789.330	795.000	802.820	812.52	823		741.820	756.500	764.220	773.97	784.52	
Total Volume (Vc) ft3	4.05	5.67	7.82	9.7	10.44		3.82	5.58	7.72	9.75	10.55	
Temperature												
beginning	54	56	56	56	57		51	51	53	54	54	
ending	56	56	56	57	57		53	53	54	54	54	
average temp (Tc)	55	56	56	56.5	57		52	52	53.5	54	54	
Time (min)	10	10	10	10	10		10	10	10	10	10	
						AVERAGE						**AVERAGE**
Y:	0.984	0.997	0.997	0.988	0.998	**0.993**	0.941	0.942	0.949	0.946	0.948	**0.945**
Difference from Average:	-0.009	0.004	0.004	-0.005	0.005		-0.004	-0.003	0.004	0.001	0.003	
^H@:	1.787	1.823	1.912	1.862	1.873	**1.851**	1.999	1.864	1.952	1.834	1.822	**1.894**
Difference from Average:	-0.065	-0.028	0.060	0.010	0.022		0.105	-0.030	0.058	-0.060	-0.072	

Y Acceptance criteria: +/- 0.02 From Average

^H@ Acceptance criteria: +/- 0.2 From Average

2011 Probe / S-Type Pitot Cals

Date:	3/4/2011		Calibrated by:		MK									
	Dimensions			Alignment						Pitot to probe components				
BH Probe	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	P-0.500"	Pitot to Sheath	Pitot to T/C	Perpendicular to Probe	Meets criteria for Cp = 0.84
BH#1-3'ss	0.378	0.251	0.251	1°	1°	1°	1°	0	0	0.498	0.438	0.415	0.156	Yes
BH#2-3'ss	0.376	0.247	0.247	0	0	0	0	0	0	0.497	0.429	0.414	0.161	Yes
BH#1-4'HT	0.378	0.251	0.251	2°	2°	0	0	0	0	0.496	0.441	0.418	0.221	Yes
BH#1-5'ss	0.379	0.250	0.250	0	0	0	0	0	0	0.498	0.530	0.429	0.197	Yes
BH#1-6'ss	0.380	0.249	0.249	1°	1°	0	0	0	0	0.488	0.297	0.376	0.209	Yes
BH#2-6'ss	0.376	0.251	0.251	0	0	0	0	0	0	0.481	0.289	0.368	0.211	Yes
BH#3-6'ss	0.380	0.249	0.249	0	0	0	0	0	0	0.491	0.297	0.373	0.214	Yes
BH#4-6'ss	0.379	0.252	0.252	1°	1°	0	0	0	0	0.492	0.288	0.377	0.196	Yes
BH#5-6'ss	0.381	0.250	0.250	0	0	0	0	0	0	0.497	0.286	0.371	0.207	Yes
BH#6-6'ss	0.379	0.249	0.249	1°	1°	1°	1°	0	0	0.491	0.284	0.376	0.202	Yes
BH#1-7'ss	0.380	0.250	0.250	2°	2°	0	0	0	0	0.486	0.391	0.416	0.210	Yes
BH#2-7'ss	0.382	0.250	0.250	0	0	0	0	0	0	0.490	0.393	0.409	0.218	Yes
BH#1-8'HT	0.379	0.251	0.251	1°	1°	0	0	0	0	0.490	0.399	0.408	0.210	Yes
BH#2-8'ss	0.383	0.253	0.253	0	0	0	0	0	0	0.488	0.414	0.419	0.222	Yes
BH#1-10'ss	0.386	0.253	0.253	2°	2°	0	0	0	0	0.490	0.403	0.418	0.212	Yes
BH#2-10'ss	0.382	0.252	0.252	0	0	0	0	0	0	0.492	0.413	0.423	0.223	Yes
BH#1-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.417	0.216	Yes
BH#2-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.417	0.216	Yes
	Dimensions			Alignment										
BH S-Type	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	CP - 0.84				
BH#1-4'ss	0.38	0.248	0.248	0	0	0	0	0	0	Yes				
BH#1-7'ss	0.380	0.251	0.251	0	0	0	0	0	0	Yes				
BH#1-10'ss	0.380	0.248	0.248	0	0	0	0	0	0	Yes				

3/4/2011

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 3' #1 Probe	31	**-1**		206	**-2**		395	**-1**	

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 3' #2 Probe	30	**-2**		205	**-3**		394	**-2**	

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 4' Hi-Temp Probe	31	**-1**		206	**-2**		393	**-3**	

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 5' Probe	32	**0**		204	**-4**		396	**0**	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #1 Probe	32	**0**		207	**-1**		397	**1**	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #2 Probe	32	**0**		208	**0**		394	**-2**	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #3 Probe	32	**0**		209	**1**		398	**2**	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #4 Probe	30	**-2**		204	**-4**		395	**-1**	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84

BH 6' #5 Probe	33	1		207	-1		395	-1	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
MFB 7' #1 Probe	32	0		207	-1		399	3	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 7' #2 Probe	33	1		205	-3		394	-2	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 8' #1 Hi-Temp Probe	33	1		206	-2		398	2	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 8' #2 Probe	34	2		203	-5		396	0	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 10' #1 Probe	34	2		203	-5		401	5	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 10' #2 Probe	35	3		205	-3		398	2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #1	32	0		207	-1	
Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #2	32	0		208	0	
Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)

NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #3	31	**-1**		206	**-2**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #4	31	**-1**		207	**-1**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #1	31	**-1**		206	**-2**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #2	31	**-1**		206	**-2**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #3	30	**-2**		206	**-2**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #4	31	**-1**		206	**-2**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
Meter Box #906017	31	**-1**		207	**-1**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
Meter Box #0610022	30	**-2**		206	**-2**	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
Meter Box #0307031	32	**0**		205	**-3**	

Calibration date:						
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)

NIST		N/A	#VALUE!		N/A	#VALUE!			
Meter Box #40835notinuse		**#VALUE!**			**#VALUE!**				

2011 Glass Nozzle Calibration Sheet						
Date:	1/12/2011		Calibrated by:		MK	
				Mike		
Nozzle ID	**D1 (inches)**	**D2 (inches)**	**D3 (inches)**	**Delta D (in)**	**D avg**	
BH1/8"-1g	0.125	0.124	0.125	0.001	**0.1247**	0.1250
BH5/32"-1G	0.156	0.157	0.158	0.002	**0.1570**	0.1563
BH3/16"-1g	0.182	0.182	0.181	0.001	**0.1817**	0.1875
BH7/32"-1g	0.222	0.224	0.222	0.002	**0.2227**	0.2188
BH1/4"-1g	0.250	0.251	0.250	0.000	**0.2503**	0.2500
BH1/4"-2G	0.251	0.252	0.249	0.002	**0.2507**	0.2500
BH9/32"-1g	0.281	0.282	0.282	0.001	**0.2817**	0.2813
BH5/16"-1g	0.319	0.318	0.319	0.001	**0.3187**	0.3125
BH11/32"-1g	0.349	0.348	0.348	0.001	**0.3483**	0.344
BH3/8"-1g	0.374	0.375	0.374	0.002	**0.3743**	0.3750
BH3/8"-2g	0.372	0.372	0.373	0.002	**0.2798**	0.3750
BH13/32"-1g	0.408	0.408	0.406	0.002	**0.4073**	0.4063
BH7/16"-1g	0.431	0.431	0.432	0.002	**0.4313**	0.4375
BH1/2"-1g	0.496	0.497	0.496	0.002	**0.4963**	0.5000
BH9/16"-G	0.562	0.562	0.563	0.001	**0.5623**	0.5625
BH9/32"-2g	0.281	0.282	0.282	0.001	**0.2817**	0.2813
BH1/4"-3g	0.250	0.251	0.250	0.002	**0.2503**	0.2500
BH1/4"-4g	0.251	0.250	0.250	0.002	**0.2503**	0.2500
BH1/4"-5g	0.250	0.250	0.250	0.002	**0.2500**	0.2500
BH1/4"-6g	0.250	0.250	0.250	0.002	**0.2500**	0.2500
BH3/8"-3g	0.374	0.373	0.373	0.002	**0.2805**	0.3750
BH3/8"-4g	0.375	0.375	0.374	0.002	**0.2815**	0.3750

DGM Y Determination (critical orifice method)

Date:	6/4/2011	Train ID:	610022
K' factor:	0.60445		
Critical Orifice ID:	63		

Dry Gas Meter		Run Number 1	2	3
Final reading	ft^3	101	106	111
Initial reading	ft^3	96	101	106
Difference, Vm	ft^3	5	5	5
Inlet temps:				
Initial	F	81	79	79
Final	F	79	79	76
Outlet temps:				
Initial	F	81	79	79
Final	F	79	79	76
Avg. temp	F	80	79	77.5
Time	sec	358	359	361
Orifice reading	in H2O	1.9	1.9	1.9
Bar. Pressure	in Hg	27.91	27.91	27.91
Ambient temp.	F	71	71	71
Pump vacuum	in Hg	15	15	15
Vm(std)	ft^3	4.58	4.59	4.60
Vcr(std)	ft^3	4.37	4.38	4.40
DGM cal factor Y		0.953	0.954	0.957

Avg DGM cal factor	0.955

DGM Y Determination (critical orifice method)

Date:	6/4/2011	Train ID:	906017
K' factor:	0.60445		
Critical Orifice ID:	63		

Dry Gas Meter		Run Number 1	2	3
Final reading	ft^3	15.1	20.5	26
Initial reading	ft^3	10	15.5	21
Difference, Vm	ft^3	5.1	5	5
Inlet temps:				
Initial	F	62	63	65
Final	F	64	65	67
Outlet temps:				
Initial	F	62	63	65
Final	F	64	65	67
Avg. temp	F	63	64	66
Time	sec	400	396	393
Orifice reading	in H2O	1.9	1.9	1.9
Bar. Pressure	in Hg	27.91	27.91	27.91
Ambient temp.	F	71	71	71
Pump vacuum	in Hg	15	15	15
Vm(std)	ft^3	4.82	4.72	4.70
Vcr(std)	ft^3	4.88	4.83	4.80
DGM cal factor Y		1.012	1.023	1.020
Avg DGM cal factor			1.018	

METHOD 5 BLANK ANALYSIS DATA FORM					
Sample Prepared by:		Homer		Date	6/3/2011
	Acetone				
Final Wt 1.:	117.48660				
Final Wt 2.:	117.48660				
Final Wt. Avg.:	117.48660				
Tare:	117.48610				
Difference:	0.00050				
Solvent vol.:	200.00000				
Residue (g/ml):	**0.0000025**				
Residue (mg/ml):	**0.0025**				

Figure 5.3a - Page 2

METHOD 5 BLANK ANALYSIS DATA FORM

Samples Prepared by Keating Date 6/22/11

Front Half:	Date/Time	Weight(g)	Audit*	T-°F	RH-%	By
Filter						
Filter ID ____						
Tare Wt. ____						
Acetone	6/23/11/16:35	117.4868	100.0115	68	49	MK
Beaker ID 14B	6/27/11/09:35	117.4866	100.0115	68	49	MK
Tare Wt. 117.4861						
Solv. Vol. -200-						
Solv. ID ____						
6/23/11/09:52						
Water						
Beaker ID ____						
Tare Wt. ____						
Solv. Vol. ____						
Solv. ID ____						
DCM						
Beaker ID ____						
Tare Wt. ____						
Solv. Vol. ____						
Solv. Wt. ____						

* 0.5000 g ± tolerance - NIST traceable Class S weight

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

MAR 5 1997

Mr. Cody Cress
Apex Instruments
P.O. Box 727
125 Quantum Street
Holly Springs, North Carolina 27540

Dear Mr. Cress:

This correspondence is in response to your letter to Mr. Peter Westlin dated February 13, 1997. In the letter you requested USEPA approval with documentation for the following method specification modifications:

1) Reduce Method 5-type dry gas meter temperature sensors from two to one. Current Method 5 specifications require the use of two temperature sensors (one located at the inlet to the dry gas meter and one located at the dry gas meter outlet).

2) Reduce the diameter size of the Method 201A filter holder assembly from 63-mm to 47-mm. The current specifications list a 63-mm filter assembly which is available from only one specific vendor.

3) Incorporate the use of an orifice device to indicate and measure sample flow rate within the Method 6 sampling system. The current Method 6 specifies the use of a rotameter, or equivalent to measure the sample flow rate.

<u>Dry Gas Meter Temperature Sensors</u>

EPA has conducted in-house evaluation tests using three sensors (one sensor was used as a control) and found that the outlet temperature sensor provided the most accurate

measurement. Therefore, it is acceptable to use only one temperature sensor if the sensor is positioned either in the meter's plenum or at the gas meter outlet connection.

Method 201A Filter Holder Assembly

EPA agrees that the filter size specification, 63-mm, and the text, Andersen filter part number SE274 described in Section 2.1.3 of Method 201A is to specific and intends to amended Section 2.1.3 as follows:

2.1.3 Filter Holder. A filter holder assembly constructed of stainless steel capable of supporting a glass fiber filter, without organic binder. Other materials of construction (e.g., glass, Teflon) may be used, subject to approval of the Administrator. The holder design shall provide a positive seal against leakage from the outside or around the filter. The holder shall be attached as shown in Figure 1. Method 201A Sampling Train.

Method 6 Flow Rate Indicator

EPA approves the use of an orifice assembly to indicate and measure the flow rate of the Method 6 type sampling train, provided that the assembly can measure the flow rate to within two percent of the desired flow rate of about 1000 cc/min. Unlike the rotameter, which does not require calibration, the orifice assembly calibration should be verified along with the metering system as described in Section 5.1.1 Initial Calibration and Section 5.1.2 Post-Test Calibration Check.

EPA believes that the revised method specification modifications stated above do not compromise the technical operating and maintenance procedures stated in the specific methods.

If you have any questions or if you would like to discuss the above responses, please call me at (919) 541-5239.

Sincerely,

Clyde E. Riley

Clyde E. Riley
Emission Measurement Center

cc: Mike Ciolek (MD-19)
Foston Curtis (MD-19)
Bill Lamason (MD-19)
Tom Logan (MD-19)
Conniesue Oldham (MD-19)
Tom Ward (MD-74B)

APEX INSTRUMENTS REFERENCE METER CALIBRATION
USING WET-TEST METER #11AE6
15-POINT ENGLISH UNITS

Calibration Meter Information	
WTM Model #	AL-20
WTM Serial #	11AE6
WTM Gamma	0.9999

Calibration Conditions			
Date	Time	12-Jan-11	8:30
Barometric Pressure		29.7	in Hg
Calibration Technician		EW	
DGM Serial Number		S-110-1019226	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	°R/in Hg

Calibration Data												Results		
Run Time	Dry Gas Meter						Calibration Meter					Dry Gas Meter		
												Calibration Factor		Flowrate
Elapsed	Meter Pressure	Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final	Value	Variation	Std & Corr
(θ)	(P_m)	(V_{mi})	(V_{mf})	(V_m)	(t_{mi})	(t_{mf})	(Vw_i)	(Vw_f)	(V_w)	(t_{wi})	(t_{wf})	(Y)	(ΔY)	($Q_{m(std)corr}$)
min	in H_2O	cubic feet	cubic feet	cubic feet	°F	°F	cubic feet	cubic feet	cubic feet	°F	°F			cfm
5	-5.0	256.676	262.834	6.158	66.2	68.0	564.230	570.200	5.970	62.0	62.0	0.9911	0.00053	1.20
11	-5.0	262.834	276.379	13.545	68.0	68.0	570.200	583.295	13.095	62.0	62.0	0.9900	-0.00053	1.20
5	-5.0	276.379	282.525	6.146	68.0	68.0	583.295	589.240	5.945	62.0	62.0	0.9906	0.00000	1.19
										Passed Calibration Fa		0.9906	Averages	1.20
6	-3.7	300.635	306.582	5.947	69.8	69.8	607.095	612.865	5.770	62.5	62.5	0.9928	0.00023	0.96
6	-3.7	306.582	312.548	5.966	69.8	69.8	612.865	618.650	5.785	62.5	62.5	0.9922	-0.00036	0.97
6	-3.7	312.548	318.510	5.962	69.8	69.8	618.650	624.434	5.784	62.5	62.5	0.9927	0.00013	0.97
										Passed Calibration Fa		0.9926	Averages	0.97
7	-3.0	318.510	324.083	5.573	69.8	69.8	624.434	629.860	5.426	62.5	63.0	0.9940	0.00041	0.78
7	-3.0	324.083	329.641	5.558	69.8	69.8	629.860	635.280	5.420	63.0	63.0	0.9951	0.00152	0.78
7	-3.0	329.641	335.208	5.567	69.8	69.8	635.280	640.690	5.410	63.0	63.0	0.9917	-0.00193	0.77
										Passed Calibration Fa		0.9936	Averages	0.78
10	-2.3	335.208	340.811	5.603	69.8	69.8	640.690	646.180	5.490	63.0	63.0	0.9982	-0.00030	0.55
10	-2.3	340.811	346.406	5.595	69.8	69.8	646.180	651.650	5.470	63.0	63.0	0.9959	-0.00251	0.55
10	-2.3	346.406	352.012	5.606	69.8	69.8	651.650	657.160	5.510	63.0	63.0	1.0013	0.00280	0.55
										Passed Calibration Fa		0.9985	Averages	0.55
15	-2.0	282.525	288.586	6.061	68.0	68.0	589.240	595.220	5.980	62.0	62.0	1.0028	0.00032	0.40
15	-2.0	288.586	294.610	6.024	68.0	68.0	595.220	601.160	5.940	62.0	62.0	1.0023	-0.00027	0.40
15	-2.0	294.610	300.635	6.025	68.0	69.8	601.160	607.095	5.935	62.0	62.5	1.0025	-0.00005	0.40
										Passed Calibration Fa		1.0025	Averages	0.40
										Overall Average Y		0.9955		

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N I S T)

Signature [illegible] Date 1/12/11

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

Bighorn Environmental
1324 N. Liberty Lake Road
Spokane, WA 99019

CERTIFICATE OF CALIBRATION

Certificate Date: 7/26/10

The instruments listed below have been serviced and calibrated by Quality Control Services on the date indicated. Service consists of accuracy tests, adjusting to manufacturer or customer specifications and complete calibration with standards traceable to the National Institute of Standards(NIST).

Item	Make Model	Serial Number Customer's ID	Location	Contact	Calibration Date	Calibration Due Date
Balance	Ohaus AP310	N91676	Lab	Tim Homer	7/26/10	7/2011

STANDARDS

Item	Make	Model	Serial #	NIST ID	Cal Date	Cal Due
Weight Set	Rice Lake	30 kg-1mg	S751	2007-1507	3/12/09	3/2011

Technician: R. Hintz

Signature:

PTID: BIGE01

Member: National Council of Standards Laboratories and Weights & Measures

Smoke School Inc

EPA Reference Method 9 Certification Card

Michael Keating

Cert. No. SS-S09-48 Exp. Date 2011-09-22

Certified Reader's Signature

Smoke School Inc. President

CLIENT: Sorrento

SOURCE: Whey Dryer - Tetrapak

DATE: 6/3/11

POST TC CALIBRATION CHECK

Probe ID	Reference Temp	TC reading	Date
BH5'-#2	130	132	6/3
BH6'#2	105	102	

NOx CONVERTER CHECK

Bottle ID	Conc	Time	Actual reading	w/in 90%
	NA			

Cyclonic Flow check <20 deg ✓

Method 16A Temp Checks

Item	Setting	Beg Temp	End Temp
Probe			
Filter	NA		
Heated Line			

Stratification Check (if needed)

	Avg.	Abs Difference
Point #1 (16.7%)		#DIV/0!
Point #2 (50%)	NA	#DIV/0!
Point #3 (83.3 %)		#DIV/0!
Average of 3 points	#DIV/0!	

	Complete	Date
Post DGM calibration check complete	✓	
Pitot tube visual inspection	✓	6/3
Water or Actetone Blank collected	✓	6/3

FIGURE 1.4

SOURCE EMISSION TEST CERTIFICATION

Test Team Report Reviewer

I hereby certify that I have reviewed this report and find it to be true and accurate, and in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control to the best of my knowledge.

Name Tim Hamer
(Print)

Signature _____ Date 6/29/11

Affiliation Bechtem

FIGURE 1.3

SOURCE EMISSION TEST CERTIFICATION

Test Team Leader

I hereby certify that the test detailed in this report was accomplished in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control. The results submitted herein are accurate and true to the best of my knowledge.

Name Tim Homer
(Print)

Signature _____ Date 6/29/11

Affiliation Bighorn

APPENDIX H
PRODUCTION DATA

What is Pressure Drop across Baghouse?
wrt - what is finished

Time	DPT	Flow PPH
14:00	3	23625
14:15	3.45	23506
14:30	3.5	23601
14:45	3.27	24190
15:00	3.05	23971
15:15	3.46	23353
15:30	3.56	24278
15:45	3.11	22576
16:00	3.07	23071
16:15	3.09	23115
16:30	3.47	22802
16:45	3.09	22443
17:00	3.58	22540
17:15	3.38	22705
17:30	3.07	21739
17:45	3.35	22405
18:00	3.39	22509
18:15	3.36	22500
18:30	3.1	22650
18:45	3.44	22150
19:00	3.38	21890
19:15	3.23	22537
19:30	3.02	22235
19:45	3.01	22680
20:00	3.44	21778
20:15	3.4	20414
20:30	3.07	20998
20:45	3.04	20868
21:00	3.01	20593
21:15	3.01	20875
21:30	3.46	21175
21:45	3.02	21296
22:00	3.42	21377

Run 1

DPT	Flow PPH
3.346	23,724

Run 2

DPT	Flow PPH
3.28	22,779

Run 3

DPT	Flow PPH
3.22	22,377

APPENDIX I
IDEQ CORRESPONDENCE

May 5, 2011

Mr. Thomas Krinke
Department of Environmental Quality
1445 N. Orchard Street
Boise, ID 83706-2239

RE: Sorrento Lactalis Nampa, ID Source Test Plan - Revised

Dear Mr. Krinke:

Please allow this letter to serve as notification that Bighorn Environmental Air Quality, LLC is scheduled to perform source testing at Sorrento Lactalis Nampa, ID facility. This testing is required to satisfy the source testing required in Sorrento Lactalis Permit to Construct. This revision adds Method 5/202 testing to the Whey Dryer Scrubber because it is a saturated source.

Purpose of Tests: To determine the compliance status of the facility as required by Sorrento Lactalis Permit #P-2009.0023, section 3.11.

Source Contact: Wendy York (208) 463-6674; PO Box 1280, Nampa, ID 83653

Sources, Parameters, and Test Dates: The following table outlines parameters and proposed test dates.

SOURCE NAME	PARAMETERS	TEST DATES
Tetrapak Whey Dryer Scrubber (P-4)	PM/CPM, Opacity, Velocity & Moisture	June 3, 2011
Tetrapak Shaking Bed Baghouse (P-5)	PM_{10}, Opacity, Velocity & Moisture	

If testing dates change, Bighorn personnel will call you soon after scheduling the new dates.

Test Methods: Testing will be conducted in accordance with the following EPA Methods *in Title 40 CFR 51 & 60, Appendix M & A, July 2009.*

Flow Rates:	EPA Methods 1 & 2
Moisture:	EPA Method 4
PM/CPM:	EPA Method 5/202
PM_{10}:	EPA Method 201A
Opacity:	EPA Method 9

Discussion of Methods: EPA Methods 1 & 2 will be used to determine flow rates. A check of the stack to verify the flow is non-cyclonic will be conducted before the test. Opacity readings will be conducted during each run using EPA Method 9. Smoke School Inc. certified the opacity observers in March 2011. Since the stack gas is essentially ambient air (no combustion gases) an assumed MW of 29 will be used as outlined in Method 2, Section 8.6 for ambient sources. The Method 5/202 will use the "new" Method 202 with back-half filter and nitrogen purge.

Data Collection: Bighorn uses standard forms, which contain all required regulatory data and any additional information necessary for flow rate and particulate determinations. Also, Bighorn uses standard analytical forms for opacity, particulate filter and silica gel records. Sorrento Lactalis personnel will collect the production/process

data required by permit condition, to show the source was operated at the maximum throughput rates stipulated in Section 3.11.2 of the permit. Please see the attachments for sample data sheets and calculations.

Source Description: Dried whey powder will be manufactured in the TetraPak whey dryer process equipment. Up to 400,000 lb/day of (95.5 percent total solid) dried whey powder will be produced in this drying process. The TetraPak whey dryer will receive whey concentrate at a rate up to 619,176 pounds per day (lb/day), assuming 62% solids content, from a new evaporator at the plant. The TetraPak whey drying process consists of two 12.5 MMBtu/hr natural gas fired burners, a drying chamber, and shaking beds. The two burners heat air that passes into the drying chamber to dry Whey. The burners are considered indirect heating devices because the combustion gases do not come in contact with the heated air. Each burner has an exhaust stack (P-2 and P-3) that discharges natural gas combustion products. The heated air dries the whey concentrate as it flows through the drying chamber. The drying chamber exhausts to cyclones where product in air is recovered. The cyclones are considered as process equipment for this application. The purpose of this equipment is to recover solids suspended in air discharged from the dryer, the recovered solids are returned to the process line. The exhaust from the cyclones passes through a venturi air scrubber (P-4) to control discharge of particulate matter from this process. Product from the drying chamber passes over a conditioning belt onto a shaking bed and then to storage silos. Exhaust air from the shaking bed passes through a baghouse (P-5) to recover product and control discharge of particulate matter to the air. The proposed natural gas-fired dryer burners (P-2 and P-3) combust natural gas exclusively and are rated at less than 50 MMBtu/hr of heat input. Therefore, the dryer burners are exempt from State of Idaho air permit requirements per IDAPA 58.01.01.222.02.c.

Sampling Replicates and Duration: Bighorn will conduct tests consisting of three 84-minute runs for PM_{10} and three runs of six-minute averages for opacity as required by permit.

QC/QA: Cross checks such as manual calculations of Bighorn's computer generated spreadsheet summaries allow test results verification. Bighorn files manufacturers' accuracy certificates and interference tables for CEMS, flow controllers, gases, etc. Additionally dry gas meters, pitot tubes, thermocouples, gas dividers, etc. are certified as per EPA requirements and frequencies. Where EPA frequencies are not specified, Bighorn has established those based on state regulatory criteria.

Thorough sample methodology adherence, chain-of-custody procedures, and documentation provide proof of our QA/QC efforts. Relevant QA/QC documentation is included in the final report's Appendices for results support and regulatory review. Please see the attachments for further discussion of QA/QC procedures.

Standard Source Sampling Language

a. It is assumed today, but will be confirmed on or before the test day, that the duct air flow measuring meets criteria in EPA Methods 1 and 2.
b. In no case, will sampling replicates be accepted if separated by a time duration of 24 or more hours, unless prior authorization is granted.
c. The sources to be tested must operate at a normal production rate during testing. Rates not in agreement with those stipulated in the Permit can result in test rejection for application to determine facility compliance. Imposed process limitations could also result from atypical rates.
d. The department must be notified of any changes in source test plans prior to testing. Significant changes not acknowledged by DEQ which could affect the accuracy and reliability of results could result in test report rejection.
e. Method specific quality assurance/quality control procedures must be performed to ensure the data is valid for determining source compliance. Documentation of the procedures and results shall be presented in the source test report for review. Omission of this critical information may result in rejection of the data, requiring a re-test.

f. Source test reports must be submitted to the department within 30 days of the test dates, unless another deadline has been stipulated, either by permit condition, or by DEQ letter approval.

Please call me at 541-954-4697 if you have any questions.

Sincerely,

Tim Homer
Air Emissions Lab Manager

Attachments-Sample Data and QA/QC forms

cc: Wendy York
EPA –Region 10

QUALITY CONTROL OUTLINE

A) Equipment Calibration

The meter box dry gas meter (DGM) will be calibrated within six months before the test against a standard DGM, which has been calibrated against a NIST traceable wet test meter (calibrated yearly). In addition a post DGM calibration will be conducted using a critical orifice at the average Delta H and maximum meter vacuum recorded during the testing.

Thermocouples will be calibrated against a NIST traceable thermometer within six months of the testing at three distinct points including an ice bath, boiling water and a recovery furnace stack that is approximately 350 ° F.

Probes and their attached S-type pitot tubes are calibrated as outlined in EPA Method 2 within six months of the test date.

The probe nozzles have been calibrated and measured prior to their use in the field.

The aneroid barometer is calibrated against a mercury barometer before each field assignment.

B) Laboratory Analysis

All samples are returned to the lab for analysis. Prior to each weighing the scale (accurate to 0.1mg) is calibrated with NIST traceable S class weights. The filters are oven dried for a minimum of three hours and weighed. The probe rinse is evaporated in a breaker and then desiccated for at least 24 hours before weighing. It is then returned to the desiccator and re-weighed at 6 hours intervals until a constant weight (± 0.5 mg) is achieved. Acetone blanks are prepared and analyzed in the same manner as the probe wash.

C) Sampling

A pre and post run leak check of the entire sampling train is performed in conjunction with each test run.

A pitot leak check is also conducted for each test run.

Thermocouples are checked against ambient conditions to determine field integrity.

Impinger contents are measured at the conclusion of each run to determine stack gas moisture.

The probe is rinsed following procedures outlined in the method and the rinse transferred to polyethylene bottles and the liquid level marked.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

May 17, 2011

Ms. Wendy York
Safety and Environmental Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Ave.
Nampa, ID 83653-1230

Re: Review of the Tetrapak Whey Dryer Scrubber and Shaking Bed Baghouse Performance Test Protocol for Sorrento Lactalis, Inc., Nampa; Facility ID No. 027-00071

Dear Ms. York:

On May 2, 2011, the Department of Environmental Quality (DEQ) received a test protocol, prepared by Bighorn Environmental Air Quality, LLC, for particulate matter and opacity testing to be conducted on the exhausts of the Tetrapak whey dryer scrubber and shaking bed baghouse. A revised test protocol was received May 9, 2011.

Testing is to be conducted pursuant to Permit to Construct No. P-2009.0023 issued August 28, 2009.

DEQ has reviewed the submitted test protocol and hereby approves it with the following comments.

1. Compliance with the PM_{10} emissions limit on the whey dryer scrubber shall be determined by summing the results of Methods 5 (filterable emissions) and 202 (condensible emissions), unless the exhaust gas temperature never exceeds 85 °F, in which case Method 202 is not required because condensible emissions would be negligible (see 40 CFR 51, Appendix M, Section 1.2(a) of Method 202). Similarly, compliance with the PM_{10} emissions limit on the baghouse stack shall be determined by summing the results of EPA Methods 201A and 202, unless the exhaust gas temperature never exceeds 85 °F, in which case only Method 201A is required.
2. The test shall be conducted at worst-case normal operating conditions in accordance with IDAPA 58.01.01.157.02.a. To document the operating conditions during the test, the production rate of finished whey product from the whey dryer must be monitored and recorded at least once every 15 minutes during test runs, unless a totalizing type meter is used, in which case recording the beginning and ending readings for each test run is sufficient for documenting the production rate during testing.
3. Please monitor and record the pressure drop across the scrubber once every 15 minutes during the test runs on the why dryer scrubber to document the operating status of the scrubber.

The testing is scheduled for June 3, 2011. If the testing dates change, you must notify DEQ at least 15 days prior to the new test date; if necessary, please do so by contacting me. If you have any questions or need further assistance, please call me at (208) 373-0419 or Zach Klotovich at (208) 373-0295.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer
DEQ Boise Regional Office

c: Tim Homer, Bighorn Environmental Air Quality, LLC
Zach Klotovich, Technical Services Division
Marilyn Seymore, Air Quality Division

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

May 17, 2011

Ms. Wendy York
Safety and Environmental Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Ave.
Nampa, ID 83653-1230

Re: Review of the Tetrapak Whey Dryer Scrubber and Shaking Bed Baghouse Performance Test Protocol for Sorrento Lactalis, Inc., Nampa; Facility ID No. 027-00071

Dear Ms. York:

On May 2, 2011, the Department of Environmental Quality (DEQ) received a test protocol, prepared by Bighorn Environmental Air Quality, LLC, for particulate matter and opacity testing to be conducted on the exhausts of the Tetrapak whey dryer scrubber and shaking bed baghouse. A revised test protocol was received May 9, 2011.

Testing is to be conducted pursuant to Permit to Construct No. P-2009.0023 issued August 28, 2009.

DEQ has reviewed the submitted test protocol and hereby approves it with the following comments.

1. Compliance with the PM_{10} emissions limit on the whey dryer scrubber shall be determined by summing the results of Methods 5 (filterable emissions) and 202 (condensible emissions), unless the exhaust gas temperature never exceeds 85 °F, in which case Method 202 is not required because condensible emissions would be negligible (see 40 CFR 51, Appendix M, Section 1.2(a) of Method 202). Similarly, compliance with the PM_{10} emissions limit on the baghouse stack shall be determined by summing the results of EPA Methods 201A and 202, unless the exhaust gas temperature never exceeds 85 °F, in which case only Method 201A is required.
2. The test shall be conducted at worst-case normal operating conditions in accordance with IDAPA 58.01.01.157.02.a. To document the operating conditions during the test, the production rate of finished whey product from the whey dryer must be monitored and recorded at least once every 15 minutes during test runs, unless a totalizing type meter is used, in which case recording the beginning and ending readings for each test run is sufficient for documenting the production rate during testing.
3. Please monitor and record the pressure drop across the scrubber once every 15 minutes during the test runs on the why dryer scrubber to document the operating status of the scrubber.

The testing is scheduled for June 3, 2011. If the testing dates change, you must notify DEQ at least 15 days prior to the new test date; if necessary, please do so by contacting me. If you have any questions or need further assistance, please call me at (208) 373-0419 or Zach Klotovich at (208) 373-0295.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer
DEQ Boise Regional Office

c: Tim Homer, Bighorn Environmental Air Quality, LLC
Zach Klotovich, Technical Services Division
Marilyn Seymore, Air Quality Division

QUALITY CONTROL OUTLINE

A) Equipment Calibration

The meter box dry gas meter (DGM) will be calibrated within six months before the test against a standard DGM, which has been calibrated against a NIST traceable wet test meter (calibrated yearly). In addition a post DGM calibration will be conducted using a critical orifice at the average Delta H and maximum meter vacuum recorded during the testing.

Thermocouples will be calibrated against a NIST traceable thermometer within six months of the testing at three distinct points including an ice bath, boiling water and a recovery furnace stack that is approximately 350 ° F.

Probes and their attached S-type pitot tubes are calibrated as outlined in EPA Method 2 within six months of the test date.

The probe nozzles have been calibrated and measured prior to their use in the field.

The aneroid barometer is calibrated against a mercury barometer before each field assignment.

B) Laboratory Analysis

All samples are returned to the lab for analysis. Prior to each weighing the scale (accurate to 0.1mg) is calibrated with NIST traceable S class weights. The filters are oven dried for a minimum of three hours and weighed. The probe rinse is evaporated in a breaker and then desiccated for at least 24 hours before weighing. It is then returned to the desiccator and re-weighed at 6 hours intervals until a constant weight (± 0.5 mg) is achieved. Acetone blanks are prepared and analyzed in the same manner as the probe wash.

C) Sampling

A pre and post run leak check of the entire sampling train is performed in conjunction with each test run.

A pitot leak check is also conducted for each test run.

Thermocouples are checked against ambient conditions to determine field integrity.

Impinger contents are measured at the conclusion of each run to determine stack gas moisture.

The probe is rinsed following procedures outlined in the method and the rinse transferred to polyethylene bottles and the liquid level marked.

What is Pressure Drop across Baghouse?
WRT - what is finished

Time	DPT	Flow PPH
14:00	3	23625
14:15	3.45	23506
14:30	3.5	23601
14:45	3.27	24190
15:00	3.05	23971
15:15	3.46	23353
15:30	3.56	24278
15:45	3.11	22576
16:00	3.07	23071
16:15	3.09	23115
16:30	3.47	22802
16:45	3.09	22443
17:00	3.58	22540
17:15	3.38	22705
17:30	3.07	21739
17:45	3.35	22405
18:00	3.39	22509
18:15	3.36	22500
18:30	3.1	22650
18:45	3.44	22150
19:00	3.38	21890
19:15	3.23	22537
19:30	3.02	22235
19:45	3.01	22680
20:00	3.44	21778
20:15	3.4	20414
20:30	3.07	20998
20:45	3.04	20868
21:00	3.01	20593
21:15	3.01	20875
21:30	3.46	21175
21:45	3.02	21296
22:00	3.42	21377

Run 1

DPT	Flow PPH
3.346	23,724

Run 2

DPT	Flow PPH
3.28	22,779

Run 3

DPT	Flow PPH
3.22	22,377

APPENDIX H
PRODUCTION DATA

FIGURE 1.3

SOURCE EMISSION TEST CERTIFICATION

Test Team Leader

I hereby certify that the test detailed in this report was accomplished in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control. The results submitted herein are accurate and true to the best of my knowledge.

Name Tim Homer
(Print)

Signature _____ Date 6/29/11

Affiliation Bichem

FIGURE 1.4

SOURCE EMISSION TEST CERTIFICATION

Test Team Report Reviewer

I hereby certify that I have reviewed this report and find it to be true and accurate, and in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control to the best of my knowledge.

Name Tim Homer
(Print)

Signature _____ Date 6/29/11

Affiliation Bishop

CLIENT: Sorrento

SOURCE: Whey Dryer - Tetrapak

DATE: 6/3/11

POST TC CALIBRATION CHECK

Probe ID	Reference Temp	TC reading	Date
BH5'-#2	130	132	6/3
BH6'#2	105	102	

NOx CONVERTER CHECK

Bottle ID	Conc	Time	Actual reading	w/in 90%
	NA			

Cyclonic Flow check <20 deg ✓

Method 16A Temp Checks

Item	Setting	Beg Temp	End Temp
Probe			
Filter	NA		
Heated Line			

Stratification Check (if needed)

	Avg.	Abs Difference
Point #1 (16.7%)		#DIV/0!
Point #2 (50%)	NA	#DIV/0!
Point #3 (83.3 %)		#DIV/0!
Average of 3 points	#DIV/0!	

	Complete	Date
Post DGM calibration check complete	✓	
Pitot tube visual inspection	✓	6/3
Water or Actetone Blank collected	✓	6/3

Smoke School Inc

EPA Reference Method 9 Certification Card

Michael Keating

Cert. No. SS-S09-48 Exp. Date 2011-09-22

Certified Reader's Signature

Smoke School Inc. President

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

Bighorn Environmental
1324 N. Liberty Lake Road
Spokane, WA 99019

CERTIFICATE OF CALIBRATION

Certificate Date: 7/26/10

The instruments listed below have been serviced and calibrated by Quality Control Services on the date indicated. Service consists of accuracy tests, adjusting to manufacturer or customer specifications and complete calibration with standards traceable to the National Institute of Standards(NIST).

Item	Make Model	Serial Number Customer's ID	Location	Contact	Calibration Date	Calibration Due Date
Balance	Ohaus AP310	N91676	Lab	Tim Homer	7/26/10	7/2011

STANDARDS

Item	Make	Model	Serial #	NIST ID	Cal Date	Cal Due
Weight Set	Rice Lake	30 kg-1mg	S751	2007-1507	3/12/09	3/2011

Technician: R. Hintz

Signature:

PTID: BIGE01

Member: National Council of Standards Laboratories and Weights & Measures

APEX INSTRUMENTS REFERENCE METER CALIBRATION
USING WET-TEST METER #11AE6
15-POINT ENGLISH UNITS

Calibration Meter Information	
WTM Model #	AL-20
WTM Serial #	11AE6
WTM Gamma	0.9999

Calibration Conditions		
Date / Time	12-Jan-11	8:30
Barometric Pressure	29.7	in Hg
Calibration Technician	EW	
DGM Serial Number	S-110-1019226	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	°R/in Hg

Calibration Data												Results		
Run Time	Dry Gas Meter						Calibration Meter					Dry Gas Meter		
												Calibration Factor		Flowrate
Elapsed	Meter Pressure	Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final	Value	Variation	Std & Corr
(θ)	(P_m)	(V_{mi})	(V_{mf})	(V_m)	(t_{mi})	(t_{mf})	(Vw_i)	(Vw_f)	(V_w)	(t_{wi})	(t_{wf})	(Y)	(ΔY)	($Q_{m(std)(corr)}$)
min	in H_2O	cubic feet	cubic feet	cubic feet	°F	°F	cubic feet	cubic feet	cubic feet	°F	°F			cfm
5	-5.0	256.676	262.834	6.158	66.2	68.0	564.230	570.200	5.970	62.0	62.0	0.9911	0.00053	1.20
11	-5.0	262.834	276.379	13.545	68.0	68.0	570.200	583.295	13.095	62.0	62.0	0.9900	-0.00053	1.20
5	-5.0	276.379	282.525	6.146	68.0	68.0	583.295	589.240	5.945	62.0	62.0	0.9906	0.00000	1.19
										Passed Calibration Fa		0.9906	Averages	1.20
6	-3.7	300.635	306.582	5.947	69.8	69.8	607.095	612.865	5.770	62.5	62.5	0.9928	0.00023	0.96
6	-3.7	306.582	312.548	5.966	69.8	69.8	612.865	618.650	5.785	62.5	62.5	0.9922	-0.00036	0.97
6	-3.7	312.548	318.510	5.962	69.8	69.8	618.650	624.434	5.784	62.5	62.5	0.9927	0.00013	0.97
										Passed Calibration Fa		0.9926	Averages	0.97
7	-3.0	318.510	324.083	5.573	69.8	69.8	624.434	629.860	5.426	62.5	63.0	0.9940	0.00041	0.78
7	-3.0	324.083	329.641	5.558	69.8	69.8	629.860	635.280	5.420	63.0	63.0	0.9951	0.00152	0.78
7	-3.0	329.641	335.208	5.567	69.8	69.8	635.280	640.690	5.410	63.0	63.0	0.9917	-0.00193	0.77
										Passed Calibration Fa		0.9936	Averages	0.78
10	-2.3	335.208	340.811	5.603	69.8	69.8	640.690	646.180	5.490	63.0	63.0	0.9982	-0.00030	0.55
10	-2.3	340.811	346.406	5.595	69.8	69.8	646.180	651.650	5.470	63.0	63.0	0.9959	-0.00251	0.55
10	-2.3	346.406	352.012	5.606	69.8	69.8	651.650	657.160	5:510	63.0	63.0	1.0013	0.00280	0.55
										Passed Calibration Fa		0.9985	Averages	0.55
15	-2.0	282.525	288.586	6.061	68.0	68.0	589.240	595.220	5.980	62.0	62.0	1.0028	0.00032	0.40
15	-2.0	288.586	294.610	6.024	68.0	68.0	595.220	601.160	5.940	62.0	62.0	1.0023	-0.00027	0.40
15	-2.0	294.610	300.635	6.025	68.0	69.8	601.160	607.095	5.935	62.0	62.5	1.0025	-0.00005	0.40
										Passed Calibration Fa		1.0025	Averages	0.40
											Overall Average Y	0.9955		

Note. For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature [signature] Date 1/12/11

If you have any questions or if you would like to discuss the above responses, please call me at (919) 541-5239.

Sincerely,

Clyde E. Riley

Clyde E. Riley
Emission Measurement Center

cc: Mike Ciolek (MD-19)
Foston Curtis (MD-19)
Bill Lamason (MD-19)
Tom Logan (MD-19)
Conniesue Oldham (MD-19)
Tom Ward (MD-74B)

measurement. Therefore, it is acceptable to use only one temperature sensor if the sensor is positioned either in the meter's plenum or at the gas meter outlet connection.

Method 201A Filter Holder Assembly

EPA agrees that the filter size specification, 63-mm, and the text, Andereen filter part number SE274 described in Section 2.1.3 of Method 201A is to specific and intends to amended Section 2.1.3 as follows:

2.1.3 Filter Holder. A filter holder assembly constructed of stainless steel capable of supporting a glass fiber filter, without organic binder. Other materials of construction (e.g., glass, Teflon) may be used, subject to approval of the Administrator. The holder design shall provide a positive seal against leakage from the outside or around the filter. The holder shall be attached as shown in Figure 1. Method 201A Sampling Train.

Method 6 Flow Rate Indicator

EPA approves the use of an orifice assembly to indicate and measure the flow rate of the Method 6 type sampling train, provided that the assembly can measure the flow rate to within two percent of the desired flow rate of about 1000 cc/min. Unlike the rotameter, which does not require calibration, the orifice assembly calibration should be verified along with the metering system as described in Section 5.1.1 Initial Calibration and Section 5.1.2 Post-Test Calibration Check.

EPA believes that the revised method specification modifications stated above do not compromise the technical operating and maintenance procedures stated in the specific methods.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

MAR 5 1997

Mr. Cody Cress
Apex Instruments
P.O. Box 727
125 Quantum Street
Holly Springs, North Carolina 27540

Dear Mr. Cress:

This correspondence is in response to your letter to Mr. Peter Westlin dated February 13, 1997. In the letter you requested USEPA approval with documentation for the following method specification modifications:

1) Reduce Method 5-type dry gas meter temperature sensors from two to one. Current Method 5 specifications require the use of two temperature sensors (one located at the inlet to the dry gas meter and one located at the dry gas meter outlet).

2) Reduce the diameter size of the Method 201A filter holder assembly from 63-mm to 47-mm. The current specifications list a 63-mm filter assembly which is available from only one specific vendor.

3) Incorporate the use of an orifice device to indicate and measure sample flow rate within the Method 6 sampling system. The current Method 6 specifies the use of a rotameter, or equivalent to measure the sample flow rate.

Dry Gas Meter Temperature Sensors

EPA has conducted in-house evaluation tests using three sensors (one sensor was used as a control) and found that the outlet temperature sensor provided the most accurate

Figure 5.3a - Page 2

METHOD 5 BLANK ANALYSIS DATA FORM

Samples Prepared by Keating Date 6/22/11

Front Half:	Date/Time	Weight(g)	Audit*	T-°F	RH-%	By
Filter						
Filter ID _____						
Tare Wt. _____						
Acetone	6/23/11/16:35	117.4868	100.0115	68	49	MK
Beaker ID 14B	6/27/11/09:35	117.4866	100.0115	68	49	MK
Tare Wt. 117.4861						
Solv. Vol. -200-						
Solv. ID _____						
6/23/11/09:52						
Water						
Beaker ID _____						
Tare Wt. _____						
Solv. Vol. _____						
Solv. ID _____						
DCM						
Beaker ID _____						
Tare Wt. _____						
Solv. Vol. _____						
Solv. Wt. _____						

* 0.5000 g ± tolerance - NIST traceable Class S weight

METHOD 5 BLANK ANALYSIS DATA FORM					
Sample Prepared by:		Homer		Date	6/3/2011
	Acetone				
Final Wt 1.:	117.48660				
Final Wt 2.:	117.48660				
Final Wt. Avg.:	117.48660				
Tare:	117.48610				
Difference:	0.00050				
Solvent vol.:	200.00000				
Residue (g/ml):	**0.0000025**				
Residue (mg/ml):	**0.0025**				

DGM Y Determination (critical orifice method)

Date:	6/4/2011	Train ID:	906017
K' factor:	0.60445		
Critical Orifice ID:	63		

Dry Gas Meter		Run Number 1	2	3
Final reading	ft^3	15.1	20.5	26
Initial reading	ft^3	10	15.5	21
Difference, Vm	ft^3	5.1	5	5
Inlet temps:				
Initial	F	62	63	65
Final	F	64	65	67
Outlet temps:				
Initial	F	62	63	65
Final	F	64	65	67
Avg. temp	F	63	64	66
Time	sec	400	396	393
Orifice reading	in H2O	1.9	1.9	1.9
Bar. Pressure	in Hg	27.91	27.91	27.91
Ambient temp.	F	71	71	71
Pump vacuum	in Hg	15	15	15
Vm(std)	ft^3	4.82	4.72	4.70
Vcr(std)	ft^3	4.88	4.83	4.80
DGM cal factor Y		1.012	1.023	1.020

Avg DGM cal factor 1.018

DGM Y Determination (critical orifice method)

Date:	6/4/2011	Train ID:	610022
K' factor:	0.60445		
Critical Orifice ID:	63		

Dry Gas Meter		Run Number 1	2	3
Final reading	ft^3	101	106	111
Initial reading	ft^3	96	101	106
Difference, Vm	ft^3	5	5	5
Inlet temps:				
Initial	F	81	79	79
Final	F	79	79	76
Outlet temps:				
Initial	F	81	79	79
Final	F	79	79	76
Avg. temp	F	80	79	77.5
Time	sec	358	359	361
Orifice reading	in H2O	1.9	1.9	1.9
Bar. Pressure	in Hg	27.91	27.91	27.91
Ambient temp.	F	71	71	71
Pump vacuum	in Hg	15	15	15
Vm(std)	ft^3	4.58	4.59	4.60
Vcr(std)	ft^3	4.37	4.38	4.40
DGM cal factor Y		0.953	0.954	0.957
Avg DGM cal factor			0.955	

2011 Glass Nozzle Calibration Sheet						
Date:	1/12/2011		Calibrated by:		MK	
				Mike		
Nozzle ID	**D1 (inches)**	**D2 (inches)**	**D3 (inches)**	**Delta D (in)**	**D avg**	
BH1/8"-1g	0.125	0.124	0.125	0.001	**0.1247**	0.1250
BH5/32"-1G	0.156	0.157	0.158	0.002	**0.1570**	0.1563
BH3/16"-1g	0.182	0.182	0.181	0.001	**0.1817**	0.1875
BH7/32"-1g	0.222	0.224	0.222	0.002	**0.2227**	0.2188
BH1/4"-1g	0.250	0.251	0.250	0.000	**0.2503**	0.2500
BH1/4"-2G	0.251	0.252	0.249	0.002	**0.2507**	0.2500
BH9/32"-1g	0.281	0.282	0.282	0.001	**0.2817**	0.2813
BH5/16"-1g	0.319	0.318	0.319	0.001	**0.3187**	0.3125
BH11/32"-1g	0.349	0.348	0.348	0.001	**0.3483**	0.344
BH3/8"-1g	0.374	0.375	0.374	0.002	**0.3743**	0.3750
BH3/8"-2g	0.372	0.372	0.373	0.002	**0.2798**	0.3750
BH13/32"-1g	0.408	0.408	0.406	0.002	**0.4073**	0.4063
BH7/16"-1g	0.431	0.431	0.432	0.002	**0.4313**	0.4375
BH1/2"-1g	0.496	0.497	0.496	0.002	**0.4963**	0.5000
BH9/16"-G	0.562	0.562	0.563	0.001	**0.5623**	0.5625
BH9/32"-2g	0.281	0.282	0.282	0.001	**0.2817**	0.2813
BH1/4"-3g	0.250	0.251	0.250	0.002	**0.2503**	0.2500
BH1/4"-4g	0.251	0.250	0.250	0.002	**0.2503**	0.2500
BH1/4"-5g	0.250	0.250	0.250	0.002	**0.2500**	0.2500
BH1/4"-6g	0.250	0.250	0.250	0.002	**0.2500**	0.2500
BH3/8"-3g	0.374	0.373	0.373	0.002	**0.2805**	0.3750
BH3/8"-4g	0.375	0.375	0.374	0.002	**0.2815**	0.3750

NIST		N/A	#VALUE!		N/A	#VALUE!			
Meter Box #40835notinuse		#VALUE!			#VALUE!				

NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #3	31	-1		206	-2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #4	31	-1		207	-1	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #1	31	-1		206	-2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #2	31	-1		206	-2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #3	30	-2		206	-2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Filter Oven #4	31	-1		206	-2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
Meter Box #906017	31	-1		207	-1	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
Meter Box #0610022	30	-2		206	-2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
Meter Box #0307031	32	0		205	-3	

Calibration date:						
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)

BH 6' #5 Probe	33	1		207	-1		395	-1	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
MFB 7' #1 Probe	32	0		207	-1		399	3	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 7' #2 Probe	33	1		205	-3		394	-2	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 8' #1 Hi-Temp Probe	33	1		206	-2		398	2	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 8' #2 Probe	34	2		203	-5		396	0	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 10' #1 Probe	34	2		203	-5		401	5	
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 10' #2 Probe	35	3		205	-3		398	2	

Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #1	32	0		207	-1	
Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02
BH Impinger Exit #2	32	0		208	0	
Calibration date:		3/4/2011				
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)

3/4/2011

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 3' #1 Probe	31	-1		206	-2		395	-1	

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 3' #2 Probe	30	-2		205	-3		394	-2	

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 4' Hi-Temp Probe	31	-1		206	-2		393	-3	

Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 5' Probe	32	0		204	-4		396	0	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #1 Probe	32	0		207	-1		397	1	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #2 Probe	32	0		208	0		394	-2	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #3 Probe	32	0		209	1		398	2	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84
BH 6' #4 Probe	30	-2		204	-4		395	-1	

NIST Thermometer I.D.:		E93-486							
Calibration date:		3/4/2011							
Temp. Device	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)	Test Value	Difference (°K)	Acceptance Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	396	N/A	12.84

2011 Probe / S-Type Pitot Cals

Date: 3/4/2011 Calibrated by: MK

	Dimensions			Alignment						Pitot to probe components				
BH Probe	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	P-0.500"	Pitot to Sheath	Pitot to T/C	Perpendicular to Probe	Meets criteria for Cp = 0.84
BH#1-3'ss	0.378	0.251	0.251	1°	1°	1°	1°	0	0	0.498	0.438	0.415	0.156	Yes
BH#2-3'ss	0.376	0.247	0.247	0	0	0	0	0	0	0.497	0.429	0.414	0.161	Yes
BH#1-4'HT	0.378	0.251	0.251	2°	2°	0	0	0	0	0.496	0.441	0.418	0.221	Yes
BH#1-5'ss	0.379	0.250	0.250	0	0	0	0	0	0	0.498	0.530	0.429	0.197	Yes
BH#1-6'ss	0.380	0.249	0.249	1°	1°	0	0	0	0	0.488	0.297	0.376	0.209	Yes
BH#2-6'ss	0.376	0.251	0.251	0	0	0	0	0	0	0.481	0.289	0.368	0.211	Yes
BH#3-6'ss	0.380	0.249	0.249	0	0	0	0	0	0	0.491	0.297	0.373	0.214	Yes
BH#4-6'ss	0.379	0.252	0.252	1°	1°	0	0	0	0	0.492	0.288	0.377	0.196	Yes
BH#5-6'ss	0.381	0.250	0.250	0	0	0	0	0	0	0.497	0.286	0.371	0.207	Yes
BH#6-6'ss	0.379	0.249	0.249	1°	1°	1°	1°	0	0	0.491	0.284	0.376	0.202	Yes
BH#1-7'ss	0.380	0.250	0.250	2°	2°	0	0	0	0	0.486	0.391	0.416	0.210	Yes
BH#2-7'ss	0.382	0.250	0.250	0	0	0	0	0	0	0.490	0.393	0.409	0.218	Yes
BH#1-8'HT	0.379	0.251	0.251	1°	1°	0	0	0	0	0.490	0.399	0.408	0.210	Yes
BH#2-8'ss	0.383	0.253	0.253	0	0	0	0	0	0	0.488	0.414	0.419	0.222	Yes
BH#1-10'ss	0.386	0.253	0.253	2°	2°	0	0	0	0	0.490	0.403	0.418	0.212	Yes
BH#2-10'ss	0.382	0.252	0.252	0	0	0	0	0	0	0.492	0.413	0.423	0.223	Yes
BH#1-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.417	0.216	Yes
BH#2-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.417	0.216	Yes

	Dimensions			Alignment						
BH S-Type	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	CP - 0.84
BH#1-4'ss	0.38	0.248	0.248	0	0	0	0	0	0	Yes
BH#1-7'ss	0.380	0.251	0.251	0	0	0	0	0	0	Yes
BH#1-10'ss	0.380	0.248	0.248	0	0	0	0	0	0	Yes

4-Mar-11

DRY GAS METER

Model:	522						522					
Serial #:	906017	Box #2					610022	Box #1				
Location:	Spokane						GEG					
Date	3/4/2011	3/4/2011	3/4/2011	3/4/2011	3/4/2011		3/4/2011	3/4/2011	3/4/2011	3/4/2011	3/4/2011	
Console leak check (cfm)	0	0	0	0	0		0	0	0	0	0	
Orifice setting (^h)	0.5	1	2	3	3.5		0.5	1	2	3	3.5	
Barometric pressure (in. Hg)	27.745	27.745	27.745	27.745	27.745		27.745	27.745	27.745	27.745	27.745	
Volume												
beginning reading	828.3	832.41	838.09	845.93	855.73		325.8	339.48	345.41	353.54	363.83	
ending reading	832.41	838.09	845.93	855.73	866.18		329.85	345.41	353.54	363.83	374.96	
Total Volume (Vd) ft3	4.11	5.68	7.84	9.8	10.45		4.05	5.93	8.13	10.29	11.13	
Temperature (deg F)												
beginning inlet												
ending inlet												
beginning outlet	54	57	58	60	62		51	53	56	57	59	
ending outlet	57	58	60	61	62		53	56	57	59	60	
average outlet temp (Tmo)	55.5	57.5	59	60.5	62		52	54.5	56.5	58	59.5	
average temp (Tm)	55.5	57.5	59	60.5	62		52	54.5	56.5	58	59.5	

CALIBRATION METER

Yc	0.999	0.999	0.999	0.999	0.999		0.999	0.999	0.999	0.999	0.999	
Volume												
beginning reading	785.280	789.330	795.000	802.82	812.56		738.000	750.920	756.500	764.22	773.97	
ending reading	789.330	795.000	802.820	812.52	823		741.820	756.500	764.220	773.97	784.52	
Total Volume (Vc) ft3	4.05	5.67	7.82	9.7	10.44		3.82	5.58	7.72	9.75	10.55	
Temperature												
beginning	54	56	56	56	57		51	51	53	54	54	
ending	56	56	56	57	57		53	53	54	54	54	
average temp (Tc)	55	56	56	56.5	57		52	52	53.5	54	54	
Time (min)	10	10	10	10	10		10	10	10	10	10	
						AVERAGE						AVERAGE
Y:	0.984	0.997	0.997	0.988	0.998	0.993	0.941	0.942	0.949	0.946	0.948	0.945
Difference from Average:	-0.009	0.004	0.004	-0.005	0.005		-0.004	-0.003	0.004	0.001	0.003	
^H@:	1.787	1.823	1.912	1.862	1.873	1.851	1.999	1.864	1.952	1.834	1.822	1.894
Difference from Average:	-0.065	-0.028	0.060	0.010	0.022		0.105	-0.030	0.058	-0.060	-0.072	

Y Acceptance criteria: +/- 0.02 From Average

^H@ Acceptance criteria: +/- 0.2 From Average

APPENDIX G
QUALITY RECORDS

LEFT INTENTIONALLY BLANK

APPENDIX F
FIELD CALIBRATION DATA

40CFR 60 APP. A, Method 5, Sect. 6.9 Eq. 5A-5

PARTICULATE CONCENTRATION = $W_{Total\ Part.}$ x K_1 ÷ $V_{m\ (std)}$: where K_1 = 15.43 grains/ft^3 ÷ 1 g/ft^3

= .003941 x 15.43 ÷ 59.872 = .01016 gr/dscf

PARTICULATE EMISSIONS RATE = 60 min/hr x Part Con. x Q_{sd} ÷ K_4 : where K_4 = 7000 grains/lb

= 60 x .01016 x 51,124.8 ÷ 7000 = 4.451 lb/hr

40CFR 60.284(c)3

PARTICULATE CONCENTRATION @ 15% O2 = Part Con. x(20.9-15) ÷(20.19-O2%)

= _____ x (20.9-15) ÷ (20.9 _____) = _____ gr/dscf

V_{lc} (Total volume of liquid collected) = impingers + silica gel = 79 + 11 = 90 mls

K_2 (water constant for density, ideal gas, molecular weight, etc.) = .04707

40CFR 60 APP. A, Method 5, Sect. 6.4 Eq. 5-2

V_w (std) (Water vapor volume corrected to std. conditions) = V_{lc} x K_2 = 90 x .04707 = 4.236 scf

40CFR 60 APP. A, Method 5, Sect. 6.5 Eq. 5-3

B_{ws} (Water vapor in gas proportioned by volume) = $V_w \div (V_{m(std)} + V_w)$ = 4.236 ÷ (4.236 + 59.872) = .06608

MOISTURE CONTENT OF STACK GAS = (100 x B_{ws}) = 100 x .06608 = 6.608 %H_2O

~~N2% = 100 - %O2 - %CO2 - %CO~~ = 100 - _____ - _____ - _____ = _____ %

MW_{dry} = 0.44 x CO_2% + 0.32 x O_2% + 0.28(N_2% + CO%)
= 0.44 x _____ + 0.32 x _____ + 0.28 x (_____ + _____) = 29 lb/lb-mole

MW_{wet} = MW_{dry} x(1- B_{ws}) + 18 lb/lb-mole x B_{ws} = 29 x (1 - .06608) + 18 x .06608 = 28.273 lb/lb-mole

40CFR 60 APP. A, Method 2, Sect. 5.3 Eq. 2-10

V_s (stack velocity) = K_p x 60 sec/min x C_p x $(\sqrt{\square P})_{avg}$ x $\sqrt{[T_s \div (P_s \times MW_{wet})]}$
where K_p = 85.49 fps x [(lb/lb-mole) x (in. Hg) ÷ (°R) x (in. H_2O)]$^{1/2}$
= 85.49 x 60 x .84 x .8246 x √[568 ÷ (27.405 x 28.273)] = 3042.02 fpm

A_{stack} = π x Dia.^{2} ÷ 4 ÷ 144 = 3.14159 x 62.25^2 ÷ 4 ÷ 144 = 21.135 ft^2

Q_a (Actual volumetric stack gas flow rate) = A_{stack} x V_s = 21.135 x 3042.02 = 64293.6 acfpm

Q_{sd} (Dry standard volumetric stack gas flow rate) = (1-B_{ws}) x Q_a x (528 ÷ T_s) x (P_s ÷ 29.92) =
= (1 - .06608) x 64293.6 x (528 ÷ 568) x (27.405 ÷ 29.92) = 51,124.8 acfpm

A_n (Area of stack sampling nozzle) = π x (Dia_{nozzle} ÷ 12)^2 ÷ 4 = 3.14159 x (.25 ÷ 12)^2 ÷ 4 = .0003409 ft^2

40CFR 60 APP. A, Method 5, Sect. 6.11.1 Eq. 5-7

ISOKINETIC VARIATION = 100xT_sx(K_3xV_{lc}+(V_mx$Y \div T_m$)x(P_b+□H÷13.6))÷(Time xV_sxP_sxA_n):
where K_3 = 0.002669 in Hg-ft^3/ml-°R

= 100x 568 x [0.002669 x 90 + (70.66 x .945 ÷ 543.3) x
(27.42 + 2.52 ÷ 13.6)] ÷ (72 x 3042.02 x 27.405 x .0003409) = 100.85 %
27.605 2046.12

$W_{total\ Particulate}$ = Fiberglass Filter Weight + Probe and Nozzle Washing + Impinger (Back Half) +
Acetone Wash Blank = .0302 + .001411 + .0078 + _____ = .03941 gms

Sorrento Wheat Scrubber Run 1

MANUAL METHOD 5 CALCULATIONS

Y (DGM CALIBRATION FACTOR):	.945	
C_p (PITOT TUBE COEFFICIENT):	.84	
NOZZLE DIAMETER:	.25	in.
STACK DIMENSION:	62.25	in.
BAROMETRIC PRESSURE P_b:	27.42	in. Hg.
STACK STATIC PRESSURE:	-.21	in. H_2O
OXYGEN CONTENT:	—	%
CARBON DIOXIDE CONTENT:	—	%
CARBON MONOXIDE CONTENT:	—	%
POST RUN LEAK RATE:	0	cfm
SAMPLING TIME:	72	min.
AVG. DGM VACUUM:	13.0	in. Hg.
AVG. STACK TEMPERATURE:	108.0	°F
AVG. SQ. ROOT OF □P:	.8246	
AVG. ORIFICE PRESS. (□H):	2.52	in. H_2O
GAS SAMPLE VOLUME V_m:	70.66	dscf
AVG. DRY GAS METER TEMP:	83.3	°F
FIBERGLASS FILTER WEIGHT:	.0302	gms
PROBE & NOZZLE WASHINGS:	.00141	gms
IMPINGER (BACK HALF) WEIGHT:	.009	gms
ACETONE WASH BLANK:		gms
IMPINGER MOISTURE VOLUME:	79	mls
SILICA GEL WEIGHT INCREASE:	11	gms
PRODUCTION RATE:		#/hr
BTU HEAT INPUT:		mmBTU/hr

CONSTANTS & CALCULATIONS

T_s (Absolute average stack gas temperature) = 460 + Ts = 460 + 108 = 568 °R

T_m (Absolute average DGM temperature) = 460 + Avg. DGM Temp. = 460 + 83.3 = 543.3 °R

T_{std} (Standard absolute temperature) = 528 °R

P_s (Absolute stack gas pressure) = P_b + (P static÷13.6 in H_2O/in Hg) = 27.42 + (-.21 ÷13.6) = 27.405 in Hg

P_{std} (Standard absolute pressure) = 29.92 in Hg

40CFR 60 APP. A, Method 5, Sect. 6.3 Eq. 5-1

DGM $V_{m(std)}$ = V_m x Y x T_{std}/T_m x (P_m/P_{std}) = 70.66 x .945 x528÷543.3 x(27.605 ÷29.92) = 59.872 dscf

Q_{ac} = Stack gas flow rate at actual conditions (acfm) = V_s x A

EMISSIONS:

C = Average gas concentration indicated by gas analyzer, dry basis (ppm)

C_o = Average of initial and final system cal bias check responses for the zero gas (ppm)

C_m = Average of initial and final system bias check responses for the upscale calibration gas (ppm)

C_{ma} = Actual concentration of the upscale calibration gas (ppm)

C_{gas} = effluent gas concentration (ppm) = $(C - C_o) \times [C_{ma} \div (C_m - C_o)]$

EMISSION RATES:

gr/dscf = $m_n * 15.43/V_{m(std)}$

lb/hr PM = gr/dscf*Q_{sd}*60/7000

CALCULATIONS

FLOW RATES:

A = Vent pipe cross-sectional area (ft^2) = πr^2

P_{bar} = Barometric pressure at measurement site (in Hg)

P_g = Stack static pressure (in Hg) = in. H_2O ÷ 13.6 in H_2O/in. Hg

P_s = Absolute stack gas pressure (in. Hg) = $P_{bar} + P_g$

t_d = Temperature dry bulb (°F)

t_w = Temperature wet bulb (°F)

e" = Stack vapor pressure (in. Hg)
$= (0.00000608746 \times t_w^3)-(0.00100431 \times t_w^2)+(0.0756026 \times t_w)-1.69343$

$\%H_2O = [e'' - (P_s - e'')x(t_d - t_w)) \div (2800 - (1.3 \times t_w)] \div P_s \times 100$

MD = Molecular Density = $(100 - \%H_2O) \div 100$

M_d = Molecular weight of dry stack gas (lb/lb-mole)
$= (\%CO_2 \times 0.44) + (\%O_2 \times 0.32) + [(\%CO + \%N_2) \times 0.28]$

FLOW RATES (cont.):

M_s = Molecular weight of wet stack gas (lb/lb-mole)
$= M_d \times (MD) + 18 lb/lb\text{-}mole \times (1-MD)$

C_p = Pitot tube coefficient

$(\sqrt{\square p})_{avg}$ = Average square root velocity head of stack gas (in. H_2O)

T_s = Absolute stack temperature (°R) = $460 + t_d$

V_s = Average stack gas velocity (ft^3/min.)
$= 85.49 \text{ ft/sec} \times 60 \text{ sec/min} \times C_p \times (\sqrt{\square p})_{avg} \times \text{sqrt}(T_s \sqrt{(P_s \times M_s)})$

Q_{sd} = Stack gas dry molecular flow rate corrected to standard conditions

$(dscfm) = MD \times V_s \times A \times (528°R \div T_s) \times (P_s \div 29.92'' \text{ Hg})$

APPENDIX E
CALCULATIONS

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST RESULTS and DATA ANALYSIS SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	14:19:00	RUN No.	3
Date:	3-Jun-2011	End Time:	15:52:00	JOB No.	

STACK DATA			Molecular Weight			EQUIPMENT			AVERAGE TEST DATA		
% Moisture:	4	% est.	%CO2:	0.03	%	METER BOX:	906107		Average ΔP:	0.98	in H_2O
Barometric:	27.42	in Hg	%O2:	20.90	%	Y:	0.993		Average T_m:	541.8	°R
Static Press:	-0.54	in H_2O	%N2/CO:	79.07	%	ΔH@:	1.843	in H_2O	Average T_s:	594.4	°R
Stack Press:	27.38	in Hg	Md:	28.84	lb/lb-mole	Cp':	0.840	S/N -	Average ΔH:	0.49	in H_2O
Stack Area:	10.3	ft^2	Actual Mw:	28.37	lb/lb-mole	Cp:	0.840	S/N -	T_{std}:	528.00	°R
# of Points:	12	points	Run Time:	96.75	min	Nozzle Dia:	0.1490	inches	P_{std}:	29.92	in Hg

<$PM_{2.5}$ Filter Analysis			<$PM_{2.5}$ Recovery Analysis			Moisture Analysis		
Container 1:	333.1	mg	Container 4:	0	mg	Container 5:	223	g
C1 + Filter Tare:	333.2	mg	Cont. 4 Tare:	0	mg	Silica Gel Tare:	210	g
Acetone V_{aw1}:	0	ml	Acetone V_{aw4}:	0	ml	M_{sg}:	13	g
Acetone W_{a1}:	0	mg	Acetone W_{a4}:	0	mg	$V_{wsg(std)}$:	0.612	scf
(Filter) M_1:	0.000	mg	($PM_{2.5}$) M_4:	0.000	mg	Container 6:	21	ml
>PM_{10} Recovery Analysis			$PM_{2.5-10}$ Recovery Analysis			$V_{wc(std)}$:	0.988	scf
Container 2:	90377.8	mg	Container 3:	114970.5	mg			
Cont. 2 Tare:	90376.7	mg	Cont. 3 Tare:	114969.3	mg	V_{ws}:	1.600	scf
Acetone V_{aw2}:	58	ml	Acetone V_{aw3}:	41	ml	B_{ws}:	0.043	H_20
Acetone W_{a2}:	0.145	mg	Acetone W_{a3}:	0.1025	mg	Actual % H_2O:	4.3	%
($PM_{2.5}$) M_2:	1.100	mg	($PM_{10-2.5}$) M_3:	1.200	mg			

Acetone Blank Analysis		
Container 7:	117486.6	mg
Container 7 Tare:	117486.1	mg
Acetone Density ρ_a:	0.785	mg/ml
Blank Volume V_{aw}:	200	ml
Blank Conc.C_a:	0.003184713	mg_r/mg_v

CALCULATIONS AND DATA ANALYSIS

V_m:	40.0900	acf - [Actual Sample Volume]	μ:	196.928	mpoise - [Actual Gas Viscosity]
V_{ms}:	35.6036	dscf - [Corrected Sample Volume (std)]	C:	1.0787	[Cunningham Correction Factor]
V_{ws}:	1.6004	scf - [Volume of Water Vapor]	D_{50}:	10.639	μmeter - D50 for Cyclone 1
Q_{Sst}:	0.36800	dscfm - [Corrected Dry Sampling Rate (std)]	D_{50IV}:	2.392	μmeter - D50 for Cyclone IV
Q_s:	0.47307	acfm - [Actual Final Sampling Rate]	$Q_{sd(stack)}$:	1,793,208.55	dscf/hr - [Dry Stack Flow Rate (std)]
I:	104.940	% - [Percent Isokinetic Sampling]	$Q_{sw(stack)}$:	1,873,813.21	scf/hr - [Wet Stack Flow Rate (std)]
N_{re}:	2713	[Actual Reynolds Number]			
$V_{s(avg)}$:	62.05	fps - [Avgerage Stack Velocity]			

Concentrations			Emission Rates		
$PM_{2.5}$:	0.00000	gr/dscf	$PM_{2.5}$:	0.0000	lb/hr
PM_{10}:	0.00052	gr/dscf	PM_{10}:	0.1332	lb/hr
Total PM:	0.00100	gr/dscf	Total PM:	0.2553	lb/hr
CPM	6.9	mg			
Total PM10 + CPM:	0.003530	gr/dscf	Total PM10 + CPM:	0.9042	lb/hr
CPM	0.002990	gr/dscf	CPM	0.7660	lb/hr

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company, Inc.

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST RESULTS and DATA ANALYSIS SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	16:24:00	RUN No.	2
Date:	10-Mar-2011	End Time:	18:02:00	JOB No.	

STACK DATA			Molecular Weight			EQUIPMENT			AVERAGE TEST DATA		
% Moisture:	4	% est.	%CO2:	0.03	%	METER BOX:	906107		Average ΔP:	1.00	in H_2O
Barometric:	27.42	in Hg	%O2:	20.90	%	Y:	0.993		Average T_m:	536.6	°R
Static Press:	-0.57	in H_2O	%N2/CO:	79.07	%	ΔH@:	1.843	in H_2O	Average T_s:	592.5	°R
Stack Press:	27.38	in Hg	Md:	28.84	lb/lb-mole	Cp':	0.840	S/N -	Average ΔH:	0.49	in H_2O
Stack Area:	10.3	ft^2	Actual Mw:	28.39	lb/lb-mole	Cp:	0.840	S/N -	T_{std}:	528.00	°R
# of Points:	-	points	Run Time:	98.00	min	Nozzle Dia:	0.1490	inches	P_{std}:	29.92	in Hg

<$PM_{2.5}$ Filter Analysis			<$PM_{2.5}$ Recovery Analysis			Moisture Analysis		
Container 1:	335	mg	Container 4:	0	mg	Container 5:	258	g
C1 + Filter Tare:	334.7	mg	Cont. 4 Tare:	0	mg	Silica Gel Tare:	240	g
Acetone V_{aw1}:	0	ml	Acetone V_{aw4}:	0	ml	M_{sg}:	18	g
Acetone W_{a1}:	0	mg	Acetone W_{a4}:	0	mg	$V_{wsg(std)}$:	0.847	scf
(Filter) M_1:	0.300	mg	($PM_{2.5}$) M_4:	0.000	mg	Container 6:	15	ml
>PM_{10} Recovery Analysis			$PM_{2.5-10}$ Recovery Analysis			$V_{wc(std)}$:	0.706	scf
Container 2:	112874.7	mg	Container 3:	89805	mg			
Cont. 2 Tare:	112873.8	mg	Cont. 3 Tare:	89804	mg	V_{ws}:	1.553	scf
Acetone V_{aw2}:	46	ml	Acetone V_{aw3}:	38	ml	B_{ws}:	0.042	H_20
Acetone W_{a2}:	0.115	mg	Acetone W_{a3}:	0.095	mg	Actual % H_2O:	4.2	%
($PM_{2.5}$) M_2:	0.900	mg	($PM_{10-2.5}$) M_3:	1.000	mg			

Acetone Blank Analysis		
Container 7:	117486.6	mg
Container 7 Tare:	117486.1	mg
Acetone Density ρ_a:	0.785	mg/ml
Blank Volume V_{aw}:	200	ml
Blank Conc.C_a:	0.003184713	mg_r/mg_v

CALCULATIONS AND DATA ANALYSIS

V_m:	39.4900	acf - [Actual Sample Volume]	μ:	196.566	mpoise - [Actual Gas Viscosity]
V_{ms}:	35.4084	dscf - [Corrected Sample Volume (std)]	C:	1.0767	[Cunningham Correction Factor]
V_{ws}:	1.5533	scf - [Volume of Water Vapor]	D_{50}:	10.789	μmeter - D50 for Cyclone 1
Q_{Sst}:	0.36131	dscfm - [Corrected Dry Sampling Rate (std)]	D_{50IV}:	2.448	μmeter - D50 for Cyclone IV
Q_s:	0.46253	acfm - [Actual Final Sampling Rate]	$Q_{sd(stack)}$:	1,810,993.35	dscf/hr - [Dry Stack Flow Rate (std)]
I:	102.022	% - [Percent Isokinetic Sampling]	$Q_{sw(stack)}$:	1,890,438.69	scf/hr - [Wet Stack Flow Rate (std)]
N_{re}:	2667	[Actual Reynolds Number]			
$V_{s(avg)}$:	62.40	fps - [Avgerage Stack Velocity]			

Concentrations			Emission Rates		
$PM_{2.5}$:		gr/dscf	$PM_{2.5}$:	-	lb/hr
PM_{10}:	0.00057	gr/dscf	PM_{10}:	0.1466	lb/hr
Total PM:	0.00096	gr/dscf	Total PM:	0.2480	lb/hr
CPM	6.9	mg			
Total PM10 + CPM:	0.003573	gr/dscf	Total PM10 + CPM:	0.9244	lb/hr
CPM	0.003007	gr/dscf	CPM	0.7779	lb/hr

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company, Inc.

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST RESULTS and DATA ANALYSIS SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	14:19:00	RUN No.	1
Date:	3-Jun-2011	End Time:	15:52:00	JOB No.	

STACK DATA			Molecular Weight			EQUIPMENT			AVERAGE TEST DATA		
% Moisture:	4	% est.	%CO2:	0.03	%	METER BOX:	906107		Average ΔP:	0.93	in H_2O
Barometric:	27.42	in Hg	%O2:	20.90	%	Y:	0.993		Average T_m:	538.8	°R
Static Press:	-0.55	in H_2O	%N2/CO:	79.07	%	ΔH@:	1.843	in H_2O	Average T_s:	591.2	°R
Stack Press:	27.38	in Hg	Md:	28.84	lb/lb-mole	Cp':	0.840	S/N -	Average ΔH:	0.49	in H_2O
Stack Area:	10.3	ft^2	Actual Mw:	28.52	lb/lb-mole	Cp:	0.840	S/N -	T_{std}:	528.00	°R
# of Points:	12	points	Run Time:	92.00	min	Nozzle Dia:	0.1490	inches	P_{std}:	29.92	in Hg

<$PM_{2.5}$ Filter Analysis			<$PM_{2.5}$ Recovery Analysis			Moisture Analysis		
Container 1:	340.5	mg	Container 4:	0	mg	Container 5:	252	g
C1 + Filter Tare:	332	mg	Cont. 4 Tare:	0	mg	Silica Gel Tare:	244	g
Acetone V_{aw1}:	0	ml	Acetone V_{aw4}:	0	ml	M_{sg}:	8	g
Acetone W_{a1}:	0	mg	Acetone W_{a4}:	0	mg	$V_{wsg(std)}$:	0.377	scf
(Filter) M_1:	8.500	mg	($PM_{2.5}$) M_4:	0.000	mg	Container 6:	14	ml
>PM_{10} Recovery Analysis			$PM_{2.5-10}$ Recovery Analysis			$V_{wc(std)}$:	0.659	scf
Container 2:	119761.1	mg	Container 3:	91082.1	mg			
Cont. 2 Tare:	119758.4	mg	Cont. 3 Tare:	91081.6	mg	V_{ws}:	1.036	scf
Acetone V_{aw2}:	52	ml	Acetone V_{aw3}:	46	ml	B_{ws}:	0.030	H_20
Acetone W_{a2}:	0.13	mg	Acetone W_{a3}:	0.115	mg	Actual % H_2O:	3.0	%
($PM_{2.5}$) M_2:	2.700	mg	($PM_{10-2.5}$) M_3:	0.500	mg			

Acetone Blank Analysis		
Container 7:	117486.6	mg
Container 7 Tare:	117486.1	mg
Acetone Density ρ_a:	0.785	mg/ml
Blank Volume V_{aw}:	200	ml
Blank Conc.C_a:	0.003184713	mg_r/mg_v

CALCULATIONS AND DATA ANALYSIS

V_m:	37.6900	acf - [Actual Sample Volume]	μ:	197.451	mpoise - [Actual Gas Viscosity]
V_{ms}:	33.6534	dscf - [Corrected Sample Volume (std)]	C:	1.0764	[Cunningham Correction Factor]
V_{ws}:	1.0355	scf - [Volume of Water Vapor]	D_{50}:	10.827	μmeter - D50 for Cyclone 1
Q_{Sst}:	0.36580	dscfm - [Corrected Dry Sampling Rate (std)]	D_{50IV}:	2.457	μmeter - D50 for Cyclone IV
Q_s:	0.46133	acfm - [Actual Final Sampling Rate]	$Q_{sd(stack)}$:	1,733,522.26	dscf/hr - [Dry Stack Flow Rate (std)]
I:	107.905	% - [Percent Isokinetic Sampling]	$Q_{sw(stack)}$:	1,786,864.10	scf/hr - [Wet Stack Flow Rate (std)]
N_{re}:	2666	[Actual Reynolds Number]			
$V_{s(avg)}$:	58.85	fps - [Avgerage Stack Velocity]			

Concentrations			Emission Rates			3 run avg
$PM_{2.5}$:		gr/dscf	$PM_{2.5}$:	-	lb/hr	
PM_{10}:	0.00413	gr/dscf	PM_{10}:	1.0220	lb/hr	
Total PM:	0.00536	gr/dscf	Total PM:	1.3286	lb/hr	
CPM	7.2	mg				
Total PM10 + CPM:	0.007428	gr/dscf	Total PM10 + CPM:	1.8394	lb/hr	.00484 gr/dscf
CPM	0.003301	gr/dscf	CPM	0.8175	lb/hr	1.2227 lb/hr

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company, Inc.

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	Stack Type	Circular

Historical Data						
Run Number		1	2	3	Average	
Run Start Time		14:20	15:58	17:43		hh:mm
Run Stop Time		15:32	17:10	18:55		hh:mm
Meter Calibration Factor	(Y)	0.945	0.945	0.945		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	(V_m)$_i$	112.900	185.100	258.100		ft^3
Final Meter Volume	(V_m)$_f$	183.560	254.320	328.430		ft^3
Total Meter Volume	(V_m)	70.660	69.220	70.330	70.070	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	(t_m)$_{avg}$	83.3	93.5	95.3	90.7	°F
Average Stack Temperature	(t_s)$_{avg}$	108.0	106.3	105.6	106.7	°F
Barometric Pressure	(P_b)	27.42	27.42	27.42	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.21	-0.20	-0.22	-0.21	in H_2O
Absolute Stack Pressure	(P_s)	27.40	27.41	27.40	27.40	in Hg
Average Orifice Pressure Drop	(ΔH)$_{avg}$	2.52	2.59	2.45	2.52	in H_2O
Absolute Meter Pressure	(P_m)	27.61	27.61	27.60	27.61	in Hg
Avg Square Root Pitot Pressure	($\Delta p^{1/2}$)$_{avg}$	0.8246	0.8330	0.8156	0.8244	(in H_2O)$^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	79.0	82.0	79.0	80.0	ml
Impinger Weight Gain	(W_n)	9.0	9.0	10.0	9.3	g
Total Water Volume Collected	(V_{lc})	88.0	91.0	89.0	89.4	ml
Standard Water Vapor Volume	(V_w)$_{std}$	4.143	4.284	4.190	4.206	scf
Standard Meter Volume	(V_m)$_{std}$	59.879	57.578	58.300	58.585	dscf
Calculated Stack Moisture	($B_{ws(calc)}$)	6.47	6.93	6.71	6.70	%
Saturated Stack Moisture	($B_{ws(svp)}$)	8.94	8.50	8.32	8.59	%
Reported Stack Moisture Content	(B_{ws})	6.47	6.93	6.71	6.70	%
Gas Analysis Data						
Carbon Dioxide Percentage	(%CO_2)					%
Oxygen Percentage	(%O_2)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	(%N_2)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.29	28.24	28.26	28.26	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	50.69	51.17	50.05	50.64	ft/sec
Stack Cross-Sectional Area	(A_s)	21.14	21.14	21.14		ft^2
Actual Stack Flow Rate	(Q_{aw})	64276	64894	63472	64214	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	3283	3325	3256	3288	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	51181	51578	50632	51131	dscfm
Percent of Isokinetic Rate	(I)	100.7	96.1	99.2	98.7	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	30.20	29.20	27.00	28.80	mg
Mass of Particulate in Acetone	(m_a')	1.41	1.19	0.89	1.16	mg
Mass due to Acetone Blank	(W_a)	0.00	0.00	0.00	0.00	mg
Total Back Half PM (blank corrected)	(m_{bh})	7.80	6.50	9.00	7.77	mg
Total Mass of Particulates	(m_n)	39.41	36.89	36.89	37.73	mg
Stack Particulate Concentration	(c_s)	0.001	0.001	0.001	0.001	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.010	0.010	0.010	0.010	gr/dscf
Particulate Emission Rate	(E)	2.02	1.98	1.92	1.98	kg/hr
	(E)	4.456	4.371	4.238	4.355	lbs/hr
	(E)					lbs/mmBtu
(Pt 75 App F Sect. 5.2.1) Heat Input	(HI)					mmBtu/Hr

APPENDIX D
CALCULATED EMISSION RATES

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST DATA SHEET

Location: Sorrento Shaking Bed Baghouse | Start Time: 18:14:00 | RUN No. 3

Date: 10-Mar-2011 | End Time: 19:50:00 | JOB No.

STACK DATA			EQUIPMENT			ESTIMATES			+/- 50°F ΔH			
% Moisture:	4	% est.	METER BOX:	906107		Ts (°F):	118	Tm (°F): 50	Ts-50°	82.503	Ts+50°	182.5
Barometric:	27.42	in Hg	Y:	0.993		Est. Qs:	0.4589	cfm	Est. Qs:	0.4931	Est. Qs:	0.5183
Static Press:	-0.54	in H_2O	ΔH@:	1.843	in H_2O	Est. μ_s:	193.28	mpoise	Est. μ_s:	172.98	Est. μ_s:	196.96
Stack Press:	27.38	in Hg	Cp':	0.840	S/N -	Est. ΔH:	0.466	("H_2O)	Est. ΔH:	0.529	Est. ΔH:	0.377
$\%CO_2$:	0.03	%	Cp:	0.840	S/N -							
$\%O_2$:	20.90	%	Nozzle Dia:	0.1490	inches							
$\%N_2/CO$:	79.07	%	Stack Area:	10.3	ft^2							
M_d:	28.84	lb/lb-mole	# of Points:	12	points							
Est. M_w:	28.41	lb/lb-mole	Run Time:	96.00	min							
T_{std}:	528	°R	P_{std}:	29.92	in Hg							

LEAK CHECKS			
DGM initial	0	0	cf
DGM final	0	0	cf
Time	1	1	min.
Leak Rate	0.0000	0.0000	cfm
Vacuum	15	4	in. Hg

Sample Point	Clock Time (min)	Dry Gas Meter Reading (ft^3)	Pitot ΔP ("H_2O)	Gas Temperatures (°F) DGM Inlet	DGM Outlet	Stack	Orifice Press. ΔH (in H_2O) Ideal	Actual	Pump Vac. (in Hg)	Gas Temps (°F) Probe	Filter	Imp. Exit	Qs (acfm)	D_{50} [10 µm]	D_{50} [2.5 µm]
1	9.00	969.2000	1.200	82.0	82.0	135	0.468	0.490	1	252	248	67	0.4846	10.48	2.33
2	17.50	973.0300	1.100	81.0	81.0	135	0.468	0.490	1	251	249	64	0.4644	10.80	2.45
3	25.75	976.4900	1.000	81.0	81.0	135	0.467	0.490	1	252	247	60	0.4701	10.70	2.42
4	33.75	979.8900	0.990	81.0	81.0	134	0.467	0.490	1	251	248	58	0.4826	10.49	2.33
5	41.75	983.2800	0.960	81.0	81.0	135	0.468	0.490	1	250	247	59	0.4663	10.77	2.44
6	48.00	986.5500	0.580	82.0	82.0	135	0.467	0.490	1	251	248	59	0.4682	10.73	2.43
7	56.00	989.1200	0.970	82.0	82.0	135	0.468	0.490	1	253	249	60	0.4612	10.85	2.47
8	64.25	992.3600	1.000	83.0	83.0	135	0.468	0.490	1	254	250	60	0.4601	10.87	2.48
9	72.75	995.7000	1.100	83.0	83.0	134	0.469	0.490	1	251	251	61	0.4685	10.72	2.42
10	80.75	999.2100	0.980	83.0	83.0	135	0.470	0.490	1	250	250	62	0.4845	10.48	2.33
11	88.75	1002.6200	0.960	83.0	83.0	134	0.469	0.490	1	251	251	62	0.4638	10.79	2.45
12	96.75	1005.8900	0.940	83.0	83.0	135	0.470	0.490	1	252	249	63	0.4830	10.50	2.34
13	-	1009.2900					0.469						-	-	-
14	-						-						-	-	-
15	-						-						-	-	-
16	-						-						-	-	-
17	-						-						-	-	-
18	-						-						-	-	-
19	-						-						-	-	-
20	-						-						-	-	-
21	-						-						-	-	-
22	-						-						-	-	-
23	-						-						-	-	-
24	-						-						-	-	-

Actual Run Time	V_m	ΔP (avg)	$T_{m\,(avg)}$	$T_{s\,(avg)}$	Max Vac.	ΔH (avg)	$V_{s\,(avg)}$
96.75 min	40.090 cf	0.982 in H_2O	541.8 °R 82.1 °F	594.4 °R 134.8 °F	1	0.490 in H_2O	fps

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 by Environmental Supply Company, Inc.

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST DATA SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:	16:24:00	RUN No.	2
Date:	10-Mar-2011	End Time:	18:02:00	JOB No.	

STACK DATA			EQUIPMENT			ESTIMATES			+/- 50°F ΔH			
% Moisture:	4	% est.	METER BOX:	906107		Ts (°F):	118	Tm (°F): 50	Ts-50°	81.17	Ts+50°	181.17
Barometric:	27.42	in Hg	Y:	0.995		Est. Qs:	0.4589	cfm	Est. Qs:	0.4927	Est. Qs:	0.5180
Static Press:	-0.57	in H_2O	ΔH@:	1.843	in H_2O	Est. μ_s:	193.28	mpoise	Est. μ_s:	172.66	Est. μ_s:	196.65
Stack Press:	27.38	in Hg	Cp':	0.840	S/N -	Est. ΔH:	0.466	("H_2O)	Est. ΔH:	0.532	Est. ΔH:	0.379
$\%CO_2$:	0.03	%	Cp:	0.840	S/N -	LEAK CHECKS						
$\%O_2$:	20.90	%	Nozzle Dia:	0.1490	inches	DGM initial					cf	
$\%N_2/CO$:	79.07	%	Stack Area:	10.3	ft^2	DGM final					cf	
M_d:	28.84	lb/lb-mole	# of Points:	12	points	Time					min.	
Est. M_w:	28.41	lb/lb-mole	Run Time:	96.00	min	Leak Rate	-		-		cfm	
T_{std}:	528	°R	P_{std}:	29.92	in Hg	Vacuum					in. Hg	

Sample Point	Clock Time (min)	Dry Gas Meter Reading (ft^3)	Pitot ΔP ("H_2O)	Gas Temperatures (°F) DGM Inlet	DGM Outlet	Stack	Orifice Press. ΔH (in H_2O) Ideal	Actual	Pump Vac. (in Hg)	Gas Temps (°F) Probe	Filter	Imp. Exit	Qs (acfm)	D_{50} [10 μm]	D_{50} [2.5 μm]
1	9.25	929.2000	1.300	77.0	77.0	132	0.468	0.490	1	251	249	66	0.4574	10.87	2.48
2	17.75	932.9000	1.100	76.0	76.0	132	0.468	0.490	1	251	248	62	0.4488	11.02	2.54
3	26.25	936.2300	1.100	76.0	76.0	131	0.467	0.490	1	250	249	58	0.4494	11.00	2.53
4	34.50	939.5700	1.000	76.0	76.0	133	0.469	0.490	1	248	247	58	0.4591	10.86	2.48
5	42.50	942.8700	0.970	76.0	76.0	132	0.466	0.490	1	249	248	59	0.4640	10.76	2.44
6	48.50	946.1100	0.550	76.0	76.0	132	0.467	0.490	1	250	249	60	0.4583	10.86	2.47
7	56.50	948.5100	0.950	77.0	77.0	133	0.467	0.490	1	248	250	61	0.4668	10.73	2.43
8	64.75	951.7700	1.000	77.0	77.0	132	0.466	0.490	1	249	251	62	0.4519	10.97	2.52
9	73.00	955.0300	1.000	78.0	78.0	133	0.468	0.490	1	251	249	62	0.4712	10.66	2.40
10	81.50	958.4300	1.100	78.0	78.0	134	0.467	0.490	1	250	250	63	0.4837	10.48	2.33
11	90.00	962.0200	0.970	78.0	78.0	135	0.466	0.490	1	251	248	65	0.4670	10.75	2.44
12	98.00	965.4800	0.940	78.0	78.0	135	0.464	0.490	1	249	247	64	0.4603	10.86	2.48
13	-	968.6900					0.464						-	-	-
14	-						-						-	-	-
15	-						-						-	-	-
16	-						-						-	-	-
17	-						-						-	-	-
18	-						-						-	-	-
19	-						-						-	-	-
20	-						-						-	-	-
21	-						-						-	-	-
22	-						-						-	-	-
23	-						-						-	-	-
24	-						-						-	-	-

Actual Run Time	V_m	ΔP (avg)	$T_{m\ (avg)}$	$T_{s\ (avg)}$	Max Vac.	ΔH (avg)	$V_{s\ (avg)}$
			536.6 °R	592.5 °R			
98.00 min	39.490 cf	0.998 in H_2O	76.9 °F	132.8 °F	1	0.490 in H_2O	62.377 fps

Test Personnel (signature/date)

Project Leader (signature/date)

Pump tripped off line at 3:56:55 into test, test stopped at that point, with 2 min left in test.

Copyright 2009 by Environmental Supply Company, Inc.

Spreadsheet for U.S. EPA OTM-27 - Determination of PM10 and PM2.5 Emissions

TEST DATA SHEET

Location: Sorrento Shaking Bed Baghouse | Start Time: 14:19:00 | RUN No. 1

Date: 3-Jun-2011 | End Time: 15:52:00 | JOB No.

STACK DATA			EQUIPMENT			ESTIMATES			+/- 50°F ΔH			
% Moisture:	4	% est.	METER BOX:	906107		Ts (°F): 118	Tm (°F):	50	Ts-50°	68	Ts+50°	168
Barometric:	27.42	in Hg	Y:	0.995		Est. Qs:	0.4589	cfm	Est. Qs:	0.4891	Est. Qs:	0.5148
Static Press:	-0.55	in H_2O	ΔH@:	1.843	in H_2O	Est. μ_s:	193.28	mpoise	Est. μ_s:	169.48	Est. μ_s:	193.52
Stack Press:	27.38	in Hg	Cp':	0.840	S/N -	Est. ΔH:	0.466	("H_2O)	Est. ΔH:	0.559	Est. ΔH:	0.395
$\%CO_2$:	0.03	%	Cp:	0.840	S/N -							
$\%O_2$:	20.90	%	Nozzle Dia:	0.1490	inches							
$\%N_2$/CO:	79.07	%	Stack Area:	10.3	ft^2							
M_d:	28.84	lb/lb-mole	# of Points:	12	points							
Est. M_w:	28.41	lb/lb-mole	Run Time:	96.00	min							
T_{std}:	528	°R	P_{std}:	29.92	in Hg							

LEAK CHECKS			
DGM initial	0	0	cf
DGM final	0	0	cf
Time	1	1	min.
Leak Rate	0.0000	0.0000	cfm
Vacuum	15	8	in. Hg

Sample Point	Clock Time (min)	Dry Gas Meter Reading (ft^3)	Pitot ΔP ("H_2O)	Gas Temperatures (°F) DGM Inlet	DGM Outlet	Stack	Orifice Press. ΔH (in H_2O) Ideal	Actual	Pump Vac. (in Hg)	Gas Temps (°F) Probe	Filter	Imp. Exit	Qs (acfm)	D_{50} [10 µm]	D_{50} [2.5 µm]
1	9.00	890.8000	1.200	76.0	76.0	131	0.469	0.490	1	251	249	65	0.4664	10.71	2.41
2	17.50	894.4700	1.100	77.0	77.0	132	0.468	0.490	1	250	248	63	0.4466	11.06	2.55
3	26.00	897.7900	1.100	78.0	78.0	132	0.469	0.490	1	252	249	61	0.4619	10.80	2.45
4	35.00	901.2300	1.200	78.0	78.0	131	0.471	0.490	1	250	247	62	0.4811	10.48	2.32
5	43.00	905.0300	0.990	77.0	77.0	132	0.468	0.490	1	251	248	63	0.4588	10.85	2.47
6	48.75	908.2400	0.510	78.0	78.0	131	0.471	0.490	1	249	249	64	0.4637	10.76	2.43
7	51.25	910.5800	0.090	79.0	79.0	131	0.471	0.490	1	251	248	62	0.4731	10.60	2.37
8	59.25	911.6200	0.970	81.0	81.0	132	0.472	0.490	1	248	248	61	0.4838	10.45	2.31
9	67.75	915.0300	1.100	82.0	82.0	131	0.474	0.490	1	250	249	62	0.4697	10.66	2.39
10	76.00	918.5600	1.000	82.0	82.0	132	0.472	0.490	1	251	250	64	0.4848	10.43	2.31
11	84.00	922.0900	0.980	81.0	81.0	131	0.473	0.490	1	252	249	60	0.4490	11.00	2.53
12	92.00	925.2600	0.960	81.0	81.0	132	0.472	0.490	1	251	250	62	0.4583	10.86	2.47
13	-	928.4900					-						-	-	-
14	-						-						-	-	-
15	-						-						-	-	-
16	-						-						-	-	-
17	-						-						-	-	-
18	-						-						-	-	-
19	-						-						-	-	-
20	-						-						-	-	-
21	-						-						-	-	-
22	-						-						-	-	-
23	-						-						-	-	-
24	-						-						-	-	-

Actual Run Time	V_m	ΔP (avg)	$T_{m\,(avg)}$	$T_{s\,(avg)}$	Max Vac.	ΔH (avg)	$V_{s\,(avg)}$
			538.8 °R	591.2 °R			
92.00 min	37.690 cf	0.933 in H_2O	79.2 °F	131.5 °F	1	0.490 in H_2O	58.961 fps

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 by Environmental Supply Company, Inc.

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento	Date	6/3/2011
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	Run #	3
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	107	°F
Avg Gas Meter Temp	(t_m)	95	°F
DH @ 0.75 SCFM	(ΔH@)	1.89	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	7.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.9614	acfm
DP to DH Isokinetic Factor	(K)	3.84	

Sampling Equipment			
Meter #	610022		
Meterbox Cal. Factor	(Y)	0.945	
Nozzle #			
Actual Nozzle Diameter	(D_{ns})	0.2500	in
Req. Nozzle Diameter	(D_{ni})	0.2611	in
Probe # / Length	72	72.00	ft
Liner Material	Glass		
Sample Case / Oven #			
Impinger Case #			

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.22	in H_2O
Absolute Stack Pressure	(P_s)	27.40	in Hg
Absolute Meter Pressure	(P_m)	27.56	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid		ft^3/min	@		in Hg
Post	0.01	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?		☑	Orsat OK?		☐

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	17:43:00	258.100	0.85	3.26	3.20	105	247	96	245	60	11.0
A-2	3.0	17:46:00	261.390	0.87	3.34	3.20	106	248	96	247	60	11.0
A-3	6.0	17:49:00	264.740	0.89	3.41	3.30	106	249	96	244	60	1.5
A-4	9.0	17:52:00	268.130	0.82	3.15	3.00	106	249	95	249	58	11.0
A-5	12.0	17:55:00	271.400	0.80	3.07	2.90	106	250	95	245	58	11.0
A-6	15.0	17:58:00	274.610	0.77	2.95	2.80	107	247	96	246	56	11.0
A-7	18.0	18:01:00	277.740	0.51	1.96	1.80	108	248	96	247	55	7.0
A-8	21.0	18:04:00	280.350	0.50	1.92	1.80	107	247	95	246	54	7.0
A-9	24.0	18:07:00	282.920	0.48	1.84	1.70	106	249	95	246	55	7.0
A-10	27.0	18:10:00	285.380	0.47	1.80	1.70	105	249	96	247	53	7.0
A-11	30.0	18:13:00	287.830	0.46	1.76	1.60	105	247	95	248	54	7.0
A-12	33.0	18:16:00	290.230	0.47	1.80	1.60	106	245	96	247	55	7.0
B-1	36.0	18:19:00	292.590	0.63	2.42	2.30	106	248	95	246	56	9.0
B-2	39.0	18:22:00	295.370	0.66	2.53	2.40	107	247	95	245	52	9.0
B-3	42.0	18:25:00	298.280	0.65	2.49	2.40	106	251	96	246	53	9.0
B-4	45.0	18:28:00	301.180	0.65	2.49	2.40	106	247	96	249	54	9.5
B-5	48.0	18:31:00	304.120	0.67	2.57	2.50	105	248	95	250	52	9.5
B-6	51.0	18:34:00	306.980	0.64	2.46	2.30	104	249	96	251	53	10.0
B-7	54.0	18:37:00	310.040	0.68	2.61	2.50	104	247	95	246	52	10.0
B-8	57.0	18:40:00	313.050	0.72	2.76	2.60	104	244	95	247	53	10.5
B-9	60.0	18:43:00	316.080	0.74	2.84	2.70	104	243	94	246	55	11.0
B-10	63.0	18:46:00	319.210	0.78	2.99	2.90	105	247	94	244	56	11.5
B-11	66.0	18:49:00	322.400	0.79	3.03	2.90	105	248	94	244	57	11.5
B-12	69.0	18:52:00	325.650	0.63	2.42	2.30	105	248	94	246	59	10.0
Last Pt	72.0	18:55:00	328.430									
Final Value	72.0	18:55:00	328.430						Maximum Vacuum			11.5
Average Values				0.67		2.45	106	248	95	247	55	
								171				

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento	Date	6/3/2011
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Horner/Keating	Run #	2
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	108	°F
Avg Gas Meter Temp	(t_m)	78	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.89	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	7.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.9814	acfm
DP to DH Isokinetic Factor	(K)	3.71	

Sampling Equipment			
Meter #	610022		
Meterbox Cal. Factor	(Y)	0.945	
Nozzle #			
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{nl})	0.2680	in
Probe # / Length	72	72.00	ft
Liner Material	Glass		
Sample Case / Oven #			
Impinger Case #			

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.20	in H_2O
Absolute Stack Pressure	(P_s)	27.41	in Hg
Absolute Meter Pressure	(P_m)	27.56	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?		☑	Orsat OK?		☐

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	15:58:00	185.100	0.600	2.228	2.200	105	245	89	241	62	7.0
A-2	3.0	16:01:00	187.880	0.620	2.302	2.300	106	245	89	242	60	7.5
A-3	6.0	16:04:00	190.590	0.680	2.525	2.500	106	246	89	240	59	8.5
A-4	9.0	16:07:00	193.700	0.710	2.636	2.600	106	247	91	241	55	10.0
A-5	12.0	16:10:00	196.660	0.690	2.562	2.500	105	246	91	240	52	9.0
A-6	15.0	16:13:00	199.550	0.640	2.376	2.300	106	247	91	241	52	8.5
A-7	18.0	16:16:00	202.390	0.700	2.599	2.600	106	248	92	242	53	9.5
A-8	21.0	16:19:00	205.450	0.790	2.933	3.000	107	249	92	243	53	10.5
A-9	24.0	16:22:00	208.510	0.820	3.044	3.000	106	240	93	245	52	10.5
A-10	27.0	16:25:00	211.930	0.840	3.119	3.100	105	242	94	246	51	11.0
A-11	30.0	16:28:00		0.800	2.970	2.900	106	243	94	245	52	11.0
A-12	33.0	16:31:00	218.530	0.760	2.822	2.800	107	246	94	246	52	11.0
B-1	36.0	16:34:00	221.790	0.480	1.782	1.800	106	247	95	247	48	11.0
B-2	39.0	16:37:00	224.370	0.590	2.190	2.200	106	247	95	250	48	8.5
B-3	42.0	16:40:00	227.140	0.530	1.968	2.000	107	250	96	251	49	8.0
B-4	45.0	16:43:00	229.830	0.520	1.931	2.000	107	251	96	251	49	8.0
B-5	48.0	16:46:00	232.530	0.560	2.079	2.100	108	249	96	252	51	8.0
B-6	51.0	16:49:00	235.220	0.500	1.856	1.900	106	246	96	249	51	8.0
B-7	54.0	16:52:00	237.870	0.760	2.822	2.800	106	245	95	246	52	9.5
B-8	57.0	16:55:00	240.980	0.780	2.896	2.900	106	246	95	247	51	10.0
B-9	60.0	16:58:00	244.300	0.810	3.007	3.000	107	251	96	247	53	10.5
B-10	63.0	17:01:00	247.580	0.860	3.193	3.200	107	252	95	246	55	10.5
B-11	66.0	17:04:00	250.950	0.860	3.193	3.200	108	251	95	245	56	11.0
B-12	69.0	17:07:00	254.320	0.890	3.304	3.200	107	250	96	240	58	11.0
Last Pt	72.0	17:10:00	257.650									
Final Value	72.0	17:10:00	254.320							Maximum Vacuum		11.0
Average Values				0.70		2.59	106	247	94	245	53	
								170				

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento	Date	6/3/2011
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Horner/Keating	Run #	1
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	110	°F
Avg Gas Meter Temp	(t_m)	81	°F
DH @ 0.75 SCFM	(ΔH@)	1.89	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.55	in H_2O
Stack Moisture Content	(B_{ws})	7.0	%
Stack Dry Molecular Weight	(M_{ds})	28.84	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	3.72	

Sampling Equipment			
Meter #	610022		
Meterbox Cal. Factor	(Y)	0.945	
Nozzle #			
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{ni})	0.2387	in
Probe # / Length	72	72.00	ft
Liner Material	Glass		
Sample Case / Oven #			
Impinger Case #			

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Stack Static Pressure	(P_{static})	-0.21	in H_2O
Absolute Stack Pressure	(P_s)	27.40	in Hg
Absolute Meter Pressure	(P_m)	27.56	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid		ft^3/min	@		in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?	☑		Orsat OK?	☐	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	14:20:00	112.900	0.430	1.599	1.600	110	246	81	256	61	6.0
A-2	3.0	14:23:00	115.240	0.580	2.157	2.100	111	247	81	254	55	7.5
A-3	6.0	14:26:00	117.920	0.630	2.343	2.300	110	247	81	253	55	8.0
A-4	9.0	14:29:00	120.680	0.600	2.231	2.200	109	247	81	257	55	8.0
A-5	12.0	14:32:00	123.500	0.570	2.120	2.100	108	247	81	256	55	8.0
A-6	15.0	14:35:00	126.230	0.550	2.046	2.000	108	248	80	257	53	8.0
A-7	18.0	14:38:00	128.910	0.640	2.380	2.400	108	247	80	257	52	8.5
A-8	21.0	14:41:00	131.880	0.740	2.752	2.700	109	248	80	254	52	9.5
A-9	24.0	14:44:00	134.870	0.820	3.050	3.000	108	247	80	250	52	10.5
A-10	27.0	14:47:00	138.110	0.880	3.273	3.300	108	246	80	248	52	12.0
A-11	30.0	14:50:00	141.500	0.910	3.384	3.400	108	247	80	249	52	13.0
A-12	33.0	14:53:00	144.950	0.930	3.459	3.500	108	247	80	249	52	13.0
B-1	36.0	14:56:00	148.410	0.420	1.562	1.600	106	249	82	245	57	6.5
B-2	39.0	14:59:00	150.750	0.600	2.231	2.200	107	246	83	247	53	7.5
B-3	42.0	15:02:00	153.400	0.750	2.789	2.700	107	245	81	246	52	9.0
B-4	45.0	15:05:00	156.380	0.810	3.012	3.000	107	247	84	248	53	10.5
B-5	48.0	15:08:00	159.610	0.800	2.975	3.000	107	247	85	248	53	10.5
B-6	51.0	15:11:00	162.860	0.680	2.529	2.500	107	248	86	247	52	10.0
B-7	54.0	15:14:00	165.860	0.700	2.603	2.500	107	247	86	250	52	10.0
B-8	57.0	15:17:00	168.820	0.660	2.455	2.400	108	246	88	246	50	10.0
B-9	60.0	15:20:00	171.720	0.680	2.529	2.500	108	246	88	245	51	10.0
B-10	63.0	15:23:00	174.780	0.720	2.678	2.600	108	248	89	246	50	10.0
B-11	66.0	15:26:00	177.670	0.710	2.641	2.600	108	247	90	248	50	10.5
B-12	69.0	15:29:00	180.640	0.660	2.455	2.300	108	248	91	247	50	10.5
Last Pt	72.0	15:32:00	183.560									
Last Pt	72.0	15:32:00	183.560						Maximum Vacuum			13.0
Average Values				0.69		2.52	108	247	83	250	53	

APPENDIX C
FLOW RATE SPREADSHEETS

PRELIMINARY TEST DATA SHEET

Location:	Sorrento Shaking Bed Baghouse	Start Time:		RUN No.	1
Date:	3-Jun-2011	End Time:		JOB No.	

STACK DATA

% Moisture:	4	% est.	$\%CO_2$:	0.03	%
Barometric:	27.42	in Hg	$\%O_2$:	20.90	%
Static Press:	-0.55	in H_2O	$\%N_2/CO$:	79.07	%
Stack Press:	27.38	in Hg	M_d:	28.84	lb/lb-mole
Stack Area:	10.32	ft^2	Est. M_w:	28.41	lb/lb-mole
Stack Area:	1486.1	in^2			
STANDARD CONDITIONS			T_{std}:	68	°F
			P_{std}:	29.92	inches Hg

PRE-TEST CALCULATIONS

Viscocity μ_s:	193.28	mpoise
Cunningham:	1.0809	
D_{50LL}:	10.33	µm
$[N_{re}>3162]$ D_{50LL}:	-	µm
D_{50T}:	10.66	µm
Estimated Q_s:	0.4589	acfm
Estimated N_{re}:	2761	
Estimated ΔH:	0.466	in H_2O

EQUIPMENT

METER BOX:	906107	
Y:	0.99	
ΔH@:	1.843	in H_2O
Estimated T_m:	50	°F
Cp':	0.840	S/N
Cp:	0.840	S/N
Nozzle Dia:	0.149	inches
Nozzle Area:	0.00012	ft^2

PRELIMINARY TRAVERSE

Sample Point	Cyclonic Flow Check Null Angle °	Preliminary ΔP (in. H_2O) ΔP_m	ΔP_s	ΔP_{s2}	Stack Temperature (°F)
1	0.0	0.730	0.730	-	118.0
2	0.0	0.930	0.930	-	118.0
3	0.0	0.840	0.840	-	118.0
4	0.0	0.810	0.810	-	118.0
5	0.0	1.050	1.050	-	118.0
6	0.0	1.400	1.400	-	118.0
7	0.0	1.200	1.200	-	118.0
8	0.0	1.200	1.200	-	118.0
9	0.0	0.930	0.930	-	118.0
10	0.0	0.910	0.910	-	118.0
11	0.0	0.860	0.860	-	118.0
12	0.0	0.870	0.870	-	118.0
13			-	-	
14			-	-	
15			-	-	
16			-	-	
17			-	-	
18			-	-	
19			-	-	
20			-	-	
21			-	-	
22			-	-	
23			-	-	
24			-	-	
	0.0 (absolute °)	0.978	0.978	-	118.000

NOZZLE SELECTION

Nozzle S/N	Diam. Dn (in)	Vn (fps)	V_{min} (fps)	V_{max} (fps)	ΔP_{min} (inches H_2O)	ΔP_{max}
1	0.131	81.72	61.83	100.52	1.00	2.64
2	***0.149***	63.17	46.42	78.57	***0.56***	***1.61***
3	0.170	48.53	33.97	61.34	0.30	0.98
4	0.180	43.28	29.38	55.21	0.23	0.80
5	0.194	37.26	23.94	48.20	0.150	0.61
6	0.213	30.91	17.79	40.85	0.08	0.44
7	0.226	27.46	14.03	36.89	0.05	0.36
8	0.266	19.82	9.91	28.21	0.03	0.21
9	0.303	15.28	7.64	22.91	0.02	0.14
10	0.345	11.78	5.89	17.67	0.01	0.08
11	0.396	8.94	4.47	13.41	0.01	0.05
12		#####	-	-	-	-

Test Personnel (signature/date)

Project Leader (signature/date)

Copyright 2009 Environmental Supply Company Inc.

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Sorrento			Date	06/03/11
Sampling Location	Whey Dryer Scubber			Project #	PM/CPM test
Operator	Homer/Keating			# of Ports Used	2
Stack Type	Circular			Meter Box Number	610022
Train Leak Check	☐	PreTest	☐ PostTest	Meter Cal Factor (Y)	0.945

Moisture Content Data								
Run Number	1		Run Start Time	14:20		Run Stop Time	15:32	
Total Meter Volume	(V_m)	70.660	dcf	Barometric Press.		(P_b)	27.25	in Hg
Avg Meter Temp	$(t_m)_{avg}$	83	°F	Stack Static Press.		(P_{static})	-0.21	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	108	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.52	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	g	g	g	ml
Contents		empty	empty	H2O			Silica	
Final Value	$(V_f),(W_f)$	71.00	9.00	99.00			245.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			234.00	
Net Value	$(V_n),(W_n)$	71.0	9.0	-1.0			11.0	
Results								
Total Volume	(V_t)	79.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.719	scf
Total Weight	(W_t)	11.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.519	scf
Std Meter Volume	$(V_{m(std)})$	59.510	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	9.0	%
Calc Moisture Content	$(B_{ws(calc)})$	6.6	%	Final Moisture Content		(B_{ws})	6.6	%

Moisture Content Data								
Run Number	2		Run Start Time	15:58		Run Stop Time	17:10	
Total Meter Volume	(V_m)	69.220	dcf	Barometric Press.		(P_b)	27.42	in Hg
Avg Meter Temp	$(t_m)_{avg}$	94	°F	Stack Static Press.		(P_{static})	-0.20	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	106	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.59	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	ml	ml	g	ml
Contents		empty	empty	H2O			Silica	
Final Value	$(V_f),(W_f)$	65.00	14.00	103.00			238.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			230.00	
Net Value	$(V_n),(W_n)$	65.0	14.0	3.0			8.0	
Results								
Total Volume	(V_t)	82.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.860	scf
Total Weight	(W_t)	8.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.377	scf
Std Meter Volume	$(V_{m(std)})$	57.578	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	8.5	%
Calc Moisture Content	(B_{ws})	6.9	%	Final Moisture Content		(B_{ws})	6.9	%

Moisture Content Data								
Run Number	3		Run Start Time	17:43		Run Stop Time	18:55	
Total Meter Volume	(V_m)	70.330	dcf	Barometric Press.		(P_b)	27.42	in Hg
Avg Meter Temp	$(t_m)_{avg}$	95	°F	Stack Static Press.		(P_{static})	-0.22	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	106	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.45	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	ml	ml	g	ml
Contents		empty	empty	H2O			Silica	
Final Value	$(V_f),(W_f)$	49.00	17.00	113.00			248.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			239.00	
Net Value	$(V_n),(W_n)$	49.0	17.0	13.0			9.0	
Results								
Total Volume	(V_t)	79.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.719	scf
Total Weight	(W_t)	9.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.424	scf
Std Meter Volume	$(V_{m(std)})$	58.300	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	8.3	%
Calc Moisture Content	(B_{ws})	6.6	%	Final Moisture Content		(B_{ws})	6.6	%

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento			Date	06/03/11
Sampling Location	Whey Dryer Scubber			Project #	PM/CPM test
Operator	Homer/Keating			# of Ports Used	2
Stack Type	Circular			Pitot Identification	BH 6'-#1
Pitot Leak Check	☐	PreTest	☐ PostTest	Pitot Coefficient (C_p)	0.84

Stack Dimensions			
Diameter or Length of Stack	(D)	62.25	in
Width of Stack	(W)		in
Area of Stack	(A_s)	21.14	ft^2

Pressures			
Barometric Pressure	(P_b)	27.42	in Hg
Static Pressure	(P_{static})	-0.21	in H_2O
Absolute Stack Pressure	(P_s)	27.40	in Hg

Stack Gas Composition			
Composition Data:	Actual ☐	Estimated ☐	
Carbon Dioxide Concentration	($\%CO_2$)	0.0	%
Oxygen Concentration	($\%O_2$)	20.9	%
Carbon Monoxide Concentration	(%CO)	0.0	%
Nitrogen Concentration	($\%N_2$)	79.1	%
Stack Moisture Content	(B_{ws})	5.000	
Stack Dry Molecular Weight	(M_d)	28.84	lb/lb-mole
Stack Wet Molecular Weight	(M_s)	28.30	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	46.8	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	2867259	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	47788	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	59289	ascf/min

Stack Cross Section Schematic

Velocity Traverse Data				
Run Number		V1		
Run Time				
Traverse Point	Velocity Head (Δp)	Stack Temp (t_s)	Null Angle deg	Local Velocity $(v_s)_i$
	in H_2O	°F		ft/sec
A-1	0.41	110	0	39.4
A-2	0.63	110	0	48.9
A-3	0.71	110	3	51.9
A-4	0.70	110	4	51.5
A-5	0.66	110	2	50.0
A-6	0.68	110	0	50.8
A-7	0.52	110	2	44.4
A-8	0.54	110	1	45.2
A-9	0.48	110	6	42.7
A-10	0.55	110	4	45.7
A-11	0.45	110	5	41.3
A-12	0.42	110	3	39.9
B-1	0.36	110	3	36.9
B-2	0.44	110	3	40.8
B-3	0.47	110	5	42.2
B-4	0.41	110	5	39.4
B-5	0.42	110	2	39.9
B-6	0.48	110	3	42.7
B-7	0.71	110	4	51.9
B-8	0.75	110	6	53.3
B-9	0.83	110	7	56.1
B-10	0.84	110	3	56.4
B-11	0.80	110	7	55.1
B-12	0.82	110	4	55.7
$(\Delta p)^{1/2}_{avg}$ [1]	0.76	110		

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Wet Bulb/Dry Bulb Estimate				
Wet Bulb Temp	110	Stack Vapor Pressure	2.57	in Hg
Dry Bulb Temp	110	Stack Moisture Content	9.39	%H2O

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

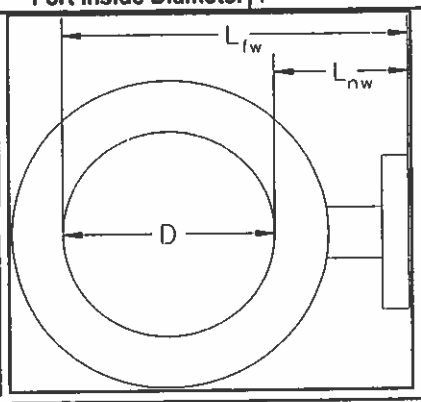
where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

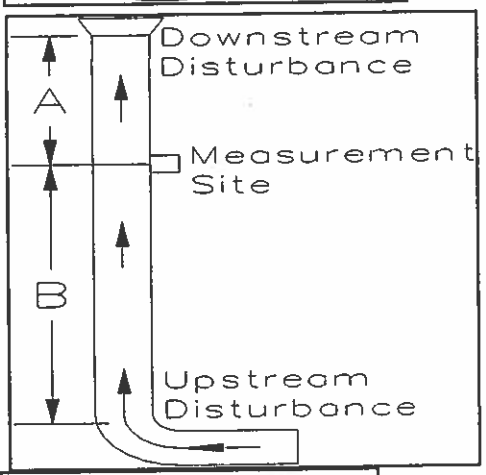
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	# of Ports Available	2
Stack Type	Circular	# of Ports Used	2
Stack Size	Large	Port Inside Diameter	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	63.50	in
Distance to Near Wall of Stack	(L_{nw})	1.25	in
(=Lfw - Lnw) Diameter of Stack	(D)	62.25	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	21.14	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	210.00	in
(=B/D) Diameters Upstream	(B_D)	3.37	diameters
Distance Downstream	(A)	54.00	in
(=A/D) Diameters Downstream	(A_D)	0.87	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	12	Across
24	Pts Used	24	Required
☑	Particulate	☐	Velocity

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
10					.974	.882
11						.933
12						.979

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.021	1 2/8	2 4/8
2	0.067	4 1/8	5 3/8
3	0.118	7 3/8	8 5/8
4	0.177	11	12 2/8
5	0.250	15 5/8	16 7/8
6	0.356	22 1/8	23 3/8
7	0.644	40 1/8	41 3/8
8	0.750	46 6/8	48
9	0.823	51 2/8	52 4/8
10	0.882	54 7/8	56 1/8
11	0.933	58 1/8	59 3/8
12	0.979	61	62 2/8

SOURCE SAMPLING TITLE PAGE

ALARMS EXIST !!! - Check Alarm Sheet

Source Information				
Plant Name	Sorrento			
Sampling Location	Whey Dryer Scubber			
Fuel or Source Type				
Fuel F-Factor				

Test Information			
Starting Test Date		06/03/11	
Project #		PM/CPM test	
Operator		Homer/Keating	
Standard Temperature			°F
Standard Pressure			in Hg
Minimum required sample vol.			scf
Run Duration		72	Minutes
Base Run Number			
# of Ports Available		2	
# of Ports Used		2	
Port Inside Diameter		4.00	in
Circular Stack?		☑	
Rectangular Stack?		☐	

Test Equipment Information			
Meter Box Number		610022	
Meter Calibration Factor	(Y)	0.945	
Orifice Meter Coefficient	($\Delta H_@$)	1.894	in H_2O
Pitot Identification		BH 6'-#1	
Pitot Tube Coefficient	(C_p)	0.840	
Orsat Identification		NA	
Nozzle Number			
Nozzle Diameter	(D_n)	0.2500	in
Probe Number		72	
Probe Length		72.00	in
(SS, Glass ....) Liner Material		Glass	
Sample Case / Oven Number			
Impinger Case Number			
Acetone Lot Number			

Testing Company Information	
Company Name	Bighorn Environmental
Address	1324 N Liberty Lake Rd
City, State Country Zip	Liberty Lake, WA 99019
Project Manager	Tim Homer
Phone Number	541-954-4697
Fax Number	888-559-5624

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento
Location: Nampa, ID
Personnel: Howell/Keating
Date: 6/3/11
Source: SKAKing BeD
Run #: 3
Ambient Temp: 70
Barometric Press.: 27.42
Assumed Moisture: 4%
Start Time: 18:14

Meter Box ID: 906017
Meter Box Y: .995
Meter Box Δ H@: 1.843
Probe ID: ~~184~~ BH45'
Probe Cp: .84
Filter #: 337
Static Pressure (in. H2O): -.54
Nozzle ID: #2
Probe/Filter Settings (F): 250
End Time: 19:50

Leak Check Results

Sample Train
Pre @ 15 in Hg.: Ø cfm
Post @ 15 in Hg.: Ø cfm
DGM Start: 9.52 DGM End: 9.52
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	—	—	100	510 g
End (ml):	4	0	117	

Color/Odor:

Traverse Point	Time (min)	Vacuum	~~DGM~~ Reading (cubic ft)	~~Inlet Temp~~ BH (°F) Filter	Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	9.0	1.0	964.20	81	82	1.2	.49	135	248	67	252	
2	17.50	1.0	973.03	82	81	1.1	.49	135	249	64	251	
3	25.79	1.0	976.49	84	81	1.0	.49	135	247	60	252	
4	33.75	1.0	979.89	80	81	.99	.49	134	248	58	251	
5	41.75	1.0	983.28	77	81	.96	.49	135	247	59	250	
6	48.00	1.0	986.55	78	82	.58	.49	135	248	59	251	
7	56.00	1.0	989.12	80	82	.97	.49	135	249	60	253	
8	64.25	1.0	992.36	81	83	1.0	.49	135	250	60	254	
9	72.75	1.0	995.70	82	83	1.1	.49	134	251	61	251	
10	80.75	1.0	999.21	82	83	.98	.49	135	250	62	250	
11	88.75	1.0	1002.62	83	83	.96	.49	134	251	62	251	
12	96.75	1.0	1005.89	84	83	.94	.49	135	249	63	252	
13		1										
14			1009.29									
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
		Final DGM	1009.29									

QA/QC Checks: Completeness: Legibility:

Notes:

Signature:

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento
Location: NAMPA, ID
Personnel: Homer / Keating
Date: ~~6/3/11~~ 6/3/11
Source: smoking Bed
Run #: 2
Ambient Temp: 73
Barometric Press.: 27.42
Assumed Moisture: 4%
Start Time: 16:24

Meter Box ID: 906017
Meter Box Y: .995
Meter Box Δ H@: 1.843
Probe ID: BH#1-5'
Probe Cp: .84
Filter #: 233
Static Pressure (in. H2O): -.157
Nozzle ID: #2
Probe/Filter Settings (F): 250
End Time: ~~18:02~~ 18:02

Leak Check Results

Sample Train
Pre @ 15 in Hg.: Ø cfm
Post @ 15 in Hg.: Ø cfm
DGM Start: 968.81 DGM End: 968.81
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	~~40~~ 0	0	100	502
End (ml):	1	1	113	
Color/Odor:				

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	~~Inlet Temp~~ BH (°F)	~~Inlet Temp~~ Filter (°F)	Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	9.25	1.0	929.20	84		77	1.3	.49	132	249	66	251	
2	17.75	1.0	932.40	81		76	~~1.1~~ 1.1	.49	132	248	62	251	
3	26.25	1.0	936.23	80		76	1.1	.49	131	249	58	250	
4	34.50	1.0	939.57	78		76	1.0	.49	133	247	58	248	
5	42.50	1.0	~~944~~ 942.87	79		76	0.97	.49	132	248	59	249	
6	48.50	1.0	946.11	81		76	.55	.49	132	249	60	250	
7	56.50	1.0	948.51	83		77	.95	.49	133	250	61	248	
8	64.70	1.0	951.77	80		77	1.6	.49	132	251	62	249	
9	73.00	1.0	955.03	78		78	1.0	.49	133	249	62	251	
10	81.00	1.0	958.43	79		78	1.1	.49	134	250	63	250	
11	90.00	1.0	962.02	80		78	.97	.49	135	248	65	251	
12	98.00	1.0	965.48	82		78	.94	.49	135	247	64	249	
13													
14													
15			968.69										
16													
17													
18													
19													
20													
21													
22													
23													
24													
		Final DGM	968.69										

QA/QC Checks: Completeness: Legibility:

Signature:

Notes: No H2O collected in Imp. 1-2 No purge required

Bighorn Environmental Method 5 Field Data Sheet M2017/202

Client/Plant Name: Sorrento
Location: Nampa, ID
Personnel: Homer/Keating
Date: 6/3/11
Source: Sighting 820
Run #: 1
Ambient Temp:
Barometric Press.: 27.42
Assumed Moisture: 4
Start Time: 14:19

Meter Box ID: 906017
Meter Box Y: .995
Meter Box Δ H@: 1.843
Probe ID: 8H5'
Probe Cp: .84
Filter #: 44
Static Pressure (in. H2O): -.55
Nozzle ID: #2
Probe/Filter Settings (F): 250
End Time: 15:52

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0 cfm
Post @ 15 in Hg.: 0 cfm
DGM Start: 928.76 DGM End: 928.76

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	500
End (ml):	1	1	112	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	8.0	1.0	890.80	78	76	1.7	.49	131	249	65	251	
2	17.50	1.0	894.47	77	77	1.1	.49	132	248	63	250	
3	26.00	1.0	897.79	77	78	1.1	.49	132	249	61	252	
4	35.00	1.0	901.23	78	78	1.2	.49	131	247	62	250	
5	43.00	1.0	905.03	77	77	1.11	.49	132	248	63	251	
6	48.75	1.0	908.24	79	78	.51	.49	132	249	64	249	
7	51.25	1.0	910.58	81	79	.09	.49	131	248	62	251	
8	59.25	1.0	911.62	83	81	.97	.49	132	248	61	248	
9	67.75	1.0	915.03	80	82	1.1	.49	131	249	62	250	
10	76.00	1.0	918.56	81	82	1.0	.49	132	250	64	251	
11	84.00	1.0	922.09	83	81	.98	.49	131	249	60	252	
12	92.00	1.0	925.2600	81	81	.96	.49	132	250	62	251	
13												
14			928.49									
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
		Final DGM	928.49									

QA/QC Checks: Completeness: Legibility:

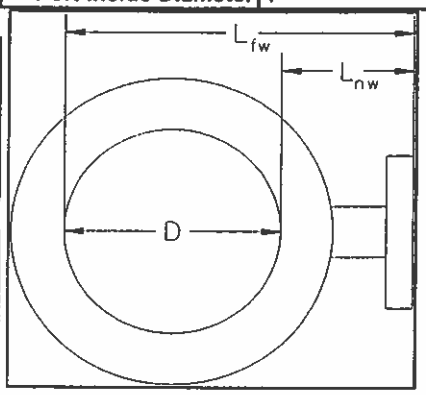
Signature:

Notes: No H2O collected in Imp 1-2, no purge required

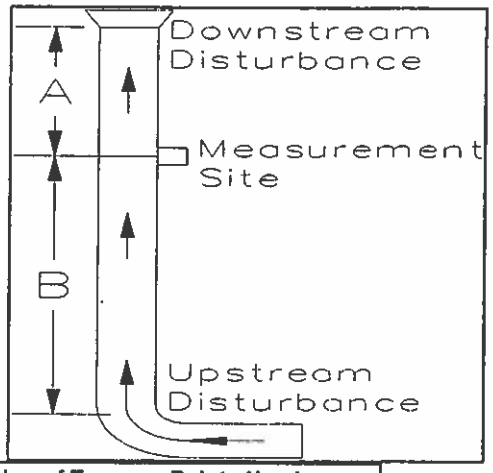
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	# of Ports Available	2
Stack Type	Circular	# of Ports Used	2
Stack Size	Large	Port Inside Diameter	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	63.50	in
Distance to Near Wall of Stack	(L_{nw})	1.25	in
(=Lfw - Lnw) Diameter of Stack	(D)	62.25	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	21.14	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	210.00	in
(=B/D) Diameters Upstream	(B_D)	3.37	diameters
Distance Downstream	(A)	54.00	in
(=A/D) Diameters Downstream	(A_D)	0.87	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	12	Across
24	Pts Used	24	Required
☑	Particulate	☐	Velocity

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
10					.974	.882
11						.933
12						.979

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.021	1 2/8	2 4/8
2	0.067	4 1/8	5 3/8
3	0.118	7 3/8	8 5/8
4	0.177	11	12 2/8
5	0.250	15 5/8	16 7/8
6	0.356	22 1/8	23 3/8
7	0.644	40 1/8	41 3/8
8	0.750	46 6/8	48
9	0.823	51 2/8	52 4/8
10	0.882	54 7/8	56 1/8
11	0.933	58 1/8	59 3/8
12	0.979	61	62 2/8

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Whey Dryer Scubber	Project #	PM/CPM test
Operator	Homer/Keating	# of Ports Used	2
Stack Type	Circular	Pitot Identification	BH 6'-#1
Pitot Leak Check	☐ PreTest ☐ PostTest	Pitot Coefficient (C_p)	0.84

Stack Dimensions			
Diameter or Length of Stack	(D)	62.25	in
Width of Stack	(W)		in
Area of Stack	(A_s)	21.14	ft^2

Pressures			
Barometric Pressure	(P_b)	27.25	in Hg
Static Pressure	(P_{static})	-0.24	in H_2O
Absolute Stack Pressure	(P_s)	27.23	in Hg

Stack Gas Composition			
Composition Data:	Actual ☐	Estimated ☐	
Carbon Dioxide Concentration	($\%CO_2$)	0.0	%
Oxygen Concentration	($\%O_2$)	20.9	%
Carbon Monoxide Concentration	(%CO)	0.0	%
Nitrogen Concentration	($\%N_2$)	79.1	%
Stack Moisture Content	(B_{ws})	5.000	
Stack Dry Molecular Weight	(M_d)	28.84	lb/lb-mole
Stack Wet Molecular Weight	(M_s)	28.30	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)		ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})		ascf/min

Stack Cross Section Schematic

Wet Bulb/Dry Bulb Estimate				
Wet Bulb Temp	91	Stack Vapor Pressure	1.46	in Hg
Dry Bulb Temp	91	Stack Moisture Content	5.35	%H2O

Velocity Traverse Data

Run Number	V1
Run Time	

Traverse Point	Velocity Head (Δp) in H_2O	Stack Temp (t_s) °F	Null Angle deg	~~Local Velocity~~ (v_s)$_l$ ft/sec
A-1	.41		0	
A-2	.63		0	
A-3	.71		3	
A-4	.70		4	
A-5	.66		2	
A-6	.68		0	
A-7	.52		2	
A-8	.54		1	
A-9	.48		6	
A-10	.55		4	
A-11	.45		5	
A-12	.42		3	
B-1	.36		3	
B-2	.44		3	
B-3	.47		5	
B-4	.41		3	
B-5	.42		2	
B-6	.48		3	
B-7	.71		4	
B-8	.75		6	
B-9	.83		7	
B-10	.84		3	
B-11	.80		7	
B-12	.82		4	
$(\Delta p)^{1/2}_{avg}$ [1]				

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento
Location: Nampa, ID
Personnel: Homer/Keating
Date: 6/3/11
Source: Whey Scrubber
Run #: 3
Ambient Temp: 74
Barometric Press.: 27.42
Assumed Moisture: 5
Start Time: 1743

Meter Box ID: 610022
Meter Box Y: .945
Meter Box Δ H@: 1.894
Probe ID: B 1/4 6' - #2
Probe Cp: .84
Filter #: 336
Static Pressure (in. H2O): -.22
Nozzle ID: B 1/4" - 6
Probe/Filter Settings (F): 250
End Time: 1858

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0 cfm
Post @ 15 in Hg.: 0.01 cfm
DGM Start: 328.74 DGM End: 328.75

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	5.02
End (ml):	49	17	11.3	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	~~Inlet Temp (°F)~~ Filter	Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	11.0	258.1	81	96	.85	3.2	105	245	60	247	
2		11.0	261.39	83	96	.87	3.2	106	247	60	248	
3		11.5	264.74	81	96	.89	3.3	106	244	60	249	
4		11.0	268.13	82	95	.82	3.0	106	249	58	249	
5		11.0	271.40	80	95	.80	2.9	106	245	58	250	
6		11.0	274.61	81	96	.77	2.8	107	246	56	247	
7		7.0	277.74	82	96	.51	1.8	108	247	55	248	
8		7.0	280.35	83	95	.50	1.8	107	246	54	247	
9		7.0	282.92	80	95	.48	1.7	106	246	55	249	
10		7.0	285.38	82	96	.47	1.7	105	247	53	249	
11		7.0	287.83	83	95	.46	1.6	105	248	54	247	
12		7.0	290.23	80	96	.47	1.6	106	247	55	245	
13		9.0	292.59	82	95	.63	2.3	106	246	56	248	
14		9.0	295.37	80	95	.66	2.4	107	245	52	247	
15		9.0	298.28	82	96	.65	2.4	106	246	53	251	
16		9.5	301.18	83	96	.65	2.4	106	244	54	247	
17		9.5	304.12	80	95	.67	2.5	105	250	52	248	
18		10.0	306.98	78	96	.64	2.3	104	251	53	249	
19		10.0	310.04	79	95	.68	2.5	104	246	52	247	
20		10.5	313.05	81	95	.72	2.6	104	247	53	244	
21		11.0	316.08	81	94	.74	2.7	104	246	55	243	
22		11.5	319.21	82	94	.78	2.9	105	244	56	247	
23		11.5	322.40	83	94	.79	2.9	105	244	57	248	
24		10.0	325.65	83	94	.63	2.3	105	246	59	248	
		Final DGM	328.43									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes: Initial 6/13

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorento
Location: Nampa, ID
Personnel: Homer/Keeting
Date: 6/3/14
Source: Wing Scrubber
Run #: 2
Ambient Temp: 74
Barometric Press.: 27.42
Assumed Moisture: 5
Start Time: 1558

Meter Box ID: 610022
Meter Box Y: .945
Meter Box Δ H@: 1.894
Probe ID: BH6'-H2
Probe Cp: .84
Filter #: 334
Static Pressure (in. H2O): -.20
Nozzle ID: BH 1/4" - 6
Probe/Filter Settings (F): 250
End Time: 1712

Leak Check Results

Sample Train
Pre @ 15 in Hg.: ✓ cfm
Post @ 15 in Hg.: ✓ cfm
DGM Start: 257.93 DGM End: 257.93

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	SO_2
End (ml):	65	14	103	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM ~~Inlet Temp~~ BH Filter (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	7.0	185.1	71	89	.60	2.2	105	241	62	245	
2		7.5	187.88	80	89	.62	2.3	106	242	60	245	
3		8.5	190.59	81	89	.68	2.5	106	240	59	246	
4		10.0	193.70	75	91	.71	2.6	106	241	55	247	
5		9.0	196.66	75	91	.69	2.5	105	240	52	246	
6 1.5		8.5	199.55	76	91	.64	2.3	106	241	52	247	
7 1.5		9.5	202.39	77	92	.70	2.6	106	242	53	248	
8 2.5		10.5	205.45	77	92	.79	3.0	107	243	53	249	
9		10.5	208.51	78	93	.82	3.0	106	245	52	240	
10		11.0	211.93	77	94	.84	3.1	105	246	51	242	
11		11.0	missed	78	94	.80	2.9	106	245	52	243	
12		11.0	218.53	76	94	.76	2.8	107	246	52	246	
13		11.0	221.79	79	95	~~.48~~	~~2.9~~ 1.8	106	247	48	247	
14		8.5	224.37	83	95	.59	2.2	106	250	48	247	
15		8.0	227.14	81	96	.53	2.0	107	251	49	250	
16		8.0	229.83	81	96	.52	2.0	107	251	49	251	
17		8.0	232.53	80	96	.56	2.1	108	252	51	249	
18		8.0	235.22	78	96	.50	1.9	106	249	51	446	
19		9.5	237.87	79	95	.76	2.8	106	246	52	445	
20		10.0	240.98	80	95	.78	2.9	106	247	51	246	
21		10.5	244.30	81	96	.81	3.0	107	247	53	251	
22		10.5	247.58	81	95	.86	3.2	107	246	55	252	
23		11.0	250.95	82	95	.86	3.2	108	245	56	251	
24		11.0	254.32	80	96	.69	3.2	107	240	58	250	
		Final DGM	257.65									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes: Impact 6/13

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Seminole
Location: Nampa, ID
Personnel: Howe / Keeting
Date: 6/3/11
Source: Wiley Scrubber
Run #: 2
Ambient Temp: 67
Barometric Press.: 27.42
Assumed Moisture: 4
Start Time: 1420

Meter Box ID: 610022
Meter Box Y: .945
Meter Box Δ H@: 1.894
Probe ID: BH6-#2
Probe Cp: .84
Filter #: 333
Static Pressure (in. H2O): -.21
Nozzle ID: BH4-C
Probe/Filter Settings (F): 250
End Time: 1534

Leak Check Results

Sample Train
Pre @ 15 in Hg.: Ø cfm
Post @ 15 in Hg.: Ø cfm
DGM Start: 183.685 DGM End: 183.685
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	Silica
End (ml):	71	9	99	

Color/Odor: +50 ml added for purge

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	6.0	112.9	71	81	.43	1.6	110	256	61	246	
2		7.5	115.24	79	81	.58	2.1	111	251	55	247	
3		8.0	117.92	80	81	.63	2.3	110	253	55	247	
4		8.0	120.68	82	81	.60	2.2	109	257	55	247	
5		8.0	123.5	82	81	.57	2.1	108	256	53	247	
6		8.0	126.23	83	80	.55	2.0	108	257	53	248	
7		8.5	128.91	83	80	.64	2.4	109	257	52	247	
8		9.5	131.88	84	80	.74	2.7	109	254	52	248	
9		10.5	134.87	86	80	.82	3.0	108	250	52	247	
10		12.0	138.11	83	80	.88	3.3	108	248	52	246	
11		13.0	141.50	83	80	.91	3.4	108	249	52	247	
12		13.0	144.95	82	80	.93	3.5	108	249	52	247	
13		6.5	148.41	79	82	.42	1.6	106	245	57	249	
14		7.5	150.75	82	83	.60	2.2	107	247	53	246	
15		9.0	153.40	84	81	.75	2.7	107	246	52	245	
16		10.5	156.38	82	84	.81	3.0	107	248	53	247	
17		10.5	159.61	79	85	.80	3.0	106	248	53	247	
18		10.0	162.86	81	86	.68	2.5	107	247	52	248	
19		10.0	165.86	82	86	.70	2.5	107	250	52	247	
20		10.0	168.82	83	88	.66	2.4	108	246	50	246	
21		10.0	171.72	82	88	.68	2.5	108	245	51	246	
22		10.0	174.78	81	89	.72	2.6	108	246	50	248	
23		10.5	177.67	83	90	.71	2.6	108	248	50	247	
24		10.5	180.64	85	91	.66	2.3	108	247	50	248	
		Final DGM	183.56									

QA/QC Checks: Completeness: Legibility:
Signature:
Notes:

6.0 RESULTS

Tables 4 and 5 summarize the results from the Whey Dryer Scrubber and Shaking Baghouse respectively.

TABLE 4. WHEY DRYER SCRUBBER EMISSION RESULTS

Parameter/Pollutant	Run 1	Run 2	Run 3	Average
PM_{10} (EPA Method 5 and 202):				
-(gr/dscf)	0.010	0.010	0.010	0.010
-(lbs/hr)	4.46	4.37	4.24	4.36
Stack Parameters:				
Stack Gas Moisture (%)	6.47	6.93	6.71	6.70
Stack Temperature (°F)	108	106	106	107
Stack Gas Velocity (ft/min)	3,036	3,070	3,003	3,038
Actual Gas Flow (ft^3/min)	64,276	64,894	63,472	64,214
Dry Std. Gas Flow (ft^3/min)	51,181	51,578	50,632	51,131
Opacity (%)	14	13	14	14
Isokinetics (%)	100.7	96.1	99.2	98.7

TABLE 5. SHAKING BAGHOUSE EMISSION RESULTS

Parameter/Pollutant	Run 1	Run 2	Run 3	Average
PM_{10} (EPA Method 201A and 202):				
-(gr/dscf)	0.0074	0.0036	0.0035	0.0048
-(lbs/hr)	1.84	0.92	0.90	1.22
Stack Parameters:				
Stack Gas Moisture (%)	3.0	4.2	4.3	3.8
Stack Temperature (°F)	132	133	135	133
Stack Gas Velocity (ft/min)	3,531	3,744	3,723	3,666
Actual Gas Flow (ft^3/min)	36,440	38,638	38,421	37833
Dry Std. Gas Flow (ft^3/min)	28,892	30,183	29,887	29654
Opacity (%)	0	0	0	0
Isokinetics (%)	107.9	102.0	104.9	104.9

pH 7 Buffer: CP lot 0327-20 x 11-30-12
pH 4 Buffer: CP lot 0334-02 x 12-7-12
0.1 N NH4OH Titrate Rcky Mnt Reagent 10-0074 x 12-29-

6-23-11 – 6/24-2011 /JH

6-23-11 % Nernst: 98.2%
QC4: 3.991
QC7: 7.014

6-24-11 % Nernst: 98.7%
QC4: 3.991
QC7: 7.009

Sx ID	start pH	End pH	mL 0.1N NH4OH
QC7	7.017		
Prep Blk	6.616	7.009	0.05
1M 550	5.731	7.010	0.05
551	6.184	7.009	0.075
552	6.28	7.055	0.075
553	5.157	7.029	0.100
554	6.189	7.026	0.050
555	JH 6-27-11		
556	JH 6-27-11		
QC7	7.026		
6-24-11			
QC7	6.998		
1M 555	6.236	7.012	0.050
556	6.493	7.067	0.075
QC7	7.024		

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

			"New" M202: Bighorn			
date/init:	06/23/11-06/24/11 JH					
		pH-start	pH-end	mL NH4OH	mass NH3 (mg)	
	Prep Blank	6.616	7.009	0.050	0.09	
	11M 550	5.731	7.010	0.050	0.09	
	11M 551	6.184	7.009	0.075	0.13	
	11M 552	6.281	7.055	0.075	0.13	
	11M 553	5.157	7.029	0.100	0.17	
	11M 554	6.189	7.026	0.050	0.09	
	11M 555	6.236	7.012	0.050	0.09	
	11M 556	6.493	7.067	0.075	0.13	
	mass NH3 = 0.1N NH4OH x mL NH4OH x 17.03 mg NH3/mmol					
	QC:					
	% Nernst slo	98.2				
	pH 4.000	3.991				
	pH 7.000	7.014				
	pH 7.000	7.017				
	pH 7.000	7.026				
	QC:					
	% Nernst slo	98.7				
	pH 4.000	3.991				
	pH 7.000	7.009				
	pH 7.000	6.998				

90 DATE SUBJECT Bighorn 202 PROJECT NO.

										Gross								Gross	
Tare in	6.14.11	JH	@	1635	7.4%	Org in:	6.20.11	JH	@	1465	0.6%	Aq in:	6.25.11	JH	@	1530	0.6%		
Tare 1	6.15.11	[illegible]		1729	0.5%	Org 1:	6.23.11	JH	@	1664	0.6%	Aq 1:	6.27.11	JH	@	1025	0.5%		
Tare 2	6.16.11	JH	@	720	0.5%	Org 2:	6.24.11	JH	@	1421	4.0%	Aq 2:	6.27.11	JH	@	1639	0.9%		

Aqueous

Sx ID	Tare 1	Tare 2	Gross 1	Gross 2
3g	3.0000	3.0000 JH 6.16.11	3.0000	3.0000
Lab Blk	1.8941	~~1.8907~~ 1.8943	1.8940	1.8943
Prep Blk	1.8904	1.8907	1.8913	1.8917
11M550	1.8838	1.8839	1.8885	1.8887
551	1.8903	1.8904	1.8943	1.8945
552	1.8800	1.8801	1.8848	1.8848
553	1.8946	1.8949	1.8978	1.8977
554	1.8963	1.8964	1.8997	1.8998
555	1.8821	1.8823	1.8853	1.8855
556	1.8857	1.8857	1.8894	1.8895

Organic

Sx ID	Tare 1	Tare 2	Gross 1	Gross 2
3g	3.0000	3.0000	3.0000	3.0000
Lab Blk	1.8809	1.8810	JH 6.27.11 ~~1.8883~~ 1.8814	1.8814
Prep Blk	1.8872	1.8875	1.8883	1.8885
11M550	1.8907	1.8908	1.8959	1.8959
551	1.8886	1.8887	1.8932	1.8933
552	1.9071	1.9073	1.9134	1.9136
553	1.8883	1.8885	1.8945	1.8946
554	1.8979	1.8980	1.9035	1.9035
555	1.8852	1.8855	JH 6.27.11 ~~1.8887~~ 1.8916	1.8916
556	1.8849	1.8852	1.8891	1.8892

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

All masses in grams (g) "New" M202: Bighorn

Aqueous Phase

Sx ID	Tare	Tare QC	Tare - QC	average Tare	Gross	Gross QC	Gross - QC	average Gross	*net (g)	net (mg)**
date/init:	6/15/2011 TMM	06/16/11 SH			06/27/11 JH	06/27/11 JH			(total mass liq)	less NH3
time:	1729	0720			1025	1639				
Rel. Humidity	0.50%	0.50%			0.50%	2.90%				
3.0000g QC	3.0000	3.0000			3.0000	3.0000				
Lab Blank	1.8941	1.8943	-0.0002	1.8942	1.8940	1.8943	-0.0003	1.8942	-0.0001	-0.1
Prep Blank	1.8904	1.8907	-0.0003	1.8906	1.8913	1.8917	-0.0004	1.8915	0.0009	0.8
11M 550	1.8838	1.8839	-0.0001	1.8839	1.8885	1.8887	-0.0002	1.8886	0.0047	4.6
11M 551	1.8903	1.8904	-0.0001	1.8904	1.8943	1.8945	-0.0002	1.8944	0.0040	3.9
11M 552	1.8800	1.8801	-0.0001	1.8801	1.8848	1.8848	0.0000	1.8848	0.0048	4.7
11M 553	1.8946	1.8949	-0.0003	1.8948	1.8978	1.8977	0.0001	1.8978	0.0032	3.0
11M 554	1.8963	1.8964	-0.0001	1.8964	1.8997	1.8998	-0.0001	1.8998	0.0034	3.3
11M 555	1.8821	1.8823	-0.0002	1.8822	1.8853	1.8855	-0.0002	1.8854	0.0032	3.1
11M 556	1.8857	1.8857	0.0000	1.8857	1.8894	1.8895	-0.0001	1.8895	0.0037	3.6

*net mass = tare - gross

**corrected net mass = net mass - (Normality NH4OH x mL NH4OH x 17.03 mg NH3/mmol)

Organic Phase

Sx ID	Tare	Tare QC	Tare - QC	average Tare	Gross	Gross QC	Gross - QC	average Gross	*net (g)	net (mg)
date/init	06/15/11 TMM	06/16/11 SH			06/23/11 JH	06/24/11 JH				
time:	1729	0720			1644	1421			(total mass liq)	
Rel. Humidity	0.50%	0.50%			0.60%	4.00%				
3.0000g QC	3.0000	3.0000			3.0000	3.0000				
Lab Blank	1.8809	1.8810	-0.0001	1.8810	1.8814	1.8814	0.0000	1.8814	0.0005	0.5
Prep Blank	1.8872	1.8875	-0.0003	1.8874	1.8883	1.8885	-0.0002	1.8884	0.0011	1.1
11M 550	1.8907	1.8908	-0.0001	1.8908	1.8959	1.8959	0.0000	1.8959	0.0052	5.2
11M 551	1.8886	1.8887	-0.0001	1.8887	1.8932	1.8933	-0.0001	1.8933	0.0046	4.6
11M 552	1.9071	1.9073	-0.0002	1.9072	1.9134	1.9136	-0.0002	1.9135	0.0063	6.3
11M 553	1.8883	1.8885	-0.0002	1.8884	1.8945	1.8946	-0.0001	1.8946	0.0062	6.2
11M 554	1.8979	1.8980	-0.0001	1.8980	1.9035	1.9035	0.0000	1.9035	0.0056	5.6
11M 555	1.8852	1.8855	-0.0003	1.8854	1.8910	1.8911	-0.0001	1.8911	0.0058	5.8
11M 556	1.8849	1.8852	-0.0003	1.8851	1.8891	1.8892	-0.0001	1.8892	0.0042	4.2

*net mass = tare - gross

N-242
B019

Company Name: Bighorn		
Contact: Tim Horner	Phone:	
E-Mail Address:	Fax:	
Report Address: 1324 N LL Rd		
City: LL	State: Mt	Zip: 99019
Billing Address: Same		
City:	State:	Zip:
PO #:	Project: Servanto	

CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Analysis Requested: CM-M202

Turn Around Time: ☒ Standard ☐ Rush _____ Specify

LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Remarks
Whey Scrubber		6/3/11	Run 1, 2, 3			Filter, H2O Rinse, Acetone/Hexane Rinse
Shaking Bed		6/3/11	Run 1, 2, 3			
1M550	Whey Run 1					
551		2				
552		3				
553	Shaking Run 1					
554		2				
555		3				
556	Recovery Blank					

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
[signature] 6/13/11 1530	[signature] 6-13-11 1530
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes:
Plus train blank, no proof blank needed

CHESTER LABNET
SOURCE SAMPLE RECEIPT CHECKLIST

Client: Bighorn | Date: 6-13-11

Runs: 6 + blank | Time: 1530

Custody Seals Inspected, If Present	—	
Chain-of-Custody Form Inspected		
CoC present with samples?	✓	*
CoC indicate analytical methodology to be used? (eg M29 etc)	✓	!!
CoC indicate if compliance testing? (esp. M26)	—	!!
M26 samples have Thiosulfate added in field?	—	!!
M29 indicate FH/BH separate or combined?	—	!!
Has Form Been Signed?	✓	
Have Date and Time Custody Released Been Noted on Form?	✓	
All Sample Containers Inspected		
Does Number of Samples Match Number on CoC Form?	✓	!!
Do All Sample ID Numbers Match Those on the CoC Form?	✓	!!
Did client mark sample volumes prior to shipment?	~~yes~~ no	*
If required by method, did client vent samples prior to shipment?	—	
Are the Sample Containers Intact?	✓	!!
Are signs of leakage present?	no	*
Chain-of-Custody Form Signed and Dated by CLN	✓	
Corrective Actions		
Client Contacted Due to Mismatching Sample ID Numbers		
Client Contacted Due to Broken Sample Container(s)		
Client Contacted Due to Leaking Sample Container(s)		
Client contacted for verification of methodology?		
Corrective Actions Documented?		
Corrective Actions Accomplished?		

*Items marked !! shall be addressed **prior to any analytical work being started**.*
*Items marked * shall be **noted in case narrative** upon reporting of results to client.*

Signed: [illegible]

Notes: SI's hand delivered

Bighorn Environmental
Sorrento Method 202 Data

Sample ID	Client ID	Sample Date	Net Weight (mg) Aqueous Phase	Net Weight (mg) Organic Phase	Comments
Prep_Blk			0.8	1.1	
Lab_Blk			-0.1	0.5	
11-M550	Whey Scrubber Run 1	6/3/11	4.6	5.2 7.8	
11-M551	Whey Scrubber Run 2	6/3/11	3.9	4.6 6.5	
11-M552	Whey Scrubber Run 3	6/3/11	4.7	6.3 9.0	
11-M553	Shaking Bed Run 1	6/3/11	3.0	6.2 7.2	
11-M554	Shaking Bed Run 2	6/3/11	3.3	5.6 6.9	
11-M555	Shaking Bed Run 3	6/3/11	3.1	5.8 6.9	
11-M556	Field Train Recovery Blank	6/3/11	3.6	4.2	

Analysis performed by: ***CHESTER LabNet***
12242 SW Garden Place ♦ Tigard, OR 97223
(503) 624-2183 ♦ www.chesterlab.net

CHESTER LabNet

12242 SW Garden Place ❖ Tigard, OR 97223-8246 ❖ USA
Telephone 503-624-2183 ❖ Fax 503-624-2653 ❖ www.chesterlab.net

Case Narrative

Date: June 28, 2011

General Information

Client:	Bighorn Environmental
Client Number:	B019
Report Number:	11-219
Sample Description:	Impinger Solutions
Sample Numbers:	11-M550 – 11-M556

Analysis

Analytes:	Particulate Mass
Analytical Protocols:	EPA Method 202 (12/2010 version)
Analytical Notes:	No problems were encountered during the analyses. Results have **not** been blank corrected.
QA/QC Review:	All of the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds the minimum requirements for acceptability.
Comments:	If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.
Disclaimer:	This report shall not be reproduced, except in full, without the written approval of the laboratory. The results only represent that of the samples as received into the laboratory.

Paul Duda 6/28/11

Project Manager Date
Paul Duda

BIGHORN ENVIRONMENTAL

CLIENT # B019
REPORT # 11-242

SUBMITTED BY:
CHESTER LabNet
12242 S.W. GARDEN PLACE
TIGARD, OR 97223
(503)624-2183/FAX (503)624-2653
www.ChesterLab.Net

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: Shaking Bed

Run #:: 3
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	17:05	.3331	.5003	68	49	MK	
Filter ID: 337								
Tare Wt.: .3332								N/A
Date/Time into dessicator:								
6/22/11 / 09:52								
Acetone	6/23/11	17:07	114.9708	100.0115	68	49	MK	
Beaker ID: 6	6/27/11	09:45	114.9705	100.0115	67	49	MK	Yes
Tare Wt.: 114.9693								PM
Volume: 41								<10
Date/Time into dessicator:								+Rinse
6/22/11 / 09:52								No
~~BACK HALF:~~								
Acetone:	6/23/11	17:09	90.3782	100.0115	68	49	MK	
Beaker ID: 9	6/27/11	09:47	90.3778	100.0115	67	49	MK	Yes
Tare Wt.: 90.3767								PM
Volume: 58								>10
Date/Time into dessicator:								No
6/22/11 / 09:52								
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	251	259	8

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: Shaking Bed

Run #:: 2
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter Filter ID: 335 Tare Wt.: .3347 Date/Time into dessicator: 6/22/11/09:52	6/23/11	17:00	.3350	.5003	68	49	MK	N/A
Acetone Beaker ID: 13 Tare Wt.: 89.8040 Volume: 38 Date/Time into dessicator: 6/22/11/09:52	6/23/11	17:02	89.8052	100.0115	68	49	MK	Yes PM <10 +Rinse No
	6/27/11	09:41	89.8050	100.0115	67	49	MK	
~~BACK HALF:~~								
Acetone: Beaker ID: 8-2P Tare Wt.: 112.8738 Volume: 46 Date/Time into dessicator: 6/22/11/09:52	6/23/11	17:04	112.8754	100.0115	68	49	MK	Yes PM >10 No
	6/27/11	09:43	112.8748	100.0115	67	49	MK	
	6/27/11	15:50	112.8747	100.0115	68	49	MK	
BH Water: Beaker ID: Tare Wt.: Volume: Date/Time into dessicator:								Yes No
DCM extract: Beaker ID: Tare Wt.: Volume: Date/Time into dessicator:								Yes No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	221	230	9

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: SHAKING BED

Run #:: 1
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter Filter ID: 44	6/23/11	16:55	.3405	.5003	68	49	MK	N/A
Tare Wt.: .3320								
Date/Time into dessicator: 6/22/11/09:52								
Acetone Beaker ID: 1	6/23/11	16:57	91.0824	100.0115	68	49	MK	Yes
Tare Wt.: 91.0816	6/27/11	09:33	91.0821	100.0115	67	49	MK	PM <10 +Rinse
Volume: 46								
Date/Time into dessicator: 6/22/11/09:52								No
~~**BACK HALF:**~~								
Acetone: Beaker ID: 2-2P	6/23/11	16:58	119.7614	100.0115	68	49	MK	Yes
Tare Wt.: 119.7584	6/27/11	09:39	119.7611	100.0115	67	49	MK	FM >10
Volume: 52								
Date/Time into dessicator: 6/22/11/09:52								No
BH Water: Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract: Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

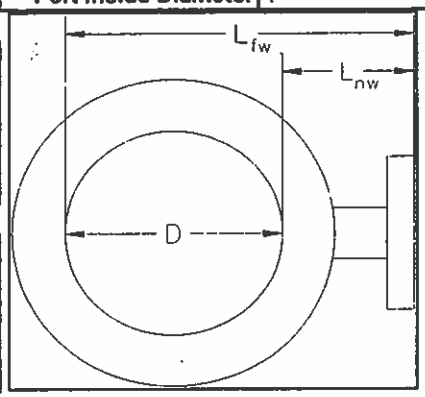
Notes:

Silica Gel Dry Wt. 244 Wet Wt. 252 Wt. Gain 8

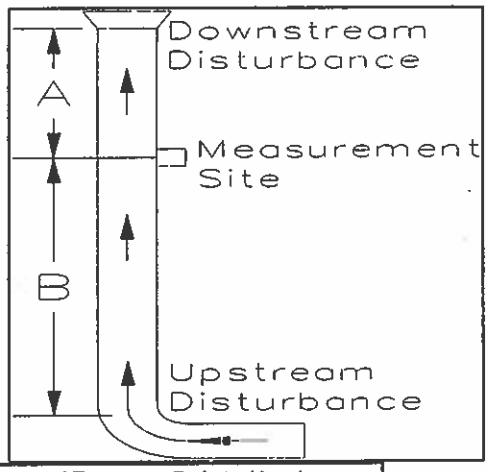
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Shaking bed	Project #	
Operator		# of Ports Available	2
Stack Type	Circular	# of Ports Used	2
Stack Size	Large	Port Inside Diameter	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	44.75	in
Distance to Near Wall of Stack	(L_{nw})	1.25	in
(=Lfw - Lnw) Diameter of Stack	(D)	43.50	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	10.32	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	180.00	in
(=B/D) Diameters Upstream	(B_D)	4.14	diameters
Distance Downstream	(A)	68.00	in
(=A/D) Diameters Downstream	(A_D)	1.56	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		16	12
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	6	Across
12	Pts Used	24	Required
☑	Particulate	☐	Velocity

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
10					.974	.882
11						.933
12						.979

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.044	1 7/8	3 1/8
2	0.146	6 3/8	7 5/8
3	0.296	12 7/8	14 1/8
4	0.704	30 5/8	31 7/8
5	0.854	37 1/8	38 3/8
6	0.956	41 5/8	42 7/8
7			
8			
9			
10			
11			
12			

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento	Date	06/03/11
Sampling Location	Shaking bed	Project #	
Operator		# of Ports Used	2
Stack Type	Circular	Pitot Identification	
Pitot Leak Check	☐ PreTest ☐ PostTest	Pitot Coefficient (C_p)	

Stack Dimensions			
Diameter or Length of Stack	(D)	43.50	in
Width of Stack	(W)		in
Area of Stack	(A_s)	10.32	ft^2

Pressures			
Barometric Pressure	(P_b)		in Hg
Static Pressure	(P_{static})		in H_2O
Absolute Stack Pressure	(P_s)		in Hg

Stack Gas Composition			
Composition Data:	Actual ☐	Estimated ☐	
Carbon Dioxide Concentration	($\%CO_2$)		%
Oxygen Concentration	($\%O_2$)		%
Carbon Monoxide Concentration	(%CO)		%
Nitrogen Concentration	($\%N_2$)		%
Stack Moisture Content	(B_{ws})		
Stack Dry Molecular Weight	(M_d)		lb/lb-mole
Stack Wet Molecular Weight	(M_s)		lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)		ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})		dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})		ascf/min

Stack Cross Section Schematic

Velocity Traverse Data				
Run Number			V1	
Run Time				
Traverse Point	Velocity Head (Δp) in H_2O	Stack Temp (t_s) °F	Null Angle ~~α, deg~~ 40	~~Local Velocity (v_s)~~ ft/sec
A-1	~~.34~~ .48		40	
A-2	.98		20	
A-3	1.1		5	
A-4	1.1		3	
A-5	1.2		3	
A-6	1.3		2	
B-1	.96		12	
B-2	.94		6	
B-3	1.05		6	
B-4	1.0		4	
B-5	.94		2	
B-6	1.0		4	
$(\Delta p)^{1/2}_{avg}$ [1]				

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Wet Bulb/Dry Bulb Estimate				
Wet Bulb Temp		Stack Vapor Pressure	-1.69	in Hg
Dry Bulb Temp		Stack Moisture Content	#VALUE!	%H2O

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

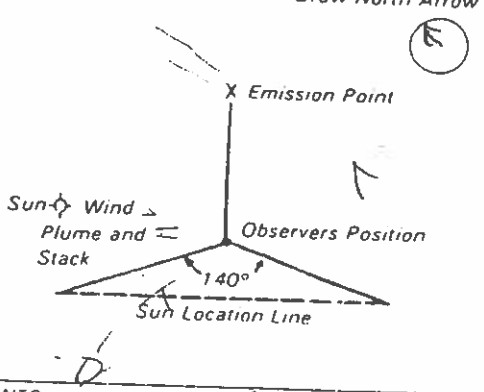
where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	NAMPA
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Shaking Bed
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT START	Round stack
DESCRIBE EMISSION POINT STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	15'
HEIGHT ABOVE GROUND LEVEL STOP	15
HEIGHT RELATIVE TO OBSERVER START	10'
HEIGHT RELATIVE TO OBSERVER STOP	10'
DISTANCE FROM OBSERVER START	19'
DISTANCE FROM OBSERVER STOP	19'
DIRECTION FROM OBSERVER START	N.E
DIRECTION FROM OBSERVER STOP	N.E.
DESCRIBE EMISSIONS START	Clear Plume
DESCRIBE EMISSIONS STOP	Clear Plume
EMISSION COLOR START	Clear
EMISSION COLOR STOP	Clear
PLUME TYPE. CONTINUOUS	☒
FUGITIVE	☐
INTERMITTENT	☐
WATER DROPLETS PRESENT NO	☒
YES	☐
IF WATER DROPLET PLUME ATTACHED	☐
DETACHED	☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	15' Above Rim
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED STOP	15" above rim
DESCRIBE BACKGROUND START	sky
DESCRIBE BACKGROUND STOP	sky
BACKGROUND COLOR START	Blue
BACKGROUND COLOR STOP	Blue
SKY CONDITIONS START	Clear
SKY CONDITIONS STOP	Clear
WIND SPEED START	0-5
WIND SPEED STOP	0-5
WIND DIRECTION START	S.
WIND DIRECTION STOP	S.
AMBIENT TEMP START	64
AMBIENT TEMP STOP	64
WET BULB TEMP.	
RH.percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	~~17:30~~ 19:30	~~17:36~~ 19:36

incorrect 24hr time format 7:30pm

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD: 0

NUMBER OF READINGS ABOVE 0 % WERE

RANGE OF OPACITY READINGS: 0 MINIMUM 0 MAXIMUM

OBSERVER'S NAME (PRINT): Michael Keating

OBSERVER'S SIGNATURE: [signature] DATE: 6/3/11

ORGANIZATION: Bighorn Environmental

CERTIFIED BY: Smoke school inc DATE: 3/11

VERIFIED BY: DATE:

COMMENTS: Nice DAY, Calm and Dry.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

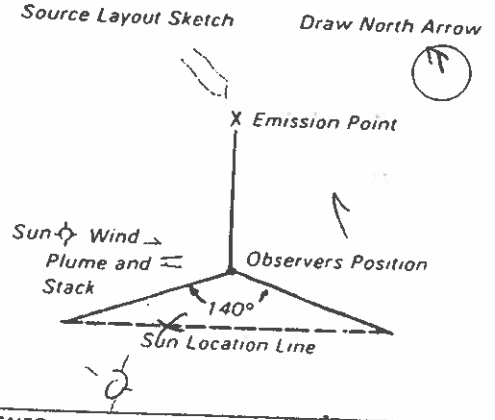
SIGNATURE

TITLE DATE

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Shaking ~~Scrubber~~ Bed
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START Round stack STOP Round stack
HEIGHT ABOVE GROUND LEVEL	START 15' STOP 15'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 18' STOP 18'
DIRECTION FROM OBSERVER	START N.E. STOP N.E.
DESCRIBE EMISSIONS	START Clear Plume STOP Clear Plume
EMISSION COLOR	START Clear STOP Clear
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 14" Above Rim STOP 14" Above Rim
DESCRIBE BACKGROUND	START SKY STOP SKY
BACKGROUND COLOR	START Blue STOP Blue
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 0-5 STOP 0-5
WIND DIRECTION	START S.E. STOP S.E.
AMBIENT TEMP	START 70 STOP 70
WET BULB TEMP	
RH, percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	16:48	16:54

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE % WERE	0
RANGE OF OPACITY READINGS	0 MINIMUM 0 MAXIMUM
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/3/11
ORGANIZATION	Bighorn Environmental
CERTIFIED BY	Smoke school inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Sunny and warm and calm out. for once.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE DATE

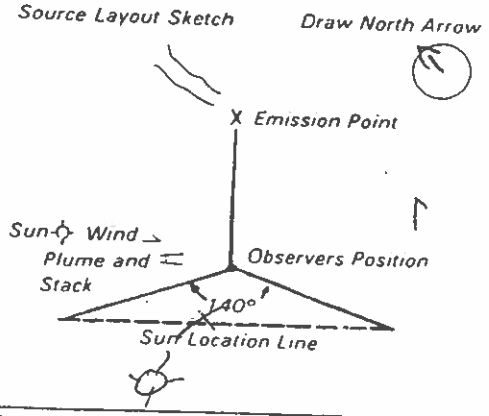
Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Shaking ~~Scrubber~~ Mt B50
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START Round stack STOP Round stack
HEIGHT ABOVE GROUND LEVEL	START 15' STOP 15'
HEIGHT RELATIVE TO OBSERVER	START 15' STOP 15'
DISTANCE FROM OBSERVER	START 18' STOP 18'
DIRECTION FROM OBSERVER	START N.E STOP N.E
DESCRIBE EMISSIONS	START white / clear STOP clear
EMISSION COLOR	START clear STOP clear
PLUME TYPE	CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 14" above rim STOP 14" above rim
DESCRIBE BACKGROUND	START Sky STOP Sky
BACKGROUND COLOR	START Blue sky STOP Blue sky
SKY CONDITIONS	START clear STOP clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S. STOP S.
AMBIENT TEMP	START 72 STOP 72
WET BULB TEMP	
RH.percent	

OBSERVATION DATE	START TIME	STOP TIME
~~10/4/82~~ 6/3/11	14:36	14:42

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch — Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE % WERE	0
RANGE OF OPACITY READINGS	0 MINIMUM 0 MAXIMUM
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	6/3/11
ORGANIZATION	Bigham Environmental
CERTIFIED BY	Smoke school inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Clear Nice Day, Slight breeze

Cool Day,

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE | DATE

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: Whey Scrubber

Run #:: 3
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	16:50	.3630	.5003	68	49	MK	
Filter ID: 336								
Tare Wt.: .3360								N/A
Date/Time into dessicator:								
6/22/11/09:52								
Acetone	6/23/11	16:52	88.6481	100.0115	68	49	MK	
Beaker ID: 14	6/27/11	09:53	88.6479	100.0115	67	49	MK	Yes
Tare Wt.: 88.6470								
Volume: 42								
Date/Time into dessicator:								No
6/22/11/09:52								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	237	247	10

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: NAMPA, ID
Source: Whey Scrubber

Run #:: 2
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	16:44	.3628	.5003	68	49		N/A
Filter ID: 334								
Tare Wt.: .3336								
Date/Time into dessicator:								
6/22/11/09:52								
Acetone	6/23/11	16:47	118.5339	100.0115	68	49	MK	Yes
Beaker ID: 11A	6/27/11	09:51	118.5335	100.0115	67	49	MK	
Tare Wt.: 118.5324								
Volume: 44								
Date/Time into dessicator:								No
6/22/11/09:52								
BACK HALF:								
Acetone:								Yes
Beaker ID:								
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								Yes
Beaker ID:								
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								Yes
Beaker ID:								
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	241	250	9

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento
Location: Nampa, ID
Source: Whey Scrubber

Run #:: 1
Test Date: 6/3/11
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	6/23/11	16:38	.3644	.5003	68	49	MK	
Filter ID: 333								
Tare Wt.: .3342								N/A
Date/Time into dessicator:								
6/22/11 / 09:52								
Acetone	6/23/11	16:40	120.0659	100.0115	68	49	MK	
Beaker ID: 9-3P	6/27/11	09:50	120.0655	100.0115	67	49	MK	Yes
Tare Wt.: 120.0642								
Volume: 34								
Date/Time into dessicator:								No
6/22/11 / 09:52								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel **Dry Wt.** 217 **Wet Wt.** 226 **Wt. Gain** 9

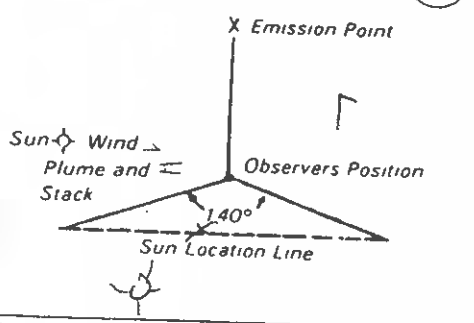
Method 5 Data Form					
Client:	Sorrento Lactalis	Source:	tetrapak Whey scrubber	Date:	6/3/2011
RUN 1	**Probe Rinse**				**Filter**
Final Wt. 1:	120.06590				0.36440
Final Wt. 2:	120.06550				0.36440
Final Wt. Avg:	120.06570				0.36440
Tare:	120.06420				0.33420
Gross Wt.:	0.00150				0.03020
Less Blank:	0.00009				0.00000
Net Wt.:	**0.00141**				**0.03020**
Volume:	34.00000				n/a
Total Front:	0.00141				
RUN 2	**Probe Rinse**				**Filter**
Final Wt. 1:	118.53390				0.36280
Final Wt. 2:	118.53350				0.36280
Final Wt. Avg:	118.53370				0.36280
Tare:	118.53240				0.33360
Gross Wt.:	0.00130				0.02920
Less Blank:	0.00011				0.00000
Net Wt.:	**0.00119**				**0.02920**
Volume:	44.00000				n/a
Total Front:	0.00119				
RUN 3	**Probe Rinse**				**Filter**
Final Wt. 1:	88.64810				0.36300
Final Wt. 2:	88.64790				0.36300
Final Wt. Avg:	88.64800				0.36300
Tare:	88.64700				0.33600
Gross Wt.:	0.00100				0.02700
Less Blank:	0.00011				0.00000
Net Wt.:	**0.00089**				**0.02700**
Volume:	42.00000				n/a
Total Front:	0.00089				

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	83653
PHONE	~~Whey scrubber~~
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Scrubber Whey
OPERATING MODE	Normal
CONTROL EQUIPMENT	Scrubber
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START Round stack STOP Round stack
HEIGHT ABOVE GROUND LEVEL	START 15' STOP 15'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 24' STOP 24'
DIRECTION FROM OBSERVER	START N.E. STOP N.E.
DESCRIBE EMISSIONS	START White P.M. STOP White P.M.
EMISSION COLOR	START White STOP White
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 60' above Rim STOP 60' above Rim
DESCRIBE BACKGROUND	START Blue sky STOP Blue sky
BACKGROUND COLOR	START Blue STOP Blue
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S. STOP S.
AMBIENT TEMP	START 72 STOP 72
WET BULB TEMP	
RH.percent	

Source Layout Sketch

Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	17:04	17:10

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	15	15	10	10	31				
2	10	10	15	15	32				
3	15	15	10	10	33				
4	15	15	15	15	34				
5	15	15	15	15	35				
6	15	15	15	15	36				
7					37				
8					38				
9					39				
10					40				
11		13:750			41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD 15

NUMBER OF READINGS ABOVE % WERE

RANGE OF OPACITY READINGS 10 MINIMUM 15 MAXIMUM

OBSERVER'S NAME (PRINT) Michael Keating

OBSERVER'S SIGNATURE [signature] DATE 6/3/11

ORGANIZATION Bigham Environmental

CERTIFIED BY Smoke School INC DATE 3/11

VERIFIED BY DATE

COMMENTS Clear day, nice cut!

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

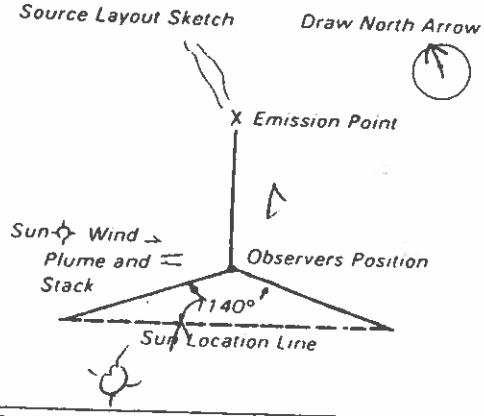
SIGNATURE

TITLE DATE

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	[illegible]
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Whey Separator
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START End of Moisture Plume STOP End of Moisture Plume
HEIGHT ABOVE GROUND LEVEL	START 5' STOP 5'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 24 STOP 24
DIRECTION FROM OBSERVER	START N.E. STOP N.E.
DESCRIBE EMISSIONS	START White P.M. STOP White P.M.
EMISSION COLOR	START White STOP White
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 60' out STOP 60' out
DESCRIBE BACKGROUND	START Blue Sky STOP Blue Sky
BACKGROUND COLOR	START Sky STOP Sky
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S. STOP S.
AMBIENT TEMP	START 71 STOP 71
WET BULB TEMP.	
RH.percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	15:05	15:11

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	10	15	10	10	31				
2	15	10	10	10	32				
3	10	15	15	15	33				
4	15	10	15	15	34				
5	15	10	10	15	35				
6	15	10	15	15	36				
7					37				
8					38				
9					39				
10					40				
11					41				
12		12:71			42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD 15	NUMBER OF READINGS ABOVE % WERE
RANGE OF OPACITY READINGS 10 MINIMUM 15 MAXIMUM	
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature] DATE 6/3/11
ORGANIZATION	Bigham Environmental
CERTIFIED BY	Smoke school inc DATE 3/11
VERIFIED BY	DATE

COMMENTS: Nice Day! Some clouds but mostly clear.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

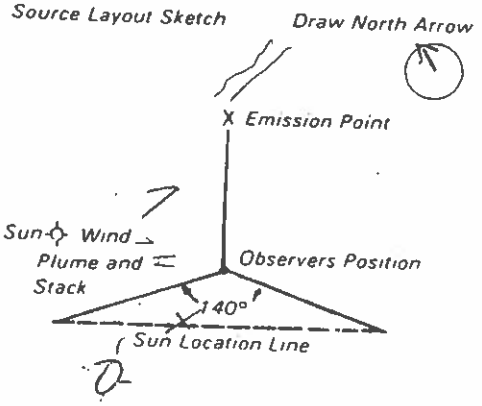
SIGNATURE

TITLE DATE

Visible Emission Observation Form

SOURCE NAME	Sorrento Lactalis
ADDRESS	
CITY	NAMPA
STATE	ID
ZIP	83653
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Whey scrubber
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	START Round stack STOP Round stack
HEIGHT ABOVE GROUND LEVEL	START 15' STOP 15'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 24' STOP 24'
DIRECTION FROM OBSERVER	START N.E STOP N.E
DESCRIBE EMISSIONS	START white P.M. STOP white P.M.
EMISSION COLOR	START white STOP white
PLUME TYPE	CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☒ YES ☐
IF WATER DROPLET PLUME	ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 60' above R/M STOP 60' above R/M
DESCRIBE BACKGROUND	START SKY STOP SKY
BACKGROUND COLOR	START Blue STOP Blue
SKY CONDITIONS	START clear STOP clear
WIND SPEED	START 5-10 STOP 5-10
WIND DIRECTION	START S.E. STOP S.E.
AMBIENT TEMP	START 71 STOP 71
WET BULB TEMP	
RH.percent	

Source Layout Sketch



OBSERVATION DATE	START TIME	STOP TIME
6/3/11	17:50	17:56

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	15	15	15	15	31				
2	15	10	15	15	32				
3	15	15	15	10	33				
4	15	15	15	15	34				
5	15	10	10	15	35				
6	15	15	10	15	36				
7					37				
8					38				
9		13.96%			39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	15
NUMBER OF READINGS ABOVE % WERE	
RANGE OF OPACITY READINGS	12 MINIMUM 15 MAXIMUM
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	
DATE	6/3/11
ORGANIZATION	Bigham Environmental
CERTIFIED BY	Smoke School Inc
DATE	3/11
VERIFIED BY	
DATE	

COMMENTS: Nice day out sunny overcast

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

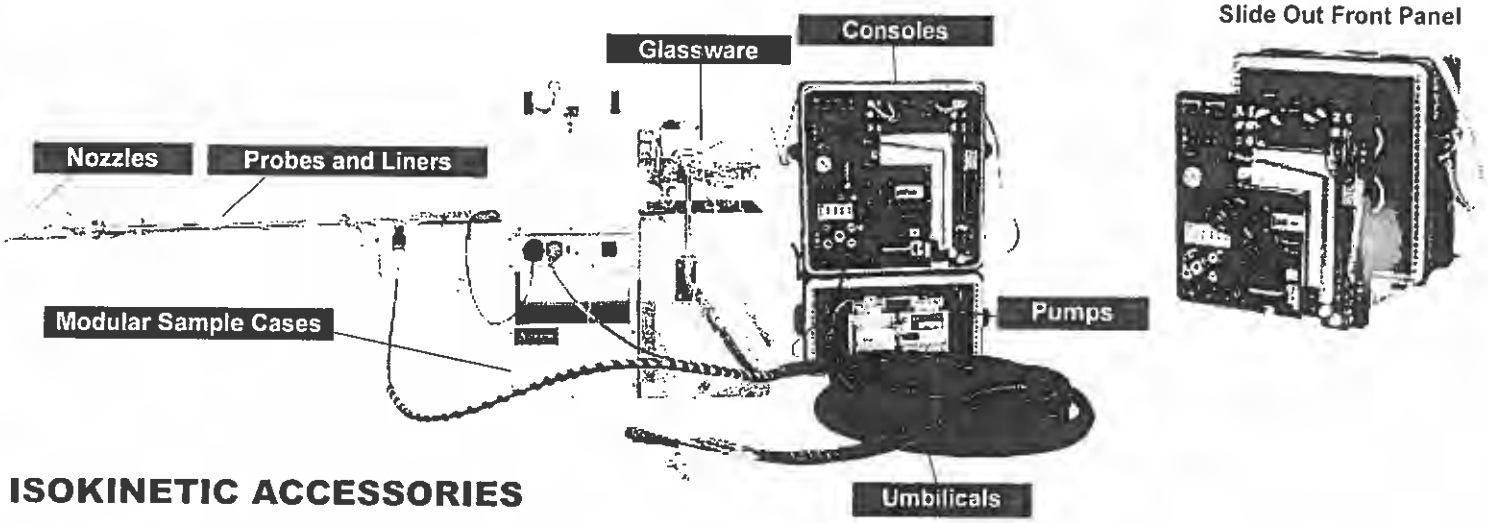
TITLE | DATE

APPENDIX B
FIELD DATA

APEX SOURCE TESTING EQUIPMENT INSTRUMENTS

VERSATILE SYSTEM DESIGNS

Due to often complex and challenging stack testing locations, we offer versatile Source Sampling Systems, such as our Flexible Method 5 Train and the Compact Method 5 Train. Please visit our website at www.apexinst.com for a complete listing of all our systems.



ISOKINETIC ACCESSORIES

UMBILICAL CABLES

Umbilical Cables are available for both rigid and flexible sampling arrangements. Standard cables feature high quality instrumentation quick-connect fittings, standard thermocouple connectors, stranded Type "K" wire and overbraid sleeve.

METHOD 5 PUMP ASSEMBLIES

The XE-0523 and the XE-DAA both feature the rugged, weather resistant, custom designed UHMW X-case pump enclosure. Choose between diaphragm or vane pumps. Alternative pumps available upon special request.

DELUXE METHOD 5 GLASSWARE SET

The Deluxe Method 5 Glassware Set with Transport Case contains all the glassware for two runs, plus spares. Four filter assemblies cover three sampling runs plus one as a spare. Two full sets of impingers and U-tubes permit a second run before recovering the first run results. The deluxe glassware set includes spare impingers, U-tubes and double "L" adapters. the glassware set fits easily into foam lined custom pockets. The sturdy transport case is lockable for secure chain-of-custody.

METHOD 5 PROBE ASSEMBLIES

Includes stainless steel probe sheath, heater, liner, Type "S" pitot tubes and thermocouple. A wide variety of liner and sheath materials are available. Ask about optional oversheaths.

NOZZLES FOR ISOKINETIC SAMPLING

Isokinetic nozzles and accessories are available from a variety of materials in a full range of sizes.

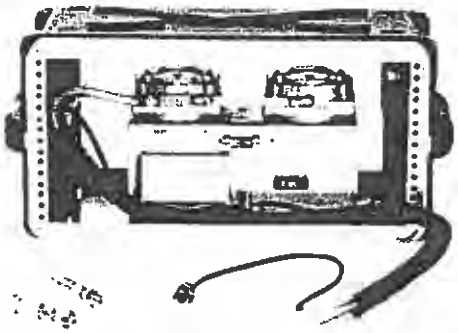
MODULAR SAMPLE CASES

Versatile, lightweight Modular Sample Case Assemblies are available in a variety of configurations. Offered are two different filter ovens and two different risers, that can attach to the bottom of both ovens. We also offer four types of impinger cases which all slide on and off for easy changing of the impingers between test runs. Several standard assemblies are available.

Distributed by:

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

SAMPLE PUMP ASSEMBLIES



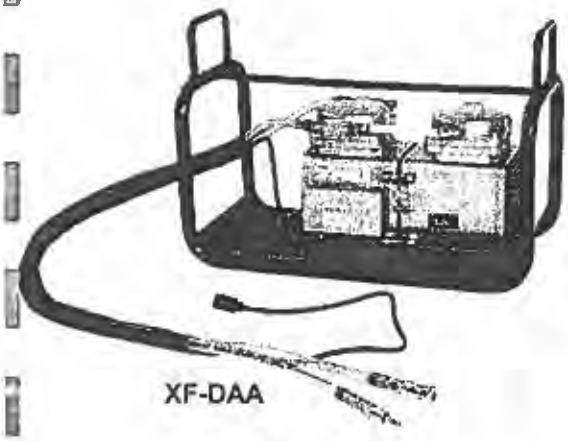
XE-DAA

XE-DAA DOUBLE HEADED DIAPHRAGM PUMPS

Specifications:

Motor: $^1/_2$ hp, 120V/240V, 60/50Hz, 5 $^1/_2$ Amp
Flow: 3.6 cfm (Open); 1.4cfm@15" HG
Maximum Vacuum: 26.5" HG
Weight: 36 lbs. (16 kg.)
Dimensions: 22.5" W x 11" H x 12.5" D

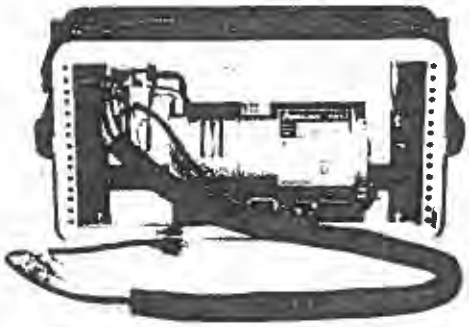
Model	Pump
XE-DAA	Double Headed Diaphragm Pump in a Molded X-Case, 110V/60Hz
XE-DAA-V	Double Headed Diaphragm Pump in a Molded X-Case, 220V/50Hz



XF-DAA

XF-DAA DIAPHRAGM PUMPS

Model	Pump
XF-DAA	Double Headed Diaphragm Pump in Tubular Steel Frame, 110V/60Hz
XF-DAA-V	Double Headed Diaphram Pump in Tubular Steel Frame, 220V/50Hz



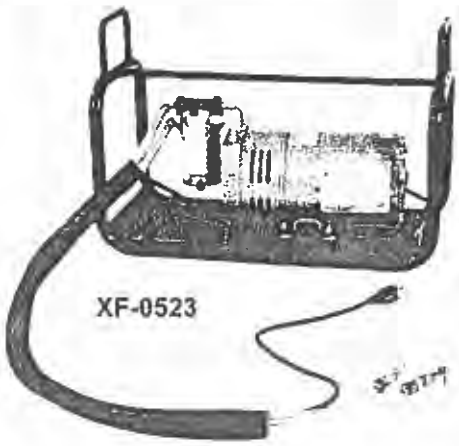
XE-0523

MODEL XE-0523 LUBRICATED ROTARY VANE PUMPS

Specifications:

Motor: $^1/_4$ hp,120/240V, 60/50Hz, 4.6/2.3 Amp, RPM 1725/1425
Flow: 4.5 cfm (Open); 1.5cfm@15" HG
Lubricator: Adjustable wick-style
Maximum Vacuum: 25" HG
Weight: 41 lbs. (18 kg.)
Dimensions: 22.5" W x 11" H x 12.5" D

Model	Description
XE-0523	Rotary Vane Pump in a Molded X-Case (120V/ 60 Hz)
XE-0523-V	Rotary Vane Pump in a Molded X-Case (240V/ 50Hz)



XF-0523

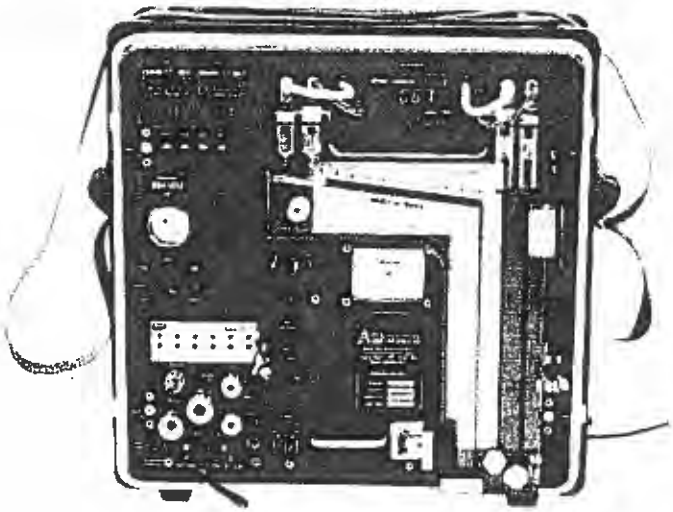
XF-0523 ROTARY VANE PUMPS

Model	Description
XF-0523	Rotary Vane Pump in Tubular Steel Frame (120V / 60 Hz)
XF-0523-V	Rotary Vane Pump in Tubular Steel Frame (240V / 50Hz)

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

XC-522 Manual Source Sampling Console

Method 5



The Apex Instruments Model XC-522 is a full featured manual meter console. The Apex Isokinetic Source Sampling Console allows the operator to monitor gas velocities, temperatures, pressures and adjust sample flow rates to maintain isokinetic sampling conditions. Designed with convenient display layout for manual data recording. The Apex Instruments Isokinetic Source Sampling Consoles are manufactured to conform to the construction design criteria and specifications cited in U.S. EPA Method 5, Code of Federal Regulations (40 CFR Part 60) and APTD-0581 documents.

Features:

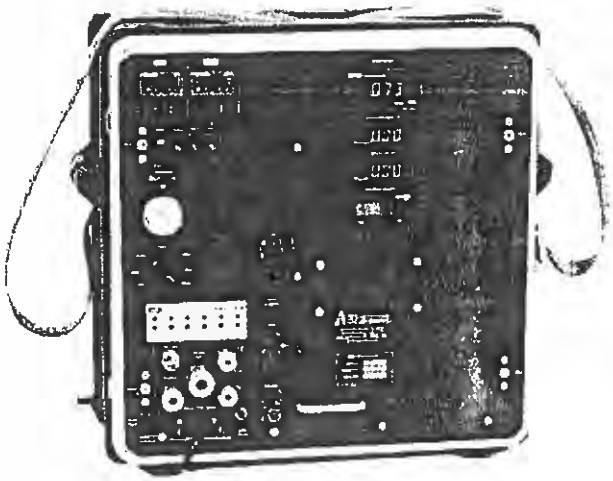
- Low Cost - Manual Console
- Easy to Operate and Maintain
- Rugged, Lightweight, Stackable Case
- Removable 19" Front Panel
- Carry Strap for Easy Transport
- Non-Reversible Sample Pump Connections
- Color Coded Thermocouple Jacks
- Bright, Easy-to-Read Temperature Displays
- Easy-Leveling Dual Column Manometers
- Dry Gas Meter with direct read index
- Stainless Steel Quick Connects & Fittings

XC-522 English Units (Cubic Feet, ^{o}F)

Model	Description
XC-522	English Meter Console, 120 V/60 Hz
XC-522-V	English Meter Console, 240 V/50 Hz
XC-522-O	English Meter Console with optional Orsat Pump Assembly, 120 V/60 Hz
XC-522-OV	English Meter Console with optional Orsat Pump Assembly, 240 V/50 H

XC-563 Digital Source Sampling Console

Method 5



Apex Instruments Model 563 Source Sampling Console is the digital equivalent to the XC-522 and XC-572; featuring an AP25 Dry Gas Meter with optical encoder and digital totalizer. The console also features differential pressure transducers for ΔP and Δ H. The temperature controllers, thermometer and timer all have digital displays.

Features

- Precision Gas Meter with LCD Totalizer
- Module with Dual Pressure Transducers
- Digital Probe Temperature Control/Display
- Vacuum Gauge (Dual Scale)
- Stainless Steel Quick Connects and Control Valves
- Digital Temperature Display (^{o}F or ^{o}C) with up to 6 Type-K Inputs
- Non-Reversible External Pump Connections
- Removable Front Lid and Back Panel
- Digital Display for Δ P Velocity Pressure, and Δ H Orifice Pressure
- No Messy Manometer Fluid
- Digital Elapsed Timer
- Lightweight

XC-563 Source Sampler Console

Model	Description
XC-563	XC-563 Meter Console, 120V/60Hz
XC-563-V	XC-563 Meter Console, 240V/50Hz
XC-563-O	XC-563 Meter Console, with optional Orsat Pump Assembly, 120V/60Hz
XC-563-OV	XC-563 Meter Console, with optional Orsat Pump Assembly, 240V/50Hz

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

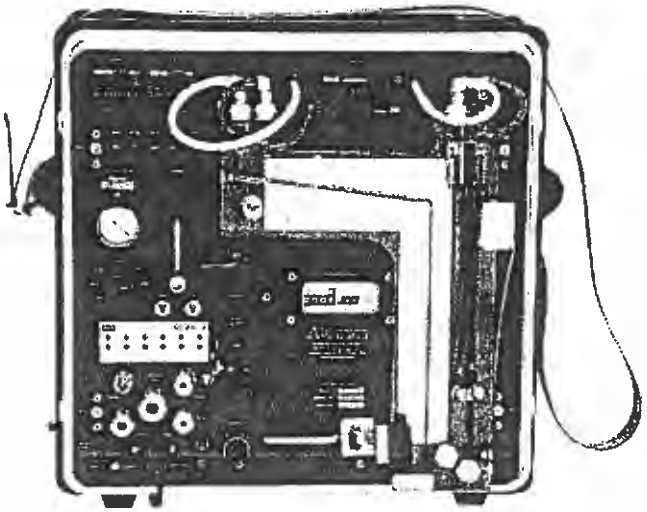
XC-500 SERIES SOURCE SAMPLER CONSOLES

XC-500 Series Source Sampler Consoles are rugged, lightweight metering consoles used to extract gas samples in accordance with US EPA Method 5 for determining source emissions for dust and fumes. The Apex Isokinetic Source Sampler allows the operator to monitor gas velocities, temperatures, pressures and adjust sample flow rates to maintain isokinetic sampling conditions. Comes with digital temperature controllers, a choice between digital or liquid manometers, digital temperature displays and external pump connections. Stainless steel fittings and quick connects are standard. Units in the XC-500 Series are available in Standard or Metric units, 110V or 220VAC, optional internal orsat pump. XC-500 Series Sampling Console features a molded, rugged X-case with side handles for attaching the easy carry strap. The X-case allows for rear door access. Apex Instrument's Isokinetic Sampling Consoles are manufactured to conform to the construction design criteria and specifications cited in U.S. EPA Method 5, Code of Federal Regulations (40 CFR Part 60) and APTD-0581 documents. All Apex consoles are calibrated prior to shipping.

XC-572 Manual Source Sampling Console

The XC-572 Source Sampling Console is the metric version of the XC-522. It is a full featured, compact, and lightweight Isokinetic Source Sampler. It has all the great features you want and the reliability you need. Field set up is easy with non-reversible external pump connections and the industry standard 4-pin electrical connector. (External sample pump sold separately). Console allows operators to monitor gas velocities, temperatures, pressures, and sample flow rates for maintaining isokinetic sampling conditions.

Method 5



Features:

- Precision gas meter with leak check indicator
- Low Cost - Manual Console
- Easy Operation and Maintenance
- Rugged, Lightweight, Stackable Case
- Removable 19" Front Panel
- Carry Strap for Easy Transport
- Non-Reversible Sample Pump Connections
- Color Coded Thermocouple Jacks
- Bright, Easy-to-Read Temperature Displays
- Easy-Leveling Dual Column Manometer
- Stainless Steel Quick Connects & Fittings
- Convenient Layout for Manual Data Recording

XC-572 Metric Units

Model	Description
XC-572	XC-572 Isokinetic Meter Console, Metric, 120V/60Hz
XC-572-V	XC-572 Isokinetic Meter Console, Metric, 240 V/50 Hz
XC-572-O	XC-572 Isokinetic Meter Console, Metric, with optional Orsat Pump Assembly, 120V/60Hz
XC-572-OV	XC-572 Isokinetic Meter Console, Metric, with optional Orsat Pump Assembly, 240 V/50 Hz

ISOKINETIC SOURCE SAMPLER CONSOLES

Apex Instruments offers a choice of different Source Sampler Consoles configured to meet your needs. Consoles feature a new custom rotationally molded rugged X-Case with side handles and rear door access, digital temperature controllers, dual column manometer, digital temperature displays and external pump assembly. Standard with stainless steel fittings and quick connects. English or metric units.

APPENDIX A
EQUIPMENT DESCRIPTIONS AND SPECIFICATIONS

Cross checks such as manual calculations of Bighorn's automated DAS computer generated results allow test results verification. Bighorn files manufacturers' accuracy certificates and interference tables for CEMS, flow controllers, gases, etc. Additionally dry gas meters, pitot tubes, thermocouples, gas dividers, etc. are certified as per EPA requirements and frequencies. Where EPA frequencies are not specified, Bighorn has established those based on state regulatory criteria.

Thorough chain-of-custody procedures and documentation provide proof of our QA/QC efforts. Relevant QA/QC documentation is included in this final report's Appendices for results support and regulatory review.

Field data sheets, flow rate information, calculated emissions data, and calculations are contained in Appendices A-E.

7.0 CALIBRATION DATA

Appendix F contains calibration field sheets while Appendix G has required support equipment quality control records.

8.0 QUALITY ASSURANCE

Bighorn's QA procedures follow EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. III, Stationary Source Specific Methods* September 1994 as revised and amended (#EPA-600/R-94/038c). Bighorn used EPA method specific quality assurance procedures. The following *July 1, 2009 40 CFR 60* sections were referenced for this project:

Appendix A - Methods 1, 2, 4, 5, 9, 201A and 202.

Bighorn Environmental is zealous in our commitment to thorough quality practices. We conduct stringent quality assurance and quality control (QA and QC) procedures on all reference CEMS and support equipment.

Bighorn employs the latest CAI 600 Series, J.U.M. and API Model 100 AH CEMS. These CEMS are considered state-of-the-art by environmental professionals. We've designed an effective primary sample conditioner that works in concert with Horiba's secondary conditioners. Together, they provide dry, clean sample gas to Bighorn's CEMS (Figure 1).

EPA Protocol No. 1 QA standards allow Bighorn to challenge equipment and methods to ensure that data is valid for determining monitor accuracy and precision. Before each test, Bighorn challenges its monitors and then entire system at the probe which simulates actual sampling. QA standards introduced at the sample probe traverse through all sample lines, conditioning chambers, and monitors to determine initial system integrity or bias. Following each run, Bighorn conducts QA of the entire monitoring system to determine final system bias and test calibration drift

Bighorn's Mobile Air Emissions Laboratory contains two APC 1400 uninterruptible power supplies (UPS) to compliment our QA/QC commitment. These QC devices continuously regulate and condition client-supplied 120 VAC power so Bighorn's electronic analyzers receive a consistent clean 115 $\pm$ 5 VAC signal. Chronic brownout and over-voltage conditions are eliminated thereby reducing hardware failures and data errors. Also, temporary power outages do not shut down our CEMS nor jeopardize data quality because the UPS will generate a consistent pure sine wave signal for up to one hour with its built in battery.

5.0 SOURCE SAMPLING EQUIPMENT

Figure 1 is a diagram of Bighorn's Particulate Sampling Train.

FIGURE 1. PARTICULATE SAMPLING TRAIN

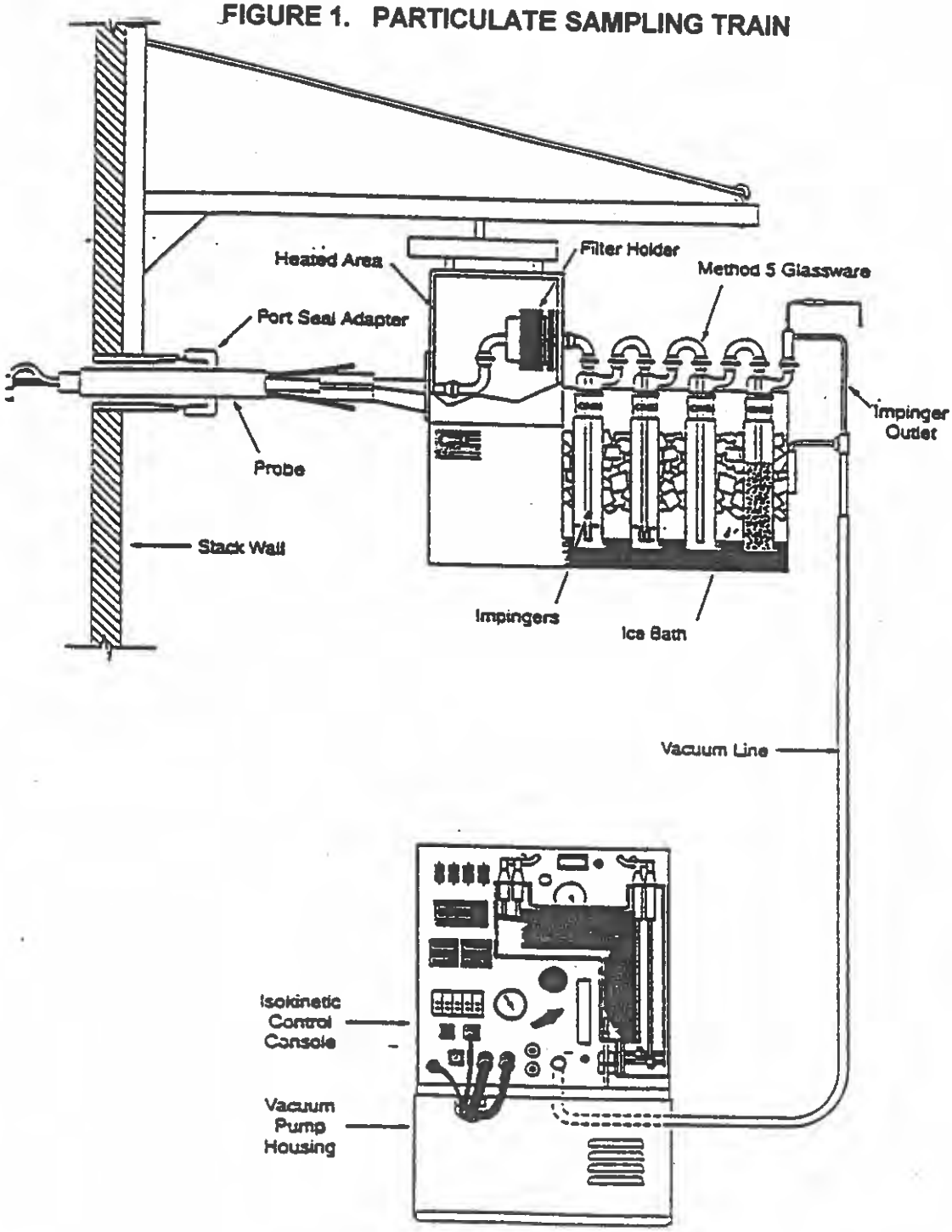


TABLE 3. TEST METHODS

PARAMETER	TEST METHODS
Velocity & Flow	EPA Methods 1 & 2
Moisture Content	EPA Method 4
Particulate Matter	EPA Method 5 and 202
PM 10	EPA Method 201A and 202
Opacity	EPA Method 9

baghouse (P-5) to recover product and control discharge of particulate matter to the air. The natural gas-fired dryer burners (P-2 and P-3) combust natural gas exclusively and are rated at less than 50 MMBtu/hr of heat input. Therefore, the dryer burners are exempt from State of Idaho air permit requirements per IDAPA 58.01.01.222.02.c.

3.0 PRODUCTION RATES

Bighorn tested the Whey Dryer and Shaking Bed while the dryer was operated at maximum throughput rates as shown in Table 2. Appendix H includes production data and pollution control parameters provided by Sorrento Lactalis for each test period.

TABLE 2. ACTUAL PRODUCTION DATA

RUN NUMBER	lbs Whey/hr	Baghouse Diff (in H_20)
1	23,724	3.35
2	22,779	3.28
3	22,377	3.22

62%
14,709
14,123
13,874
14,235.25

4.0 POLLUTANTS AND TEST METHODS

Bighorn used its isokinetic particulate testing equipment for this project.

Bighorn performed velocity traverses on the sources to calculate flow rates and convert analytical results to mass emissions. Opacity readings were conducted concurrently with each particulate run.

Because the scrubber baghouse stack was saturated a Method 201A test could not be conducted, therefore an EPA Method 5 test was conducted and all PM recovered is counted as PM_{10}. Table 3 outlines the test methods Bighorn used during testing.

1.0 SOURCE INFORMATION AND TEST DATE

Sorrento Lactalis hired Bighorn Environmental to perform source testing on the new Tetrapak Whey Dryer, at its Nampa, ID facility to quantify its emissions. This was done to satisfy testing condition 3.11 as outlined in Sorrento Lactalis's PTC #2009.0023. Bighorn conducted the source test on June 3, 2011.

Sorrento Lactalis' Wendy York coordinated this project. Ms. York also represented Sorrento Lactalis during the test. Bighorn's Mike Keating and Tim Homer conducted the source test. A copy of the source test plan submitted to DEQ along with their approval letter can be found in Appendix I.

The testing consisted of three runs for particulate matter on each source. Table 1 lists sources, test dates, and times.

TABLE 1. SOURCE TEST DATES AND TIMES

Emission Unit	2011 Date	Time
Whey Dryer Scrubber	June 3	14:20-15:34; 15:58-17:12; 17:43-18:58
Shaking Baghouse	June 3	14:19-15:52; 16:24-18:02; 18:14-19:50

2.0 PROCESS DESCRIPTION

Dried whey powder will be manufactured in the TetraPak whey dryer process equipment. Up to 400,000 lb/day of (95.5 percent total solid) dried whey powder will be produced in this drying process. The TetraPak whey dryer will receive whey concentrate at a rate up to 619,176 pounds per day (lb/day), assuming 62% solids content, from a new evaporator at the plant. The TetraPak whey drying process consists of two 12.5 MMBtu/hr natural gas fired burners, a drying chamber, and shaking beds. The two burners heat air that passes into the drying chamber to dry Whey. The burners are considered indirect heating devices because the combustion gases do not come in contact with the heated air. Each burner has an exhaust stack (P-2 and P-3) that discharges natural gas combustion products. The heated air dries the whey concentrate as it flows through the drying chamber. The drying chamber exhausts to cyclones where product in air is recovered. The cyclones are considered as process equipment for this application. The purpose of this equipment is to recover solids suspended in air discharged from the dryer, the recovered solids are returned to the process line. The exhaust from the cyclones passes through a venturi air scrubber (P-4) to control discharge of particulate matter from this process. Product from the drying chamber passes over a conditioning belt onto a shaking

CONTENTS

EXECUTIVE SUMMARY i

1.0 SOURCE INFORMATION AND TEST DATES 1

2.0 PROCESS DESCRIPTION 1

3.0 PRODUCTION RATES 2

4.0 POLLUTANTS AND TEST METHODS 2

5.0 SOURCE SAMPLING EQUIPMENT 4

6.0 RESULTS 5

7.0 CALIBRATION DATA 6

8.0 QUALITY ASSURANCE 6

APPENDIX A CEMS DESCRIPTIONS AND SPECIFICATIONS

APPENDIX B FIELD DATA

APPENDIX C FLOW RATE SPREADSHEETS

APPENDIX D CALCULATED EMISSION RATES

APPENDIX E CALCULATIONS

APPENDIX F FIELD CALIBRATION DATA

APPENDIX G QUALITY RECORDS

APPENDIX H PRODUCTION DATA

APPENDIX I IDEQ CORRESPONDENCE

EXECUTIVE SUMMARY

The results from the Tetrapak Whey Dryer compliance test are summarized below.

Tetrapak Whey Dryer PM_{10} Results

Source	gr/dscf	lb/hr
EPA Method 5/202*		
Whey Dryer Scrubber	0.010	4.36
EPA Method 201A/202		
Shaking Bed Baghouse	0.0048	1.22

*All PM counted as PM_{10}.

Detailed discussions and results from this emissions test project are included in the body of this report.

SORRENTO LACTALIS
TETRAPAK WHEY DRYER
COMPLIANCE TEST

NAMPA, IDAHO
FACILITY
JUNE 3, 2011

June 29, 2011

Prepared by:

TIM HOMER
AIR EMISSIONS LABORATORY MANAGER

BIGHORN ENVIRONMENTAL AIR QUALITY, LLC
1324 N LIBERTY LAKE RD • LIBERTY LAKE, WA 99019 • (541) 726-2689 • FAX(888) 559-5624

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550

C.L. "Butch" Otter, Governor
Curt Fransen, Director

February 13, 2013

Ms. Wendy York
Safety and Environmental Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Ave.
Nampa, ID 83653-1230

Re: Review of the Meyer-Sterner Whey Dryer Performance Test Protocol for Sorrento Lactalis, Inc.; Facility ID No. 027-00071

Dear Ms. York:

On January 31, 2013, the Department of Environmental Quality (DEQ) received a test protocol, prepared by Bighorn Environmental Air Quality, LLC, for particulate matter and opacity testing to be conducted on the Meyer-Sterner whey dryer. Testing is to be conducted pursuant to Permit to Construct No. P-2009.0023 as modified August 28, 2009.

DEQ has reviewed the submitted test protocol and hereby approves it with the following comments.

1. Compliance with the PM_{10} emissions limit on the whey dryer stack shall be determined by summing the results of Methods 5 (filterable emissions) and 202 (condensible emissions).
2. The opacity observations shall include a minimum of 30 observations (7.5 minutes) during each test run, in accordance with permit condition 2.6.
3. The test shall be conducted at worst-case normal operating conditions in accordance with IDAPA 58.01.01.157.02.a. To document the operating conditions during the test, the production rate of finished whey product from the dryer must be monitored and recorded at least once every 15 minutes, unless a totalizing type meter is used, in which case recording the beginning and ending readings for each test run is sufficient for documenting the production rate during testing.

The testing is scheduled for February 18, 2013. If the testing dates change, you must notify DEQ at least 15 days prior to the new test date; if necessary, please do so by contacting me. If you have any questions, or if I can be of assistance to you, please call me at (208) 373-0419 or Zach Klotovich at (208) 373-0295.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer

c: Tim Homer, Bighorn Environmental Air Quality, LLC
Zach Klotovich, Technical Services Division
Marilyn Seymore, Air Quality Division

Printed on Recycled Pa

QUALITY CONTROL OUTLINE

A) Equipment Calibration

The meter box dry gas meter (DGM) will be calibrated within six months before the test against a standard DGM, which has been calibrated against a NIST traceable wet test meter (calibrated yearly). In addition a post DGM calibration will be conducted using a critical orifice at the average Delta H and maximum meter vacuum recorded during the testing.

Thermocouples will be calibrated against a NIST traceable thermometer within six months of the testing at three distinct points including an ice bath, boiling water and a recovery furnace stack that is approximately 350 ° F.

Probes and their attached S-type pitot tubes are calibrated as outlined in EPA Method 2 within six months of the test date.

The probe nozzles have been calibrated and measured prior to their use in the field.

The aneroid barometer is calibrated against a mercury barometer before each field assignment.

B) Laboratory Analysis

All samples are returned to the lab for analysis. Prior to each weighing the scale (accurate to 0.1mg) is calibrated with NIST traceable S class weights. The filters are oven dried for a minimum of three hours and weighed. The probe rinse is evaporated in a breaker and then desiccated for at least 24 hours before weighing. It is then returned to the desiccator and re-weighed at 6 hours intervals until a constant weight (± 0.5 mg) is achieved. Acetone blanks are prepared and analyzed in the same manner as the probe wash.

C) Sampling

A pre and post run leak check of the entire sampling train is performed in conjunction with each test run.

A pitot leak check is also conducted for each test run.

Thermocouples are checked against ambient conditions to determine field integrity.

Impinger contents are measured at the conclusion of each run to determine stack gas moisture.

The probe is rinsed following procedures outlined in the method and the rinse transferred to polyethylene bottles and the liquid level marked.

Please call me at 541-954-4697 if you have any questions.

Sincerely,

Tim Homer
Air Emissions Lab Manager

Attachments-Sample Data and QA/QC forms

cc: Wendy York

data required by permit condition, to show the source was operated at the maximum throughput rates stipulated in Section 3.11.2 of the permit. Please see the attachments for sample data sheets and calculations.

Source Description: WPC (Whey Protein concentrate) is produced at Sorrento Lactalis mozzarella cheese plant in Nampa, Idaho and processed through 3 different membrane processing equipment. The liquid WPC is fed into a high-pressure pump, which sprays the product at 2,500 psi into a drying chamber at the rate of 3,200 lb/hr at 31% T.S (total solids). The product is atomized in the drying chamber and the rate of water removal from the atomization is 2,100lb/hr. The powder is conveyed thru the drying tube below the main chamber and dropped into the main cyclone of the dyer. The air from the chamber is exhausted into the baghouse and through the stack on the roof. The product is transferred from the large cyclone and transferred into the small cyclone above the sifter with the powder-conveying fan. The air from the powder-conveying fan is exhausted into the bottom of the bag house and the residual powder is augured into the powder conveying fan line and returned back to the small cyclone. The powder that is collected on the bags in the bag house is air pulsed every 3 seconds per bank of bag filters and the residual powder is also collected by the auger in the bottom of the bag house and sent back to the small cyclone which leads to the sifter. The powder is packaged and sealed for human consumption.

Sampling Replicates and Duration: Bighorn will conduct tests consisting of three 60-minute runs for PM (with a minimum of 31.8 dscf) and three runs of six-minute averages for opacity as required by permit.

QC/QA: Cross checks such as manual calculations of Bighorn's computer generated spreadsheet summaries allow test results verification. Bighorn files manufacturers' accuracy certificates and interference tables for CEMS, flow controllers, gases, etc. Additionally dry gas meters, pitot tubes, thermocouples, gas dividers, etc. are certified as per EPA requirements and frequencies. Where EPA frequencies are not specified, Bighorn has established those based on state regulatory criteria.

Thorough sample methodology adherence, chain-of-custody procedures, and documentation provide proof of our QA/QC efforts. Relevant QA/QC documentation is included in the final report's Appendices for results support and regulatory review. Please see the attachments for further discussion of QA/QC procedures.

Standard Source Sampling Language

a. It is assumed today, but will be confirmed on or before the test day, that the duct air flow measuring meets criteria in EPA Methods 1 and 2.
b. In no case, will sampling replicates be accepted if separated by a time duration of 24 or more hours, unless prior authorization is granted.
c. The sources to be tested must operate at a normal production rate during testing. Rates not in agreement with those stipulated in the Permit can result in test rejection for application to determine facility compliance. Imposed process limitations could also result from atypical rates.
d. The department must be notified of any changes in source test plans prior to testing. Significant changes not acknowledged by DEQ which could affect the accuracy and reliability of results could result in test report rejection.
e. Method specific quality assurance/quality control procedures must be performed to ensure the data is valid for determining source compliance. Documentation of the procedures and results shall be presented in the source test report for review. Omission of this critical information may result in rejection of the data, requiring a re-test.
f. Source test reports must be submitted to the department within 30 days of the test dates, unless another deadline has been stipulated, either by permit condition, or by DEQ letter approval.

January 30, 2013

Mr. Thomas Krinke
Department of Environmental Quality
1445 N. Orchard Street
Boise, ID 83706-2239

RE: Sorrento Lactalis Nampa, ID Source Test Plan

Dear Mr. Krinke:

Please allow this letter to serve as notification that Bighorn Environmental Air Quality, LLC is scheduled to perform source testing at Sorrento Lactalis Nampa, ID facility. This testing is required to satisfy the source testing required in Sorrento Lactalis Permit to Construct.

Purpose of Tests: To determine the compliance status of the facility as required by Sorrento Lactalis Permit #P-2009.0023, Section 2.10.

Source Contact: Wendy York (208) 463-6674; PO Box 1280, Nampa, ID 83653

Sources, Parameters, and Test Dates: The following table outlines parameters and proposed test dates.

SOURCE NAME	PARAMETERS	TEST DATES
Meyers-Sterner Baghouse (P-1)	PM_{10}, Opacity, Velocity & Moisture	February 18

If testing dates change, Bighorn personnel will call you soon after scheduling the new dates.

Test Methods: Testing will be conducted in accordance with the following EPA Methods *in Title 40 CFR 51 & 60, Appendix M & A, July 2012.*

Flow Rates:	EPA Methods 1 & 2
Moisture:	EPA Method 4
PM/CPM:	EPA Method 5/202 (all PM to be counted as PM_{10})
Opacity:	EPA Method 9

Discussion of Methods: EPA Methods 1 & 2 will be used to determine flow rates. A check of the stack to verify the flow is non-cyclonic will be conducted before the test. Opacity readings will be conducted during each run using EPA Method 9. Smoke School Inc. certified the opacity observers in February 2013. Since the stack gas is essentially ambient air (no combustion gases) an assumed MW of 29 will be used as outlined in Method 2, Section 8.6 for ambient sources. The Method 5/202 will use the "new" Method 202 with back-half filter and nitrogen purge.

Data Collection: Bighorn uses standard forms, which contain all required regulatory data and any additional information necessary for flow rate and particulate determinations. Also, Bighorn uses standard analytical forms for opacity, particulate filter and silica gel records. Sorrento Lactalis personnel will collect the production/process

APPENDIX G
IDEQ CORRESPONDENCE

DEQ testing. WPC dryer 02 / 18 / 2013				
Time	Dryer speed (Wet side) --> Lbs/min	Powder Flow (wet side * 0.29 (solids) * 1.045 (humudity left in the product) --> Lbs / min	Pressure differential on baghouse --> Inches of water	
12:10 pm	70	21.21	0	
12:25 pm	70	21.21	0	
~~12:50 pm~~ 12:40	70	21.21	~~0~~	Run 1
12:55 pm	70	21.21	~~0~~	
1:10 pm	70	21.21	~~0~~	
1:25 pm	70	21.21	~~0~~	
1:40 pm	70	21.21	~~0~~	
1:55 pm	70	21.21	~~0~~	
2:10	70	21.21	~~0~~	Run 2
2:25	70	21.21	~~0~~	
2:40	71	21.52	~~0~~	
2:55	71	21.52	~~0~~	
3:10	71	21.52	~~0~~	
3:25	71	21.52	~~0~~	
3:40	70	21.21	~~0~~	Run 3
3:55	70	21.21	~~0~~	
4:10	70	21.21	0	

--> DATA needs to be record every 15 min.

PM/PM10 limit 1.6 lb/hr

APPENDIX F
PRODUCTION DATA

FIGURE 1.3

SOURCE EMISSION TEST CERTIFICATION

Test Team Leader

I hereby certify that the test detailed in this report was accomplished in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control. The results submitted herein are accurate and true to the best of my knowledge.

Name Tim Hamer
(Print)

Signature _____ Date 3/15/13

Affiliation Bighorn Environmental

FIGURE 1.4

SOURCE EMISSION TEST CERTIFICATION

Test Team Report Reviewer

I hereby certify that I have reviewed this report and find it to be true and accurate, and in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control to the best of my knowledge.

Name Jim Homer
(Print)

Signature _____ Date 3/15/13

Affiliation Bishop Environmental

Smoke School Inc

EPA Reference Method 9 Certification Card

Michael Keating

Cert. No. SS-S09-48 Exp. Date 2013-08-12

Certified Reader's Signature

Smoke School Inc. President

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

Bighorn Environmental
2021 N. Chase Rd.
Liberty Lake, WA 99019

CERTIFICATE OF SERVICE AND CALIBRATION

The measurement and test equipment initialed and dated on the QCS Report of Service and Calibration #39590 has been serviced and calibrated by Quality Control Services using test standards that are traceable to the National Institute of Standards and Technology (N.I.S.T.) through QCS master standard #1550.01. Unless otherwise noted in the comments section of the report, all measurement and test equipment meets or exceeds customer calibration tolerances.

Technician Signature: _____ **Date:** 7·10·2012

Technician Signature: _____ **Date:** _____

PTID: BIGE01

CLIENT:	Sirrente					
SOURCE:	Meyer	Stemmer	Prop.			
DATE:	2/19/13					
POST TC CALIBRATION CHECK						
Probe ID	**Reference Temp**		**TC reading**	**Date**		
BHS'	48		46	2/18		
NOx CONVERTER CHECK						
Bottle ID	Conc	Time	Actual reading		w/in 90%	
	NA					
Cyclonic Flow check <20 deg						
	✓					
Method 16A Temp Checks						
Item	Setting	Beg Temp	End Temp			
Probe						
Filter	NA					
Heated Line						
Stratification Check (if needed)						
		Avg.	Abs Difference			
Point #1 (16.7%)			#DIV/0!			
Point #2 (50%)	NA		#DIV/0!			
Point #3 (83.3 %)			#DIV/0!			
Average of 3 points		#DIV/0!				
			Complete		**Date**	
Post DGM calibration check complete			✓		2/18	
Pitot tube visual inspection			✓		2/18	
Water or Actetone Blank collected			✓		2/18	

DGM Y Determination (critical orifice method)

Date: 2/18/2013 Train ID: 1208030
K' factor: 0.58281
Critical Orifice ID: 63

Dry Gas Meter		Run Number 1	2	3
Final reading	ft^3	810	815	820
Initial reading	ft^3	805	810	815
Difference, Vm	ft^3	5	5	5
Inlet temps:				
Initial	F	102	102	103
Final	F	102	103	103
Outlet temps:				
Initial	F	102	102	103
Final	F	102	103	103
Avg. temp	F	102	102.5	103
Time	sec	376	377	378
Orifice reading	in H2O	1.9	1.9	1.9
Bar. Pressure	in Hg	27.7	27.7	27.7
Ambient temp.	F	97	97	97
Pump vacuum	in Hg	18	18	18
Vm(std)	ft^3	4.37	4.37	4.36
Vcr(std)	ft^3	4.29	4.30	4.31
DGM cal factor Y		0.981	0.985	0.988
Avg DGM cal factor			0.985	

APEX INSTRUMENTS
METHOD 5 XC-522 CONSOLE CALIBRATION
for
Bighorn Env. Quality

Meter Console Information	
Console Model Number	XC-522
Console Serial Number	170N030
DGM Model Number	S-110
DGM Serial Number	978563

Calibration Conditions			
Date	time	13-Aug-12	1:15
Barometric Pressure		30.00	in Hg
Calibration Technician		Eric Waters	
Calibration Meter Gamma		0.9999	

Standardized Factors/Conversions		
Temperature	[illegible]	R
Pressure	[illegible]	in Hg
K_1	[illegible]	R/in Hg

Test Time	Metering Console							Calibration Meter				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final		Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final
θ minutes	P_m in H_2O	V_{mi} cubic feet	V_{mf} cubic feet	V_m cubic feet	t_{mi} °F	t_{mf} °F		V_{ci} cubic feet	V_{cf} cubic feet	V_c cubic feet	t_{ci} °F	t_{cf} °F
5.00	5.00	760.798	767.136	6.340	83	84		224.425	230.740	6.315	77	77
6.00	3.00	743.798	749.958	6.160	83	83		207.500	213.340	5.840	77	77
7.00	2.00	749.658	755.250	5.592	83	83		213.340	218.905	5.565	77	77
10.00	1.00	755.250	760.796	5.546	83	83		218.905	224.425	5.520	77	77
15.00	0.50	737.929	743.798	5.869	83	83		201.660	207.500	5.840	77	77

Standardized Results				Results				
Dry Gas Meter		Calibration Meter		Calibration Factor		Dry Gas Meter		
				Value	Variation	Flowrate	$\Delta H_@$	
V_m cubic feet	Q_{std} ft^3/min	V_{cstd} cubic feet	Q_{std} ft^3/min	Y	ΔY	Std & Corr Q_{std} ft^3/min	0.75 SCFM $\Delta H_@$ in H_2O	Variation $\Delta\Delta H_@$
6.251	1.250	6.226	1.245	0.9958	-0.005	1.245	1.768	-0.044
5.755	0.959	5.757	0.959	1.0003	-0.001	0.959	1.780	-0.024
5.479	0.783	5.486	0.784	1.0013	0.000	0.784	1.787	-0.025
5.420	0.542	5.441	0.544	1.0039	0.003	0.544	1.853	0.041
5.729	0.382	5.757	0.384	1.0048	0.004	0.384	[illegible]	0.051
				1.0012	Y Average		1.812	$\Delta H_@$ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is ±0.02.

Note: For $\Delta H_@$, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +0.2inches (5.1mm) H_2O.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Primary Wet Test Meter # 11A0 b, which in turn was calibrated using the American Meg Prover # 157, certified 05/26/2008 using Pi Tape S/N 20700136, which is traceable to the National Bureau of Standards. (NIST)

Signature: [illegible]
Eric Waters

Date: 13-Aug-12

APEX INSTRUMENTS

00014

APEX INSTRUMENTS REFERENCE METER VERIFICATION
USING WET-TEST METER #11AE6
2-POINT ENGLISH UNITS

Calibration Meter Information	
WTM Model #	AL20
WTM Serial #	11AE6
WTM Gamma	0.9999
Original 18Pt Gamma	0.9986

Calibration Conditions		
Date / Time	13-Jan-12	3:15
Barometric Pressure	29.55	in Hg
Calibration Tech	EW	
DGM Serial Number	S-110-1019226	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	°R/in Hg

Calibration Data												Results		
	Metering Console						Calibration Meter					Dry Gas Meter		
Run Time												Calibration Factor		Flowrate
Elapsed	DGM Input Pressure	Volume Initial	Volume Final	Volume Sample	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Final	Volume Sample	Outlet Temp Initial	Outlet Temp Final	Previous	Current	Std & Corr
(θ)	(P_{in})	(V_{mi})	(V_{mf})	(V_m)	(t_{mi})	(t_{mf})	(V_{wi})	(V_{wf})	(V_w)	(t_{wi})	(t_{wf})	(Y)	(Y)	($Q_{std(corr)}$)
min	in H_2O	cubic feet	cubic feet	cubic feet	°F	°F	cubic feet	cubic feet	cubic feet	°F	°F			cfm
6.00	-3.8	801.491	807.622	6.131	77.0	77.0	237.070	243.050	5.980	71	71	0.9959	0.9958	0.979
											Variation	0.01%	must be less than 1.5%	
10.00	-2.3	807.622	813.325	5.703	77.0	78.8	243.050	248.660	5.610	71	71	0.9989	1.0022	0.551
											Variation	0.33%	must be less than 1.5%	

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, App A, Method 5, Paragraph 7.1.2.2, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature [illegible] Date 1/13/12

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #1	32	0		207	-3	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #2	31	-1		208	-2	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #3	33	1		206	-4	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #4	31	-1		207	-3	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #1	31	-1		206	-4	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #2	31	-1		205	-5	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #3	30	-2		206	-4	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #4	31	-1		204	-6	
Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
Meter Box #906017	31	-1		205	-5	

NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
MFB 7' #1 Probe	33	**1**		205	**-3**		387	**-7**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 7' #2 Probe	32	**0**		203	**-5**		393	**-1**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 10' #1 Probe	35	**3**		206	**-2**		389	**-5**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 10' #2 Probe	36	**4**		205	**-3**		389	**-5**	

8/28/2012									
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 3' #1 Probe	32	**0**		206	**-2**		390	**-4**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 3' #2 Probe	39	**7**		204	**-4**		392	**-2**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 4' Hi-Temp Probe	31	**-1**		207	**-1**		382	**-12**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 5' Probe	35	**3**		205	**-3**		389	**-5**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #1 Probe	38	**6**		206	**-2**		391	**-3**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #2 Probe	34	**2**		208	**0**		397	**3**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #3 Probe	34	**2**		206	**-2**		394	**0**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #4 Probe	36	**4**		203	**-5**		395	**1**	

2012 Probe / S-Type Pitot Cals

Date: 8/28/2012 Calibrated by: MK

	Dimensions			Alignment						Pitot to probe components				
BH Probe	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	P-0.500"	Pitot to Sheath	Pitot to T/C	Perpendicular to Probe	Meets criteria for Cp = 0.84
BH#1-3'ss	0.378	0.251	0.251	1°	1°	1°	1°	0	0	0.498	0.438	0.412	0.156	Yes
BH#2-3'ss	0.376	0.247	0.247	1°	1°	1°	1°	0	0	0.494	0.429	0.414	0.161	Yes
BH#1-4'HT	0.378	0.251	0.251	2°	2°	1°	1°	0	0	0.498	0.441	0.418	0.221	Yes
BH#1-5'ss	0.379	0.250	0.250	0	0	0	0	0	0	0.494	0.530	0.429	0.197	Yes
BH#1-6'ss	0.380	0.249	0.249	2°	2°	2°	2°	0	0	0.491	0.297	0.376	0.209	Yes
BH#2-6'ss	0.376	0.251	0.251	0	0	0	0	0	0	0.481	0.289	0.368	0.211	Yes
BH#3-6'ss	0.380	0.249	0.249	0	0	0	0	0	0	0.491	0.297	0.373	0.214	Yes
BH#4-6'ss	0.379	0.252	0.252	1°	1°	0	0	0	0	0.492	0.288	0.379	0.196	Yes
BH#5-6'ss	0.381	0.250	0.250	0	0	0	0	0	0	0.497	0.286	0.371	0.207	Yes
BH#6-6'ss	0.379	0.249	0.249	1°	1°	1°	1°	0	0	0.496	0.288	0.376	0.202	Yes
BH#1-7'ss	0.380	0.250	0.250	2°	2°	0	0	0	0	0.486	0.396	0.418	0.210	Yes
BH#2-7'ss	0.382	0.250	0.250	1°	1°	1°	0	0	0	0.490	0.393	0.404	0.218	Yes
BH#1-8'HT	0.379	0.251	0.251	1°	1°	0	0	0	0	0.490	0.399	0.408	0.210	Yes
BH#2-8'ss	0.383	0.253	0.253	0	0	0	0	0	0	0.488	0.414	0.419	0.222	Yes
BH#1-10'ss	0.386	0.253	0.253	2°	2°	0	0	0	0	0.490	0.403	0.415	0.212	Yes
BH#2-10'ss	0.382	0.252	0.252	1°	1°	0	0	0	0	0.492	0.413	0.423	0.223	Yes
BH#1-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.417	0.216	Yes
BH#2-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.419	0.216	Yes

	Dimensions			Alignment						
BH S-Type	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	Cp - 0.84
BH#1-4'ss	0.38	0.248	0.248	0	0	0	0	0	0	Yes
BH#1-7'ss	0.380	0.251	0.251	0	0	0	0	0	0	Yes
BH#1-10'ss	0.380	0.248	0.248	0	0	0	0	0	0	Yes

2013 Nozzle Calibration Sheet SS						
Date:	1/23/2013		Calibrated by:		MK	
Nozzle ID	**D1 (inches)**	**D2 (inches)**	**D3 (inches)**	**Delta D (in)**	**D avg**	
BH1/8"-1	0.128	0.127	0.125	0.001	**0.127**	0.1250
BH1/8"-2	0.126	0.125	0.123	0.001	**0.125**	0.1250
BH1/8"-3	0.127	0.126	0.127	0.001	**0.127**	0.1250
BH5/32"-1	0.156	0.157	0.159	0.001	**0.157**	0.1563
BH5/32"-2	0.155	0.158	0.157	0.001	**0.157**	0.1563
BH5/32"-3	0.158	0.155	0.156	0.001	**0.156**	0.1563
BH3/16"-1	0.189	0.187	0.188	0.001	**0.188**	0.1875
BH3/16"-2	0.188	0.188	0.188	0.001	**0.188**	0.1875
BH3/16"-3	0.187	0.189	0.188	0.001	**0.188**	0.1875
BH7/32"-1	0.218	0.217	0.218	0.001	**0.218**	0.2188
BH1/4" 1	0.251	0.250	0.251	0.002	**0.251**	0.2500
BH1/4" 2	0.249	0.251	0.252	0.002	**0.251**	0.2500
BH1/4" 3	0.249	0.250	0.248	0.002	**0.249**	0.2500
BH1/4" 4	0.252	0.250	0.251	0.002	**0.251**	0.2500
BH1/4" 5	0.244	0.242	0.243	0.002	**0.243**	0.2500
BH1/4" 6	0.241	0.240	0.242	0.002	**0.241**	0.2500
BH1/4" 7	0.248	0.247	0.249	0.002	**0.248**	0.2500
BH9/32"-1	0.286	0.284	0.283	0.001	**0.284**	0.2813
BH9/32"-2	0.282	0.281	0.283	0.001	**0.282**	0.2813
BH5/16"-1	0.316	0.312	0.314	0.001	**0.314**	0.3125
BH5/16"-2	0.313	0.310	0.312	0.001	**0.312**	0.3125
BH11/32"-1	0.347	0.347	0.347	0.002	**0.347**	0.344
BH11/32"-2	0.346	0.346	0.348	0.002	**0.347**	0.344
BH3/8"-1	0.375	0.375	0.376	0.001	**0.375**	0.3750
BH3/8"-2	0.369	0.368	0.372	0.001	**0.370**	0.3750
BH13/32"-1	0.403	0.405	0.407	0.001	**0.405**	0.4063
BH7/16"-1	0.437	0.435	0.434	0.003	**0.435**	0.4375
BH7/16"-2	0.430	0.431	0.428	0.003	**0.430**	0.4375
BH1/2"-1	0.500	0.504	0.500	0.001	**0.501**	0.5000
BH1/2"-2	0.500	0.501	0.501	0.001	**0.501**	0.5000
BH9/16"-1	0.561	0.562	0.559	0.002	**0.561**	0.5625
BH5/8"-1	0.625	0.625	0.627	0.002	**0.626**	0.625
BH11/16"-1	0.687	0.687	0.688	0.001	**0.516**	0.688
BH1/2"-1	0.499	0.502	0.501	0.001	**0.501**	0.5000
BH1/2"-2	0.501	0.500	0.504	0.001	**0.502**	0.5000
HITPBH-9/32-2	0.274	0.277	0.272	0.001	**0.274**	0.2813
HITPBH-27/64-'	0.420	0.421	0.420	0.001	**0.420**	0.4219
BH13/32	on order					

APPENDIX E
QUALITY RECORDS

40CFR 60 APP. A, Method 5, Sect. 6.9 Eq. 5A-5

PARTICULATE CONCENTRATION= $W_{Total\ Part.}$ x K_1 ÷ $V_{m\ (std)}$: where K_1=15.43 grains/ft^3 ÷ 1 g/ft^3

= 100679 x 15.43 ÷ 54.017 = .00194 gr/dscf

PARTICULATE EMISSIONS RATE= 60 min/hr x Part Con. x Q_{sd} ÷ K_4 : where K_4=7000 grains/lb

= 60 x .00194 x 15352.6 ÷ 7000 = 0.255 lb/hr

40CFR 60.284(c)3

PARTICULATE CONCENTRATION @ 15% O2=Part Con. x(20.9-15) ÷(20.19-O2%)

= _____ x (20.9-15) ÷ (20.9 - _____)= _____ gr/dscf

V_{lc} (Total volume of liquid collected)= impingers + silica gel = 74 + 10 = 84 mls

K_2 (water constant for density, ideal gas, molecular weight, etc.)= .04707

40CFR 60 APP. A, Method 5, Sect. 6.4 Eq. 5-2

V_w (std) (Water vapor volume corrected to std. conditions)= V_{lc} x K_2 = 84 x .04707 = 3.954 scf

40CFR 60 APP. A, Method 5, Sect. 6.5 Eq. 5-3

B_{ws} (Water vapor in gas proportioned by volume)=$V_w \div (V_{m(std)}+V_w)$=3.954 ÷(3.954 +54.07)= .068207

MOISTURE CONTENT OF STACK GAS = (100 x B_{WS}) = 100 x .068207 = 6.8207 %H_2O

N2% =100 - %O2 - %CO2 - %CO = 100 - ____ - ____ - ____ = ____ %

Mw_{dry} = 0.44 x CO_2% + 0.32 x O_2% + 0.28(N_2% + CO%)
= 0.44 x ____ + 0.32 x ____ + 0.28 x (____ + ____) = assumed 29 lb/lb-mole

MW_{wet} = MW_{dry} x(1- B_{ws}) + 18 lb/lb-mole x B_{ws}= 29 x (1 - .068207) + 18 x .068207 = 28.25 lb/lb-mole

40CFR 60 APP. A, Method 2, Sect. 5.3 Eq. 2-10

V_s (stack velocity)= K_p x 60 sec/min x C_p x $(\sqrt{\square P})_{avg}$ x $\sqrt{[T_s \div (P_s \times MW_{wet})]}$
where K_p = 85.49 fps x [(lb/lb-mole) x (in. Hg) ÷ (°R) x (in. H_2O)]$^{1/2}$
= 85.49 x 60 x .84 x .7516 x √[573.2 ÷ (27.70 x 28.25)]= 2771.64 fpm

A_{stack} = π x Dia.^{2}÷ 4 ÷ 144 = 3.14159 x 35.75 ^{2} ÷ 4 ÷ 144 = 6.971 ft^2

Q_a (Actual volumetric stack gas flow rate)= A_{stack} x V_s = 6.971 x 2771.64 = 19,320.4 acfpm

Q_{sd} (Dry standard volumetric stack gas flow rate) = (1-B_{ws}) x Q_a x (528 ÷ T_s) x (P_s ÷ 29.92)=
= (1 - .068207) x 19370.4 x (528 ÷ 573.2) x (27.70 ÷ 29.92) = 15352.6 acfpm

A_n (Area of stack sampling nozzle)= π x (Dia_{nozzle} ÷ 12)^2 ÷ 4 = 3.14159 x (.25 ÷ 12)^2 ÷ 4= .000341 ft^2

40CFR 60 APP. A, Method 5, Sect. 6.11.1 Eq. 5-7

ISOKINETIC VARIATION=100xT_sx(K_3xV_{lc}+(V_mxY÷T_m)x(P_b+□H÷13.6))÷(Time xV_sxP_sxA_n):
where K_3 = 0.002669 in Hg-ft^3/ml-°R

=100x 573.2 x [0.002669 x 84 + (6.073 x 1.001 ÷ ~~583.5~~ 553.3) x
(27.70 + 2.21 ÷ 13.6)] ÷ (.72 x 2771.64 x 27.70 x .000341)= 99.93 %
27.86 1884.3

$W_{totol\ Particulate}$ = Fiberglass Filter Weight + Probe and Nozzle Washing + Impinger (Back Half) + Acetone Wash Blank = .001 + .0139 + .0044 + ____ = .02079 gms

Sorrento Meyer Sterner Run 1 2/18/13

MANUAL METHOD 5 CALCULATIONS

Y (DGM CALIBRATION FACTOR):	1.001	
C_p (PITOT TUBE COEFFICIENT):	.84	
NOZZLE DIAMETER:	.25	in.
STACK DIMENSION:	35.75	in.
BAROMETRIC PRESSURE P_b:	27.70	in. Hg.
STACK STATIC PRESSURE:	0	in. H_2O
OXYGEN CONTENT:	—	%
CARBON DIOXIDE CONTENT:	—	%
CARBON MONOXIDE CONTENT:	—	%
POST RUN LEAK RATE:	0	cfm
SAMPLING TIME:	72	min.
AVG. DGM VACUUM:	4	in. Hg.
AVG. STACK TEMPERATURE:	113.2	°F
AVG. SQ. ROOT OF □P:	.7516	
AVG. ORIFICE PRESS. (□H):	2.21	in. H_2O
GAS SAMPLE VOLUME V_m:	60.73	dscf
AVG. DRY GAS METER TEMP:	93.3	°F
FIBERGLASS FILTER WEIGHT:		gms
PROBE & NOZZLE WASHINGS:		gms
IMPINGER (BACK HALF) WEIGHT:		gms
ACETONE WASH BLANK:	—	gms
IMPINGER MOISTURE VOLUME:	74	mls
SILICA GEL WEIGHT INCREASE:	10	gms
PRODUCTION RATE:	—	#/hr
BTU HEAT INPUT:	—	mmBTU/hr

CONSTANTS & CALCULATIONS

T_s (Absolute average stack gas temperature)= 460 + T_S = 460 + 113.2 = 573.2 °R

T_m (Absolute average DGM temperature) = 460 + Avg. DGM Temp. = 460 + 93.3 = 553.3 °R

T_{std} (Standard absolute temperature) = 528 °R

P_s (Absolute stack gas pressure) = P_b + (P static÷13.6 in H_2O/in Hg)= 27.7 + (0 ÷13.6)= 27.70 in Hg

P_{std} (Standard absolute pressure) = 29.92 in Hg

40CFR 60 APP. A, Method 5, Sect. 6.3 Eq. 5-1

DGM $V_{m\,(std)}$= V_m x Y x T_{std}/T_m x (P_m/P_{std}) = 60.73 x 1.001 x528÷ 553.3 x(27.86 ÷29.92)= 54.017 dscf

APPENDIX D
CALCULATIONS

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	GP Toleto, OR	**Date**	02/18/13
Sampling Location	Nampa, ID	**Project #**	Whey Dryer
Operator	Homer	**Stack Type**	Circular

Historical Data						
Run Number		1	2	3	**Average**	
Run Start Time		12:08	13:30	14:58		hh:mm
Run Stop Time		13:20	14:42	16:10		hh:mm
Meter Calibration Factor	(Y)	1.001	1.001	1.001		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	$(V_m)_i$	614.400	675.700	738.600		ft^3
Final Meter Volume	$(V_m)_f$	675.130	737.120	800.210		ft^3
Total Meter Volume	(V_m)	60.730	61.420	61.610	61.253	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	$(t_m)_{avg}$	93.3	103.3	104.9	100.5	°F
Average Stack Temperature	$(t_s)_{avg}$	113.2	113.9	113.5	113.5	°F
Barometric Pressure	(P_b)	27.70	27.70	27.70	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	27.70	27.70	27.70	in Hg
Average Orifice Pressure Drop	$(\Delta H)_{avg}$	2.21	2.25	2.25	2.23	in H_2O
Absolute Meter Pressure	(P_m)	27.86	27.87	27.87	27.86	in Hg
Avg Square Root Pitot Pressure	$(\Delta p^{1/2})_{avg}$	0.7516	0.7538	0.7536	0.7530	$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	74.0	71.0	87.0	77.3	ml
Impinger Weight Gain	(W_n)	10.0	9.0	8.0	9.0	g
Total Water Volume Collected	(V_{lc})	84.0	80.0	95.0	86.3	ml
Standard Water Vapor Volume	$(V_w)_{std}$	3.955	3.766	4.472	4.064	scf
Standard Meter Volume	$(V_m)_{std}$	54.026	53.672	53.683	53.794	dscf
Calculated Stack Moisture	$(B_{ws(calc)})$	6.82	6.56	7.69	7.02	%
Saturated Stack Moisture	$(B_{ws(svp)})$	10.26	10.46	10.36	10.36	%
Reported Stack Moisture Content	(B_{ws})	6.82	6.56	7.69	7.02	%
Gas Analysis Data						
Carbon Dioxide Percentage	($\%CO_2$)					%
Oxygen Percentage	($\%O_2$)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	($\%N_2$)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.25	28.28	28.15	28.23	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	46.20	46.33	46.41	46.31	ft/sec
Stack Cross-Sectional Area	(A_s)	6.97	6.97	6.97		ft^2
Actual Stack Flow Rate	(Q_{aw})	19322	19378	19411	19370	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	989	990	993	991	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	15353	15423	15272	15350	dscfm
Percent of Isokinetic Rate	(I)	99.9	98.8	99.8	99.5	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	0.00	0.00	0.00	0.00	mg
Mass of Particulate in Acetone	(m_a')	0.00	0.00	0.00	0.00	mg
Mass Due to Backhalf	(W_e)	4.40	5.20	3.40	4.33	mg
Total Mass of Particulates	(m_n)	4.40	5.20	3.40	4.33	mg
Stack Particulate Concentration	(c_s)	0.000	0.000	0.000	0.000	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.0013	0.0015	0.0010	0.0012	gr/dscf
Particulate Emission Rate	(E)	0.1654	0.1977	0.1279	0.1637	lbs/hr
	(E)					lbs/ton BLS
	(E)	#DIV/0!	#DIV/0!	#DIV/0!		lbs/ADTP
Production Rate	(PR)					ton BLS/hr
Production Rate	(PR)					ADTP/hr

M202

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	GP Toleto, OR	Date	02/18/13
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Stack Type	Circular

M5 only

Historical Data						
Run Number		1	2	3	Average	
Run Start Time		12:08	13:30	14:58		hh:mm
Run Stop Time		13:20	14:42	16:10		hh:mm
Meter Calibration Factor	(Y)	1.001	1.001	1.001		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{ne})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	$(V_m)_i$	614.400	675.700	738.600		ft^3
Final Meter Volume	$(V_m)_f$	675.130	737.120	800.210		ft^3
Total Meter Volume	(V_m)	60.730	61.420	61.610	61.253	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	$(t_m)_{avg}$	93.3	103.3	104.9	100.5	°F
Average Stack Temperature	$(t_s)_{avg}$	113.2	113.9	113.5	113.5	°F
Barometric Pressure	(P_b)	27.70	27.70	27.70	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	27.70	27.70	27.70	in Hg
Average Orifice Pressure Drop	$(\Delta H)_{avg}$	2.21	2.25	2.25	2.23	in H_2O
Absolute Meter Pressure	(P_m)	27.86	27.87	27.87	27.86	in Hg
Avg Square Root Pitot Pressure	$(\Delta p^{1/2})_{avg}$	0.7516	0.7538	0.7536	0.7530	$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	74.0	71.0	87.0	77.3	ml
Impinger Weight Gain	(W_n)	10.0	9.0	8.0	9.0	g
Total Water Volume Collected	(V_{tc})	84.0	80.0	95.0	86.3	ml
Standard Water Vapor Volume	$(V_w)_{std}$	3.955	3.766	4.472	4.064	scf
Standard Meter Volume	$(V_m)_{std}$	54.026	53.672	53.683	53.794	dscf
Calculated Stack Moisture	$(B_{ws(calc)})$	6.82	6.56	7.69	7.02	%
Saturated Stack Moisture	$(B_{ws(svp)})$	10.26	10.46	10.36	10.36	%
Reported Stack Moisture Content	(B_{ws})	6.82	6.56	7.69	7.02	%
Gas Analysis Data						
Carbon Dioxide Percentage	($\%CO_2$)					%
Oxygen Percentage	($\%O_2$)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	($\%N_2$)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.25	28.28	28.15	28.23	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	46.20	46.33	46.41	46.31	ft/sec
Stack Cross-Sectional Area	(A_s)	6.97	6.97	6.97		ft^2
Actual Stack Flow Rate	(Q_{sw})	19322	19378	19411	19370	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	989	990	993	991	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	15353	15423	15272	15350	dscfm
Percent of Isokinetic Rate	(I)	99.9	98.8	99.8	99.5	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	1.00	1.70	1.00	1.23	mg
Mass of Particulate in Acetone	(m_a')	1.39	1.01	0.32	0.91	mg
Mass Due to Backhalf	(W_a)	0.00	0.00	0.00	0.00	mg
Total Mass of Particulates	(m_n)	2.39	2.71	1.32	2.14	mg
Stack Particulate Concentration	(c_s)	0.000	0.000	0.000	0.000	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.0007	0.0008	0.0004	0.0006	gr/dscf
Particulate Emission Rate	(E)	0.0898	0.1030	0.0497	0.0808	lbs/hr
	(E)					lbs/ton BLS
	(E)	#DIV/0!	#DIV/0!	#DIV/0!		lbs/ADTP
Production Rate	(PR)					ton BLS/hr
Production Rate	(PR)					ADTP/hr

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	GP Toleto, OR	Date	02/18/13
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Stack Type	Circular

M5/202

Historical Data						
Run Number		1	2	3	Average	
Run Start Time		12:08	13:30	14:58		hh:mm
Run Stop Time		13:20	14:42	16:10		hh:mm
Meter Calibration Factor	(Y)	1.001	1.001	1.001		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	$(V_m)_i$	614.400	675.700	738.600		ft^3
Final Meter Volume	$(V_m)_f$	675.130	737.120	800.210		ft^3
Total Meter Volume	(V_m)	60.730	61.420	61.610	61.253	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	$(t_m)_{avg}$	93.3	103.3	104.9	100.5	°F
Average Stack Temperature	$(t_s)_{avg}$	113.2	113.9	113.5	113.5	°F
Barometric Pressure	(P_b)	27.70	27.70	27.70	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	27.70	27.70	27.70	in Hg
Average Orifice Pressure Drop	$(\Delta H)_{avg}$	2.21	2.25	2.25	2.23	in H_2O
Absolute Meter Pressure	(P_m)	27.86	27.87	27.87	27.86	in Hg
Avg Square Root Pitot Pressure	$(\Delta p^{1/2})_{avg}$	0.7516	0.7538	0.7536	0.7530	$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	74.0	71.0	87.0	77.3	ml
Impinger Weight Gain	(W_n)	10.0	9.0	8.0	9.0	g
Total Water Volume Collected	(V_{lc})	84.0	80.0	95.0	86.3	ml
Standard Water Vapor Volume	$(V_w)_{std}$	3.955	3.766	4.472	4.064	scf
Standard Meter Volume	$(V_m)_{std}$	54.026	53.672	53.683	53.794	dscf
Calculated Stack Moisture	($B_{ws(calc)}$)	6.82	6.56	7.69	7.02	%
Saturated Stack Moisture	($B_{ws(svp)}$)	10.26	10.46	10.36	10.36	%
Reported Stack Moisture Content	(B_{ws})	6.82	6.56	7.69	7.02	%
Gas Analysis Data						
Carbon Dioxide Percentage	($\%CO_2$)					%
Oxygen Percentage	($\%O_2$)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	($\%N_2$)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.25	28.28	28.15	28.23	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	46.20	46.33	46.41	46.31	ft/sec
Stack Cross-Sectional Area	(A_s)	6.97	6.97	6.97		ft^2
Actual Stack Flow Rate	(Q_{aw})	19322	19378	19411	19370	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	989	990	993	991	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	15353	15423	15272	15350	dscfm
Percent of Isokinetic Rate	(I)	99.9	98.8	99.8	99.5	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	1.00	1.70	1.00	1.23	mg
Mass of Particulate in Acetone	(m_a')	1.39	1.01	0.32	0.91	mg
Mass Due to Backhalf	(W_a)	4.40	5.20	3.40	4.33	mg
Total Mass of Particulates	(m_n)	6.79	7.91	4.72	6.47	mg
Stack Particulate Concentration	(c_s)	0.000	0.000	0.000	0.000	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.0019	0.0023	0.0014	0.0019	gr/dscf
Particulate Emission Rate	(E)	0.2552	0.3007	0.1776	0.2445	lbs/hr
	(E)					lbs/ton BLS
	(E)	#DIV/0!	#DIV/0!	#DIV/0!		lbs/ADTP
Production Rate	(PR)					ton BLS/hr
Production Rate	(PR)					ADTP/hr

APPENDIX C
CALCULATED EMISSION RATES

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento - Lactalis	Date	2/18/2013
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Run #	3
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	115	°F
Avg Gas Meter Temp	(t_m)	101	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.81	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	8.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.8531	acfm
DP to DH Isokinetic Factor	(K)	3.60	

Sampling Equipment			
Meter #	1203080		
Meterbox Cal. Factor	(Y)	1.001	
Nozzle #	BH1/4"		
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{nl})	0.2471	in
Probe # / Length	BH5'SS	5'	ft
Liner Material	SS		
Sample Case / Oven #	BH1		
Impinger Case #	BH1		

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg
Absolute Meter Pressure	(P_m)	27.83	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid	na	ft^3/min	@	na	in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?	☑		Orsat OK?	☐	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	14:58:00	738.600	0.72	2.59	2.60	112	251	104	246	52	4.0
A-2	3.0	15:01:00	741.470	0.76	2.73	2.70	113	246	104	247	54	4.0
A-3	6.0	15:04:00	744.470	0.81	2.91	2.90	114	247	104	246	55	4.0
A-4	9.0	15:07:00	747.370	0.85	3.06	3.10	115	249	105	249	56	5.0
A-5	12.0	15:10:00	750.740	0.91	3.27	3.20	114	251	104	248	56	5.0
A-6	15.0	15:13:00	753.760	0.90	3.24	3.20	113	248	105	250	57	5.5
A-7	18.0	15:16:00	756.910	0.30	1.08	1.10	114	249	105	248	55	3.0
A-8	21.0	15:19:00	759.040	0.12	0.43	0.43	115	247	105	246	52	3.0
A-9	24.0	15:22:00	760.220	0.09	0.32	0.32	114	246	105	247	50	3.0
A-10	27.0	15:25:00	761.140	0.07	0.25	0.25	115	247	105	248	50	3.0
A-11	30.0	15:28:00	762.110	0.09	0.32	0.32	115	248	105	249	51	3.0
A-12	33.0	15:31:00	763.170	0.10	0.36	0.36	114	249	105	245	51	3.0
B-1	36.0	15:34:00	764.470	0.72	2.59	2.60	114	250	105	248	50	3.0
B-2	39.0	15:37:00	767.340	0.75	2.70	2.70	113	247	105	248	47	3.0
B-3	42.0	15:40:00	769.980	0.70	2.52	2.50	113	245	105	248	47	3.0
B-4	45.0	15:43:00	772.920	0.80	2.88	2.90	111	243	105	248	48	3.5
B-5	48.0	15:46:00	776.020	0.75	2.70	2.70	111	245	105	247	49	3.5
B-6	51.0	15:49:00	779.020	0.69	2.48	2.50	111	247	105	248	50	3.5
B-7	54.0	15:52:00	781.900	0.76	2.73	2.70	110	242	105	248	50	3.5
B-8	57.0	15:55:00	784.790	0.92	3.31	3.30	114	246	105	247	50	4.0
B-9	60.0	15:58:00	788.110	0.84	3.02	3.00	117	247	106	249	51	3.5
B-10	63.0	16:01:00	791.200	0.77	2.77	2.80	116	245	105	248	51	3.5
B-11	66.0	16:04:00	794.210	0.82	2.95	2.90	114	247	105	248	51	3.5
B-12	69.0	16:07:00	797.250	0.80	2.88	2.80	113	247	106	247	51	4.0
Last Pt	72.0	16:10:00	800.210									
Final Value	72.0	16:10:00	800.210						Maximum Vacuum			5.5
Average Values				0.6267		2.25	114	247	105	248	51	
								176				

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento - Lactalis	Date	2/18/2013
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Run #	2
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	111	°F
Avg Gas Meter Temp	(t_m)	93	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.81	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	8.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.8435	acfm
DP to DH Isokinetic Factor	(K)	3.57	

Sampling Equipment			
Meter #	1203080		
Meterbox Cal. Factor	(Y)	1.001	
Nozzle #	BH1/4"		
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{ni})	0.2471	in
Probe # / Length	BH5'SS	5'	ft
Liner Material	SS		
Sample Case / Oven #	BH1		
Impinger Case #	BH1		

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg
Absolute Meter Pressure	(P_m)	27.83	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid	na	ft^3/min	@	na	in Hg
Post	0.005	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?	☑		Orsat OK?	☐	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	13:30:00	675.700	0.710	2.535	2.500	115	248	101	244	45	4.0
A-2	3.0	13:33:00	678.520	0.760	2.714	2.700	114	247	101	245	48	5.0
A-3	6.0	13:36:00	681.500	0.800	2.857	2.900	115	244	101	246	49	5.0
A-4	9.0	13:39:00	684.490	0.880	3.142	3.100	114	244	102	247	52	7.0
A-5	12.0	13:42:00	687.660	0.910	3.249	3.300	115	246	102	248	53	7.0
A-6	15.0	13:45:00	690.780	0.930	3.321	3.300	114	245	102	250	53	7.0
A-7	18.0	13:48:00	694.270	0.250	0.893	0.890	115	248	102	249	55	6.0
A-8	21.0	13:51:00	696.090	0.100	0.357	0.400	115	245	102	248	57	3.0
A-9	24.0	13:54:00	697.110	0.090	0.321	0.320	113	246	102	246	57	3.0
A-10	27.0	13:57:00	698.030	0.080	0.286	0.290	113	249	102	244	58	2.0
A-11	30.0	14:00:00	699.120	0.100	0.357	0.400	114	250	103	246	55	3.0
A-12	33.0	14:03:00	699.840	0.100	0.357	0.400	114	249	103	248	55	3.0
B-1	36.0	14:06:00	701.360	0.790	2.821	2.800	113	247	103	248	53	7.0
B-2	39.0	14:09:00	704.210	0.760	2.714	2.700	114	249	103	247	50	7.0
B-3	42.0	14:12:00	707.320	0.750	2.678	2.700	113	244	103	246	51	6.5
B-4	45.0	14:15:00	710.340	0.800	2.857	2.900	115	251	104	246	51	7.0
B-5	48.0	14:18:00	713.350	0.710	2.535	2.500	114	247	104	247	51	6.5
B-6	51.0	14:21:00	716.190	0.640	2.285	2.300	114	252	105	248	53	6.0
B-7	54.0	14:24:00	718.950	0.720	2.571	2.500	114	249	105	247	53	6.0
B-8	57.0	14:27:00	721.730	0.800	2.857	2.900	112	245	106	248	53	6.0
B-9	60.0	14:30:00	724.670	0.900	3.214	3.200	113	249	106	249	53	7.0
B-10	63.0	14:33:00	727.820	0.840	2.999	3.000	115	247	106	248	53	7.0
B-11	66.0	14:36:00	730.980	0.860	3.071	3.100	113	242	106	246	53	7.0
B-12	69.0	14:39:00	734.100	0.800	2.857	2.900	112	245	105	246	54	7.0
Last Pt	72.0	14:42:00	737.120									
Final Value	72.0	14:42:00	737.120							Maximum Vacuum		7.0
Average Values				0.63		2.25	114	247	103	247	53	
								175				

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento - Lactalis	Date	2/18/2013
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Run #	1
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	111	°F
Avg Gas Meter Temp	(t_m)	93	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.81	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	8.0	%
Stack Dry Molecular Weight	(M_{ds})	28.82	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	3.57	

Sampling Equipment			
Meter #	1203080		
Meterbox Cal. Factor	(Y)	1.001	
Nozzle #	BH1/4"		
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{ni})	0.2326	in
Probe # / Length	BH5'SS	5'	ft
Liner Material	SS		
Sample Case / Oven #	BH1		
Impinger Case #	BH1		

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg
Absolute Meter Pressure	(P_m)	27.83	in Hg

ΔV_m			Leak Checks		
Pre	0	ft^3/min	@	15	in Hg
Mid	na	ft^3/min	@	na	in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?	☑		Orsat OK?	☐	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	12:08:00	614.400	0.720	2.570	2.500	112	239	85	246	48	2.0
A-2	3.0	12:11:00	617.210	0.780	2.784	2.700	113	239	85	242	49	2.5
A-3	6.0	12:14:00	620.070	0.830	2.963	2.800	114	243	86	246	51	3.0
A-4	9.0	12:17:00	623.110	0.900	3.213	3.200	113	249	86	247	54	4.0
A-5	12.0	12:20:00	626.320	0.910	3.248	3.200	112	243	88	247	57	4.0
A-6	15.0	12:23:00	629.550	0.870	3.106	3.100	114	238	89	246	55	4.0
A-7	18.0	12:26:00	632.670	0.240	0.857	0.850	113	240	90	245	53	1.0
A-8	21.0	12:29:00	634.220	0.100	0.357	0.350	121	251	90	248	53	1.0
A-9	24.0	12:32:00	635.220	0.080	0.286	0.280	122	250	91	246	50	1.0
A-10	27.0	12:35:00	636.120	0.070	0.250	0.250	123	250	91	246	50	1.0
A-11	30.0	12:38:00	637.030	0.100	0.357	0.350	124	242	92	245	49	1.0
A-12	33.0	12:41:00	638.110	0.110	0.393	0.390	123	244	92	244	48	1.0
B-1	36.0	12:44:00	639.230	0.780	2.784	2.700	113	239	93	240	47	3.5
B-2	39.0	12:47:00	642.190	0.750	2.677	2.600	110	247	94	245	45	3.5
B-3	42.0	12:50:00	644.960	0.700	2.499	2.500	110	237	95	244	47	3.0
B-4	45.0	12:53:00	647.830	0.770	2.749	2.700	108	245	96	246	47	3.5
B-5	48.0	12:56:00	650.810	0.750	2.677	2.700	108	240	97	245	48	3.5
B-6	51.0	12:59:00	653.790	0.630	2.249	2.200	110	242	98	245	48	2.5
B-7	54.0	13:02:00	656.510	0.770	2.749	2.700	109	251	98	244	48	3.0
B-8	57.0	13:05:00	659.490	0.900	3.213	3.200	109	245	99	245	48	4.0
B-9	60.0	13:08:00	662.730	0.850	3.034	3.000	108	250	100	248	48	4.0
B-10	63.0	13:11:00	665.880	0.780	2.784	2.800	110	244	101	244	49	3.5
B-11	66.0	13:14:00	668.920	0.830	2.963	3.000	109	246	101	245	49	4.0
B-12	69.0	13:17:00	672.020	0.800	2.856	2.900	109	244	101	244	50	4.0
Last Pt	72.0	13:20:00	675.130									
Last Pt	72.0	13:20:00	675.130						Maximum Vacuum			4.0
Average Values				0.63		2.21	113.2	244	93.3	245	50	

APPENDIX B
FLOW RATE SPREADSHEETS

13-111

Company Name	Bighorn Environmental
Contact	Tim Homer
Phone	541-954-4697
E-Mail Address	Tim@thehomes.NET
Fax	
Report Address	1324 N. Liberty Lk RD
City	Liberty Lake
State	WA
Zip	99019
Billing Address	Same
City	
State	
Zip	
PO #	
Project	Sorrento-Lactalis Nampk, ID

CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page ___ of ___

Turn Around Time
☐ Standard
☐ Rush _____ Specify

Analysis Requested: Methyl ZnZ

	LabNet ID	Field Sample ID	Site	Sample Date	Volume (m³)	Particle Size	Methyl ZnZ	Remarks
135481	Meyer-	Stemor Whey	Meyer - Run 1	2/18			X	H2O + Acetone, Hexane, Filter
485	"	"	Run 2	2/18			X	
486	"	" "	" Run 3	2/18			X	
		2.25.13						
	Per Tim Homer - H2O & Acetone accidentally combined in field - analyze samples & note in Case Narrative.							
135487	FTR3							

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
8:55am 2/25/13	2.25.13 0855
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes: Field Train Blank included

CHESTER LABNET

SOURCE SAMPLE RECEIPT CHECKLIST

Client	Bighorn	Date	2/25/13
# Runs	4 runs ~~+ blks~~	Time	8:55

Custody Seals Inspected, If Present	NA	
Chain-of-Custody Form Inspected	Y	
CoC present with samples?	Y	*
CoC indicate analytical methodology to be used? (eg M29 etc)	Y	!!
CoC indicate if compliance testing? (esp. M26)	NA	!!
M26 samples have Thiosulfate added in field?	NA	!!
M29 indicate FH/BH separate or combined?	NA	!!
Has Form Been Signed?	Y	
Have Date and Time Custody Released Been Noted on Form?	Y	
All Sample Containers Inspected	Y	
Does Number of Samples Match Number on CoC Form?	Y	!!
Do All Sample ID Numbers Match Those on the CoC Form?	Y	!!
Did client mark sample volumes prior to shipment?	Y	*
If required by method, did client vent samples prior to shipment?	NA	
Are the Sample Containers Intact?	Y	!!
Are signs of leakage present?	No	*
Chain-of-Custody Form Signed and Dated by CLN	Y	
Corrective Actions		
Client Contacted Due to Mismatching Sample ID Numbers		
Client Contacted Due to Broken Sample Container(s)		
Client Contacted Due to Leaking Sample Container(s)	2/27	
Client contacted for verification of methodology?		
Corrective Actions Documented?		
Corrective Actions Accomplished?		

*Items marked !! shall be addressed **prior to any analytical work being started**.*
*Items marked * shall be **noted in case narrative** upon reporting of results to client.*

Signed _____

Notes _____

102 DATE SUBJECT 13-111 Bighorn M202 PROJECT NO.

Cal pH 4: CP B060-14 x: 3.02.14
Cal pH 7: CP A320-15 x: 11.23.12
QC pH 7: CP 3037-14 x: 02.2014
0.1N NH_4OH Rocky Mountain Reagents 12-0080 x: 3.5.14

% Nernst: 97.8
Cal pH 4: 4.003
Cal pH 7: 7.000
QC pH 7: ~~7.009~~ SR 7.007

Sx ID	Start pH	End pH	ml titrant
QC pH 7	7.000		
SR PB	6.013	7.166	0.075
13-8-DS 484	5.548	7.135	0.075
485	6.129	7.031	0.050
QC pH 7	6.995	—	—
486	6.440	7.121	0.075
487	6.469	7.038	0.050
QC pH 7	7.005	—	—

3.18.13 SR

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

				"New" M202: Bighorn 13-111						
date/init: 3/13/13 SR										
		pH-start	pH-end	mL NH4OH	mass NH3 (mg)					
	Prep Blank	6.013	7.166	0.0750	0.13					
	484	5.548	7.135	0.0750	0.13					
	485	6.129	7.031	0.0500	0.09					
	486	6.440	7.121	0.0750	0.13					
	487	6.469	7.038	0.0500	0.09					
	mass NH3 = 0.1N NH4OH x mL NH4OH x 17.03 mg NH3/mmol									
	QC:									
	% Nernst slope: 97.8									
CAL	pH 4.000	4.003								
CAL	pH 7.000	7.000								
QC	pH 7.000	7.007								
QC	pH 7.000	7.000								
QC	pH 7.000	6.995								
QC	pH 7.000	7.005								

All masses in grams (g)

"New" M202: Bighorn 13-111

Aqueous Phase

Sx ID	Tare	Tare QC	Tare - QC	Gross	Gross QC	Gross - QC	*net (g)	net (mg)**
date/init:	3/4/13 SR	3/5/13 SR		3/15/13 SR	3/17/13 SR		(total mass liq)	less NH3
time:	0839	1308		1423	0913			
Rel. Humidity	5.1%	7.3%		0.5%	1.7%			
Temp (C/F)	20.7C / 69.3F	19.3C / 66.7F		20.8C / 69.4F	17.0C / 62.6F			
0.2000g QC	0.2000	0.2000		0.2000	0.2000			
3.0000g QC	3.0000	3.0000		3.0000	3.0000			
5.0000g QC	5.0000	5.0000		5.0000	5.0000			
Lab Blank	1.8522	1.8523	-0.0001	1.8523	1.8523	0.0000	0.0001	0.1
Prep Blank	1.8258	1.8258	0.0000	1.8271	1.8270	0.0001	0.0013	1.2
484	1.8509	1.8510	-0.0001	1.8541	1.8540	0.0001	0.0032	3.1
485	1.8610	1.8610	0.0000	1.8651	1.8651	0.0000	0.0041	4.0
486	1.8306	1.8306	0.0000	1.8332	1.8330	0.0002	0.0026	2.5
487	1.8486	1.8486	0.0000	1.8503	1.8502	0.0001	0.0017	1.6

*net mass = gross - tare (g)

**corrected net mass = net mass - (Normality NH4OH x mL NH4OH x 17.03 mg NH3/mmol)

Organic Phase

Sx ID	Tare	Tare QC	Tare - QC	Gross	Gross QC	Gross - QC	*net (g)	net (mg)
date/init	3/4/13 SR	3/5/13 SR		3/15/13 SR	3/17/13 SR			
time:	0839	1308		1423	0913		(total mass liq)	
Rel. Humidity	5.1%	7.3%		0.5%	1.7%			
Temp (C/F)	20.7C / 69.3F	19.3C / 66.7F		20.8C / 69.4F	17.0C / 62.6F			
0.2000g QC	0.2000	0.2000		0.2000	0.2000			
3.0000g QC	3.0000	3.0000		3.0000	3.0000			
5.0000g QC	5.0000	5.0000		5.0000	5.0000			
Lab Blank	1.8512	1.8512	0.0000	1.8513	1.8513	0.0000	0.0001	0.1
Prep Blank	1.8414	1.8414	0.0000	1.8418	1.8418	0.0000	0.0004	0.4
484	1.8464	1.8464	0.0000	1.8477	1.8477	0.0000	0.0013	1.3
485	1.8378	1.8376	0.0002	1.8390	1.8391	-0.0001	0.0012	1.2
486	1.8553	1.8552	0.0001	1.8562	1.8563	-0.0001	0.0009	0.9
487	1.8540	1.8540	0.0000	1.8545	1.8544	0.0001	0.0005	0.5

*net mass = gross - tare (g)

DATE SUBJECT 13-111 Bighorn "New" 202 PROJECT NO. 101

Tare In: 3.01.13 SR @ 0650 5.1% 19.8°C Gross In: 3.14.13 SR @ 1340 0.5% 20.7°C

Tare 1: 3.4.13 SR @ 0839 5.1% 20.7°C Gross 1: 3.15.13 SR @ 1423 0.5% 20.8°C

Tare 2: 3.5.13 SR @ 1308 7.3% 19.3°C Gross 2: 3.17.13 SR @ 0913 1.7% 17.0°C

[Aqueous]

Sx ID	Tare 1(g)	Tare 2(g)	Gross 1(g)	Gross 2(g)
0.2000g	0.2000	0.2000	0.2000	0.2000
3.0000g	3.0000	3.0000	3.0000	3.0000
5.0000g	5.0000	5.0000	5.0000	5.0000
48	1.8522	1.8523	1.8523	1.8523
98	1.8258	1.8258	1.8271	1.8270
484	1.8509	~~1.8511~~ SR 1.8510	1.8541	1.8540
485	1.8610	1.8610	1.8651	1.8651
486	1.8306	1.8306	1.8332	1.8330
487	1.8486	1.8486	1.8503	~~1.8502~~ SR 1.8502

[Organic]

Sx ID	Tare 1(g)	Tare 2(g)	Gross 1(g)	Gross 2(g)
0.2000g	Same	Same	Same	Same
3.0000g	as	as	as	as
5.0000g	above	above	above	above
48	~~1.8511~~ SR 1.8512	1.8512	1.8513	1.8513
98	1.8414	1.8414	1.8418	1.8418
484	1.8464	1.8464	1.8477	1.8477
485	1.8378	1.8376	1.8390	1.8391
486	1.8553	1.8552	1.8562	1.8563
487	1.8540	1.8540	1.8545	1.8544

3.18.13 SR

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

Bighorn Environmental

Sorrento-Lactolis Nampa, ID Method 202 Data - Report # 13-111

Sample ID	Client ID	Sample Date	Sample Volume (mL) Aqueous Phase	Sample Volume (mL) Organic Phase	Net Weight (mg) Aqueous Phase	Net Weight (mg) Organic Phase	Comments
Lab_Blk					**0.1**	**0.1**	
Prep_Blk					**1.2**	**0.4**	
13-S484	Meyer-Sterner Whey Dryer Run 1	2/18/13	212	54	**3.1**	**1.3**	
13-S485	Meyer-Sterner Whey Dryer Run 2	2/18/13	190	42	**4.0**	**1.2**	
13-S486	Meyer-Sterner Whey Dryer Run 3	2/18/13	214	48	**2.5**	**0.9**	
13-S487	Field Train Recovery Blank	2/18/13	196	58	**1.6**	**0.5**	

Analysis performed by: ***CHESTER LabNet***
12242 SW Garden Place ♦ Tigard, OR 97223
(503) 624-2183 ♦ www.chesterlab.net

CHESTER LabNet

12242 SW Garden Place ❖ Tigard, OR 97223-8246 ❖ USA
Telephone 503-624-2183 ❖ Fax 503-624-2653 ❖ www.chesterlab.net

Case Narrative

Date: March 18, 2013

General Information

Client:	Bighorn Environmental
Client Number:	B019
Report Number:	13-111
Sample Description:	Impinger Solutions, Filters
Sample Numbers:	13-S484 – 13-S487

Analysis

Analytes:	Particulate Mass
Analytical Protocols:	EPA Method 202 (12/2010 version)
Analytical Notes:	The acetone and water were accidentally combined in the field. The results have **not** been blank corrected.
QA/QC Review:	All of the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds the minimum requirements for acceptability.
Comments:	If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.
Disclaimer:	This report shall not be reproduced, except in full, without the written approval of the laboratory. The results only represent that of the samples as received into the laboratory.

Paul Duda 3/18/13

Project Manager Date
Paul Duda

BIGHORN ENVIRONMENTAL

SORRENTO-LACTOLIS, NAMPA, ID

CLIENT # B019
REPORT # 13-111

SUBMITTED BY:
CHESTER LabNet
12242 S.W. GARDEN PLACE
TIGARD, OR 97223
(503)624-2183/FAX (503)624-2653
www.ChesterLab.Net

TRAVERSE POINT LOCATION WORKSHEET
METHOD 1

DATA

STACK CROSS SECTION DIAGRAM

Plant:	Sorrento Lactalis	Location:	Nampa, ID
Source:	Whey Dryer	Operator:	Homer
Date	2/18.13	Port Depth(in.):	1
Stack Dia. (in.)	36	Stack Area (ft2):	7.07
Distance to disturbance:			
Upstream(in):	68	Downstream(in):	100
# of traverse points required:		24	

Traverse point #	% of Stack Dia.	Stack Dia.	% of Stack Dia. X Stack Dia.	Port Depth	Taverse Point Location
1	0.021	36	0.8	1	1.76
2	0.067	36	2.4	1	3.41
3	0.118	36	4.2	1	5.25
4	0.177	36	6.4	1	7.37
5	0.25	36	9.0	1	10.00
6	0.356	36	12.8	1	13.82
7	0.644	36	23.2	1	24.18
8	0.75	36	27.0	1	28.00
9	0.823	36	29.6	1	30.63
10	0.882	36	31.8	1	32.75
11	0.933	36	33.6	1	34.59
12	0.979	36	35.2	1	36.24

NOTES:

GAS VELOCITY AND VOLUMETRIC FLOW FORM
METHOD 2

Plant	Sorrento Lactalis	Location:	Nampa, ID	Source:	Whey Dryer
Date	2/18.13	Operator:	Homer	Run No.:	pre survery
Barometric Press.	27.70	Reading Location:	Lab	Ambient Temp:	38
Elevation:	0	Elevation Corr.:	0	Corr. Bar. Press.:	0
Avg. wet bulb temp (F)		% O2		% CO2:	
Pitot tube ID #:	BH 4' S-type	Pitot Cp: Leak ✓ ok	0.84	Last Calibration:	8/28/2012

Traverse Point #	Velocity Head	Stack Temp (F)	Static Press.	Cyclonic Flow Check	
				Vel. At 0 reference	Angle to get 0 Flow
1	.71	1170	0	.30	6
2	.76			.21	4
3	.89			.48	7
4	.81			.18	3
5	.91			.12	3
6	.85			0	0
7	.21			0	0
8	.07			.08	10
9	.05			.09	13
10	.10			.03	2
11	.09			0	0
12	.10			0	0
13	.80			.15	4
14	.76			.05	3
15	.72			.10	6
16	.80			0	0
17	.75			0	0
18	.67			0	0
19	.78			0	0
20	.91			.05	6
21	.88			.22	5
22	.81			.20	7
23	.85			.22	4
24	.80			0	0

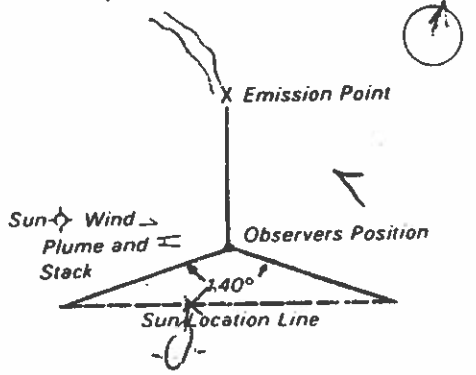
Visible Emission Observation Form

SOURCE NAME	Sorento Lodge
ADDRESS	
CITY	Napa
STATE	Ca
ZIP	9
PHONE	
SOURCE ID NUMBER	Maple Valley Blvd
PROCESS EQUIPMENT	
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	
DESCRIBE EMISSION POINT START	Round stack
STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	4'
STOP	4'
HEIGHT RELATIVE TO OBSERVER START	7'
STOP	3'
DISTANCE FROM OBSERVER, START	26'
STOP	26
DIRECTION FROM OBSERVER START	46° NE
STOP	46° NE
DESCRIBE EMISSIONS START	white smoke
STOP	white smoke
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS	☒
FUGITIVE	☐
INTERMITTENT	☐
WATER DROPLETS PRESENT: NO	☒
YES	☐
IF WATER DROPLET PLUME: ATTACHED	☐
DETACHED	☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	6" above the stack
STOP	6" above stack
DESCRIBE BACKGROUND START	white clouds
STOP	white sky
BACKGROUND COLOR START	white
STOP	white
SKY CONDITIONS START	cloudy
STOP	cloudy
WIND SPEED START	10-15
STOP	10-15
WIND DIRECTION START	S.E
STOP	S.E
AMBIENT TEMP. START	38
STOP	35
WET BULB TEMP.	
RH, percent	

OBSERVATION DATE	START TIME	STOP TIME
2/18/13	14:20	14:27:30

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0			38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch — Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE	0 % WERE 0
RANGE OF OPACITY READINGS	0 MINIMUM 0 MAXIMUM
OBSERVER'S NAME (PRINT)	Mike Hosting
OBSERVER'S SIGNATURE	[signature]
DATE	2/18/13
ORGANIZATION	Bigland Environmental
CERTIFIED BY	Smoke School Inc
DATE	2/13
VERIFIED BY	
DATE	

COMMENTS	windy and cold

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE
TITLE DATE

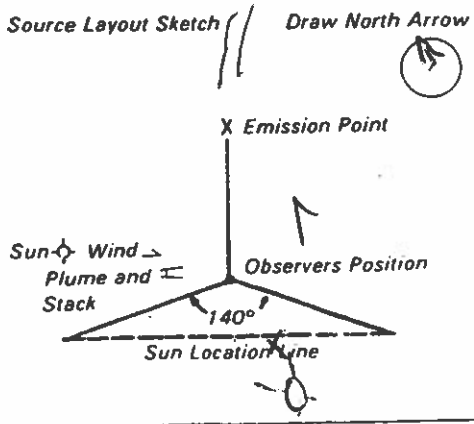
Visible Emission Observation Form

SOURCE NAME	Simplot Lactos
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	
PHONE	
SOURCE ID NUMBER	Mayor Corey Dunck
PROCESS EQUIPMENT	
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	
DESCRIBE EMISSION POINT START	Round stack
STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	4'
STOP	4'
HEIGHT RELATIVE TO OBSERVER START	2'
STOP	2'
DISTANCE FROM OBSERVER START	22'
STOP	22'
DIRECTION FROM OBSERVER START	354° N
STOP	354° N
DESCRIBE EMISSIONS START	white smoke
STOP	white smoke
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS	☑
FUGITIVE	☐
INTERMITTENT	☐
WATER DROPLETS PRESENT: NO	☒
YES	☐
IF WATER DROPLET PLUME: ATTACHED	☐
DETACHED	☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	6" above RM
STOP	6" above RM
DESCRIBE BACKGROUND START	thin white clouds
STOP	thin white clouds
BACKGROUND COLOR START	white
STOP	white
SKY CONDITIONS START	overcast
STOP	overcast
WIND SPEED START	10-15
STOP	10-15
WIND DIRECTION START	S
STOP	S
AMBIENT TEMP. START	39
STOP	39
WET BULB TEMP.	
RH.percent	

OBSERVATION DATE	START TIME	STOP TIME
2/18/13	12:30	12:37:30

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0			38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch



AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE % WERE	0
RANGE OF OPACITY READINGS MINIMUM	0
MAXIMUM	0
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	7/18/13
ORGANIZATION	Bighorn Environmental
CERTIFIED BY	Smoke School INC
DATE	2/13
VERIFIED BY	
DATE	

COMMENTS windy but bright out.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE DATE

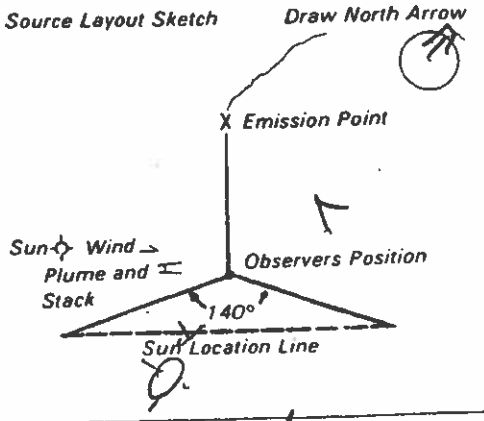
Visible Emission Observation Form

SOURCE NAME	Sorento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	
PHONE	
SOURCE ID NUMBER	Marsh refinery DRER
PROCESS EQUIPMENT	
OPERATING MODE	NORMA
CONTROL EQUIPMENT	
OPERATING MODE	
DESCRIBE EMISSION POINT START	Round stack
STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	9'
STOP	9
HEIGHT RELATIVE TO OBSERVER START	3'
STOP	3'
DISTANCE FROM OBSERVER START	25'
STOP	25'
DIRECTION FROM OBSERVER START	44° NE
STOP	44° NE
DESCRIBE EMISSIONS START	white thin Plume
STOP	white thin Plume
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT NO ☒ YES ☐	
IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	6" above stack
STOP	6" above stack
DESCRIBE BACKGROUND START	white cloudy
STOP	white cloudy
BACKGROUND COLOR START	white
STOP	white
SKY CONDITIONS START	cloudy
STOP	cloudy
WIND SPEED START	15-20
STOP	15-20
WIND DIRECTION START	S.E.
STOP	S.E.
AMBIENT TEMP. START	37
STOP	37
WET BULB TEMP.	
RH.percent	

OBSERVATION DATE	START TIME	STOP TIME
2/10/13	15:25	15:32:30

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0			38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch



AVERAGE OPACITY FOR HIGHEST PERIOD 0

NUMBER OF READINGS ABOVE 0 % WERE 0

RANGE OF OPACITY READINGS 0 MINIMUM 0 MAXIMUM

OBSERVER'S NAME (PRINT) Michael Keith

OBSERVER'S SIGNATURE [illegible] DATE 2/10/13

ORGANIZATION [illegible]

CERTIFIED BY Smoke School Inc DATE 2/13

VERIFIED BY DATE

COMMENTS windy and cold

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE DATE

METHOD 5 BLANK ANALYSIS DATA FORM					
Sample Prepared by:		Homer		Date	3/1/2013
		Acetone			
Final Wt 1.:		112.17110			
Final Wt 2.:		112.17100			
Final Wt. Avg.:		112.17105			
Tare:		112.17040			
Difference:		0.00065			
Solvent vol.:		200.00000			
Residue (g/ml):	**#DIV/0!**	**0.0000033**			
Residue (mg/ml):	**#DIV/0!**	**0.00325**			

Figure 5.3a - Page 2

METHOD 5 BLANK ANALYSIS DATA FORM

Samples Prepared by Keathg Date 3/1/13

Front Half:	Date/Time	Weight(g)	Audit*	T-°F	RH-%	By
Filter						
Filter ID ____						
Tare Wt. ____						
Acetone	3/14/13/01:49	112.1718	100.0106	70	42	MK
Beaker ID 11A	3/14/13/09:10	112.1711	100.0106	70	43	MK
Tare Wt. 112.1704	3/15/13/10:44	112.1710	100.0106	70	45	MK
Solv. Vol. -200-						
Solv. ID ____						
3/1/13/10:11						
Water						
Beaker ID ____						
Tare Wt. ____						
Solv. Vol. ____						
Solv. ID ____						
DCM						
Beaker ID ____						
Tare Wt. ____						
Solv. Vol. ____						
Solv. Wt. ____						

* 0.5000 g ± tolerance - NIST traceable Class S weight

Bighorn Environmental Method 5 Data Analysis Form

Client: Sunburst Gaetal's
Location: Nampa, ID
Source: Dryer

Run #:: 3
Test Date: 2/18/13
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	2/28/13	08:29	.3312	.5003	70	43	MK	
Filter ID: 213								
Tare Wt.: .3302								N/A
Date/Time into dessicator:								
2/25/13/09:18								
Acetone	3/12/13	07:59	70.6957	100.0106	70	43	MK	
Beaker ID: 83	3/14/13	09:17	70.6954	100.0106	70	43	MK	Yes
Tare Wt.: 70.6949								
Volume: 56								
Date/Time into dessicator:								No
3/1/13/10:11								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	244	252	8

Bighorn Environmental Method 5 Data Analysis Form

Client: Simplot, Lactas
Location: Nampa, ID
Source: Dryer

Run #:: 2
Test Date: 2/18/13
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	2/25/13	09:31	.3247	.5003	70	43	MK	
Filter ID: 214								
Tare Wt.: .3280								N/A
Date/Time into dessicator:								
2/25/13/09:18								
Acetone	3/12/13	07:56	71.6478	100.0106	70	42	MK	
Beaker ID: 87	3/14/13	09:12	71.6475	100.0106	70	43	MK	Yes
Tare Wt.: 71.6463								
Volume: 58								
Date/Time into dessicator:								No
3/1/13/10:11								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	240	249	9

Bighorn Environmental Method 5 Data Analysis Form

Client: Soclwto LaFtalis
Location: Nampa, ID
Source: Dryer

Run #:: 1
Test Date: 2/18/13
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	2/20/13	09:24	.3332	.5003	70	43	MK	
Filter ID: 215								
Tare Wt.: .3312								N/A
Date/Time into dessicator:								
2/25/13 / 09:18								
Acetone	3/12/13	07:51	73.2481	100.0106	70	42	MK	
Beaker ID: 86	3/14/13	09:12	73.2476	100.0106	70	43	MK	Yes
Tare Wt.: 73.2460								
Volume: 64								
Date/Time into dessicator:								No
3/1/13 / 10:11								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	244	254	10

Method 5 Data Form					
Client:	Sorrento	Source:	Meyer Sterner Dryer	Date:	2/18/2013
RUN 1	**Probe Rinse**				**Filter**
Final Wt. 1:	73.24810				0.33220
Final Wt. 2:	73.24760				0.33220
Final Wt. Avg:	73.24785				0.33220
Tare:	73.24600				0.33120
Gross Wt.:	0.00160				0.00100
Less Blank:	0.00021				0.00000
Net Wt.:	**0.00139**				**0.00100**
Volume:	64.00000				n/a
Total Front:	0.00139				
RUN 2	**Probe Rinse**				**Filter**
Final Wt. 1:	71.64780				0.32970
Final Wt. 2:	71.64750				0.32970
Final Wt. Avg:	71.64765				0.32970
Tare:	71.64630				0.32800
Gross Wt.:	0.00120				0.00170
Less Blank:	0.00019				0.00000
Net Wt.:	**0.00101**				**0.00170**
Volume:	58.00000				n/a
Total Front:	0.00101				
RUN 3	**Probe Rinse**				**Filter**
Final Wt. 1:	70.69570				0.33120
Final Wt. 2:	70.69540				0.33120
Final Wt. Avg:	70.69555				0.33120
Tare:	70.69490				0.33020
Gross Wt.:	0.00050				0.00100
Less Blank:	0.00018				0.00000
Net Wt.:	**0.00032**				**0.00100**
Volume:	56.00000				n/a
Total Front:	0.00032				

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento - Lactalis
Location: Nampa, ID
Personnel: Horner / Keating
Date: 2/18/13
Source: Meyer Wing Dryer
Run #: 3
Ambient Temp: 45
Barometric Press.: 27.70
Assumed Moisture: 8
Start Time: 1458

Meter Box ID: 1208030
Meter Box Y: 1.001
Meter Box Δ H@: 1.812
Probe ID: BH-6'
Probe Cp: .84
Filter #:
Static Pressure (in. H2O): 0
Nozzle ID: BH/4" SS
Probe/Filter Settings (F): 250
End Time: 1612

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0.00 cfm
Post @ 15 in Hg.: 0.00 cfm
DGM Start: 800.39 DGM End: 800.39

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	SD2
End (ml):	~~47~~	~~23~~	~~108~~	
Color/Odor:	56	23	108	

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	4.0	738.60	70	104	.72	2.60	112	246	52	251	
2		4.0	741.47	70	104	.76	2.7	113	247	54	246	
3		4.0	744.47	70	104	.81	2.9	114	246	55	247	
4		5.0	747.37	70	105	.85	3.1	115	249	56	249	
5		5.0	750.74	71	104	.91	3.2	114	248	56	251	
6		5.5	753.76	71	105	.90	3.2	113	250	57	248	
7		3.0	756.91	72	105	.30	1.1	114	248	55	247	
8		3.0	759.04	72	105	.12	.43	115	246	52	247	
9		3.0	760.22	72	105	.09	.32	114	247	50	246	
10		3.0	761.14	72	105	.07	.25	115	248	50	247	
11		3.0	762.11	72	105	.09	.32	115	244	51	248	
12		3.0	763.17	72	105	.10	.36	114	245	51	249	
13 36		3.0	764.47	72	105	.72	2.6	114	248	50	250	
14 39		3.0	767.34	74	105	.75	2.7	113	248	47	247	
15		3.0	769.98	76	105	.70	2.5	113	248	47	245	
16		3.5	772.92	78	105	.80	2.9	111	248	48	243	
17		3.5	776.02	74	105	.75	2.7	111	247	49	245	
18		3.5	779.02	74	105	.69	2.5	111	248	50	247	
19		3.5	781.90	73	105	.76	2.7	110	248	50	242	
20		4.0	784.79	71	105	.92	3.3	114	247	50	246	
21		3.5	788.11	70	106	.84	3.0	117	249	51	247	
22		3.5	791.2	69	105	.77	2.8	116	248	51	245	
23		3.5	794.21	70	105	.82	2.9	114	248	51	247	
24		4.0	797.25	71	106	.80	2.8	113	247	51	247	
	Final DGM		800.21									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes:

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Simplot - Lewiston
Location: Nampa, ID
Personnel: Homer / Leasting
Date: 2/28/13
Source: Meyer - Stemer Dryer
Run #: 2
Ambient Temp: 44
Barometric Press.: 27.70
Assumed Moisture: 8
Start Time: 1330

Meter Box ID: 1208030
Meter Box Y: 1.001
Meter Box Δ H@: 1.812
Probe ID: #15'-SS
Probe Cp: .84
Filter #:
Static Pressure (in. H2O): 0
Nozzle ID: 5/32" SS
Probe/Filter Settings (F): 250
End Time: 1445

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0.00 cfm
Post @ 15 in Hg.: 0.00 cfm
DGM Start: 737.28 DGM End: 737.28

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	5.02
End (ml):	43	23	105	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	4.0	675.70	70	101	.71	2.5	115	244	45	248	
2		5.0	678.52	70	101	.76	2.7	114	245	48	247	
3		5.0	681.50	71	101	.80	2.9	115	246	49	244	
4		7.0	684.49	71	102	.88	3.1	114	247	52	244	
5		7.0	687.66	71	102	.91	3.3	115	248	53	246	
6		7.0	690.78	71	102	.93	3.3	114	250	53	245	
7		3.0	644.27	72	102	.25	.89	115	249	55	248	
8		3.0	696.04	72	102	.10	.40	115	248	57	245	
9		3.0	697.11	72	102	.09	.32	117	246	57	246	
10		2.0	698.03	72	102	.08	.29	113	244	58	249	
11		3.0	699.12	72	103	.10	.40	114	246	55	250	
12		3.0	699.84	72	103	.10	.40	114	248	55	249	
13		7.0	701.36	73	103	.79	2.8	113	248	53	247	
14		7.0	704.21	73	103	.76	2.7	114	247	50	244	
15		6.5	707.32	75	103	.75	2.7	113	246	51	244	
16		7.0	710.34	77	104	.80	2.9	115	246	51	251	
17		6.5	713.35	74	104	.71	2.5	114	247	51	247	
18		6.0	716.19	72	105	.64	2.3	114	248	53	252	
19		6.0	718.95	71	105	.72	2.5	114	247	53	249	
20		6.0	721.73	72	106	.80	2.9	112	248	53	245	
21		7.0	724.67	70	106	.90	3.2	113	249	53	249	
22		7.0	727.82	73	106	.84	3.0	115	248	53	247	
23		7.0	730.98	73	106	.86	3.1	113	246	53	242	
24		7.0	734.10	75	105	.80	2.9	112	246	54	245	
		Final DGM	737.12									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes:

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento - Lactalis
Location: Nampa, ID
Personnel: Hymer / Keating
Date: 2/18/13
Source: Meyer - Steamer Wing Dryer
Run #: 1
Ambient Temp: 39
Barometric Press.: 27.70
Assumed Moisture: 8
Start Time: 1208

Meter Box ID: 1208030
Meter Box Y: 1.001
Meter Box Δ H@: 1.812
Probe ID: B145'
Probe Cp: .84
Filter #:
Static Pressure (in. H2O): 0
Nozzle ID: 8H/4"SS
Probe/Filter Settings (F): 250
End Time: 1322

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0.00 cfm
Post @ 15 in Hg.: 0.00 cfm
DGM Start: 675.31 DGM End: 675.31

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	SiO2
End (ml):	52	20	102	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM ~~Inlet Temp~~ Filter (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	2.0	614.4	67	85	.72	~~2.8~~ 2.5	112	246	48	239	
2		2.5	617.21	69	85	.78	2.7	113	242	49	239	
3		3.0	620.07	69	86	.83	2.8	114	246	51	243	
4		4.0	623.11	71	86	.90	3.2	113	247	54	249	
5		4.0	626.32	70	88	.91	3.2	112	247	57	243	
6		4.0	629.55	73	89	.87	3.1	114	246	55	238	
7		1.0	632.67	74	90	.24	.85	113	245	53	240	
8		1.0	634.22	71	90	.10	.35	121	248	53	251	
9		1.0	635.22	73	91	.08	.28	122	246	50	250	
10		1.0	636.12	77	91	.07	.25	123	246	50	250	
11		1.0	637.03	77	92	.10	.35	124	245	49	242	
12		1.0	638.11	74	92	.11	.39	123	244	48	244	
13 36		3.5	639.23	72	93	.78	2.7	113	240	47	239	
14 39		3.5	642.19	71	94	.75	2.6	110	245	45	247	
15 42		3.0	644.96	70	95	.70	2.5	110	244	47	237	
16		3.5	647.83	70	96	.77	2.7	108	246	47	245	
17		3.5	650.81	73	97	.75	2.7	108	245	48	240	
18		2.5	653.79	76	98	.63	2.2	110	245	48	242	
19		3.0	656.51	75	98	.77	2.7	109	244	48	251	
20		4.0	659.49	75	99	.90	3.2	109	245	48	245	
21		4.0	662.73	74	100	.85	3.0	108	248	48	250	
22		3.5	665.88	76	101	.78	2.8	110	244	49	244	
23		4.0	668.92	75	101	.83	3.0	109	245	49	246	
24	✓	4.0	672.02	75	101	.80	2.9	109	248	50	244	
		Final DGM	675.1[illegible]									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes:

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Sorrento - Lactalis			Date	02/18/13
Sampling Location	Nampa, ID			Project #	Whey Dryer
Operator	Homer			# of Ports Used	2
Stack Type	Circular			Meter Box Number	1203080
Train Leak Check	☑ PreTest	☑ PostTest		Meter Cal Factor (Y)	1.001

Moisture Content Data								
Run Number	1		Run Start Time	12:08		Run Stop Time	13:20	
Total Meter Volume	(V_m)	60.730	dcf	Barometric Press.		(P_b)	27.70	in Hg
Avg Meter Temp	$(t_m)_{avg}$	93	°F	Stack Static Press.		(P_{static})	0.00	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	113	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.21	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	g	g	g	ml
Contents		H2O	H2O	H2O			Silica	
Final Value	$(V_f),(W_f)$	52.00	20.00	102.00			254.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			244.00	
Net Value	$(V_n),(W_n)$	52.0	20.0	2.0			10.0	
Results								
Total Volume	(V_t)	74.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.483	scf
Total Weight	(W_t)	10.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.472	scf
Std Meter Volume	$(V_{m(std)})$	54.026	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	10.3	%
Calc Moisture Content	$(B_{ws(calc)})$	6.8	%	Final Moisture Content		(B_{ws})	6.8	%

Moisture Content Data								
Run Number	2		Run Start Time	13:30		Run Stop Time	14:42	
Total Meter Volume	(V_m)	61.420	dcf	Barometric Press.		(P_b)	27.70	in Hg
Avg Meter Temp	$(t_m)_{avg}$	103	°F	Stack Static Press.		(P_{static})	0.00	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	114	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.25	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	ml	ml	g	ml
Contents		H2O	H2O	H2O			Silica	
Final Value	$(V_f),(W_f)$	43.00	23.00	105.00			249.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			240.00	
Net Value	$(V_n),(W_n)$	43.0	23.0	5.0			9.0	
Results								
Total Volume	(V_t)	71.00	ml	Water Vol Condensed		$(V_{wc(std)})$	3.342	scf
Total Weight	(W_t)	9.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.424	scf
Std Meter Volume	$(V_{m(std)})$	53.672	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	10.5	%
Calc Moisture Content	(B_{ws})	6.6	%	Final Moisture Content		(B_{ws})	6.6	%

Moisture Content Data								
Run Number	3		Run Start Time	14:58		Run Stop Time	16:10	
Total Meter Volume	(V_m)	61.610	dcf	Barometric Press.		(P_b)	27.70	in Hg
Avg Meter Temp	$(t_m)_{avg}$	105	°F	Stack Static Press.		(P_{static})	0.00	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	114	°F	Avg Orifice Press.		$(\Delta H)_{avg}$	2.25	in H_2O
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		ml	ml	ml	ml	ml	g	ml
Contents		H2O	H2O	H2O			Silica	
Final Value	$(V_f),(W_f)$	56.00	23.00	108.00			252.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			244.00	
Net Value	$(V_n),(W_n)$	56.0	23.0	8.0			8.0	
Results								
Total Volume	(V_t)	87.00	ml	Water Vol Condensed		$(V_{wc(std)})$	4.095	scf
Total Weight	(W_t)	8.00	g	Water Vol Weighed		$(V_{wsg(std)})$	0.377	scf
Std Meter Volume	$(V_{m(std)})$	53.683	dscf	Sat. Moisture Content		$(B_{ws(svp)})$	10.4	%
Calc Moisture Content	(B_{ws})	7.7	%	Final Moisture Content		(B_{ws})	7.7	%

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento - Lactalis			Date	02/18/13
Sampling Location	Nampa, ID			Project #	Whey Dryer
Operator	Homer			# of Ports Used	2
Stack Type	Circular			Pitot Identification	BH5'SS
Pitot Leak Check	☑	PreTest	☑ PostTest	Pitot Coefficient (C_p)	0.84

Stack Dimensions			
Diameter or Length of Stack	(D)	35.75	in
Width of Stack	(W)		in
Area of Stack	(A_s)	6.97	ft^2

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg

Stack Gas Composition			
Composition Data:	Actual ☐	Estimated ☑	
Carbon Dioxide Concentration	($\%CO_2$)	0.0	%
Oxygen Concentration	($\%O_2$)	20.5	%
Carbon Monoxide Concentration	(%CO)	0.0	%
Nitrogen Concentration	($\%N_2$)	79.5	%
Stack Moisture Content	(B_{ws})	8.000	
Stack Dry Molecular Weight	(M_d)	28.82	lb/lb-mole
Stack Wet Molecular Weight	(M_s)	27.96	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	46.5	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	909158	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	15153	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	19441	ascf/min

Stack Cross Section Schematic

Velocity Traverse Data

Run Number	V1			
Run Time				
Traverse Point	Velocity Head (Δp)	Stack Temp (t_s)	Null Angle deg	Local Velocity $(v_s)_l$
	in H_2O	°F		ft/sec
A-1	0.71	117	6	52.2
A-2	0.76		4	
A-3	0.89		7	
A-4	0.81		3	
A-5	0.91		3	
A-6	0.85		0	
A-7	0.21		0	
A-8	0.07		10	
A-9	0.05		13	
A-10	0.10		2	
A-11	0.09		0	
A-12	0.10		0	
B-1	0.80		4	
B-2	0.76		3	
B-3	0.72		6	
B-4	0.80		0	
B-5	0.75		0	
B-6	0.67		0	
B-7	0.78		0	
B-8	0.91		6	
B-9	0.88		5	
B-10	0.81		7	
B-11	0.85		4	
B-12	0.80		0	
$(\Delta p)^{1/2}_{avg}$ [1]	0.75	117	3.5	

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Wet Bulb/Dry Bulb Estimate

Wet Bulb Temp	165	Stack Vapor Pressure	10.79	in Hg
Dry Bulb Temp	165	Stack Moisture Content	38.94	%H2O

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}\,(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

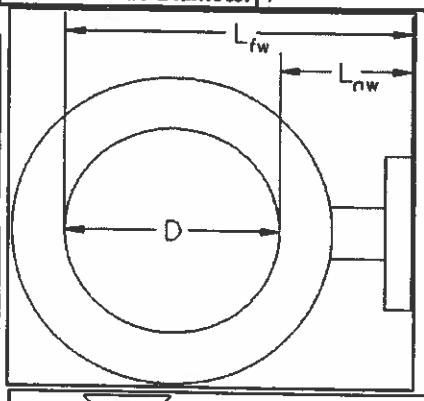
where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

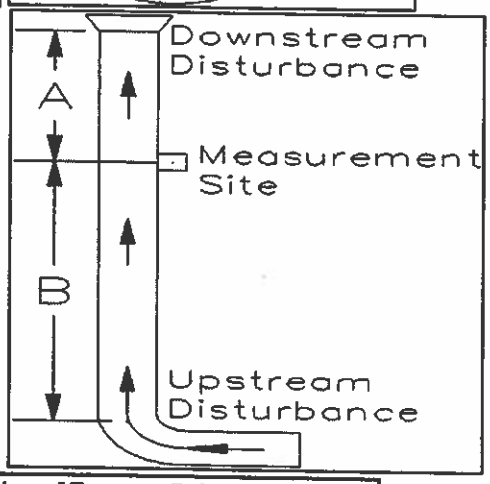
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento - Lactalis	Date	02/18/13
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	# of Ports Available	2
Stack Type	Circular	# of Ports Used	2
Stack Size	Large	Port Inside Diameter	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	36.75	in
Distance to Near Wall of Stack	(L_{nw})	1.00	in
(=Lfw - Lnw) Diameter of Stack	(D)	35.75	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	6.97	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	100.00	in
(=B/D) Diameters Upstream	(B_D)	2.80	diameters
Distance Downstream	(A)	68.00	in
(=A/D) Diameters Downstream	(A_D)	1.90	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		12	12
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	12	Across
24	Pts Used	24	Required
☑	Particulate	☐	Velocity

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.021	6/8	1 6/8
2	0.067	2 3/8	3 3/8
3	0.118	4 2/8	5 2/8
4	0.177	6 3/8	7 3/8
5	0.250	9	10
6	0.356	12 6/8	13 6/8
7	0.644	23	24
8	0.750	26 7/8	27 7/8
9	0.823	29 3/8	30 3/8
10	0.882	31 4/8	32 4/8
11	0.933	33 3/8	34 3/8
12	0.979	35	36

APPENDIX A
FIELD DATA

Thorough chain-of-custody procedures and documentation provide proof of our QA/QC efforts. Relevant QA/QC documentation is included in this final report's Appendices for results support and regulatory review.

8.0 QUALITY ASSURANCE

Bighorn's QA procedures follow EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. III, Stationary Source Specific Methods* September 1994 as revised and amended (#EPA-600/R-94/038c). Bighorn used EPA method specific quality assurance procedures. The following *July 1, 2012 40 CFR 60* sections were referenced for this project:

Appendix A - Methods 1, 2, 4, 5, 9 and 202.

Bighorn Environmental is zealous in our commitment to thorough quality practices. We conduct stringent quality assurance and quality control (QA and QC) procedures on all reference CEMS and support equipment.

Bighorn employs the latest CAI 600 Series, J.U.M. and API Model 100 AH CEMS. These CEMS are considered state-of-the-art by environmental professionals. We've designed an effective primary sample conditioner that works in concert with Horiba's secondary conditioners. Together, they provide dry, clean sample gas to Bighorn's CEMS (Figure 1).

EPA Protocol No. 1 QA standards allow Bighorn to challenge equipment and methods to ensure that data is valid for determining monitor accuracy and precision. Before each test, Bighorn challenges its monitors and then entire system at the probe which simulates actual sampling. QA standards introduced at the sample probe traverse through all sample lines, conditioning chambers, and monitors to determine initial system integrity or bias. Following each run, Bighorn conducts QA of the entire monitoring system to determine final system bias and test calibration drift

Bighorn's Mobile Air Emissions Laboratory contains two APC 1400 uninterruptible power supplies (UPS) to compliment our QA/QC commitment. These QC devices continuously regulate and condition client-supplied 120 VAC power so Bighorn's electronic analyzers receive a consistent clean 115 $\pm$ 5 VAC signal. Chronic brownout and over-voltage conditions are eliminated thereby reducing hardware failures and data errors. Also, temporary power outages do not shut down our CEMS nor jeopardize data quality because the UPS will generate a consistent pure sine wave signal for up to one hour with its built in battery.

Cross checks such as manual calculations of Bighorn's automated DAS computer generated results allow test results verification. Bighorn files manufacturers' accuracy certificates and interference tables for CEMS, flow controllers, gases, etc. Additionally dry gas meters, pitot tubes, thermocouples, gas dividers, etc. are certified as per EPA requirements and frequencies. Where EPA frequencies are not specified, Bighorn has established those based on state regulatory criteria.

6.0 RESULTS

Table 4 summarizes the results from the Whey Dryer.

TABLE 4. POLLUTANT EMISSION RESULTS

Parameter/Pollutant	Run 1	Run 2	Run 3	Average
Particulate (EPA Method 5):				
-(gr/dscf)	7.0E-4	8.0E-4	4.0E-4	6.0E-4
-(lbs/hr)	0.09	0.10	0.05	0.08
Particulate (EPA Method 202):				
-(gr/dscf)	1.3E-3	1.5E-3	1.0E-3	1.2E-3
-(lbs/hr)	0.16	0.20	0.13	0.16
PM/PM_{10} (EPA Method 5/202)				
-(gr/dscf)	1.9E-3	2.3E-3	1.4E-3	1.9E-3
-(lbs/hr)	0.26	0.30	0.18	0.24
Stack Parameters:				
Stack Gas Moisture (%)	6.82	6.56	7.69	7.02
Stack Temperature (°F)	113	114	114	114
Stack Gas Velocity (ft/min)	2,772	2,780	2,785	2,779
Actual Gas Flow (ft^3/min)	19,322	19,378	19,411	19,370
Dry Std. Gas Flow (ft^3/min)	15,353	15,423	15,272	15,350
Opacity (%)	0	0	0	0
Isokinetics (%)	99.9	98.8	99.8	99.5

Field data sheets, flow rate information, calculated emissions data, and calculations are contained in Appendices A-D.

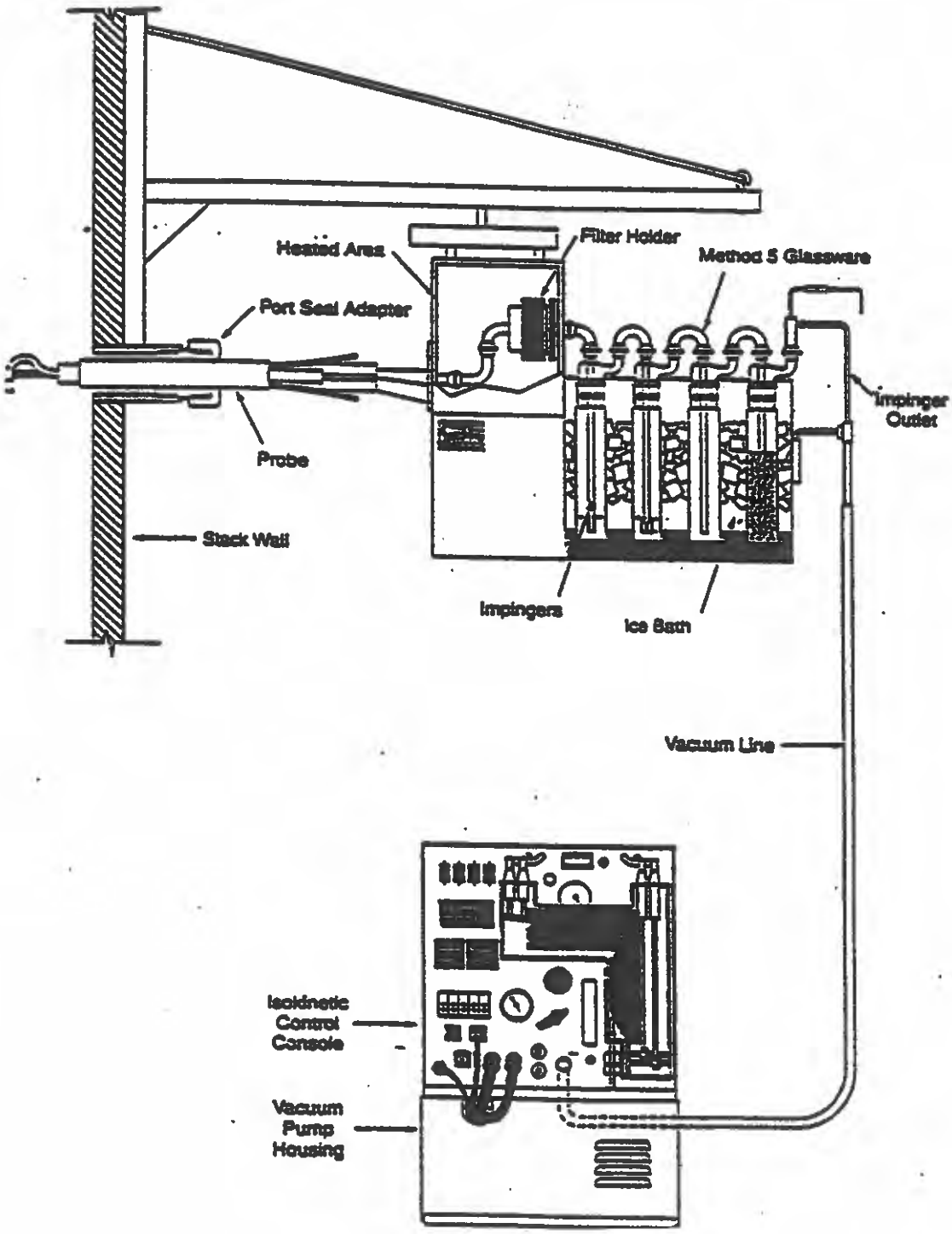
7.0 CALIBRATION DATA

Appendix G has required support equipment quality control records.

5.0 SOURCE SAMPLING EQUIPMENT

Figure 1 is a diagram of Bighorn's Particulate Sampling Train.

FIGURE 1. PARTICULATE SAMPLING TRAIN



3.0 PRODUCTION RATES

Bighorn tested the Whey Dryer while the dryer was operated at maximum throughput rates as shown in Table 2. Appendix H includes production data and pollution control parameters provided by Sorrento Lactalis for each test period.

TABLE 2. ACTUAL PRODUCTION DATA

RUN NUMBER	lbs Whey/hr (wet)	Baghouse Diff (in H_20)
1	4,200	0.0
2	4,200	0.0
3	4,230	0.0

4.0 POLLUTANTS AND TEST METHODS

Bighorn used its particulate testing equipment for this project.

Bighorn performed velocity traverses on the source to calculate flow rates and convert analytical outputs to mass emissions. Opacity readings were conducted concurrently with each particulate run. Table 3 outlines the test methods Bighorn used during testing.

TABLE 3. TEST METHODS

PARAMETER	TEST METHODS
Velocity & Flow	EPA Methods 1&2
Moisture Content	EPA Method 4
Particulate Matter	EPA Method 5 and 202
Opacity	EPA Method 9

1.0 SOURCE INFORMATION AND TEST DATE

Sorrento Lactalis hired Bighorn Environmental to perform source testing on the Meyer-Sterner Whey Dryer, at its Nampa, ID facility to quantify its emissions. This was done to satisfy the testing conditions outlined in Sorrento Lactalis's Air Quality Permit #027-00071. Bighorn conducted the source test on February 18, 2013.

Sorrento Lactalis' Wendy York coordinated this project. Ms. York also represented Sorrento Lactalis during the test. Bighorn's Mike Keating and Tim Homer conducted the source test. A copy of the source test plan submitted to DEQ along with their approval letter can be found in Appendix G.

The testing consisted of three 72-minute runs for particulate matter. Table 1 lists sources, test dates, and times.

TABLE 1. SOURCE TEST DATES AND TIMES

Emission Unit	2013 Date	Time
Whey Dryer	February 18	12:08-13:22; 13:30-14:45; 14:58-16:12

2.0 PROCESS DESCRIPTION

WPC (Whey Protein concentrate) is produced by the Sorrento Lactalis mozzarella cheese plant in Nampa, Idaho and processed through 3 different membrane processing equipment. The liquid WPC is fed into a high-pressure pump, which sprays the product at 2,500 psi into a drying chamber at the rate of 3,200 lb/hr at 31% T.S (total solids). The product is atomized in the drying chamber and the rate of water removal from the atomization is 2,100lb/hr. The powder is conveyed thru the drying tube below the main chamber and dropped into the main cyclone of the dyer. The air from the chamber is exhausted into the baghouse and through the stack on the roof. The product is transferred from the large cyclone and transferred into the small cyclone above the sifter with the powder-conveying fan. The air from the powder-conveying fan is exhausted into the bottom of the bag house and the residual powder is augured into the powder conveying fan line and returned back to the small cyclone. The powder that is collected on the bags in the bag house is air pulsed every 3 seconds per bank of bag filters and the residual powder is also collected by the auger in the bottom of the bag house and sent back to the small cyclone which leads to the sifter. The powder is packaged and sealed for human consumption.

CONTENTS

EXECUTIVE SUMMARY i

1.0 SOURCE INFORMATION AND TEST DATES 1

2.0 PROCESS DESCRIPTION 1

3.0 PRODUCTION RATES 2

4.0 POLLUTANTS AND TEST METHODS 2

5.0 SOURCE SAMPLING EQUIPMENT 3

6.0 RESULTS 5

7.0 CALIBRATION DATA 5

8.0 QUALITY ASSURANCE 6

APPENDIX A FIELD DATA

APPENDIX B FLOW RATE SPREADSHEETS

APPENDIX C CALCULATED EMISSION RATES

APPENDIX D CALCULATIONS

APPENDIX E QUALITY RECORDS

APPENDIX F PRODUCTION DATA

APPENDIX G IDEQ CORRESPONDENCE

EXECUTIVE SUMMARY

The results from the Whey Dryer compliance test are summarized below.

Whey Dryer Particulate Matter Results

Pollutant	gr/dscf	lb/hr
EPA Method 5		
Particulate Matter	6.0E-4	0.08
EPA Method 202 (Condensable Particulate)		
Particulate Matter	1.2E-3	0.16
Combined M5/202 – Total PM/PM_{10}		
PM/PM_{10}	1.9E-3	0.24

Detailed discussions and results from this emissions test project are included in the body of this report.

SORRENTO LACTALIS
WHEY DRYER
COMPLIANCE TEST

NAMPA, IDAHO
FACILITY
FEBRUARY 18, 2013

March 15, 2013

Prepared by:

TIM HOMER
AIR EMISSIONS LABORATORY MANAGER

BIGHORN ENVIRONMENTAL AIR QUALITY, LLC
1324 N LIBERTY LAKE RD • LIBERTY LAKE, WA 99019 • (541)726-2689 • FAX(888) 559-5624

SORRENTO LACTALIS
WHEY DRYER
COMPLIANCE TEST

NAMPA, IDAHO
FACILITY
FEBRUARY 18, 2013

March 15, 2013

Prepared by:

TIM HOMER
AIR EMISSIONS LABORATORY MANAGER

BIGHORN ENVIRONMENTAL AIR QUALITY, LLC
1324 N LIBERTY LAKE RD • LIBERTY LAKE, WA 99019 • (541)726-2689 • FAX(888) 559-5624

EXECUTIVE SUMMARY

The results from the Whey Dryer compliance test are summarized below.

Whey Dryer Particulate Matter Results

Pollutant	gr/dscf	lb/hr
EPA Method 5		
Particulate Matter	6.0E-4	0.08
EPA Method 202 (Condensable Particulate)		
Particulate Matter	1.2E-3	0.16
Combined M5/202 – Total PM/PM_{10}		
PM/PM_{10}	1.9E-3	0.24

Detailed discussions and results from this emissions test project are included in the body of this report.

1.0 SOURCE INFORMATION AND TEST DATE

Sorrento Lactalis hired Bighorn Environmental to perform source testing on the Meyer-Sterner Whey Dryer, at its Nampa, ID facility to quantify its emissions. This was done to satisfy the testing conditions outlined in Sorrento Lactalis's Air Quality Permit #027-00071. Bighorn conducted the source test on February 18, 2013.

Sorrento Lactalis' Wendy York coordinated this project. Ms. York also represented Sorrento Lactalis during the test. Bighorn's Mike Keating and Tim Homer conducted the source test. A copy of the source test plan submitted to DEQ along with their approval letter can be found in Appendix G.

The testing consisted of three 72-minute runs for particulate matter. Table 1 lists sources, test dates, and times.

TABLE 1. SOURCE TEST DATES AND TIMES

Emission Unit	2013 Date	Time
Whey Dryer	February 18	12:08-13:22; 13:30-14:45; 14:58-16:12

2.0 PROCESS DESCRIPTION

WPC (Whey Protein concentrate) is produced by the Sorrento Lactalis mozzarella cheese plant in Nampa, Idaho and processed through 3 different membrane processing equipment. The liquid WPC is fed into a high-pressure pump, which sprays the product at 2,500 psi into a drying chamber at the rate of 3,200 lb/hr at 31% T.S (total solids). The product is atomized in the drying chamber and the rate of water removal from the atomization is 2,100lb/hr. The powder is conveyed thru the drying tube below the main chamber and dropped into the main cyclone of the dyer. The air from the chamber is exhausted into the baghouse and through the stack on the roof. The product is transferred from the large cyclone and transferred into the small cyclone above the sifter with the powder-conveying fan. The air from the powder-conveying fan is exhausted into the bottom of the bag house and the residual powder is augured into the powder conveying fan line and returned back to the small cyclone. The powder that is collected on the bags in the bag house is air pulsed every 3 seconds per bank of bag filters and the residual powder is also collected by the auger in the bottom of the bag house and sent back to the small cyclone which leads to the sifter. The powder is packaged and sealed for human consumption.

3.0 PRODUCTION RATES

Bighorn tested the Whey Dryer while the dryer was operated at maximum throughput rates as shown in Table 2. Appendix H includes production data and pollution control parameters provided by Sorrento Lactalis for each test period.

TABLE 2. ACTUAL PRODUCTION DATA

RUN NUMBER	lbs Whey/hr (wet)	Baghouse Diff (in H_20)
1	4,200	0.0
2	4,200	0.0
3	4,230	0.0

4.0 POLLUTANTS AND TEST METHODS

Bighorn used its particulate testing equipment for this project.

Bighorn performed velocity traverses on the source to calculate flow rates and convert analytical outputs to mass emissions. Opacity readings were conducted concurrently with each particulate run. Table 3 outlines the test methods Bighorn used during testing.

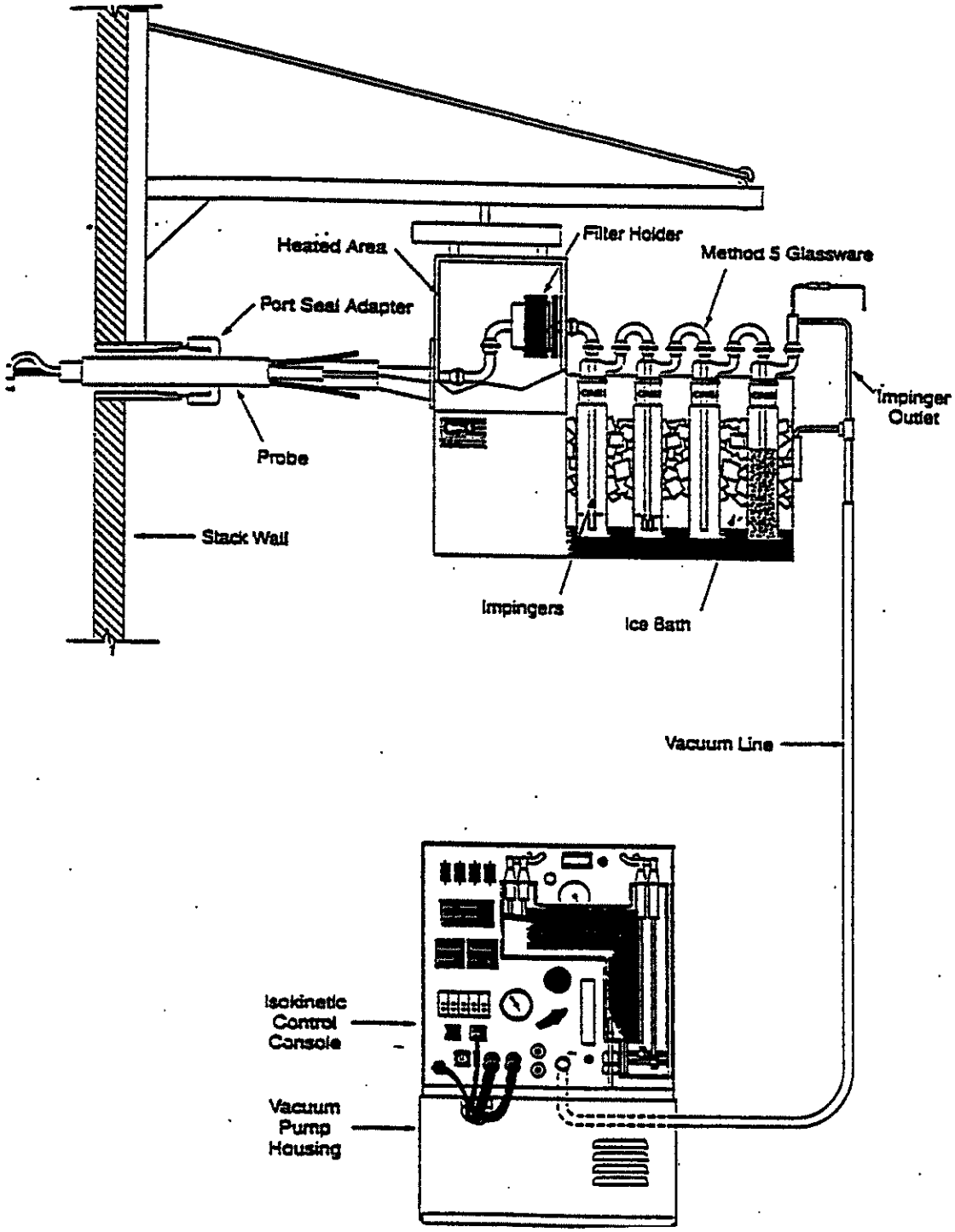
TABLE 3. TEST METHODS

PARAMETER	TEST METHODS
Velocity & Flow	EPA Methods 1&2
Moisture Content	EPA Method 4
Particulate Matter	EPA Method 5 and 202
Opacity	EPA Method 9

5.0 SOURCE SAMPLING EQUIPMENT

Figure 1 is a diagram of Bighorn's Particulate Sampling Train.

FIGURE 1. PARTICULATE SAMPLING TRAIN



6.0 RESULTS

Table 4 summarizes the results from the Whey Dryer.

TABLE 4. POLLUTANT EMISSION RESULTS

Parameter/Pollutant	Run 1	Run 2	Run 3	Average
Particulate (EPA Method 5):				
-(gr/dscf)	7.0E-4	8.0E-4	4.0E-4	6.0E-4
-(lbs/hr)	0.09	0.10	0.05	0.08
Particulate (EPA Method 202):				
-(gr/dscf)	1.3E-3	1.5E-3	1.0E-3	1.2E-3
-(lbs/hr)	0.16	0.20	0.13	0.16
PM/PM_{10} (EPA Method 5/202)				
-(gr/dscf)	1.9E-3	2.3E-3	1.4E-3	1.9E-3
-(lbs/hr)	0.26	0.30	0.18	0.24
Stack Parameters:				
Stack Gas Moisture (%)	6.82	6.56	7.69	7.02
Stack Temperature (°F)	113	114	114	114
Stack Gas Velocity (ft/min)	2,772	2,780	2,785	2,779
Actual Gas Flow (ft^3/min)	19,322	19,378	19,411	19,370
Dry Std. Gas Flow (ft^3/min)	15,353	15,423	15,272	15,350
Opacity (%)	0	0	0	0
Isokinetics (%)	99.9	98.8	99.8	99.5

Field data sheets, flow rate information, calculated emissions data, and calculations are contained in Appendices A-D.

7.0 CALIBRATION DATA

Appendix G has required support equipment quality control records.

8.0 QUALITY ASSURANCE

Bighorn's QA procedures follow EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. III, Stationary Source Specific Methods* September 1994 as revised and amended (#EPA-600/R-94/038c). Bighorn used EPA method specific quality assurance procedures. The following *July 1, 2012 40 CFR 60* sections were referenced for this project:

Appendix A - Methods 1, 2, 4, 5, 9 and 202.

Bighorn Environmental is zealous in our commitment to thorough quality practices. We conduct stringent quality assurance and quality control (QA and QC) procedures on all reference CEMS and support equipment.

Bighorn employs the latest CAI 600 Series, J.U.M. and API Model 100 AH CEMS. These CEMS are considered state-of-the-art by environmental professionals. We've designed an effective primary sample conditioner that works in concert with Horiba's secondary conditioners. Together, they provide dry, clean sample gas to Bighorn's CEMS (Figure 1).

EPA Protocol No. 1 QA standards allow Bighorn to challenge equipment and methods to ensure that data is valid for determining monitor accuracy and precision. Before each test, Bighorn challenges its monitors and then entire system at the probe which simulates actual sampling. QA standards introduced at the sample probe traverse through all sample lines, conditioning chambers, and monitors to determine initial system integrity or bias. Following each run, Bighorn conducts QA of the entire monitoring system to determine final system bias and test calibration drift

Bighorn's Mobile Air Emissions Laboratory contains two APC 1400 uninterruptible power supplies (UPS) to compliment our QA/QC commitment. These QC devices continuously regulate and condition client-supplied 120 VAC power so Bighorn's electronic analyzers receive a consistent clean 115 $\pm$ 5 VAC signal. Chronic brownout and over-voltage conditions are eliminated thereby reducing hardware failures and data errors. Also, temporary power outages do not shut down our CEMS nor jeopardize data quality because the UPS will generate a consistent pure sine wave signal for up to one hour with its built in battery.

Cross checks such as manual calculations of Bighorn's automated DAS computer generated results allow test results verification. Bighorn files manufacturers' accuracy certificates and interference tables for CEMS, flow controllers, gases, etc. Additionally dry gas meters, pitot tubes, thermocouples, gas dividers, etc. are certified as per EPA requirements and frequencies. Where EPA frequencies are not specified, Bighorn has established those based on state regulatory criteria.

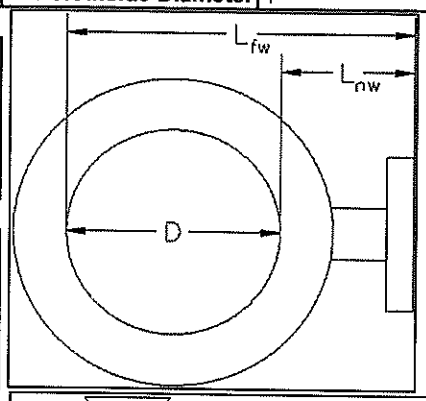
Thorough chain-of-custody procedures and documentation provide proof of our QA/QC efforts. Relevant QA/QC documentation is included in this final report's Appendices for results support and regulatory review.

APPENDIX A
FIELD DATA

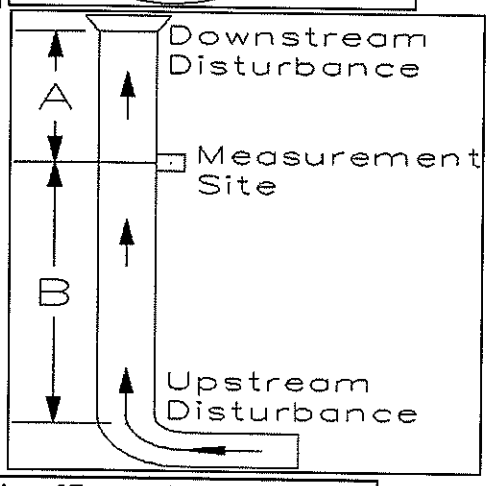
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Sorrento - Lactalis	**Date**	02/18/13
Sampling Location	Nampa, ID	**Project #**	Whey Dryer
Operator	Homer	**# of Ports Available**	2
Stack Type	Circular	**# of Ports Used**	2
Stack Size	Large	**Port Inside Diameter**	4

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	36.75	in
Distance to Near Wall of Stack	(L_{nw})	1.00	in
(=Lfw - Lnw) **Diameter of Stack**	(D)	35.75	in
(=3.14(D/2/Cunits)2) **Area of Stack**	(A_s)	6.97	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	100.00	in
(=B/D) **Diameters Upstream**	(B_D)	2.80	diameters
Distance Downstream	(A)	68.00	in
(=A/D) **Diameters Downstream**	(A_D)	1.90	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		**Minimum Number of[1] Traverse Points**	
Up Stream	**Down Stream**	**Particulate Points**	**Velocity Points**
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		12	12
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	**Ports by**	12	**Across**
24	**Pts Used**	24	**Required**
☑	**Particulate**	☐	**Velocity**

Traverse Point Locations			
Traverse Point Number	**Fraction of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Nipple Length**
		in	in
1	0.021	6/8	1 6/8
2	0.067	2 3/8	3 3/8
3	0.118	4 2/8	5 2/8
4	0.177	6 3/8	7 3/8
5	0.250	9	10
6	0.356	12 6/8	13 6/8
7	0.644	23	24
8	0.750	26 7/8	27 7/8
9	0.823	29 3/8	30 3/8
10	0.882	31 4/8	32 4/8
11	0.933	33 3/8	34 3/8
12	0.979	35	36

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	Sorrento - Lactalis			Date	02/18/13
Sampling Location	Nampa, ID			Project #	Whey Dryer
Operator	Homer			# of Ports Used	2
Stack Type	Circular			Pitot Identification	BH5'SS
Pitot Leak Check	☑	PreTest	☑ PostTest	Pitot Coefficient (C_p)	0.84

Stack Dimensions			
Diameter or Length of Stack	(D)	35.75	in
Width of Stack	(W)		in
Area of Stack	(A_s)	6.97	ft^2

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg

Stack Gas Composition			
Composition Data:	Actual ☐	Estimated ☑	
Carbon Dioxide Concentration	($\%CO_2$)	0.0	%
Oxygen Concentration	($\%O_2$)	20.5	%
Carbon Monoxide Concentration	(%CO)	0.0	%
Nitrogen Concentration	($\%N_2$)	79.5	%
Stack Moisture Content	(B_{ws})	8.000	
Stack Dry Molecular Weight	(M_d)	28.82	lb/lb-mole
Stack Wet Molecular Weight	(M_s)	27.96	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v_s)	46.5	ft/sec
Avg Stack Dry Std Flow Rate	(Q_{sd})	909158	dscf/hr
Avg Stack Dry Std Flow Rate	(Q_{sd})	15153	dscf/min
Avg Stack Wet Flow Rate	(Q_{aw})	19441	ascf/min

Stack Cross Section Schematic

Velocity Traverse Data

Run Number		V1		
Run Time				
Traverse Point	Velocity Head (Δp)	Stack Temp (t_s)	Null Angle deg	Local Velocity $(v_s)_i$
	in H_2O	°F		ft/sec
A-1	0.71	117	6	52.2
A-2	0.76		4	
A-3	0.89		7	
A-4	0.81		3	
A-5	0.91		3	
A-6	0.85		0	
A-7	0.21		0	
A-8	0.07		10	
A-9	0.05		13	
A-10	0.10		2	
A-11	0.09		0	
A-12	0.10		0	
B-1	0.80		4	
B-2	0.76		3	
B-3	0.72		6	
B-4	0.80		0	
B-5	0.75		0	
B-6	0.67		0	
B-7	0.78		0	
B-8	0.91		6	
B-9	0.88		5	
B-10	0.81		7	
B-11	0.85		4	
B-12	0.80		0	
$(\Delta p)^{1/2}_{avg}$ [1]	0.75	117	3.5	

[1] Average of the square roots of Δp
where $(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

Wet Bulb/Dry Bulb Estimate

Wet Bulb Temp	165	Stack Vapor Pressure	10.79	in Hg
Dry Bulb Temp	165	Stack Moisture Content	38.94	%H2O

Formulas Used

$A_s = DW/K_u$ for Rectangular Stacks

$A_s = (\pi(D/2)^2)/K_u$ for Circular Stacks

where $K_u = 1$ for metric units

where $K_u = 144$ (in^2/ft^2) for English units

$P_s = P_{bar} + P_{static}/13.6$

$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$

$M_d = .44(\%CO_2) + .32(\%O_2) + .28(\%N_2 + \%CO)$

$M_s = M_d(1 - B_{ws}) + 18B_{ws}$

$(\Delta p)^{1/2}_{avg} = {}^1/_n\Sigma(\Delta p^{1/2})$

$T_{s(avg)} = {}^1/_n\Sigma t_s + T_u$

where $T_u = 273$ °K for metric units

where $T_u = 460$ °R for English units

$v_s = K_pC_p(\Delta p)^{1/2}_{avg}\,(T_{s(avg)}/(P_sM_s))^{1/2}$

where $K_p = 34.97$ for metric units

where $K_p = 85.49$ for English units

$Q_{sd} = 3600(1 - B_{ws})v_sA_s(T_{std}/T_{s(avg)})(P_s/P_{std})$

where $T_{std} = 293$ °K, $P_{std} = 760$ mm Hg, for metric units

where $T_{std} = 528$ °R, $P_{std} = 29.92$ in Hg, for English units

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Sorrento - Lactalis			**Date**	02/18/13
Sampling Location	Nampa, ID			**Project #**	Whey Dryer
Operator	Homer			**# of Ports Used**	2
Stack Type	Circular			**Meter Box Number**	1203080
Train Leak Check	☑	**PreTest**	☑ **PostTest**	**Meter Cal Factor (Y)**	1.001

Moisture Content Data							
Run Number	1		**Run Start Time**	12:08		**Run Stop Time**	13:20
Total Meter Volume	(V_m)	60.730	dcf	**Barometric Press.**	(P_b)	27.70	in Hg
Avg Meter Temp	$(t_m)_{avg}$	93	°F	**Stack Static Press.**	(P_{static})	0.00	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	113	°F	**Avg Orifice Press.**	$(\Delta H)_{avg}$	2.21	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		ml	ml	ml	g	g	g	ml
Contents		H2O	H2O	H2O			Silica	
Final Value	$(V_f),(W_f)$	52.00	20.00	102.00			254.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			244.00	
Net Value	$(V_n),(W_n)$	52.0	20.0	2.0			10.0	
Results								
Total Volume	(V_t)	74.00	ml	**Water Vol Condensed**	$(V_{wc(std)})$	3.483	scf	
Total Weight	(W_t)	10.00	g	**Water Vol Weighed**	$(V_{wsg(std)})$	0.472	scf	
Std Meter Volume	$(V_{m(std)})$	54.026	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	10.3	%	
Calc Moisture Content	$(B_{ws(calc)})$	6.8	%	**Final Moisture Content**	(B_{ws})	6.8	%	

Moisture Content Data							
Run Number	2		**Run Start Time**	13:30		**Run Stop Time**	14:42
Total Meter Volume	(V_m)	61.420	dcf	**Barometric Press.**	(P_b)	27.70	in Hg
Avg Meter Temp	$(t_m)_{avg}$	103	°F	**Stack Static Press.**	(P_{static})	0.00	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	114	°F	**Avg Orifice Press.**	$(\Delta H)_{avg}$	2.25	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		ml	ml	ml	ml	ml	g	ml
Contents		H2O	H2O	H2O			Silica	
Final Value	$(V_f),(W_f)$	43.00	23.00	105.00			249.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			240.00	
Net Value	$(V_n),(W_n)$	43.0	23.0	5.0			9.0	
Results								
Total Volume	(V_t)	71.00	ml	**Water Vol Condensed**	$(V_{wc(std)})$	3.342	scf	
Total Weight	(W_t)	9.00	g	**Water Vol Weighed**	$(V_{wsg(std)})$	0.424	scf	
Std Meter Volume	$(V_{m(std)})$	53.672	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	10.5	%	
Calc Moisture Content	(B_{ws})	6.6	%	**Final Moisture Content**	(B_{ws})	6.6	%	

Moisture Content Data							
Run Number	3		**Run Start Time**	14:58		**Run Stop Time**	16:10
Total Meter Volume	(V_m)	61.610	dcf	**Barometric Press.**	(P_b)	27.70	in Hg
Avg Meter Temp	$(t_m)_{avg}$	105	°F	**Stack Static Press.**	(P_{static})	0.00	in H_2O
Avg Stack Temp	$(t_s)_{avg}$	114	°F	**Avg Orifice Press.**	$(\Delta H)_{avg}$	2.25	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**
		ml	ml	ml	ml	ml	g	ml
Contents		H2O	H2O	H2O			Silica	
Final Value	$(V_f),(W_f)$	56.00	23.00	108.00			252.00	
Initial Value	$(V_i),(W_i)$	0.00	0.00	100.00			244.00	
Net Value	$(V_n),(W_n)$	56.0	23.0	8.0			8.0	
Results								
Total Volume	(V_t)	87.00	ml	**Water Vol Condensed**	$(V_{wc(std)})$	4.095	scf	
Total Weight	(W_t)	8.00	g	**Water Vol Weighed**	$(V_{wsg(std)})$	0.377	scf	
Std Meter Volume	$(V_{m(std)})$	53.683	dscf	**Sat. Moisture Content**	$(B_{ws(svp)})$	10.4	%	
Calc Moisture Content	(B_{ws})	7.7	%	**Final Moisture Content**	(B_{ws})	7.7	%	

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento - Lactalis
Location: Nampa, ID
Personnel: Hymer / Keeting
Date: 2/18/13
Source: Meyer - Sterner Whey Dryer
Run #: 1
Ambient Temp: 39
Barometric Press.: 27.70
Assumed Moisture: 8
Start Time: 1208

Meter Box ID: 1208030
Meter Box Y: 1.001
Meter Box Δ H@: 1.812
Probe ID: BH5'
Probe Cp: .84
Filter #:
Static Pressure (in. H2O): 0
Nozzle ID: BH/4"SS
Probe/Filter Settings (F): 250
End Time: 1322

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0.00 cfm
Post @ 15 in Hg.: 0.00 cfm
DGM Start: 675.31 DGM End: 675.31

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	SiO2
End (ml):	52	20	102	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM ~~Inlet Temp~~ Filter (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	2.0	614.4	67	85	.72	~~2.3~~ 2.5	112	246	48	239	
2		2.5	617.21	69	85	.78	2.7	113	242	49	239	
3		3.0	620.07	69	86	.83	2.8	114	246	51	243	
4		4.0	623.11	71	86	.90	3.2	113	247	54	249	
5		4.0	626.32	70	88	.91	3.2	112	247	57	243	
6		4.0	629.55	73	89	.87	3.1	114	246	55	238	
7		1.0	632.67	74	90	.24	.85	113	245	53	240	
8		1.0	634.22	71	90	.10	.35	121	248	53	251	
9		1.0	635.22	73	91	.08	.28	122	246	50	250	
10		1.0	636.12	77	91	.07	.25	123	246	50	250	
11		1.0	637.03	77	92	.10	.35	124	245	49	242	
12		1.0	638.11	74	92	.11	.39	123	244	48	244	
13 36		3.5	639.23	72	93	.78	2.7	113	240	47	239	
14 39		3.5	642.19	71	94	.75	2.6	110	245	45	247	
15 42		3.0	644.96	70	95	.70	2.5	110	244	47	237	
16		3.5	647.83	70	96	.77	2.7	108	246	47	245	
17		3.5	650.81	73	97	.75	2.7	108	245	48	240	
18		2.5	653.79	76	98	.63	2.2	110	245	48	242	
19		3.0	656.51	75	98	.77	2.7	109	244	48	251	
20		4.0	659.49	75	99	.90	3.2	109	245	48	245	
21		4.0	662.73	74	100	.85	3.0	108	248	48	250	
22		3.5	665.88	76	101	.78	2.8	110	244	49	244	
23		4.0	668.92	75	101	.83	3.0	109	245	49	246	
24		4.0	672.02	75	101	.80	2.9	109	244	50	244	
		Final DGM	675.13									

QA/QC Checks: Completeness: Legibility:

Notes:

Signature:

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento - Lactalis
Location: Nampa, ID
Personnel: Homer / Keeating
Date: 2/28/13
Source: Meyer - Stemer Dryer
Run #: 2
Ambient Temp: 44
Barometric Press.: 27.70
Assumed Moisture: 8
Start Time: 1330

Meter Box ID: 120B030
Meter Box Y: 1.001
Meter Box Δ H@: 1.812
Probe ID: 8ft 5'-SS
Probe Cp: .84
Filter #:
Static Pressure (in. H2O): 0
Nozzle ID: 8 3/4" SS
Probe/Filter Settings (F): 250
End Time: 1445

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0.00 cfm
Post @ 15 in Hg.: 0.00 cfm
DGM Start: 737.28 DGM End: 737.28

Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	Sio2
End (ml):	43	23	105	

Color/Odor:

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	4.0	675.70	70	101	.71	2.5	115	244	45	248	
2		5.0	678.52	70	101	.76	2.7	114	245	48	247	
3		5.0	681.50	71	101	.80	2.9	115	246	49	244	
4		7.0	684.49	71	102	.88	3.1	114	247	52	244	
5		7.0	687.66	71	102	.91	3.3	115	248	53	246	
6		7.0	690.78	71	102	.93	3.3	114	250	53	245	
7		7.0	644.77	72	102	.25	.89	115	249	55	248	
8		3.0	696.04	72	102	.10	.40	115	248	57	245	
9		3.0	697.11	72	102	.09	.32	113	246	57	246	
10		2.0	698.07	72	102	.08	.29	113	244	58	249	
11		3.0	699.12	72	103	.10	.40	114	246	55	250	
12		3.0	699.84	72	103	.10	.40	114	248	55	249	
13		7.0	701.36	73	103	.79	2.8	113	248	53	247	
14		7.0	704.21	73	103	.76	2.7	114	247	50	249	
15		6.5	707.32	75	103	.75	2.7	113	246	51	244	
16		7.0	710.34	77	104	.80	2.9	115	246	51	251	
17		6.5	713.35	74	104	.71	2.5	114	247	51	247	
18		6.0	716.19	72	105	.64	2.3	114	248	53	252	
19		6.0	718.95	71	105	.72	2.5	114	247	53	249	
20		6.0	721.73	72	106	.80	2.9	112	248	53	245	
21		7.0	724.67	70	106	.90	3.2	113	249	53	249	
22		7.0	727.82	73	106	.84	3.0	115	248	53	247	
23		7.0	730.98	73	106	.86	3.1	113	246	53	242	
24		7.0	734.10	75	105	.80	2.9	112	246	54	245	
		Final DGM	737.12									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes:

Bighorn Environmental Method 5 Field Data Sheet

Client/Plant Name: Sorrento - Lactalis
Location: Nampa, ID
Personnel: Hymer / Keating
Date: 2/18/13
Source: Meyer Wing Dryer
Run #: 3
Ambient Temp: 45
Barometric Press.: 27.70
Assumed Moisture: 8
Start Time: 1458

Meter Box ID: 1208030
Meter Box Y: 1.001
Meter Box Δ H@: 1.812
Probe ID: BH-8'
Probe Cp: .84
Filter #:
Static Pressure (in. H2O): 0
Nozzle ID: BH/4" SS
Probe/Filter Settings (F): 250
End Time: 1612

Leak Check Results

Sample Train
Pre @ 15 in Hg.: 0.00 cfm
Post @ 15 in Hg.: 0.00 cfm
DGM Start: 800.39 DGM End: 800.39
Pitot (> 3 in) Pre: ✓ Post: ✓

Impinger Moisture Catch

Impinger	1	2	3	4
Begin (ml):	0	0	100	SDR
End (ml):	~~47~~	~~23~~	~~108~~	
Color/Odor:	56	23	108	

Traverse Point	Time (min)	Vacuum	DGM Reading (cubic ft)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pitot ΔP (in H_2O)	Orifice Press (in. H_2O)	Stack Temp (°F)	Filter Temp (°F)	Impinger Exit (°F)	Probe Temp (°F)	Port ID
1	3	4.0	738.60	70	104	.72	2.60	112	246	52	251	
2		4.0	741.47	70	104	.76	2.7	113	247	54	246	
3		4.0	744.47	70	104	.81	2.9	114	246	55	247	
4		5.0	747.37	70	105	.85	3.1	115	249	56	249	
5		5.0	750.74	71	104	.91	3.2	114	248	56	251	
6		5.5	753.76	71	105	.90	3.2	113	250	57	248	
7		3.0	756.91	72	105	.30	1.1	114	248	55	247	
8		3.0	759.04	72	105	.12	.43	115	246	52	247	
9		3.0	760.22	72	105	.09	.32	114	247	50	246	
10		3.0	761.14	72	105	.07	.25	115	248	50	247	
11		3.0	762.11	72	105	.09	.32	115	249	51	248	
12		3.0	763.17	72	105	.10	.36	114	245	51	249	
13 36		3.0	764.42	72	105	.72	2.6	114	248	50	250	
14 39		3.0	767.34	74	105	.75	2.7	113	248	47	247	
15		3.0	769.98	76	105	.70	2.5	113	248	47	245	
16		3.5	772.92	78	105	.80	2.9	111	248	48	243	
17		3.5	776.02	74	105	.75	2.7	111	247	49	245	
18		3.5	779.02	74	105	.69	2.5	111	248	50	247	
19		3.5	781.90	73	105	.76	2.7	110	248	50	242	
20		4.0	784.79	71	105	.92	3.3	114	247	50	246	
21		3.5	788.11	70	106	.84	3.0	117	249	51	247	
22		3.5	791.2	69	105	.77	2.8	116	248	51	245	
23		3.5	794.21	70	105	.82	2.9	114	248	51	247	
24		4.0	797.25	71	106	.80	2.8	113	247	51	247	
	Final DGM		800.21									

QA/QC Checks: Completeness: Legibility:

Signature:

Notes:

Method 5 Data Form					
Client:	Sorrento	Source:	Meyer Sterner Dryer	Date:	2/18/2013
RUN 1	**Probe Rinse**				**Filter**
Final Wt. 1:	73.24810				0.33220
Final Wt. 2:	73.24760				0.33220
Final Wt. Avg:	73.24785				0.33220
Tare:	73.24600				0.33120
Gross Wt.:	0.00160				0.00100
Less Blank:	0.00021				0.00000
Net Wt.:	**0.00139**				**0.00100**
Volume:	64.00000				n/a
Total Front:	0.00139				
RUN 2	**Probe Rinse**				**Filter**
Final Wt. 1:	71.64780				0.32970
Final Wt. 2:	71.64750				0.32970
Final Wt. Avg:	71.64765				0.32970
Tare:	71.64630				0.32800
Gross Wt.:	0.00120				0.00170
Less Blank:	0.00019				0.00000
Net Wt.:	**0.00101**				**0.00170**
Volume:	58.00000				n/a
Total Front:	0.00101				
RUN 3	**Probe Rinse**				**Filter**
Final Wt. 1:	70.69570				0.33120
Final Wt. 2:	70.69540				0.33120
Final Wt. Avg:	70.69555				0.33120
Tare:	70.69490				0.33020
Gross Wt.:	0.00050				0.00100
Less Blank:	0.00018				0.00000
Net Wt.:	**0.00032**				**0.00100**
Volume:	56.00000				n/a
Total Front:	0.00032				

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorbito Lattaly
Location: Nampa, ID
Source: Dryer

Run #:: 1
Test Date: 2/18/13
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	2/28/13	09:24	.3332	.8003	70	43	MK	
Filter ID: 215								
Tare Wt.: .3312								N/A
Date/Time into dessicator:								
2/25/13 / 09:18								
Acetone	3/12/13	07:51	73.2481	100.0106	70	42	MK	
Beaker ID: 86	3/14/13	09:12	73.2476	100.0106	70	43	MK	Yes
Tare Wt.: 73.2460								
Volume: 64								
Date/Time into dessicator:								No
3/1/13 / 10:11								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	244	254	10

Bighorn Environmental Method 5 Data Analysis Form

Client: Sorrento, Lactalis
Location: Nampa, ID
Source: Dryer

Run #:: 2
Test Date: 2/18/13
Analyst: Keating

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	2/26/13	08:31	.3247	.5003	70	43	MK	
Filter ID: 214								
Tare Wt.: .3280								N/A
Date/Time into dessicator:								
2/25/13/09:18								
Acetone	3/12/13	07:56	71.6478	100.0106	70	42	MK	
Beaker ID: 87	3/14/13	09:12	71.6475	100.0106	70	43	MK	Yes
Tare Wt.: 71.6463								
Volume: 58								
Date/Time into dessicator:								No
3/1/13/10:11								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	245	249	9

Bighorn Environmental Method 5 Data Analysis Form

Client: Sunburst Lacdal's
Location: Nampa, ID
Source: Dryer

Run #:: 3
Test Date: 2/18/13
Analyst: Keeling

	Date	Time	Weight (g)	Audit Wt. (g)*	Lab Temp (F)	Rel Hum (%)	Initials	Leakage
FRONT HALF:								
Filter	2/28/13	08:29	.3312	.5003	70	43	MK	
Filter ID: 213								
Tare Wt.: .3302								N/A
Date/Time into dessicator:								
2/25/13/09:18								
Acetone	3/12/13	07:59	70.6457	100.0106	70	43	MK	
Beaker ID: 83	3/14/13	09:17	70.6954	100.0106	70	43	MK	Yes
Tare Wt.: 70.6949								
Volume: 56								
Date/Time into dessicator:								No
3/1/13/10:11								
BACK HALF:								
Acetone:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
BH Water:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No
DCM extract:								
Beaker ID:								Yes
Tare Wt.:								
Volume:								
Date/Time into dessicator:								No

*+/-0.5000 g tolerance - NIST traceable Class S weight

Filters have been weighed and dessicated as per 40 CFR 60 Appendix A, Method 5, Section 11.2.

Notes:

Silica Gel	Dry Wt.	Wet Wt.	Wt. Gain
	242	252	8

Figure 5.3a - Page 2

METHOD 5 BLANK ANALYSIS DATA FORM

Samples Prepared by Keating Date 3/1/13

Front Half:	Date/Time	Weight(g)	Audit*	T-°F	RH-%	By
Filter						
Filter ID ____ Tare Wt. ____						
Acetone	3/14/13/07:49	112.1718	100.0106	70	42	MK
Beaker ID 11A	3/14/13/09:10	112.1711	100.0106	70	43	MK
Tare Wt. 112.1704	3/15/13/01:44	112.1710	100.0106	70	45	MK
Solv. Vol. -200-						
Solv. ID ____						
3/1/13/10:11						
Water						
Beaker ID ____						
Tare Wt. ____						
Solv. Vol. ____						
Solv. ID ____						
DCM						
Beaker ID ____						
Tare Wt. ____						
Solv. Vol. ____						
Solv. Wt. ____						

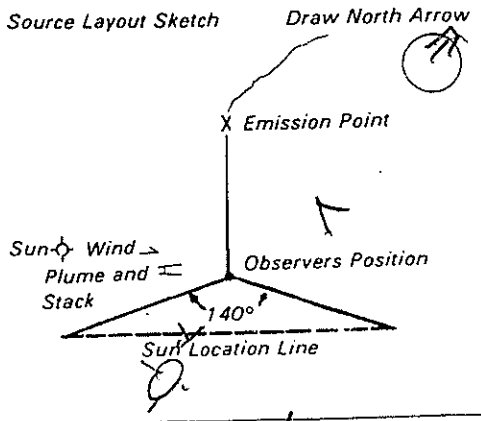
* 0.5000 g ± tolerance - NIST traceable Class S weight

METHOD 5 BLANK ANALYSIS DATA FORM					
Sample Prepared by:		Homer		Date	3/1/2013
		Acetone			
Final Wt 1.:		112.17110			
Final Wt 2.:		112.17100			
Final Wt. Avg.:		112.17105			
Tare:		112.17040			
Difference:		0.00065			
Solvent vol.:		200.00000			
Residue (g/ml):	**#DIV/0!**	**0.0000033**			
Residue (mg/ml):	**#DIV/0!**	**0.00325**			

Visible Emission Observation Form

SOURCE NAME	Sorento Lactalis
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	
PHONE	
SOURCE ID NUMBER	Main Winery Dryer
PROCESS EQUIPMENT	
OPERATING MODE	NORMAL
CONTROL EQUIPMENT	
OPERATING MODE	
DESCRIBE EMISSION POINT START	Round stack
STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	9'
STOP	9'
HEIGHT RELATIVE TO OBSERVER START	3'
STOP	3'
DISTANCE FROM OBSERVER START	25'
STOP	25'
DIRECTION FROM OBSERVER START	44° NE
STOP	44° NE
DESCRIBE EMISSIONS START	white thin Plume
STOP	white thin Plume
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS	☒
FUGITIVE	☐
INTERMITTENT	☐
WATER DROPLETS PRESENT: NO	☒
YES	☐
IF WATER DROPLET PLUME: ATTACHED	☐
DETACHED	☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	6" above stack
STOP	6" above stack
DESCRIBE BACKGROUND START	white clouds
STOP	white clouds
BACKGROUND COLOR START	white
STOP	white
SKY CONDITIONS START	cloudy
STOP	cloudy
WIND SPEED START	15-20
STOP	15-20
WIND DIRECTION START	S.
STOP	S.
AMBIENT TEMP. START	37
STOP	37
WET BULB TEMP.	
RH.percent	

Source Layout Sketch



OBSERVATION DATE	START TIME	STOP TIME
2/10/13	15:17.5	15:32.70

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0			38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE % WERE	0 / 0
RANGE OF OPACITY READINGS MINIMUM	0
MAXIMUM	0
OBSERVER'S NAME (PRINT)	Michael Kostka
OBSERVER'S SIGNATURE	[signature]
DATE	2/10/13
ORGANIZATION	Bigham Engineering
CERTIFIED BY	Smoke School Inc
DATE	2/13
VERIFIED BY	
DATE	

COMMENTS: windy and cold

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE

DATE

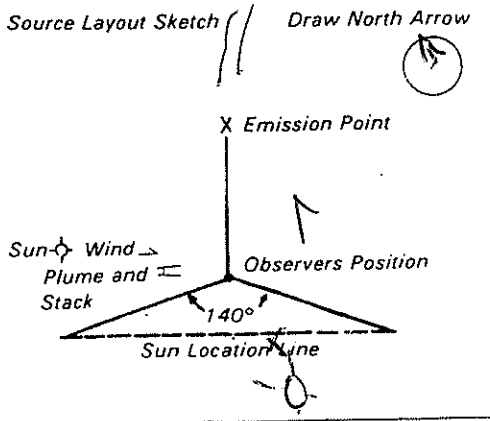
Visible Emission Observation Form

SOURCE NAME	Simplot Lactos
ADDRESS	
CITY	Nampa
STATE	ID
ZIP	
PHONE	
SOURCE ID NUMBER	Mayflower Dairy Stack
PROCESS EQUIPMENT	
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	
DESCRIBE EMISSION POINT START	Round stack
STOP	Round stack
HEIGHT ABOVE GROUND LEVEL START	9'
STOP	9'
HEIGHT RELATIVE TO OBSERVER START	2'
STOP	2'
DISTANCE FROM OBSERVER START	22'
STOP	22'
DIRECTION FROM OBSERVER START	354° N
STOP	354° N
DESCRIBE EMISSIONS START	white smoke
STOP	white smoke
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS	☑
FUGITIVE	☐
INTERMITTENT	☐
WATER DROPLETS PRESENT: NO	☒
YES	☐
IF WATER DROPLET PLUME: ATTACHED	☐
DETACHED	☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	6" above RM
STOP	6" above RM
DESCRIBE BACKGROUND START	thin white clouds
STOP	thin white clouds
BACKGROUND COLOR START	white
STOP	white
SKY CONDITIONS START	overcast
STOP	overcast
WIND SPEED START	10-15
STOP	10-15
WIND DIRECTION START	S
STOP	S
AMBIENT TEMP. START	39
STOP	39
WET BULB TEMP.	
RH.percent	

OBSERVATION DATE	START TIME	STOP TIME
2/18/13	12:30	12:37:30

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0			38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch



AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE	0 % WERE 0
RANGE OF OPACITY READINGS MINIMUM	0
MAXIMUM	0
OBSERVER'S NAME (PRINT)	Michael Keating
OBSERVER'S SIGNATURE	[signature]
DATE	7/18/13
ORGANIZATION	Bighorn Environmental
CERTIFIED BY	Smoke School INC
DATE	2/13
VERIFIED BY	
DATE	

COMMENTS windy but bright sun.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE

DATE

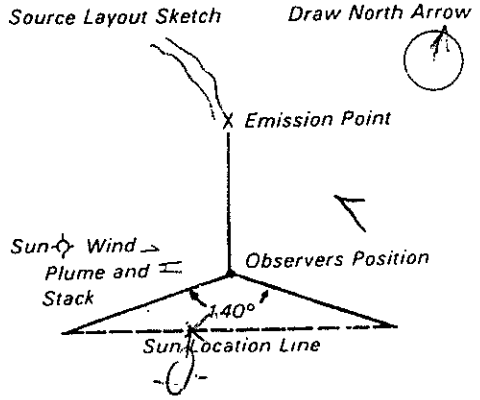
Visible Emission Observation Form

SOURCE NAME	Sokeite Lodge
ADDRESS	
CITY	Nampa
STATE	Id
ZIP	8
PHONE	
SOURCE ID NUMBER	Mayor Lodge Block
PROCESS EQUIPMENT	
OPERATING MODE	Normal
CONTROL EQUIPMENT	
OPERATING MODE	
DESCRIBE EMISSION POINT START	Round Stack
STOP	Round Stack
HEIGHT ABOVE GROUND LEVEL START	4'
STOP	9'
HEIGHT RELATIVE TO OBSERVER START	7'
STOP	3'
DISTANCE FROM OBSERVER START	26'
STOP	26
DIRECTION FROM OBSERVER START	46° NE
STOP	46° NE
DESCRIBE EMISSIONS START	white smoke
STOP	white smoke
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS	☒
FUGITIVE	☐
INTERMITTENT	☐
WATER DROPLETS PRESENT: NO	☒
YES	☐
IF WATER DROPLET PLUME: ATTACHED	☐
DETACHED	☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	6" above the stack
STOP	6" above stack
DESCRIBE BACKGROUND START	white clouds
STOP	white sky
BACKGROUND COLOR START	white
STOP	white
SKY CONDITIONS START	cloudy
STOP	cloudy
WIND SPEED START	10-15
STOP	10-15
WIND DIRECTION START	S.E
STOP	S.E
AMBIENT TEMP. START	38
STOP	35
WET BULB TEMP.	
RH, percent	

OBSERVATION DATE	START TIME	STOP TIME
2/18/13	14:20	14:27:30

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0			38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch — Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE	0 % WERE 0
RANGE OF OPACITY READINGS MINIMUM	0
MAXIMUM	0
OBSERVER'S NAME (PRINT)	Mike Keating
OBSERVER'S SIGNATURE	[signature]
DATE	2/18/13
ORGANIZATION	Bigland Environmental
CERTIFIED BY	Smoke School Inc
DATE	2/13
VERIFIED BY	
DATE	
COMMENTS	windy and cold
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE	
TITLE	
DATE	

GAS VELOCITY AND VOLUMETRIC FLOW FORM
METHOD 2

Plant	Sorrento Lactalis	Location:	Nampa, ID	Source:	Whey Dryer
Date	2/18.13	Operator:	Homer	Run No.:	pre survery
Barometric Press.	27.70	Reading Location:	Lab	Ambient Temp:	38
Elevation:	0	Elevation Corr.:	0	Corr. Bar. Press.:	0
Avg. wet bulb temp (F)		% O2		% CO2:	
Pitot tube ID #:	BH 4' S-type	Pitot Cp: Leak ✓ ok	0.84	Last Calibration:	8/28/2012

Traverse Point #	Velocity Head	Stack Temp (F)	Static Press.	Cyclonic Flow Check	
				Vel. At 0 reference	Angle to get 0 Flow
1	.71	1170	0	.30	6
2	.76			.21	4
3	.89			.48	7
4	.81			.18	3
5	.91			.12	3
6	.85			0	0
7	.21			0	0
8	.07			.08	10
9	.05			.09	13
10	.10			.03	2
11	.09			0	0
12	.10			0	0
13	.80			.15	4
14	.76			.05	3
15	.72			.10	6
16	.80			0	0
17	.75			0	0
18	.67			0	0
19	.78			0	0
20	.91			.05	6
21	.88			.22	5
22	.81			.20	7
23	.85			.22	4
24	.80			0	0

TRAVERSE POINT LOCATION WORKSHEET
METHOD 1

DATA

STACK CROSS SECTION DIAGRAM

Plant:	Sorrento Lactalis	Location:	Nampa, ID
Source:	Whey Dryer	Operator:	Homer
Date	2/18.13	Port Depth(in.):	1
Stack Dia. (in.)	36	Stack Area (ft2):	7.07
Distance to disturbance:			
Upstream(in):	68	Downstream(in):	100
# of traverse points required:		24	

Traverse point #	% of Stack Dia.	Stack Dia.	% of Stack Dia. X Stack Dia.	Port Depth	Taverse Point Location
1	0.021	36	0.8	1	1.76
2	0.067	36	2.4	1	3.41
3	0.118	36	4.2	1	5.25
4	0.177	36	6.4	1	7.37
5	0.25	36	9.0	1	10.00
6	0.356	36	12.8	1	13.82
7	0.644	36	23.2	1	24.18
8	0.75	36	27.0	1	28.00
9	0.823	36	29.6	1	30.63
10	0.882	36	31.8	1	32.75
11	0.933	36	33.6	1	34.59
12	0.979	36	35.2	1	36.24

NOTES:

BIGHORN ENVIRONMENTAL

SORRENTO-LACTOLIS, NAMPA, ID

CLIENT # B019
REPORT # 13-111

SUBMITTED BY:
CHESTER LabNet
12242 S.W. GARDEN PLACE
TIGARD, OR 97223
(503)624-2183/FAX (503)624-2653
www.ChesterLab.Net

CHESTER LabNet

12242 SW Garden Place ❖ Tigard, OR 97223-8246 ❖ USA
Telephone 503-624-2183 ❖ Fax 503-624-2653 ❖ www.chesterlab.net

Case Narrative

Date: March 18, 2013

General Information

Client:	Bighorn Environmental
Client Number:	B019
Report Number:	13-111
Sample Description:	Impinger Solutions, Filters
Sample Numbers:	13-S484 – 13-S487

Analysis

Analytes:	Particulate Mass
Analytical Protocols:	EPA Method 202 (12/2010 version)
Analytical Notes:	The acetone and water were accidentally combined in the field. The results have **not** been blank corrected.
QA/QC Review:	All of the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds the minimum requirements for acceptability.
Comments:	If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.
Disclaimer:	This report shall not be reproduced, except in full, without the written approval of the laboratory. The results only represent that of the samples as received into the laboratory.

Paul Duda 3/18/13

Project Manager Date
Paul Duda

Bighorn Environmental

Sorrento-Lactolis Nampa, ID Method 202 Data - Report # 13-111

Sample ID	Client ID	Sample Date	Sample Volume (mL) Aqueous Phase	Sample Volume (mL) Organic Phase	Net Weight (mg) Aqueous Phase	Net Weight (mg) Organic Phase	Comments
Lab_Blk					**0.1**	**0.1**	
Prep_Blk					**1.2**	**0.4**	
13-S484	Meyer-Sterner Whey Dryer Run 1	2/18/13	212	54	**3.1**	**1.3**	
13-S485	Meyer-Sterner Whey Dryer Run 2	2/18/13	190	42	**4.0**	**1.2**	
13-S486	Meyer-Sterner Whey Dryer Run 3	2/18/13	214	48	**2.5**	**0.9**	
13-S487	Field Train Recovery Blank	2/18/13	196	58	**1.6**	**0.5**	

Analysis performed by: ***CHESTER LabNet***
12242 SW Garden Place ♦ Tigard, OR 97223
(503) 624-2183 ♦ www.chesterlab.net

DATE SUBJECT 13-111 Bighorn "New" 202 PROJECT NO. 101

Tare In: 3.01.13 SR @ 0650 5.1% 19.8°C Gross In: 3.14.13 SR @ 1340 0.5% 20.7°C
Tare 1: 3.4.13 SR @ 0839 5.1% 20.7°C Gross 1: 3.15.13 SR @ 1423 0.5% 20.8°C
Tare 2: 3.5.13 SR @ 1308 7.8% 19.3°C Gross 2: 3.17.13 SR @ 0913 1.7% 17.0°C

[Aqueous]

Sx ID	Tare 1(g)	Tare 2(g)	Gross 1(g)	Gross 2(g)
QC 0.2000g	0.2000	0.2000	0.2000	0.2000
QC 3.0000g	3.0000	3.0000	3.0000	3.0000
QC 5.0000g	5.0000	5.0000	5.0000	5.0000
LB	1.8522	1.8523	1.8523	1.8523
PB	1.8258	1.8258	1.8271	1.8270
484	1.8509	~~1.8511~~ SR 1.8510	1.8541	1.8540
485	1.8610	1.8610	1.8651	1.8651
486	1.8306	1.8306	1.8332	1.8330
487	1.8486	1.8486	1.8503	~~1.8502~~ SR 1.8502

[Organic]

Sx ID	Tare 1(g)	Tare 2(g)	Gross 1(g)	Gross 2(g)
QC 0.2000g	Same as above	Same as above	Same as above	Same as above
QC 3.0000g				
QC 5.0000g				
LB	~~1.8511~~ SR 1.8512	1.8512	1.8513	1.8513
PB	1.8414	1.8414	1.8418	1.8418
484	1.8464	1.8464	1.8477	1.8477
485	1.8378	1.8376	1.8390	1.8391
486	1.8553	1.8552	1.8562	1.8563
487	1.8540	1.8540	1.8545	1.8544

3.18.13 SR

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

All masses in grams (g)			"New" M202: Bighorn 13-111					
		Aqueous Phase						
Sx ID	Tare	Tare QC	Tare - QC	Gross	Gross QC	Gross - QC	*net (g)	net (mg)**
date/init:	3/4/13 SR	3/5/13 SR		3/15/13 SR	3/17/13 SR		(total mass liq)	less NH3
time:	0839	1308		1423	0913			
Rel. Humidity	5.1%	7.3%		0.5%	1.7%			
Temp (C/F)	20.7C / 69.3F	19.3C / 66.7F		20.8C / 69.4F	17.0C / 62.6F			
0.2000g QC	0.2000	0.2000		0.2000	0.2000			
3.0000g QC	3.0000	3.0000		3.0000	3.0000			
5.0000g QC	5.0000	5.0000		5.0000	5.0000			
Lab Blank	1.8522	1.8523	-0.0001	1.8523	1.8523	0.0000	0.0001	0.1
Prep Blank	1.8258	1.8258	0.0000	1.8271	1.8270	0.0001	0.0013	1.2
484	1.8509	1.8510	-0.0001	1.8541	1.8540	0.0001	0.0032	3.1
485	1.8610	1.8610	0.0000	1.8651	1.8651	0.0000	0.0041	4.0
486	1.8306	1.8306	0.0000	1.8332	1.8330	0.0002	0.0026	2.5
487	1.8486	1.8486	0.0000	1.8503	1.8502	0.0001	0.0017	1.6
*net mass = gross - tare (g)								
**corrected net mass = net mass - (Normality NH4OH x mL NH4OH x 17.03 mg NH3/mmol)								
		Organic Phase						
Sx ID	Tare	Tare QC	Tare - QC	Gross	Gross QC	Gross - QC	*net (g)	net (mg)
date/init	3/4/13 SR	3/5/13 SR		3/15/13 SR	3/17/13 SR			
time:	0839	1308		1423	0913		(total mass liq)	
Rel. Humidity	5.1%	7.3%		0.5%	1.7%			
Temp (C/F)	20.7C / 69.3F	19.3C / 66.7F		20.8C / 69.4F	17.0C / 62.6F			
0.2000g QC	0.2000	0.2000		0.2000	0.2000			
3.0000g QC	3.0000	3.0000		3.0000	3.0000			
5.0000g QC	5.0000	5.0000		5.0000	5.0000			
Lab Blank	1.8512	1.8512	0.0000	1.8513	1.8513	0.0000	0.0001	0.1
Prep Blank	1.8414	1.8414	0.0000	1.8418	1.8418	0.0000	0.0004	0.4
484	1.8464	1.8464	0.0000	1.8477	1.8477	0.0000	0.0013	1.3
485	1.8378	1.8376	0.0002	1.8390	1.8391	-0.0001	0.0012	1.2
486	1.8553	1.8552	0.0001	1.8562	1.8563	-0.0001	0.0009	0.9
487	1.8540	1.8540	0.0000	1.8545	1.8544	0.0001	0.0005	0.5
*net mass = gross - tare (g)								

				"New" M202: Bighorn 13-111	
date/init: 3/13/13 SR					
		pH-start	pH-end	mL NH4OH	mass NH3 (mg)
	Prep Blank	6.013	7.166	0.0750	0.13
	484	5.548	7.135	0.0750	0.13
	485	6.129	7.031	0.0500	0.09
	486	6.440	7.121	0.0750	0.13
	487	6.469	7.038	0.0500	0.09
	mass NH3 = 0.1N NH4OH x mL NH4OH x 17.03 mg NH3/mmol				
	QC:				
	% Nernst slope: 97.8				
CAL	pH 4.000	4.003			
CAL	pH 7.000	7.000			
QC	pH 7.000	7.007			
QC	pH 7.000	7.000			
QC	pH 7.000	6.995			
QC	pH 7.000	7.005			

102 DATE SUBJECT 13-111 Bighorn MZ02 PROJECT NO.

Cal pH 4: CP B060-14 x: 3:02:14
Cal pH 7: CP A320-15 x: 11-23-12
QC pH 7: CP 3037-14 x: 02-2014
0.1N NH_4OH Rocky Mountain Reagents 12-0080 x: 3.5.14

% Nernst: 97.8
Cal pH 4: 4.003
Cal pH 7: 7.000
QC pH 7: ~~7.009~~ SR 7.007

Sx ID	Start pH	End pH	mL titrant
QC pH 7	7.000		
PB	6.013	7.166	0.075
SR ~~B8~~ BS 484	5.548	7.135	0.075
485	6.129	7.031	0.050
QC pH 7	6.995	—	—
486	6.440	7.121	0.078
487	6.469	7.038	0.050
QC pH 7	7.005	—	—

3.18.13 SR

WITNESSED AND UNDERSTOOD

SIGNED DATE SIGNED

SIGNED DATE DATE

CHESTER LABNET

SOURCE SAMPLE RECEIPT CHECKLIST

Client	Bighorn	Date	2/25/13
# Runs	4 runs ~~+ blks~~	Time	8:55

Custody Seals Inspected, If Present	NA	
Chain-of-Custody Form Inspected	Y	
CoC present with samples?	Y	*
CoC indicate analytical methodology to be used? (eg M29 etc)	Y	!!
CoC indicate if compliance testing? (esp. M26)	NA	!!
M26 samples have Thiosulfate added in field?	NA	!!
M29 indicate FH/BH separate or combined?	NA	!!
Has Form Been Signed?	Y	
Have Date and Time Custody Released Been Noted on Form?	Y	
All Sample Containers Inspected	Y	
Does Number of Samples Match Number on CoC Form?	Y	!!
Do All Sample ID Numbers Match Those on the CoC Form?	Y	!!
Did client mark sample volumes prior to shipment?	Y	*
If required by method, did client vent samples prior to shipment?	NA	
Are the Sample Containers Intact?	Y	!!
Are signs of leakage present?	NO	*
Chain-of-Custody Form Signed and Dated by CLN	Y	
Corrective Actions		
Client Contacted Due to Mismatching Sample ID Numbers		
Client Contacted Due to Broken Sample Container(s)		
Client Contacted Due to Leaking Sample Container(s)	2/27/13	
Client contacted for verification of methodology?		
Corrective Actions Documented?		
Corrective Actions Accomplished?		

Items marked !! shall be addressed ***prior to any analytical work being started****.*
*Items marked * shall be* ***noted in case narrative*** *upon reporting of results to client.*

Signed _____

Notes _____

13-111

Company Name	Bighorn Environmental
Contact	Tim Homer
Phone	541-954-4697
E-Mail Address	Tim@thehomes.NET
Fax	
Report Address	1324 N. Liberty Lk RD
City	Liberty Lake
State	WA
Zip	99019
Billing Address	Same
City	
State	
Zip	
PO #	
Project	Sorrento-Lactalis Nampa, ID

CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
(503) 624-2183
Fax (503) 624-2653
cln@chesterlab.net

CHAIN-OF-CUSTODY RECORD

Page ___ of ___

Turn Around Time
☐ Standard
☐ Rush _____ Specify

	LabNet ID	Field Sample ID	Site	Sample Date	Volume (m^3)	Particle Size	Analysis Requested: Method 202	Remarks
135484	Meyer-	Stemer Whey	Meyer - Run 1	2/18			X	H_2O + Acetone, Hexane, Filter
485	"	"	Run 2	2/18			X	
486	"	"	Run 3	2/18			X	
		2.25.13						
	Per Tim Homer - H_2O & Acetone accidentally combined in field - analyze samples & note in Case Narrative.							
135487	FTB							

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
8:55am 2/25/13	2.25.13 0855
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes: Field Train Blank included

APPENDIX B
FLOW RATE SPREADSHEETS

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento - Lactalis	Date	2/18/2013
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Run #	1
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	111	°F
Avg Gas Meter Temp	(t_m)	93	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.81	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	8.0	%
Stack Dry Molecular Weight	(M_{ds})	28.82	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.7500	acfm
DP to DH Isokinetic Factor	(K)	3.57	

Sampling Equipment			
Meter #	1203080		
Meterbox Cal. Factor	(Y)	1.001	
Nozzle #	BH1/4"		
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{nl})	0.2326	in
Probe # / Length	BH5'SS	5'	ft
Liner Material	SS		
Sample Case / Oven #	BH1		
Impinger Case #	BH1		

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg
Absolute Meter Pressure	(P_m)	27.83	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid	na	ft^3/min	@	na	in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?	☑		Orsat OK?	☐	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	12:08:00	614.400	0.720	2.570	2.500	112	239	85	246	48	2.0
A-2	3.0	12:11:00	617.210	0.780	2.784	2.700	113	239	85	242	49	2.5
A-3	6.0	12:14:00	620.070	0.830	2.963	2.800	114	243	86	246	51	3.0
A-4	9.0	12:17:00	623.110	0.900	3.213	3.200	113	249	86	247	54	4.0
A-5	12.0	12:20:00	626.320	0.910	3.248	3.200	112	243	88	247	57	4.0
A-6	15.0	12:23:00	629.550	0.870	3.106	3.100	114	238	89	246	55	4.0
A-7	18.0	12:26:00	632.670	0.240	0.857	0.850	113	240	90	245	53	1.0
A-8	21.0	12:29:00	634.220	0.100	0.357	0.350	121	251	90	248	53	1.0
A-9	24.0	12:32:00	635.220	0.080	0.286	0.280	122	250	91	246	50	1.0
A-10	27.0	12:35:00	636.120	0.070	0.250	0.250	123	250	91	246	50	1.0
A-11	30.0	12:38:00	637.030	0.100	0.357	0.350	124	242	92	245	49	1.0
A-12	33.0	12:41:00	638.110	0.110	0.393	0.390	123	244	92	244	48	1.0
B-1	36.0	12:44:00	639.230	0.780	2.784	2.700	113	239	93	240	47	3.5
B-2	39.0	12:47:00	642.190	0.750	2.677	2.600	110	247	94	245	45	3.5
B-3	42.0	12:50:00	644.960	0.700	2.499	2.500	110	237	95	244	47	3.0
B-4	45.0	12:53:00	647.830	0.770	2.749	2.700	108	245	96	246	47	3.5
B-5	48.0	12:56:00	650.810	0.750	2.677	2.700	108	240	97	245	48	3.5
B-6	51.0	12:59:00	653.790	0.630	2.249	2.200	110	242	98	245	48	2.5
B-7	54.0	13:02:00	656.510	0.770	2.749	2.700	109	251	98	244	48	3.0
B-8	57.0	13:05:00	659.490	0.900	3.213	3.200	109	245	99	245	48	4.0
B-9	60.0	13:08:00	662.730	0.850	3.034	3.000	108	250	100	248	48	4.0
B-10	63.0	13:11:00	665.880	0.780	2.784	2.800	110	244	101	244	49	3.5
B-11	66.0	13:14:00	668.920	0.830	2.963	3.000	109	246	101	245	49	4.0
B-12	69.0	13:17:00	672.020	0.800	2.856	2.900	109	244	101	244	50	4.0
Last Pt	72.0	13:20:00	675.130									
Last Pt	72.0	13:20:00	675.130						Maximum Vacuum			4.0
Average Values				0.63		2.21	113.2	244	93.3	245	50	

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento - Lactalis	Date	2/18/2013
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Run #	2
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	111	°F
Avg Gas Meter Temp	(t_m)	93	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.81	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	8.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.8435	acfm
DP to DH Isokinetic Factor	(K)	3.57	

Sampling Equipment			
Meter #	1203080		
Meterbox Cal. Factor	(Y)	1.001	
Nozzle #	BH1/4"		
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{ni})	0.2471	in
Probe # / Length	BH5'SS	5'	ft
Liner Material	SS		
Sample Case / Oven #	BH1		
Impinger Case #	BH1		

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg
Absolute Meter Pressure	(P_m)	27.83	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid	na	ft^3/min	@	na	in Hg
Post	0.005	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?		☑	Orsat OK?		☐

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	13:30:00	675.700	0.710	2.535	2.500	115	248	101	244	45	4.0
A-2	3.0	13:33:00	678.520	0.760	2.714	2.700	114	247	101	245	48	5.0
A-3	6.0	13:36:00	681.500	0.800	2.857	2.900	115	244	101	246	49	5.0
A-4	9.0	13:39:00	684.490	0.880	3.142	3.100	114	244	102	247	52	7.0
A-5	12.0	13:42:00	687.660	0.910	3.249	3.300	115	246	102	248	53	7.0
A-6	15.0	13:45:00	690.780	0.930	3.321	3.300	114	245	102	250	53	7.0
A-7	18.0	13:48:00	694.270	0.250	0.893	0.890	115	248	102	249	55	6.0
A-8	21.0	13:51:00	696.090	0.100	0.357	0.400	115	245	102	248	57	3.0
A-9	24.0	13:54:00	697.110	0.090	0.321	0.320	113	246	102	246	57	3.0
A-10	27.0	13:57:00	698.030	0.080	0.286	0.290	113	249	102	244	58	2.0
A-11	30.0	14:00:00	699.120	0.100	0.357	0.400	114	250	103	246	55	3.0
A-12	33.0	14:03:00	699.840	0.100	0.357	0.400	114	249	103	248	55	3.0
B-1	36.0	14:06:00	701.360	0.790	2.821	2.800	113	247	103	248	53	7.0
B-2	39.0	14:09:00	704.210	0.760	2.714	2.700	114	249	103	247	50	7.0
B-3	42.0	14:12:00	707.320	0.750	2.678	2.700	113	244	103	246	51	6.5
B-4	45.0	14:15:00	710.340	0.800	2.857	2.900	115	251	104	246	51	7.0
B-5	48.0	14:18:00	713.350	0.710	2.535	2.500	114	247	104	247	51	6.5
B-6	51.0	14:21:00	716.190	0.640	2.285	2.300	114	252	105	248	53	6.0
B-7	54.0	14:24:00	718.950	0.720	2.571	2.500	114	249	105	247	53	6.0
B-8	57.0	14:27:00	721.730	0.800	2.857	2.900	112	245	106	248	53	6.0
B-9	60.0	14:30:00	724.670	0.900	3.214	3.200	113	249	106	249	53	7.0
B-10	63.0	14:33:00	727.820	0.840	2.999	3.000	115	247	106	248	53	7.0
B-11	66.0	14:36:00	730.980	0.860	3.071	3.100	113	242	106	246	53	7.0
B-12	69.0	14:39:00	734.100	0.800	2.857	2.900	112	245	105	246	54	7.0
Last Pt	72.0	14:42:00	737.120									
Final Value	72.0	14:42:00	737.120							Maximum Vacuum		7.0
Average Values				0.63		2.25	114	247	103	247	53	
								175				

ISOKINETIC SAMPLING DATA

Plant Name	Sorrento - Lactalis	Date	2/18/2013
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Run #	3
# of Points Across	12	# of Ports Used	2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C_p)	0.840	
Avg Stack Temp	(t_s)	115	°F
Avg Gas Meter Temp	(t_m)	101	°F
DH @ 0.75 SCFM	($\Delta H@$)	1.81	in H_2O
Avg Pitot Tube Diff. Pressure	(Δp_{avg})	0.60	in H_2O
Stack Moisture Content	(B_{ws})	8.0	%
Stack Dry Molecular Weight	(M_{ds})	29.00	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.8531	acfm
DP to DH Isokinetic Factor	(K)	3.60	

Sampling Equipment			
Meter #	1203080		
Meterbox Cal. Factor	(Y)	1.001	
Nozzle #	BH1/4"		
Actual Nozzle Diameter	(D_{na})	0.2500	in
Req. Nozzle Diameter	(D_{nl})	0.2471	in
Probe # / Length	BH5'SS	5'	ft
Liner Material	SS		
Sample Case / Oven #	BH1		
Impinger Case #	BH1		

Pressures			
Barometric Pressure	(P_b)	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	in Hg
Absolute Meter Pressure	(P_m)	27.83	in Hg

ΔV_m		Leak Checks			
Pre	0	ft^3/min	@	15	in Hg
Mid	na	ft^3/min	@	na	in Hg
Post	0	ft^3/min	@	15	in Hg
ΔV_m <	0.020	ft^3/min	☑	Leak Check OK?	
Pitot OK?	☑		Orsat OK?	☐	

Traverse Point #	Sampling Time (Θ)	Clock Time	Dry Gas Meter Reading (V_m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH)	Actual Orifice ΔH (ΔH)	Stack Temp (t_s)	Probe Temp (t_p)	Meter Outlet Temp (t_{mo})	Filter Temp	Impinger Exit Temp	Pump Vacuum
	min	hh:mm:ss	ft^3	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	in Hg
A-1	0.0	14:58:00	738.600	0.72	2.59	2.60	112	251	104	246	52	4.0
A-2	3.0	15:01:00	741.470	0.76	2.73	2.70	113	246	104	247	54	4.0
A-3	6.0	15:04:00	744.470	0.81	2.91	2.90	114	247	104	246	55	4.0
A-4	9.0	15:07:00	747.370	0.85	3.06	3.10	115	249	105	249	56	5.0
A-5	12.0	15:10:00	750.740	0.91	3.27	3.20	114	251	104	248	56	5.0
A-6	15.0	15:13:00	753.760	0.90	3.24	3.20	113	248	105	250	57	5.5
A-7	18.0	15:16:00	756.910	0.30	1.08	1.10	114	249	105	248	55	3.0
A-8	21.0	15:19:00	759.040	0.12	0.43	0.43	115	247	105	246	52	3.0
A-9	24.0	15:22:00	760.220	0.09	0.32	0.32	114	246	105	247	50	3.0
A-10	27.0	15:25:00	761.140	0.07	0.25	0.25	115	247	105	248	50	3.0
A-11	30.0	15:28:00	762.110	0.09	0.32	0.32	115	248	105	249	51	3.0
A-12	33.0	15:31:00	763.170	0.10	0.36	0.36	114	249	105	245	51	3.0
B-1	36.0	15:34:00	764.470	0.72	2.59	2.60	114	250	105	248	50	3.0
B-2	39.0	15:37:00	767.340	0.75	2.70	2.70	113	247	105	248	47	3.0
B-3	42.0	15:40:00	769.980	0.70	2.52	2.50	113	245	105	248	47	3.0
B-4	45.0	15:43:00	772.920	0.80	2.88	2.90	111	243	105	248	48	3.5
B-5	48.0	15:46:00	776.020	0.75	2.70	2.70	111	245	105	247	49	3.5
B-6	51.0	15:49:00	779.020	0.69	2.48	2.50	111	247	105	248	50	3.5
B-7	54.0	15:52:00	781.900	0.76	2.73	2.70	110	242	105	248	50	3.5
B-8	57.0	15:55:00	784.790	0.92	3.31	3.30	114	246	105	247	50	4.0
B-9	60.0	15:58:00	788.110	0.84	3.02	3.00	117	247	106	249	51	3.5
B-10	63.0	16:01:00	791.200	0.77	2.77	2.80	116	245	105	248	51	3.5
B-11	66.0	16:04:00	794.210	0.82	2.95	2.90	114	247	105	248	51	3.5
B-12	69.0	16:07:00	797.250	0.80	2.88	2.80	113	247	106	247	51	4.0
Last Pt	72.0	16:10:00	800.210									
Final Value	72.0	16:10:00	800.210							Maximum Vacuum		5.5
Average Values				0.6267		2.25	114	247	105	248	51	
								176				

APPENDIX C
CALCULATED EMISSION RATES

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	GP Toleto, OR	Date	02/18/13
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Stack Type	Circular

M5/202

Historical Data						
Run Number		1	2	3	Average	
Run Start Time		12:08	13:30	14:58		hh:mm
Run Stop Time		13:20	14:42	16:10		hh:mm
Meter Calibration Factor	(Y)	1.001	1.001	1.001		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	$(V_m)_i$	614.400	675.700	738.600		ft^3
Final Meter Volume	$(V_m)_f$	675.130	737.120	800.210		ft^3
Total Meter Volume	(V_m)	60.730	61.420	61.610	61.253	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	$(t_m)_{avg}$	93.3	103.3	104.9	100.5	°F
Average Stack Temperature	$(t_s)_{avg}$	113.2	113.9	113.5	113.5	°F
Barometric Pressure	(P_b)	27.70	27.70	27.70	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	27.70	27.70	27.70	in Hg
Average Orifice Pressure Drop	$(\Delta H)_{avg}$	2.21	2.25	2.25	2.23	in H_2O
Absolute Meter Pressure	(P_m)	27.86	27.87	27.87	27.86	in Hg
Avg Square Root Pitot Pressure	$(\Delta p^{1/2})_{avg}$	0.7516	0.7538	0.7536	0.7530	$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	74.0	71.0	87.0	77.3	ml
Impinger Weight Gain	(W_n)	10.0	9.0	8.0	9.0	g
Total Water Volume Collected	(V_{lc})	84.0	80.0	95.0	86.3	ml
Standard Water Vapor Volume	$(V_w)_{std}$	3.955	3.766	4.472	4.064	scf
Standard Meter Volume	$(V_m)_{std}$	54.026	53.672	53.683	53.794	dscf
Calculated Stack Moisture	$(B_{ws(calc)})$	6.82	6.56	7.69	7.02	%
Saturated Stack Moisture	$(B_{ws(svp)})$	10.26	10.46	10.36	10.36	%
Reported Stack Moisture Content	(B_{ws})	6.82	6.56	7.69	7.02	%
Gas Analysis Data						
Carbon Dioxide Percentage	($\%CO_2$)					%
Oxygen Percentage	($\%O_2$)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	($\%N_2$)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.25	28.28	28.15	28.23	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	46.20	46.33	46.41	46.31	ft/sec
Stack Cross-Sectional Area	(A_s)	6.97	6.97	6.97		ft^2
Actual Stack Flow Rate	(Q_{aw})	19322	19378	19411	19370	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	989	990	993	991	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	15353	15423	15272	15350	dscfm
Percent of Isokinetic Rate	(I)	99.9	98.8	99.8	99.5	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	1.00	1.70	1.00	1.23	mg
Mass of Particulate in Acetone	(m_a')	1.39	1.01	0.32	0.91	mg
Mass Due to Backhalf	(W_a)	4.40	5.20	3.40	4.33	mg
Total Mass of Particulates	(m_n)	6.79	7.91	4.72	6.47	mg
Stack Particulate Concentration	(c_s)	0.000	0.000	0.000	0.000	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.0019	0.0023	0.0014	0.0019	gr/dscf
Particulate Emission Rate	(E)	0.2552	0.3007	0.1776	0.2445	lbs/hr
	(E)					lbs/ton BLS
	(E)	#DIV/0!	#DIV/0!	#DIV/0!		lbs/ADTP
Production Rate	(PR)					ton BLS/hr
Production Rate	(PR)					ADTP/hr

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	GP Toleto, OR	Date	02/18/13
Sampling Location	Nampa, ID	Project #	Whey Dryer
Operator	Homer	Stack Type	Circular

M5 only

Historical Data						
Run Number		1	2	3	Average	
Run Start Time		12:08	13:30	14:58		hh:mm
Run Stop Time		13:20	14:42	16:10		hh:mm
Meter Calibration Factor	(Y)	1.001	1.001	1.001		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	($(V_m)_i$)	614.400	675.700	738.600		ft^3
Final Meter Volume	($(V_m)_f$)	675.130	737.120	800.210		ft^3
Total Meter Volume	(V_m)	60.730	61.420	61.610	61.253	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	($(t_m)_{avg}$)	93.3	103.3	104.9	100.5	°F
Average Stack Temperature	($(t_s)_{avg}$)	113.2	113.9	113.5	113.5	°F
Barometric Pressure	(P_b)	27.70	27.70	27.70	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	27.70	27.70	27.70	in Hg
Average Orifice Pressure Drop	($(\Delta H)_{avg}$)	2.21	2.25	2.25	2.23	in H_2O
Absolute Meter Pressure	(P_m)	27.86	27.87	27.87	27.86	in Hg
Avg Square Root Pitot Pressure	($(\Delta p^{1/2})_{avg}$)	0.7516	0.7538	0.7536	0.7530	$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	74.0	71.0	87.0	77.3	ml
Impinger Weight Gain	(W_n)	10.0	9.0	8.0	9.0	g
Total Water Volume Collected	(V_{lc})	84.0	80.0	95.0	86.3	ml
Standard Water Vapor Volume	($(V_w)_{std}$)	3.955	3.766	4.472	4.064	scf
Standard Meter Volume	($(V_m)_{std}$)	54.026	53.672	53.683	53.794	dscf
Calculated Stack Moisture	($B_{ws(calc)}$)	6.82	6.56	7.69	7.02	%
Saturated Stack Moisture	($B_{ws(svp)}$)	10.26	10.46	10.36	10.36	%
Reported Stack Moisture Content	(B_{ws})	6.82	6.56	7.69	7.02	%
Gas Analysis Data						
Carbon Dioxide Percentage	($\%CO_2$)					%
Oxygen Percentage	($\%O_2$)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	($\%N_2$)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.25	28.28	28.15	28.23	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	46.20	46.33	46.41	46.31	ft/sec
Stack Cross-Sectional Area	(A_s)	6.97	6.97	6.97		ft^2
Actual Stack Flow Rate	(Q_{aw})	19322	19378	19411	19370	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	989	990	993	991	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	15353	15423	15272	15350	dscfm
Percent of Isokinetic Rate	(I)	99.9	98.8	99.8	99.5	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	1.00	1.70	1.00	1.23	mg
Mass of Particulate in Acetone	(m_a')	1.39	1.01	0.32	0.91	mg
Mass Due to Backhalf	(W_a)	0.00	0.00	0.00	0.00	mg
Total Mass of Particulates	(m_n)	2.39	2.71	1.32	2.14	mg
Stack Particulate Concentration	(c_s)	0.000	0.000	0.000	0.000	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.0007	0.0008	0.0004	0.0006	gr/dscf
Particulate Emission Rate	(E)	0.0898	0.1030	0.0497	0.0808	lbs/hr
	(E)					lbs/ton BLS
	(E)	#DIV/0!	#DIV/0!	#DIV/0!		lbs/ADTP
Production Rate	(PR)					ton BLS/hr
Production Rate	(PR)					ADTP/hr

METHOD 5 - DETERMINATION OF PARTICULATE EMISSIONS - RESULTS

Plant Name	GP Toleto, OR	**Date**	02/18/13
Sampling Location	Nampa, ID	**Project #**	Whey Dryer
Operator	Homer	**Stack Type**	Circular

Historical Data						
Run Number		1	2	3	**Average**	
Run Start Time		12:08	13:30	14:58		hh:mm
Run Stop Time		13:20	14:42	16:10		hh:mm
Meter Calibration Factor	(Y)	1.001	1.001	1.001		
Pitot Tube Coefficient	(C_p)	0.840	0.840	0.840		
Actual Nozzle Diameter	(D_{na})	0.250	0.250	0.250		in
Stack Test Data						
Initial Meter Volume	$(V_m)_i$	614.400	675.700	738.600		ft^3
Final Meter Volume	$(V_m)_f$	675.130	737.120	800.210		ft^3
Total Meter Volume	(V_m)	60.730	61.420	61.610	61.253	ft^3
Total Sampling Time	(Θ)	72.0	72.0	72.0	72.0	min
Average Meter Temperature	$(t_m)_{avg}$	93.3	103.3	104.9	100.5	°F
Average Stack Temperature	$(t_s)_{avg}$	113.2	113.9	113.5	113.5	°F
Barometric Pressure	(P_b)	27.70	27.70	27.70	27.70	in Hg
Stack Static Pressure	(P_{static})	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	(P_s)	27.70	27.70	27.70	27.70	in Hg
Average Orifice Pressure Drop	$(\Delta H)_{avg}$	2.21	2.25	2.25	2.23	in H_2O
Absolute Meter Pressure	(P_m)	27.86	27.87	27.87	27.86	in Hg
Avg Square Root Pitot Pressure	$(\Delta p^{1/2})_{avg}$	0.7516	0.7538	0.7536	0.7530	$(in\ H_2O)^{1/2}$
Moisture Content Data						
Impingers Water Volume Gain	(V_n)	74.0	71.0	87.0	77.3	ml
Impinger Weight Gain	(W_n)	10.0	9.0	8.0	9.0	g
Total Water Volume Collected	(V_{lc})	84.0	80.0	95.0	86.3	ml
Standard Water Vapor Volume	$(V_w)_{std}$	3.955	3.766	4.472	4.064	scf
Standard Meter Volume	$(V_m)_{std}$	54.026	53.672	53.683	53.794	dscf
Calculated Stack Moisture	$(B_{ws(calc)})$	6.82	6.56	7.69	7.02	%
Saturated Stack Moisture	$(B_{ws(svp)})$	10.26	10.46	10.36	10.36	%
Reported Stack Moisture Content	(B_{ws})	6.82	6.56	7.69	7.02	%
Gas Analysis Data						
Carbon Dioxide Percentage	($\%CO_2$)					%
Oxygen Percentage	($\%O_2$)					%
Carbon Monoxide Percentage	(%CO)					%
Nitrogen Percentage	($\%N_2$)					%
Dry Gas Molecular Weight	(M_d)	29.00	29.00	29.00	29.00	lb/lb-mole
Wet Stack Gas Molecular Weight	(M_s)	28.25	28.28	28.15	28.23	lb/lb-mole
Calculated Fuel Factor	(F_o)					
Fuel F-Factor	(F_d)	0	0	0	0	dscf/mmBtu
Percent Excess Air	(%EA)					%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(v_s)	46.20	46.33	46.41	46.31	ft/sec
Stack Cross-Sectional Area	(A_s)	6.97	6.97	6.97		ft^2
Actual Stack Flow Rate	(Q_{aw})	19322	19378	19411	19370	acfm
Wet Standard Stack Flow Rate	(Q_{sw})	989	990	993	991	wkscfh
Dry Standard Stack Flow Rate	(Q_{sd})	15353	15423	15272	15350	dscfm
Percent of Isokinetic Rate	(I)	99.9	98.8	99.8	99.5	%
Emission Rate Data						
Mass of Particulate on Filter	(m_f)	0.00	0.00	0.00	0.00	mg
Mass of Particulate in Acetone	(m_a')	0.00	0.00	0.00	0.00	mg
Mass Due to Backhalf	(W_a)	4.40	5.20	3.40	4.33	mg
Total Mass of Particulates	(m_n)	4.40	5.20	3.40	4.33	mg
Stack Particulate Concentration	(c_s)	0.000	0.000	0.000	0.000	g/dscf
O_2 Correction	(c_s)					gr/dscf (O2 Corr)
	(c_s)	0.0013	0.0015	0.0010	0.0012	gr/dscf
Particulate Emission Rate	(E)	0.1654	0.1977	0.1279	0.1637	lbs/hr
	(E)					lbs/ton BLS
	(E)	#DIV/0!	#DIV/0!	#DIV/0!		lbs/ADTP
Production Rate	(PR)					ton BLS/hr
Production Rate	(PR)					ADTP/hr

M202

APPENDIX D
CALCULATIONS

Sorrento Meyer Stamer Run 1 2/11/13

MANUAL METHOD 5 CALCULATIONS

Y (DGM CALIBRATION FACTOR):	1.001	
C_p (PITOT TUBE COEFFICIENT):	.84	
NOZZLE DIAMETER:	.25	in.
STACK DIMENSION:	35.75	in.
BAROMETRIC PRESSURE P_b:	27.70	in. Hg.
STACK STATIC PRESSURE:	0	in. H_2O
OXYGEN CONTENT:	—	%
CARBON DIOXIDE CONTENT:	—	%
CARBON MONOXIDE CONTENT:	—	%
POST RUN LEAK RATE:	0	cfm
SAMPLING TIME:	72	min.
AVG. DGM VACUUM:	4	in. Hg.
AVG. STACK TEMPERATURE:	113.2	°F
AVG. SQ. ROOT OF □P:	.7516	
AVG. ORIFICE PRESS. (□H):	2.21	in. H_2O
GAS SAMPLE VOLUME V_m:	60.73	dscf
AVG. DRY GAS METER TEMP:	93.3	°F
FIBERGLASS FILTER WEIGHT:		gms
PROBE & NOZZLE WASHINGS:		gms
IMPINGER (BACK HALF) WEIGHT:		gms
ACETONE WASH BLANK:	—	gms
IMPINGER MOISTURE VOLUME:	74	mls
SILICA GEL WEIGHT INCREASE:	10	gms
PRODUCTION RATE:	—	#/hr
BTU HEAT INPUT:	—	mmBTU/hr

CONSTANTS & CALCULATIONS

T_s (Absolute average stack gas temperature)= 460 + T_S = 460 + 113.2 = 573.2 °R

T_m (Absolute average DGM temperature) = 460 + Avg. DGM Temp. = 460 + 93.3 = 553.3 °R

T_{std} (Standard absolute temperature) = 528 °R

P_s (Absolute stack gas pressure) = P_b + (P static÷13.6 in H_2O/in Hg)= 27.7 + (0 ÷13.6)= 27.70 in Hg

P_{std} (Standard absolute pressure) = 29.92 in Hg

40CFR 60 APP. A, Method 5, Sect. 6.3 Eq. 5-1

DGM $V_{m\,(std)}$= V_m x Y x T_{std}/T_m x (P_m/P_{std}) = 60.73 x1.001 x528÷ 553.3 x(27.86 ÷29.92)= 54.097 dscf

V_{lc} (Total volume of liquid collected)= impingers + silica gel = 74 + 10 = 84 mls

K_2 (water constant for density, ideal gas, molecular weight, etc.)= .04707

40CFR 60 APP. A, Method 5, Sect. 6.4 Eq. 5-2

V_w (std) (Water vapor volume corrected to std. conditions)= V_{lc} x K_2 = 84 x .04707 = 3.954 scf

40CFR 60 APP. A, Method 5, Sect. 6.5 Eq. 5-3

B_{ws} (Water vapor in gas proportioned by volume)=$V_w \div (V_{m(std)}+V_w)$=3.954 ÷(3.954 + 54.07)= .068207

MOISTURE CONTENT OF STACK GAS = (100 x B_{WS}) = 100 x .068207 = 6.8207 %H_2O

N2% = 100 - %O2 - %CO2 - %CO = 100 - _____ - _____ - _____ = _____ %

Mw_{dry} = 0.44 x CO_2% + 0.32 x O_2% + 0.28(N_2% + CO%)
= 0.44 x _____ + 0.32 x _____ + 0.28 x (_____ + _____) = assumed 29 lb/lb-mole

MW_{wet} = MW_{dry} x(1- B_{ws}) + 18 lb/lb-mole x B_{ws}= 29 x (1 - .068207) + 18 x .068207 = 28.25 lb/lb-mole

40CFR 60 APP. A, Method 2, Sect. 5.3 Eq. 2-10

V_s (stack velocity)= K_p x 60 sec/min x C_p x $(\sqrt{\square P})_{avg}$ x $\sqrt{[T_s \div (P_s \times MW_{wet})]}$
where K_p = 85.49 fps x [(lb/lb-mole) x (in. Hg) ÷ (°R) x (in. H_20)]^{½}
= 85.49 x 60 x .84 x .7516 x √[573.2 ÷ (27.70 x 28.25)]= 2771.64 fpm

A_{stack} = π x Dia.^{2}÷ 4 ÷ 144 = 3.14159 x 35.75 ^{2} ÷ 4 ÷ 144 = 6.971 ft^2

Q_a (Actual volumetric stack gas flow rate)= A_{stack} x V_s = 6.971 x 2771.64 = 19,320.4 acfpm

Q_{sd} (Dry standard volumetric stack gas flow rate) = (1-B_{ws}) x Q_a x (528 ÷ T_s) x (P_s ÷ 29.92)=
= (1 - .068207) x 19320.4 x (528 ÷ 573.2) x (27.70 ÷ 29.92) = 15352.6 acfpm

A_n (Area of stack sampling nozzle)= π x $(Dia_{nozzle} \div 12)^2 \div 4$ = 3.14159 x (.25 ÷ 12)^2 ÷ 4= .000341 ft^2

40CFR 60 APP. A, Method 5, Sect. 6.11.1 Eq. 5-7

ISOKINETIC VARIATION=100xT_sx(K_3xV_{lc}+(V_mxY÷T_m)x(P_b+□H÷13.6))÷(Time xV_sxP_sxA_n):
where K_3 = 0.002669 in Hg-ft^3/ml-°R

=100x 573.2 x [0.002669 x 84 + (62.73 x 1.001 ÷ ~~573.2~~ 553.3) x
(27.70 + 2.21 ÷ 13.6)] ÷ (.72 x 2771.64 x 27.70 x .000341)= 99.93 %
27.86 1884.3

$W_{totol\ Particulate}$ = Fiberglass Filter Weight + Probe and Nozzle Washing + Impinger (Back Half) + Acetone Wash Blank = .001 + .0139 + .00044 + _____ = .00678 gms

40CFR 60 APP. A, Method 5, Sect. 6.9 Eq. 5A-5

PARTICULATE CONCENTRATION= $W_{Total\ Part.}$ x K_1 ÷ $V_{m\ (std)}$: where K_1=15.43 grains/ft^3 ÷ 1 g/ft^3

= 100679 x 15.43 ÷ 54.017 = .00194 gr/dscf

PARTICULATE EMISSIONS RATE= 60 min/hr x Part Con. x Q_{sd} ÷ K_4 : where K_4=7000 grains/lb

= 60 x 100194 x 1535216 ÷ 7000 = 0.255 lb/hr

40CFR 60.284(c)3

PARTICULATE CONCENTRATION @ 15% O2=Part Con. x(20.9-15) ÷(20.19-O2%)

= _____ x (20.9-15) ÷ (20.9 - _____)= _____ gr/dscf

APPENDIX E
QUALITY RECORDS

2013 Nozzle Calibration Sheet SS						
Date:	1/23/2013		Calibrated by:		MK	
Nozzle ID	**D1 (inches)**	**D2 (inches)**	**D3 (inches)**	**Delta D (in)**	**D avg**	
BH1/8"-1	0.128	0.127	0.125	0.001	**0.127**	0.1250
BH1/8"-2	0.126	0.125	0.123	0.001	**0.125**	0.1250
BH1/8"-3	0.127	0.126	0.127	0.001	**0.127**	0.1250
BH5/32"-1	0.156	0.157	0.159	0.001	**0.157**	0.1563
BH5/32"-2	0.155	0.158	0.157	0.001	**0.157**	0.1563
BH5/32"-3	0.158	0.155	0.156	0.001	**0.156**	0.1563
BH3/16"-1	0.189	0.187	0.188	0.001	**0.188**	0.1875
BH3/16"-2	0.188	0.188	0.188	0.001	**0.188**	0.1875
BH3/16"-3	0.187	0.189	0.188	0.001	**0.188**	0.1875
BH7/32"-1	0.218	0.217	0.218	0.001	**0.218**	0.2188
BH1/4" 1	0.251	0.250	0.251	0.002	**0.251**	0.2500
BH1/4" 2	0.249	0.251	0.252	0.002	**0.251**	0.2500
BH1/4" 3	0.249	0.250	0.248	0.002	**0.249**	0.2500
BH1/4" 4	0.252	0.250	0.251	0.002	**0.251**	0.2500
BH1/4" 5	0.244	0.242	0.243	0.002	**0.243**	0.2500
BH1/4" 6	0.241	0.240	0.242	0.002	**0.241**	0.2500
BH1/4" 7	0.248	0.247	0.249	0.002	**0.248**	0.2500
BH9/32"-1	0.286	0.284	0.283	0.001	**0.284**	0.2813
BH9/32"-2	0.282	0.281	0.283	0.001	**0.282**	0.2813
BH5/16"-1	0.316	0.312	0.314	0.001	**0.314**	0.3125
BH5/16"-2	0.313	0.310	0.312	0.001	**0.312**	0.3125
BH11/32"-1	0.347	0.347	0.347	0.002	**0.347**	0.344
BH11/32"-2	0.346	0.346	0.348	0.002	**0.347**	0.344
BH3/8"-1	0.375	0.375	0.376	0.001	**0.375**	0.3750
BH3/8"-2	0.369	0.368	0.372	0.001	**0.370**	0.3750
BH13/32"-1	0.403	0.405	0.407	0.001	**0.405**	0.4063
BH7/16"-1	0.437	0.435	0.434	0.003	**0.435**	0.4375
BH7/16"-2	0.430	0.431	0.428	0.003	**0.430**	0.4375
BH1/2"-1	0.500	0.504	0.500	0.001	**0.501**	0.5000
BH1/2"-2	0.500	0.501	0.501	0.001	**0.501**	0.5000
BH9/16"-1	0.561	0.562	0.559	0.002	**0.561**	0.5625
BH5/8"-1	0.625	0.625	0.627	0.002	**0.626**	0.625
BH11/16"-1	0.687	0.687	0.688	0.001	**0.516**	0.688
BH1/2"-1	0.499	0.502	0.501	0.001	**0.501**	0.5000
BH1/2"-2	0.501	0.500	0.504	0.001	**0.502**	0.5000
HITPBH-9/32-2	0.274	0.277	0.272	0.001	**0.274**	0.2813
HITPBH-27/64-'	0.420	0.421	0.420	0.001	**0.420**	0.4219
BH13/32	on order					

2012 Probe / S-Type Pitot Cals

Date: 8/28/2012 Calibrated by: MK

	Dimensions			Alignment						Pitot to probe components				
BH Probe	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	P-0.500"	Pitot to Sheath	Pitot to T/C	Perpendicular to Probe	Meets criteria for Cp = 0.84
BH#1-3'ss	0.378	0.251	0.251	1°	1°	1°	1°	0	0	0.498	0.438	0.412	0.156	Yes
BH#2-3'ss	0.376	0.247	0.247	1°	1°	1°	1°	0	0	0.494	0.429	0.414	0.161	Yes
BH#1-4'HT	0.378	0.251	0.251	2°	2°	1°	1°	0	0	0.498	0.441	0.418	0.221	Yes
BH#1-5'ss	0.379	0.250	0.250	0	0	0	0	0	0	0.494	0.530	0.429	0.197	Yes
BH#1-6'ss	0.380	0.249	0.249	2°	2°	2°	2°	0	0	0.491	0.297	0.376	0.209	Yes
BH#2-6'ss	0.376	0.251	0.251	0	0	0	0	0	0	0.481	0.289	0.368	0.211	Yes
BH#3-6'ss	0.380	0.249	0.249	0	0	0	0	0	0	0.491	0.297	0.373	0.214	Yes
BH#4-6'ss	0.379	0.252	0.252	1°	1°	0	0	0	0	0.492	0.288	0.379	0.196	Yes
BH#5-6'ss	0.381	0.250	0.250	0	0	0	0	0	0	0.497	0.286	0.371	0.207	Yes
BH#6-6'ss	0.379	0.249	0.249	1°	1°	1°	1°	0	0	0.496	0.288	0.376	0.202	Yes
BH#1-7'ss	0.380	0.250	0.250	2°	2°	0	0	0	0	0.486	0.396	0.418	0.210	Yes
BH#2-7'ss	0.382	0.250	0.250	1°	1°	1°	0	0	0	0.490	0.393	0.404	0.218	Yes
BH#1-8'HT	0.379	0.251	0.251	1°	1°	0	0	0	0	0.490	0.399	0.408	0.210	Yes
BH#2-8'ss	0.383	0.253	0.253	0	0	0	0	0	0	0.488	0.414	0.419	0.222	Yes
BH#1-10'ss	0.386	0.253	0.253	2°	2°	0	0	0	0	0.490	0.403	0.415	0.212	Yes
BH#2-10'ss	0.382	0.252	0.252	1°	1°	0	0	0	0	0.492	0.413	0.423	0.223	Yes
BH#1-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.417	0.216	Yes
BH#2-16'ss	0.378	0.250	0.250	0	0	0	0	0	0	0.497	0.421	0.419	0.216	Yes

	Dimensions			Alignment						
BH S-Type	(Dτ)	(PA)	(PB)	$A_1 < 10°$	$A_2 < 10°$	$B_1 < 5°$	$B_2 < 5°$	Z	W	CP - 0.84
BH#1-4'ss	0.38	0.248	0.248	0	0	0	0	0	0	Yes
BH#1-7'ss	0.380	0.251	0.251	0	0	0	0	0	0	Yes
BH#1-10'ss	0.380	0.248	0.248	0	0	0	0	0	0	Yes

8/28/2012									
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 3' #1 Probe	32	**0**		206	**-2**		390	**-4**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 3' #2 Probe	39	**7**		204	**-4**		392	**-2**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 4' Hi-Temp Probe	31	**-1**		207	**-1**		382	**-12**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 5' Probe	35	**3**		205	**-3**		389	**-5**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #1 Probe	38	**6**		206	**-2**		391	**-3**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #2 Probe	34	**2**		208	**0**		397	**3**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #3 Probe	34	**2**		206	**-2**		394	**0**	
NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 6' #4 Probe	36	**4**		203	**-5**		395	**1**	

NIST Thermometer I.D.:		E93-486							
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
MFB 7' #1 Probe	33	**1**		205	**-3**		387	**-7**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 7' #2 Probe	32	**0**		203	**-5**		393	**-1**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 10' #1 Probe	35	**3**		206	**-2**		389	**-5**	
Calibration date:		8/28/2012							
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	208	N/A	10.02	394	N/A	12.81
BH 10' #2 Probe	36	**4**		205	**-3**		389	**-5**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #1	32	**0**		207	**-3**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #2	31	**-1**		208	**-2**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #3	33	**1**		206	**-4**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Impinger Exit #4	31	**-1**		207	**-3**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #1	31	**-1**		206	**-4**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #2	31	**-1**		205	**-5**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #3	30	**-2**		206	**-4**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
BH Filter Oven #4	31	**-1**		204	**-6**	

Calibration date:		8/28/2012				
Temp.	Test	Difference	Acceptance	Test	Difference	Acceptance
Device	Value	(°K)	Criteria (+/-)	Value	(°K)	Criteria (+/-)
NIST	32	N/A	7.38	210	N/A	10.05
	31	**-1**		205	**-5**	
Meter Box #906017						

APEX INSTRUMENTS REFERENCE METER VERIFICATION

USING WET-TEST METER #11AE6

2-POINT ENGLISH UNITS

Calibration Meter Information	
WTM Model #	AL20
WTM Serial #	11AE6
WTM Gamma	0.9999
Original 15Pt Gamma	0.9986

Calibration Conditions		
Date / Time	13-Jan-12	3:15
Barometric Pressure	29.55	in Hg
Calibration Tech	EW	
DGM Serial Number	S-110-1019226	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K_1	17.647	°R/in Hg

Calibration Data												Results		
	Metering Console						Calibration Meter					Dry Gas Meter		
												Calibration Factor		Flowrate
Run Time Elapsed (Θ) min	DGM Input Pressure (P_m) in H_2O	Volume Initial (V_{mi}) cubic feet	Volume Final (V_{mf}) cubic feet	Volume Sample (V_m) cubic feet	Outlet Temp Initial (t_{mi}) °F	Outlet Temp Final (t_{mf}) °F	Volume Initial (Vw_i) cubic feet	Volume Final (Vw_f) cubic feet	Volume Sample (V_w) cubic feet	Outlet Temp Initial (t_{wi}) °F	Outlet Temp Final (t_{wf}) °F	Previous (Y)	Current (Y)	Std & Corr ($Q_{std(corr)}$) cfm
6.00	-3.8	801.491	807.622	6.131	77.0	77.0	237.070	243.050	5.980	71	71	0.9959	0.9958	0.979
											Variation	0.01%	must be less than 1.5%	
10.00	-2.3	807.622	813.325	5.703	77.0	78.8	243.050	248.660	5.610	71	71	0.9989	1.0022	0.551
											Variation	0.33%	must be less than 1.5%	

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, App A, Method 5, Paragraph 7.1.2.2, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature [illegible] Date 1/13/12

APEX INSTRUMENTS
METHOD 5 XC-522 CONSOLE CALIBRATION
for
Bighorn Env. Quality

Meter Console Information	
Console Model Number	XC-522
Console Serial Number	1208030
DGM Model Number	S-110
DGM Serial Number	975563

Calibration Conditions			
Date	Time	13-Aug-12	1:15
Barometric Pressure		30.00	in Hg
Calibration Technician		Eric Waters	
Calibration Meter Gamma		0.9999	

Standardized Factors/Conversions		
Temperature	528	R
Pressure	29.92	in Hg
K_1	17.647	R/in Hg

Calibration Data

Run Time	Metering Console						Calibration Meter				
	DGM Orifice ΔH	Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Final	Sample Volume	Outlet Temp Initial	Outlet Temp Final
Elapsed θ minutes	P_m in H_2O	V_{mi} cubic feet	V_{mf} cubic feet	V_m cubic feet	t_{ci} °F	t_{cf} °F	V_{wi} cubic feet	V_{wf} cubic feet	V_w cubic feet	t_{wi} °F	t_{wf} °F
5.00	5.00	760.796	767.136	6.340	83	84	224.425	230.740	6.315	77	77
6.00	3.00	743.798	749.658	5.860	83	83	207.500	213.340	5.840	77	77
7.00	2.00	749.658	755.250	5.592	83	83	213.340	218.905	5.565	77	77
10.00	1.00	755.250	760.796	5.546	83	83	218.905	224.425	5.520	77	77
15.00	0.50	737.928	743.798	5.869	83	83	201.660	207.500	5.840	77	77

Results

Standardized Data: Dry Gas Meter		Calibration Meter		Calibration Factor		Dry Gas Meter: Flowrate	$\Delta H_@$	
$V_{m(std)}$ cubic feet	$Q_{m(std)}$ ft^3/min	$V_{w(std)}$ cubic feet	$Q_{w(std)}$ ft^3/min	Value Y	Variation ΔY	Std & Corr $Q_{m(std)(corr)}$ ft^3/min	0.75 SCFM $\Delta H_@$ in H_2O	Variation $\Delta\Delta H_@$
6.251	1.250	6.225	1.245	0.9958	-0.005	1.245	1.768	-0.044
5.755	0.958	5.757	0.959	1.0003	-0.001	0.959	1.788	-0.024
5.479	0.783	5.486	0.784	1.0013	0.000	0.784	1.787	-0.025
5.420	0.542	5.441	0.544	1.0039	0.003	0.544	1.853	0.041
5.729	0.382	5.757	0.384	1.0048	0.004	0.384	1.863	0.051
				1.0012	Y Average		1.812	$\Delta H_@$ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is ±0.02

Note: For $DH_@$, orifice pressure differential that equates to 0.75cfm (0.0212m³/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +-0.2inches (5.1mm) H_2O.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Pressure Wet Test Meter # 1141 G, which in turn was calibrated using the American Gas Prover # 157, certified 05/26/2008 using Pi Tape S/N 20700139, which is traceable to the National Bureau of Standards. (NIST)

Signature: Eric Waters

Date: 13-Aug-12

APEX INSTRUMENTS • 204 Technology Park Lane • Fuquay-Varina, NC 27526 • (919) 557-7110

00014

DGM Y Determination (critical orifice method)

Date:	2/18/2013	Train ID:	1208030
K' factor:	0.58281		
Critical Orifice ID:	63		

Dry Gas Meter		Run Number 1	2	3
Final reading	ft^3	810	815	820
Initial reading	ft^3	805	810	815
Difference, Vm	ft^3	5	5	5
Inlet temps:				
Initial	F	102	102	103
Final	F	102	103	103
Outlet temps:				
Initial	F	102	102	103
Final	F	102	103	103
Avg. temp	F	102	102.5	103
Time	sec	376	377	378
Orifice reading	in H2O	1.9	1.9	1.9
Bar. Pressure	in Hg	27.7	27.7	27.7
Ambient temp.	F	97	97	97
Pump vacuum	in Hg	18	18	18
Vm(std)	ft^3	4.37	4.37	4.36
Vcr(std)	ft^3	4.29	4.30	4.31
DGM cal factor Y		0.981	0.985	0.988
Avg DGM cal factor			0.985	

CLIENT:	Sirrente					
SOURCE:	Meyer	Stemmer	Prop.			
DATE:	2/19/13					
POST TC CALIBRATION CHECK						
Probe ID	**Reference Temp**		**TC reading**	**Date**		
BH5'	49		46	2/18		
NOx CONVERTER CHECK						
Bottle ID	Conc	Time	Actual reading		w/in 90%	
	NA					
Cyclonic Flow check <20 deg						
	✓					
Method 16A Temp Checks						
Item	Setting	Beg Temp	End Temp			
Probe						
Filter	NA					
Heated Line						
Stratification Check (if needed)						
		Avg.	Abs Difference			
Point #1 (16.7%)			#DIV/0!			
Point #2 (50%)	NA		#DIV/0!			
Point #3 (83.3 %)			#DIV/0!			
Average of 3 points		#DIV/0!				
			Complete		**Date**	
Post DGM calibration check complete			✓		2/18	
Pitot tube visual inspection			✓		2/18	
Water or Actetone Blank collected			✓		2/18	

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

Bighorn Environmental
2021 N. Chase Rd.
Liberty Lake, WA 99019

CERTIFICATE OF SERVICE AND CALIBRATION

The measurement and test equipment initialed and dated on the QCS Report of Service and Calibration #39590 has been serviced and calibrated by Quality Control Services using test standards that are traceable to the National Institute of Standards and Technology (N.I.S.T.) through QCS master standard #1550.01. Unless otherwise noted in the comments section of the report, all measurement and test equipment meets or exceeds customer calibration tolerances.

Technician Signature: _____ **Date:** 7·10·2012

Technician Signature: _____ **Date:** _____

PTID: BIGE01

Smoke School Inc

EPA Reference Method 9 Certification Card

Michael Keating

Cert. No. SS-S09-48 Exp. Date 2013-08-12

Certified Reader's Signature

Smoke School Inc. President

FIGURE 1.4

SOURCE EMISSION TEST CERTIFICATION

Test Team Report Reviewer

I hereby certify that I have reviewed this report and find it to be true and accurate, and in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control to the best of my knowledge.

Name Jim Homer
(Print)

Signature _____ Date 3/15/13

Affiliation Bishop Environmental

FIGURE 1.3

SOURCE EMISSION TEST CERTIFICATION

Test Team Leader

I hereby certify that the test detailed in this report was accomplished in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control. The results submitted herein are accurate and true to the best of my knowledge.

Name Tim Hamer
(Print)

Signature _____ Date 3/15/13

Affiliation Bighorn Environmental

APPENDIX F
PRODUCTION DATA

DEQ testing. WPC dryer 02 / 18 / 2013				
Time	**Dryer speed (Wet side)** **--> Lbs/min**	**Powder Flow (wet side * 0.29 (** solids **) * 1.045** (humudity left in the product) **--> Lbs / min**	**Pressure differential on baghouse** **--> Inches of water**	
12:10 pm	70	21.21	0	Run 1
12:25 pm	70	21.21	0	
~~12:50 pm~~ 12:40	70	21.21	~~0~~	
12:55 pm	70	21.21	~~0~~	
1:10 pm	70	21.21	~~0~~	
1:25 pm	70	21.21	~~0~~	Run 2
1:40 pm	70	21.21	~~0~~	
1:55 pm	70	21.21	~~0~~	
2:10	70	21.21	~~0~~	
2:25	70	21.21	~~0~~	
2:40	71	21.52	~~0~~	Run 3
2:55	71	21.52	~~0~~	
3:10	71	21.52	~~0~~	
3:25	71	21.52	~~0~~	
3:40	70	21.21	~~0~~	
3:55	70	21.21	~~0~~	
4:10	70	21.21	0	

--> DATA needs to be record every 15 min.

PM/PM10 limit 1.6 lb/hr

APPENDIX G
IDEQ CORRESPONDENCE

January 30, 2013

Mr. Thomas Krinke
Department of Environmental Quality
1445 N. Orchard Street
Boise, ID 83706-2239

RE: Sorrento Lactalis Nampa, ID Source Test Plan

Dear Mr. Krinke:

Please allow this letter to serve as notification that Bighorn Environmental Air Quality, LLC is scheduled to perform source testing at Sorrento Lactalis Nampa, ID facility. This testing is required to satisfy the source testing required in Sorrento Lactalis Permit to Construct.

Purpose of Tests: To determine the compliance status of the facility as required by Sorrento Lactalis Permit #P-2009.0023, Section 2.10.

Source Contact: Wendy York (208) 463-6674; PO Box 1280, Nampa, ID 83653

Sources, Parameters, and Test Dates: The following table outlines parameters and proposed test dates.

SOURCE NAME	PARAMETERS	TEST DATES
Meyers-Sterner Baghouse (P-1)	PM_{10}, Opacity, Velocity & Moisture	February 18

If testing dates change, Bighorn personnel will call you soon after scheduling the new dates.

Test Methods: Testing will be conducted in accordance with the following EPA Methods *in Title 40 CFR 51 & 60, Appendix M & A, July 2012.*

Flow Rates:	EPA Methods 1 & 2
Moisture:	EPA Method 4
PM/CPM:	EPA Method 5/202 (all PM to be counted as PM_{10})
Opacity:	EPA Method 9

Discussion of Methods: EPA Methods 1 & 2 will be used to determine flow rates. A check of the stack to verify the flow is non-cyclonic will be conducted before the test. Opacity readings will be conducted during each run using EPA Method 9. Smoke School Inc. certified the opacity observers in February 2013. Since the stack gas is essentially ambient air (no combustion gases) an assumed MW of 29 will be used as outlined in Method 2, Section 8.6 for ambient sources. The Method 5/202 will use the "new" Method 202 with back-half filter and nitrogen purge.

Data Collection: Bighorn uses standard forms, which contain all required regulatory data and any additional information necessary for flow rate and particulate determinations. Also, Bighorn uses standard analytical forms for opacity, particulate filter and silica gel records. Sorrento Lactalis personnel will collect the production/process

data required by permit condition, to show the source was operated at the maximum throughput rates stipulated in Section 3.11.2 of the permit. Please see the attachments for sample data sheets and calculations.

Source Description: WPC (Whey Protein concentrate) is produced at Sorrento Lactalis mozzarella cheese plant in Nampa, Idaho and processed through 3 different membrane processing equipment. The liquid WPC is fed into a high-pressure pump, which sprays the product at 2,500 psi into a drying chamber at the rate of 3,200 lb/hr at 31% T.S (total solids). The product is atomized in the drying chamber and the rate of water removal from the atomization is 2,100lb/hr. The powder is conveyed thru the drying tube below the main chamber and dropped into the main cyclone of the dyer. The air from the chamber is exhausted into the baghouse and through the stack on the roof. The product is transferred from the large cyclone and transferred into the small cyclone above the sifter with the powder-conveying fan. The air from the powder-conveying fan is exhausted into the bottom of the bag house and the residual powder is augured into the powder conveying fan line and returned back to the small cyclone. The powder that is collected on the bags in the bag house is air pulsed every 3 seconds per bank of bag filters and the residual powder is also collected by the auger in the bottom of the bag house and sent back to the small cyclone which leads to the sifter. The powder is packaged and sealed for human consumption.

Sampling Replicates and Duration: Bighorn will conduct tests consisting of three 60-minute runs for PM (with a minimum of 31.8 dscf) and three runs of six-minute averages for opacity as required by permit.

QC/QA: Cross checks such as manual calculations of Bighorn's computer generated spreadsheet summaries allow test results verification. Bighorn files manufacturers' accuracy certificates and interference tables for CEMS, flow controllers, gases, etc. Additionally dry gas meters, pitot tubes, thermocouples, gas dividers, etc. are certified as per EPA requirements and frequencies. Where EPA frequencies are not specified, Bighorn has established those based on state regulatory criteria.

Thorough sample methodology adherence, chain-of-custody procedures, and documentation provide proof of our QA/QC efforts. Relevant QA/QC documentation is included in the final report's Appendices for results support and regulatory review. Please see the attachments for further discussion of QA/QC procedures.

Standard Source Sampling Language

a. It is assumed today, but will be confirmed on or before the test day, that the duct air flow measuring meets criteria in EPA Methods 1 and 2.
b. In no case, will sampling replicates be accepted if separated by a time duration of 24 or more hours, unless prior authorization is granted.
c. The sources to be tested must operate at a normal production rate during testing. Rates not in agreement with those stipulated in the Permit can result in test rejection for application to determine facility compliance. Imposed process limitations could also result from atypical rates.
d. The department must be notified of any changes in source test plans prior to testing. Significant changes not acknowledged by DEQ which could affect the accuracy and reliability of results could result in test report rejection.
e. Method specific quality assurance/quality control procedures must be performed to ensure the data is valid for determining source compliance. Documentation of the procedures and results shall be presented in the source test report for review. Omission of this critical information may result in rejection of the data, requiring a re-test.
f. Source test reports must be submitted to the department within 30 days of the test dates, unless another deadline has been stipulated, either by permit condition, or by DEQ letter approval.

Please call me at 541-954-4697 if you have any questions.

Sincerely,

Tim Homer
Air Emissions Lab Manager

Attachments-Sample Data and QA/QC forms

cc: Wendy York

QUALITY CONTROL OUTLINE

A) Equipment Calibration

The meter box dry gas meter (DGM) will be calibrated within six months before the test against a standard DGM, which has been calibrated against a NIST traceable wet test meter (calibrated yearly). In addition a post DGM calibration will be conducted using a critical orifice at the average Delta H and maximum meter vacuum recorded during the testing.

Thermocouples will be calibrated against a NIST traceable thermometer within six months of the testing at three distinct points including an ice bath, boiling water and a recovery furnace stack that is approximately 350 ° F.

Probes and their attached S-type pitot tubes are calibrated as outlined in EPA Method 2 within six months of the test date.

The probe nozzles have been calibrated and measured prior to their use in the field.

The aneroid barometer is calibrated against a mercury barometer before each field assignment.

B) Laboratory Analysis

All samples are returned to the lab for analysis. Prior to each weighing the scale (accurate to 0.1mg) is calibrated with NIST traceable S class weights. The filters are oven dried for a minimum of three hours and weighed. The probe rinse is evaporated in a breaker and then desiccated for at least 24 hours before weighing. It is then returned to the desiccator and re-weighed at 6 hours intervals until a constant weight (± 0.5 mg) is achieved. Acetone blanks are prepared and analyzed in the same manner as the probe wash.

C) Sampling

A pre and post run leak check of the entire sampling train is performed in conjunction with each test run.

A pitot leak check is also conducted for each test run.

Thermocouples are checked against ambient conditions to determine field integrity.

Impinger contents are measured at the conclusion of each run to determine stack gas moisture.

The probe is rinsed following procedures outlined in the method and the rinse transferred to polyethylene bottles and the liquid level marked.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550

C.L. "Butch" Otter, Governor
Curt Fransen, Director

February 13, 2013

Ms. Wendy York
Safety and Environmental Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Ave.
Nampa, ID 83653-1230

Re: Review of the Meyer-Sterner Whey Dryer Performance Test Protocol for Sorrento Lactalis, Inc.; Facility ID No. 027-00071

Dear Ms. York:

On January 31, 2013, the Department of Environmental Quality (DEQ) received a test protocol, prepared by Bighorn Environmental Air Quality, LLC, for particulate matter and opacity testing to be conducted on the Meyer-Sterner whey dryer. Testing is to be conducted pursuant to Permit to Construct No. P-2009.0023 as modified August 28, 2009.

DEQ has reviewed the submitted test protocol and hereby approves it with the following comments.

1. Compliance with the PM_{10} emissions limit on the whey dryer stack shall be determined by summing the results of Methods 5 (filterable emissions) and 202 (condensible emissions).
2. The opacity observations shall include a minimum of 30 observations (7.5 minutes) during each test run, in accordance with permit condition 2.6.
3. The test shall be conducted at worst-case normal operating conditions in accordance with IDAPA 58.01.01.157.02.a. To document the operating conditions during the test, the production rate of finished whey product from the dryer must be monitored and recorded at least once every 15 minutes, unless a totalizing type meter is used, in which case recording the beginning and ending readings for each test run is sufficient for documenting the production rate during testing.

The testing is scheduled for February 18, 2013. If the testing dates change, you must notify DEQ at least 15 days prior to the new test date; if necessary, please do so by contacting me. If you have any questions, or if I can be of assistance to you, please call me at (208) 373-0419 or Zach Klotovich at (208) 373-0295.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer

c: Tim Homer, Bighorn Environmental Air Quality, LLC
Zach Klotovich, Technical Services Division
Marilyn Seymore, Air Quality Division

Printed on Recycled Paper

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
Curt Fransen, Director

January 6, 2014

Ms. Wendy York
Safety and Environmental Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Ave.
Nampa, ID 83653-1230

Re: Review of the Meyer-Sterner Whey Dryer Particulate Matter Performance Test Conducted by Sorrento Lactalis, Inc., on February 18, 2013; Facility ID No. 027-00071

Dear Ms. York:
On March 21, 2013, the Department of Environmental Quality (DEQ) received a performance test report, prepared by Bighorn Environmental Air Quality, LLC, for the Meyer-Sterner whey dryer operated by Sorrento Lactalis, Inc., in Nampa, Idaho. The purpose of the tests was to demonstrate compliance with the requirements of Permit to Construct No. P-2009.0023 issued August 28, 2009. The performance test was conducted on February 18, 2013. On November 6, 2013, DEQ issued a comment letter regarding the test report. On December 20, 2013, DEQ received a response to the comment letter.

On January 31, 2013, DEQ received a test protocol. DEQ conditionally approved the protocol in a letter dated February 13, 2013. DEQ did not observe the test.

Based on a review of the submitted test report, DEQ has determined the particulate matter test on the Meyer-Sterner whey dryer and associated cyclone and baghouse demonstrated compliance with the emission limits listed in Permit to Construct No. P-2009.0023 during the test period. A summary of the test results is provided in Table 1.

Table 1. Meyer-Sterner Whey Dryer Test Results, as Measured February 18, 2013.

Source	Measured PM_{10} emission rate (lb/hr)	PM_{10} Emissions Limit (lb/hr)	Measured emissions as % of emissions standard	Measured Opacity	Opacity Standard
Meyer Sterner whey dryer baghouse stack	0.2[a]	1.6	13%	0%	20%

a) PM_{10} emissions are reported as a sum of EPA Methods 5 and 202.

Permit Condition 2.10.3 states:

> If the PM_{10} emissions measured in the performance test is less than or equal to 75 percent of the permitted PM_{10} emission limits in this permit, a source test shall be required every five years. If the PM_{10} emissions measured during the performance test is greater than 75 percent, but less than or equal to 90 percent of the

> permitted PM_{10} emission limit in this permit, a source test shall be required every three years after issuance of this permit. If the PM_{10} emissions measured during the performance test is greater than 90 percent of the permitted PM_{10} emission limit in this permit, the permittee shall conduct a performance test annually.

In accordance with Permit Condition 2.10.3, the Meyer-Sterner whey dryer stack shall be tested within five years. **Therefore, the next test on the Meyer-Sterner whey dryer scrubber shall be conducted no later than February 18, 2018.**

The average production rate of whey during emissions testing was ~1,322 pounds (dry) per hour, which is approximately 66% of the 2,000 lb/hr dry whey production rate limit in the permit. The December 13, 2007 test review letter on the Meyer-Sterner whey plant dryer limited the maximum allowable operating rate of the dryer to 1,496 lb/hr, which was established as 120% of the operating rate attained during the October 2007 test. **DEQ accepts the 1,322 pound per hour dry whey production rate as representative of worst-case normal operating conditions, in accordance with IDAPA 58.01.01.157.02, and DEQ is affirming the 1,496 lb/hr (24-hour average) dry whey production limit until such time that Sorrento Lactalis demonstrates compliance through testing at a higher operating rate.** DEQ will revise the permit to include this operational limit within 30 days of this letter, unless Sorrento Lactalis contacts DEQ to discuss alternatives. Should Sorrento Lactalis accept the permit limit as stated in this letter, no permit fees are required by DEQ to revise the permit. For questions concerning the permitting process, please contact Bill Rogers, Permit Program Coordinator, at 208-373-0437.

The average pressure drop across the baghouse was reported as 0.0 inches of water. Sorrento Lactalis's December 20, 2013 letter explained that the baghouse pressure differential was recorded as zero because "We had replaced the socks in the baghouse just before the tests, so the air was moving freely with no pressure differential. The resolution of the magnahelic (manual, not digital) is only in whole numbers and you can either get 0, 1, 2, 3, ...etc." The baghouse pressure drop is not required to be monitored by the permit, so DEQ has no further comment on this matter.

The highest 3-minute aggregated opacity was 0% on the dryer baghouse stack. The December 20, 2013 response letter included corrected visible emission observation sheets. The sheets were corrected and initialed by the original observer, Mike Keating, who was an employee of Bighorn Environmental. The corrected sheets note that the actual stack height above ground level is 68 feet, whereas the initial run sheets recorded a stack height of 9 feet, which was actually the height above the roof top. The observation sheets were also corrected to indicate that water droplets <u>were present</u>, which explains how Mr. Keating could have observed a "white" plume that resulted in zero percent opacity.

The prior test on the Meyer-Sterner whey dryer stack was conducted October 10, 2007. According to DEQ's December 13, 2007 review letter, "The measured PM_{10} emission rate was 77.1 percent of the permitted emission rate; therefore, the next performance test is to be conducted by October 10, 2010." The recent test was conducted February 18, 2013, which was apparently late. However, DEQ agrees that some confusion was created by DEQ in that Table 1 of the December 13, 2007 letter lists the measured emission rate as 1.2 lb/hr, which equates to 75% of the 1.6 lb/hr emission limit. At 75% of the emission limit, the next test should have been required within 5 years (by October 10, 2012). In addition, P-2009.0023, issued August 28, 2009, states in Permit Condition 2.10.3, "If the PM_{10} emissions measured during the performance test are greater than 75 percent, but less than or equal to 90 percent of the permitted PM_{10} emission limit in this permit, a source test shall be required every three years after issuance of this permit" (emphasis added). The revised permit could be interpreted to reset the test date to 3 years after issuance of the revised permit, which would have been August 28, 2012. DEQ has determined to use its enforcement discretion for the aforementioned test date compliance issue.

Although DEQ intends no further action regarding this matter, you should be aware that any future violations of this type can result in the issuance of a Notice of Violation (NOV) and a monetary penalty.

Please call me at (208) 373-0550 or Zach Klotovich at (208) 373-0295, if you have any questions regarding this performance test review.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer

ec: Zach Klotovich, Technical Services Division
Marilyn Seymore, Air Quality Division
Steve Bacom, Air Quality Division
Bill Rogers, Air Quality Division

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
Curt Fransen, Director

December 18, 2014

CERTIFIED MAIL #7010 3090 0002 3445 5225
RETURN RECEIPT REQUESTED

Mr. Fabrice Sera
Whey Plant Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Road
Nampa, ID 83687

RE: Review of the TetraPak Whey Dryer Scrubber Particulate Matter Performance Test Conducted by Sorrento Lactalis, Inc. on October 2, 2014; Facility ID No. 027-00071

Dear Mr. Sera:

On November 7, 2014, the Department of Environmental Quality (DEQ) received an emission test report, prepared by JBR Environmental (now Stantec), for the TetraPak whey dryer scrubber operated by Sorrento Lactalis, Inc. (Sorrento), in Nampa, Idaho. The performance test was conducted on October 2, 2014. The purpose of the test was to demonstrate compliance with the limits in Permit to Construct No. P-2009.0023, issued March 13, 2014. Prior testing conducted May 28, 2014 indicated apparent noncompliance with the PM_{10} emission limit.

On August 26, 2014, DEQ received a test protocol. DEQ issued a protocol approval letter with comments on September 3, 2014. DEQ's Zach Klotovich observed a portion of the test during the afternoon of October 2, 2014.

Based on a review of the submitted test report, DEQ has determined that the particulate matter emission test on the TetraPak whey dryer scrubber exhaust stack demonstrated compliance with the PM_{10} emissions limit in P-2009.0023 during the test period. The test results are summarized in Table 1.

Table 1. TetraPak Whey Dryer Scrubber October 2, 2014 Test Summary

Pollutant	Run 1	Run 2	Run 3	**Average Emission Rate**	Emission Limit
PM_{10}[a]	1.01 lb/hr	1.69 lb/hr	1.22 lb/hr	**1.31 lb/hr**	5.66 lb/hr

a) PM_{10} emissions are reported as a sum of EPA Methods 5 (filterable) and 202 (condensible) particulate matter.

Visible emission observations were conducted for 60 minutes during each test run. The highest 3-minute aggregate opacity observed was 5%, which is in compliance with the 20% opacity limit.

Printed on Recycled Paper

Permit Condition 3.11.2 requires that the production rate of "finished whey product in pounds per hour" from the TetraPak whey dryer be recorded during each performance test. The test report included the "Dryer Speed" (finish product) in pounds per hour. The dry whey production limit for the TetraPak whey dryer is 16,667 lb/hr, based on a 24-hour average. The average dryer production rate recorded during the test was approximately 14,730 lb/hr.

Sorrento Lactalis installed scrubber flow rate and pressure drop monitoring equipment for the TetraPak whey dryer scrubber since the previous test conducted May 28, 2014. The scrubber parameters were monitored and recorded at 15-minute intervals during the test. The average scrubber liquid flow rate was 608 gallons per minute, and the average scrubber pressure drop was 6.8 inches of water.

Please call me at (208) 373-0550, or Zach Klotovich at (208) 373-0295, if you have any questions regarding this performance test review.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer

ec: Wendy York, Sorrento Lactalis
Zach Klotovich, Technical Services Division
Marilyn Seymore, Air Quality Division
Steve Bacom, Air Quality Division

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
Curt Fransen, Director

September 3, 2014

Ms. Wendy York
Safety and Environmental Manager
Sorrento Lactalis, Inc.
4912 E. Franklin Avenue
Nampa, ID 83653-1230

RE: Review of the TetraPak Whey Dryer Scrubber Performance Test Protocol for Sorrento Lactalis
Facility ID No. 027-00071

Dear Ms. York:

On August 26, 2014, the Department of Environmental Quality (DEQ) received a test protocol, prepared by JBR Environmental Consultants, Inc. (now Stantec), for particulate matter and opacity testing to be conducted on the TetraPak whey dryer scrubber stack. This is a re-test of the emission unit to demonstrate compliance with the limits in Permit to Construct No. P-2009.0023, modified March 13, 2014.

DEQ has reviewed the submitted test protocol and provides the following comments:

1. Compliance with the PM_{10} emissions limit on the whey dryer stack shall be determined by summing the results of Methods 5 (filterable emissions) and 202 (condensable emissions).
2. As noted in Wendy York's August 22, 2014 email to William Rogers at DEQ, Sorrento is now monitoring the pressure drop of the wet scrubber by magnehelic gage. Please record the pressure drop across the scrubber at least once during each 15-minute period of the test, in addition to the other operating parameters identified in the test protocol.
3. If Sorrento identifies that an upset condition occurs during a test run, the test should be stopped and the run discarded. Sorrento should then conduct an additional test run to replace any test runs that are discarded due to upset conditions. The test results should be presented as the average of three test runs that are representative of worst-case normal operation.

The testing is scheduled for October 2, 2014. If the testing dates change, you must notify DEQ at least 15 (fifteen) days prior to the new test date. If you have any questions or need to contact DEQ, please call Zach Klotovich at (208) 373-0295, or myself at (208) 373-0419.

Sincerely,

Thomas W. Krinke
Air Quality Compliance Officer

ec: Zach Klotovich, Technical Services Division
Steve Bacom, Air Quality Division
Marilyn Seymore, Air Quality Division

Printed on Recycled Paper

Sorrento Lactalis, Inc.

Nampa Whey Plant

Compliance Test Report

TetraPak Dryer Wet Scrubber

Boise, Idaho

October 2, 2014

Agencies:

Idaho Department of Environmental Quality

Boise Regional Office

1100 West Washington Street

Phoenix, Arizona 85007

Prepared for:

Sorrento Lactalis

4912 Franklin Road

Nampa, Idaho 83684

Prepared by:

JBR, now Stantec

1553 West Elna Rae, Suite 101

Tempe, Arizona 85281

October 29, 2014

CERTIFICATION

This certifies that the data collected and presented herein is true and accurate to the best of our knowledge. All attempts were made to collect and analyze the data within the applicable guidelines established by the United States Environmental Protection Agency and the Idaho Department of Environmental Quality.

Daniel Vandenberg, QSTI	Kathy Houed
Senior Environmental Technician	Environmental Consultant
Test Team Leader	Quality Assurance Supervisor

Table of Contents

1.0 INTRODUCTION 1.1
1.1 SOURCE DESCRIPTION 1.2
1.2 FACILITY AND TEST FIRM INFORMATION 1.2
1.3 TEST FIRM PROJECT SPECIFIC PERSONNEL 1.3

2.0 TEST CHRONOLOGY AND RESULTS SUMMARY 2.1
2.1 TEST CHRONOLOGY 2.1
2.2 TEST RESULTS 2.1

3.0 EMISSION UNIT INFORMATION 3.1
3.1 EMISSION AND CONTROL UNIT DESCRIPTIONS 3.1
3.2 PROCESS CONDITIONS 3.1
3.3 EMISSION POINT INFORMATION 3.1

4.0 TESTING METHODS AND PROCEDURES 4.1
4.1 TESTING METHODS 4.1
4.2 SAMPLING EQUIPMENT DESCRIPTION 4.1
4.3 METHOD DESCRIPTIONS 4.4
4.3.1 EPA Method 1: Sampling and Velocity Traverses for Stationary Sources 4.4
4.3.2 EPA Method 2: Determination of Velocity and Volumetric flow Rates 4.4
4.3.3 EPA Method 3: Determination of CO_2, O_2, and Dry Molecular Weight 4.4
4.3.4 EPA Method 4: Determination of Stack Gas Moisture Content 4.4
4.3.5 EPA Method 5/202: Determination of Total Particulate Emissions 4.4
4.3.6 EPA Method 9: Visual Determination of Opacity 4.5
4.4 METHOD DEVIATIONS 4.5

5.0 QUALITY ASSURANCE / QUALITY CONTROL 5.1

LIST OF TABLES

Table 1 Applicable Regulations and Regulatory Requirements 1.1
Table 2 Facility and Test Firm Information 1.3
Table 3 Source Testing Chronology 2.1
Table 4 Particulate Matter (PM) Emissions Results 2.2
Table 5 Opacity Results 2.2
Table 6 Emission Unit and Control Unit Information 3.1
Table 7 Traverse Point Locations 3.2
Table 8 Test Methods 4.1

LIST OF FIGURES

Figure 1 Sample Port Locations 3.3
Figure 2 Schematic of EPA Methods 5 & 202 Sampling System 4.3

LIST OF APPENDICES

APPENDIX A TEST RESULTS A.1

APPENDIX B FIELD DATA SHEETS B.1

APPENDIX C LABORATORY RESULTS C.1

APPENDIX D FACILITY PROCESS RATES AND OPERATIONAL PARAMETERS D.1

APPENDIX E QUALITY ASSURANCE AND CALIBRATION DATA E.1

1.0 INTRODUCTION

Source emission testing was conducted by JBR, now Stantec (Stantec) at Sorrento Lactalis, Inc. (Sorrento) Nampa Whey Plant located in Nampa, Idaho, in order to determine compliance with applicable permit (P-2009.0023) emission limits on the TetraPak Dryer wet scrubber for particulate matter (PM), particulate matter less than 10 microns nominal aerodynamic diameter (PM10) and opacity. The emission unit and emission species tested during the compliance program along with applicable limits are presented in Table 1. The applicable regulations and regulatory requirements for the emission unit that was tested are presented in Table 2.

This report summarizes data from the testing programs conducted on October 2, 2014. Daniel Vandenberg and Greg Kendall conducted the testing. Mr. Vandenberg served as test team leader.

Table 1 Emission/Control Units, Emission Species and Emission Limits

EMISSION UNITS	EMISSION SPECIES	EMISSION LIMITS
TetraPak Drying Chamber	PM_{10}	≤ 5.66 lb/hr ≤ 24.80 tons/yr [a]
	Visual Opacity	Shall not exceed 20% opacity for a period or periods aggregating more than 3 minutes in a 60-minute period.
[a] Tons per consecutive 12-calender month period.		

Table 1 Applicable Regulations and Regulatory Requirements

IDEQ Permit to Construct (PTC) No. P-2009.0023
Idaho Administrative Procedures Act (IDAPA) Title 58

1.1 SOURCE DESCRIPTION

Dry whey powder is manufactured in the TetraPak whey dryer process equipment. Up to 400,000 pounds per day (lb/day) of (95.5 percent total solid) dried whey powder is produced in this drying process.

The TetraPak whey dryer receives whey concentrate at a rate up to 619,176 lb/day, assuming 62% solids content, from the new evaporator at the plant. The TetraPak whey drying process consists of two 12.5 million British thermal units per hour (MMBtu/hr) natural gas fired burners, a drying chamber, and shaking beds. The two burners heat air that passes into the drying chamber to dry whey. The burners are considered indirect heating devices because the combustion gases do not come in contact with the heated air. Each burner has an exhaust stack (P-2 and P-3) that discharges natural gas combustion products. The heated air dries the whey concentrate as it flows through the drying chamber. The drying chamber exhausts to cyclones where product in air is recovered. The cyclones are considered as process equipment for this application. The purpose of this equipment is to recover solids suspended in air discharged from the dryer, which are returned to the process line. The exhaust from the cyclones passes through a venturi air scrubber (P-4) to control discharge of particulate matter from this process. Product from the drying chamber passes over a conditioning belt onto a shaking bed and then to storage silos. Exhaust air from the shaking bed passes through a baghouse (P-5) to recover product and control discharge of particulate matter to the air.

1.2 FACILITY AND TEST FIRM INFORMATION

Information on the facility location and firms involved with the emissions testing program is provided in Table 3.

Table 2 Facility and Test Firm Information

FACILITY	CONTACT
Sorrento Lactalis, Inc. 4912 Franklin Road Nampa, Idaho 83687	Wendy R. York Safety & Environmental Manager (208) 463-6674
TEST FIRM	**CONTACT**
JBR, now Stantec 1553 West Elna Rae, Suite 101 Tempe, Arizona 85281	Daniel Vandenberg, QSTI Senior Technician 480.829.0457

1.3 TEST FIRM PROJECT SPECIFIC PERSONNEL

The following were the assignments for designated personnel.

Test Team Leader: Daniel Vandenberg served as Stantec's primary contact with Sorrento personnel. Mr. Vandenberg was in charge of all testing activities, daily QA/QC checks, data reduction and validation, and final report preparation. Mr. Vandenberg also performed the EPA Method 9 observations and assisted with the operation of the EPA Method 5/202 metering consoles and sampling trains.

Quality Manager: Kathy Houed was responsible for ensuring that field QA/QC procedures were followed. Mrs. Houed was also responsible for the final report review and approval.

Laboratory Manager: Daniel Vandenberg coordinated in-house laboratory operations. Mr. Vandenberg was responsible for glassware and reagent preparation as well as PM sample analysis.

Support Staff: Greg Kendall provided assistance with the project. The support staff was responsible for operating the metering consoles and sampling trains at the stack outlets, as well as performing the initial flow rate traverse, moving the sample probe, and assisting with the recovery of the sample trains.

2.0 TEST CHRONOLOGY AND RESULTS SUMMARY

2.1 TEST CHRONOLOGY

The chronology of tests that were conducted during the testing program is presented in Table 4.

Table 3 Source Testing Chronology

DATE	TIME	TEST METHODS
10/2/14	0930-1137	EPA Methods 1, 2, 3, 5/202, and 9 – Run 1
10/2/14	1159-1403	EPA Methods 1, 2, 3, 5/202, and 9 – Run 2
10/2/14	1427-1635	EPA Methods 1, 2, 3, 5/202, and 9 – Run 3

2.2 TEST RESULTS

Results of the tests conducted during the compliance program are presented in Tables 5 and 6. Test results are presented in Appendix A. Field data sheets are presented in Appendix B. Laboratory results are presented in Appendix C. Process data are presented in Appendix D. Quality assurance and calibration data are presented in Appendix E.

Table 4 Particulate Matter (PM) Emissions Results

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Date	10/2/14	10/2/14	10/2/14	
Time	0930-1137	1159-1403	1427-1635	
STACK GAS PARAMETERS				
Average Temperature (°F)	111	113	113	112
Moisture Content (%)	5.0	8.1	8.3	7
Volumetric Flow Rate (dscfm)	47,883	49,283	48,265	48,477
FILTERABLE PM EMISSIONS (EPA Method 5)				
Average Concentration (gr/dscf)	0.00115	0.00148	0.000548	0.0011
FILTERABLE AND CONDENSABLE PARTICULATES EMISSIONS (EPA Method 202)				
Average Concentration (gr/dscf)	0.00245	0.00400	0.00295	0.0031
Mass Emission Rate (lb/hr)	1.01	1.69	1.22	**1.3**
				Emission Limit: 5.66 lb/hr

Table 5 Opacity Results

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Date	10/2/14	10/2/14	10/2/14	
Time	1005-1104	1217-1316	1500-1600	
STACK GAS PARAMETERS				
Opacity (%)	0	5	0	**1.7**
Time Opacity > 20% (Minutes)	0	0	0	**0**
				Emission Limit: ≤ 20% except for up to 3 minutes in a 60-minute period

3.0 EMISSION UNIT INFORMATION

3.1 EMISSION AND CONTROL UNIT DESCRIPTIONS

The applicable emission unit and control unit information are presented in Table 7.

Table 6 Emission Unit and Control Unit Information

PROCESS UNIT(S)	CONTROL DEVICE		
	TYPE	MAKE AND MODEL	RATED CAPACITY
TetraPak Whey Dryer	Venturi Wet Scrubber	Fisher Klosterman, Inc. M/N: MS-1200 Scrubber SS316	73,358 acfm

3.2 PROCESS CONDITIONS

All attempts were made to operate the process units at or near maximum production as specified in the operating permit. However, in consideration of the potential for variations in production requirements and operational conditions at the time of the test, these requirements were deemed to be satisfied if the emission unit being tested was operating at or above 90% of its maximum permitted capacity. Plant process data and operational parameters are presented in Appendix D.

3.3 EMISSION POINT INFORMATION

Traverse point locations for testing were determined on-site based on the EPA Method 1 requirements in order to properly characterize any stratification of emissions within the stack. The traverse point locations for the stack outlets are shown in Table 8. The sample port locations and appropriate stack dimensions for the stacks are shown in Figure 1.

Table 7 Traverse Point Locations

24 POINT PARTICULATE TRAVERSE STACK DIAMETER = 61.5 INCHES			
PORT	DISTANCE FROM STACK WALL (IN)	POINT	DISTANCE FROM STACK WALL (IN)
1	1.3	7	39.6
2	4.1	8	46.1
3	7.3	9	50.6
4	10.9	10	54.3
5	15.4	11	57.4
6	21.9	12	60.2

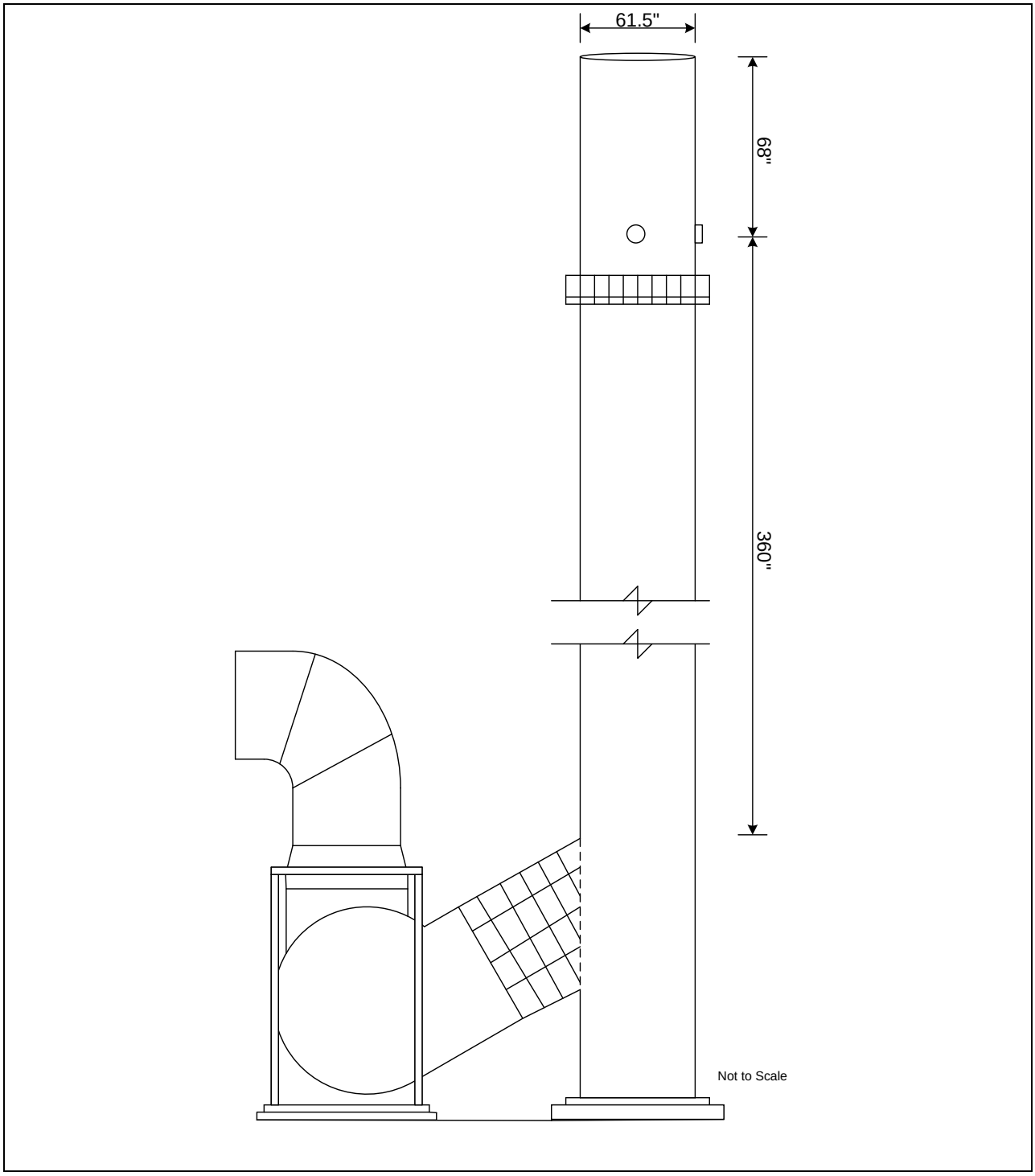


Figure 1 Sample Port Locations

4.0 TESTING METHODS AND PROCEDURES

4.1 TESTING METHODS

The test methods used for each emission unit and emission species are specified in Table 9. Unless deviations are specified in Section 4.4 below, tests conformed to the applicable methodologies specified in 40 CFR Parts 51 and 60 and the U.S. Environmental Protection Agency Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 3.

Particulate testing consisted of three reference method test runs performed on each emission unit. Stack emissions were calculated as the average of the three test runs for comparison with applicable emission limits. Each particulate test run was conducted for a minimum of 120 minutes and a minimum sample volume of 60 dscf was collected.

Visual opacity observations were performed on each emission unit and were conducted concurrently with the particulate matter performance tests. Visible emissions observation runs were performed for 60 minutes.

Table 8 Test Methods

EMISSION SPECIES	TEST METHODS
Sample Site / Traverse Points	EPA Method 1
Volumetric Flow Rates	EPA Method 2
O_2 / CO_2	EPA Method 3
Stack Gas Moisture	EPA Method 4
Particulate Matter (PM / PM_{10})	EPA Method 5 / 202
Visible Opacity	EPA Method 9

4.2 SAMPLING EQUIPMENT DESCRIPTION

The equipment requirements for the sampling train, sample recovery, and analysis of PM_{10} are the same as specified in EPA Methods 5 and 202. The sample probe consisted of a 2" stainless steel, protective outer tube that encased a heated quartz probe liner, thermocouple, and an "S" type Pitot tube assembly. A heated filter assembly was attached at the back end of the probe and connected to an impinger train with an ultra pure, flexible Teflon tube. This sampling

train configuration is similar to the Method 5 conventional train except that it replaces the modular sample unit with a more versatile CATECO heated filter unit. Separating the probe and heated filter from the glassware makes this train ideal for vertical and hard to access testing locations. A diagram of this sampling train is presented in Figure 2.

Stantec performed the nitrogen purge required by EPA Method 202. The nitrogen purge was used for the removal of dissolved sulfur dioxide (SO_2) from the collected sample.

The measurement of velocity and temperature at each traverse point specified by EPA method 1 was conducted in accordance with EPA Method 2. Post-test leak checks of the Pitot tubes were performed as described in Section 8.1 to EPA Method 2.

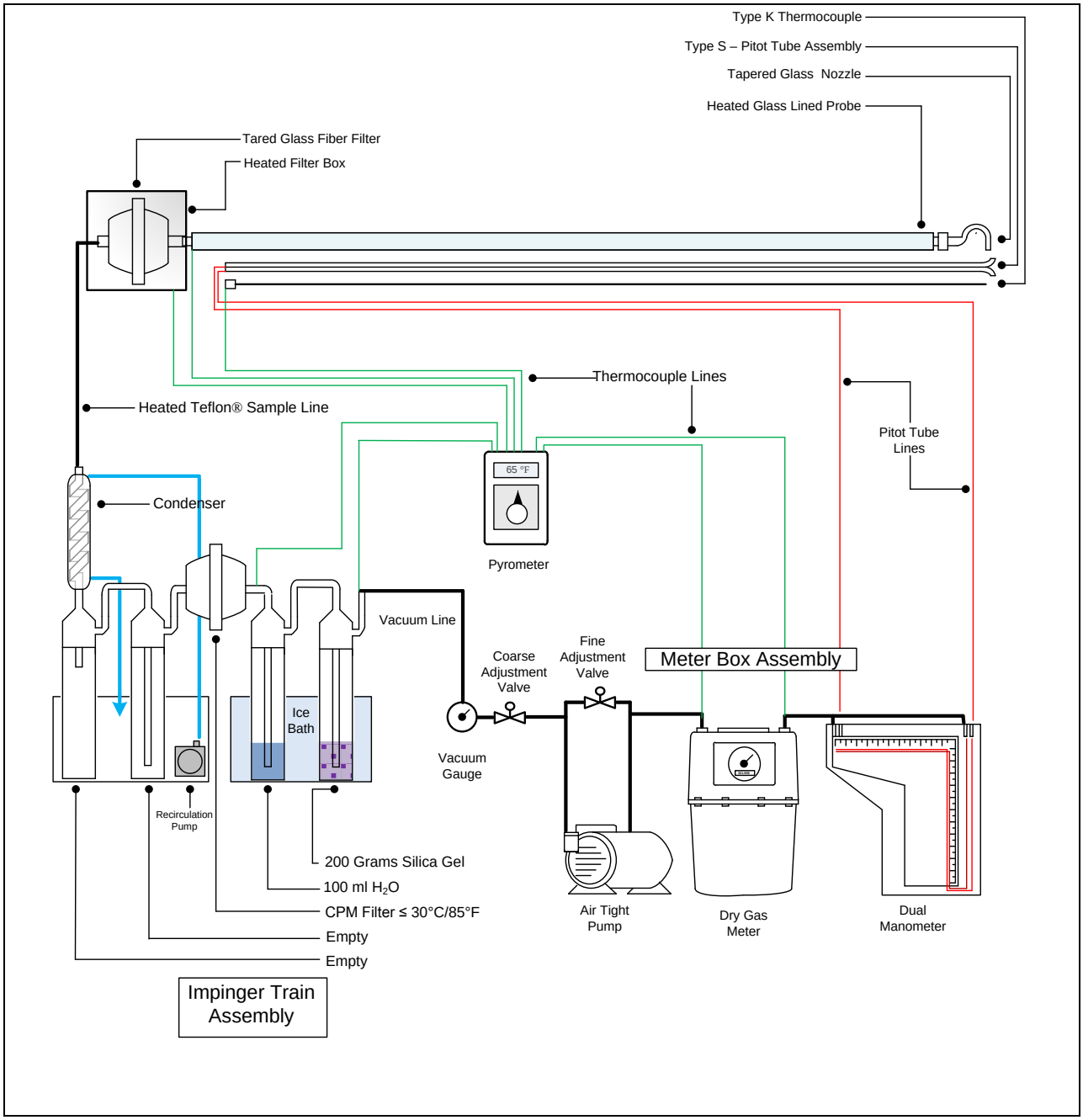


Figure 2 Schematic of EPA Methods 5 & 202 Sampling System

4.3 METHOD DESCRIPTIONS

The following is a brief summary of each of the applicable test methodologies employed during the testing program. Complete method descriptions are presented in the appendices to 40 CFR Parts 51 and 60.

4.3.1 EPA Method 1: Sampling and Velocity Traverses for Stationary Sources

Prior to a source test, a site assessment was performed in order to locate sample points for obtaining the best representative measurements of pollution concentrations and volumetric flow rates. EPA Method 1 takes into account duct area, straight run and cyclonic or stratified flow patterns.

4.3.2 EPA Method 2: Determination of Velocity and Volumetric flow Rates

EPA Method 2 was used to determine stack gas velocity and volumetric flow rates. A calibrated type-S Pitot tube was connected to an inclined manometer and leak checked. Stack gas temperature and manometer displacement (ΔP) were recorded at each traverse point and a duct static pressure was also measured and recorded. Stack gas velocity and volumetric flow rate were calculated in accordance with EPA Method 2.

4.3.3 EPA Method 3: Determination of CO_2, O_2, and Dry Molecular Weight

Concurrent with each particulate sample run, an integrated gas sample was withdrawn through the sample train and collected into a Tedlar bag. The stack gas sample was then analyzed with a Fyrite analyzer for fixed gas composition and determination of stack gas dry molecular weight.

4.3.4 EPA Method 4: Determination of Stack Gas Moisture Content

Stack gas moisture content was determined by removing the moisture from the stack gas by drawing a known amount of stack gas through chilled impingers. Impinger weights were determined prior to and following sampling. Stack gas moisture content was determined from the mass of the water collected and the sample gas volume.

4.3.5 EPA Method 5/202: Determination of Total Particulate Emissions

Preliminary measurements were made prior to conducting the particulate test based on EPA Methods 1 and 2 as described previously. Percent water was determined by a psychrometric chart or from combustion analysis of the stack gases. These preliminary results were used to determine an appropriate nozzle size for isokinetic sampling.

Stack gas samples were drawn isokinetically through a heated probe to a heated, tared filter where particulate matter was removed. The sample was then drawn through a series of four impingers for collection of condensable particulate matter (CPM) and moisture determination.

CPM was collected in the first two impingers of the sampling train, as well as on a CPM filter, located between the second and third impingers. The contents of the condenser, first two impingers, and the front half of the CPM filter housing were extracted with water, acetone, and hexane and the organic and aqueous fractions were taken to dryness and the residues weighed. The total of both fractions represents the total CPM. The particulate mass collected on the CPM filter was also extracted and combined with the organic and aqueous fractions.

4.3.6 EPA Method 9: Visual Determination of Opacity

Visible emissions estimations were made to determine percent opacity by a certified observer following the procedures outlined in 40 CFR Part 60. Field information was recorded and includes: ambient conditions stack location, facility information, plume description, and location of the observer relative to the plume. Observations were recorded to the nearest five percent opacity at 15-second intervals. The minimum distance between the observer and the emission source was 15 feet.

4.4 METHOD DEVIATIONS

During the second half of Run 2 the temperature for the CPM filter holder exceeded the maximum allowable temperature. The technician filling out the data sheet was recording the ambient temperature and not the CPM filter temperature. The mistake was discovered after Run 2 was completed. The impinger exit temperature was below 68 degree for the entire run.

The following deviations were requested in the test protocol and approved by IDEQ prior to conducting the test.

Stantec performed the post-test meter box calibrations based on the guidelines of EPA Alternative Method 009. The alternative post-test calibration procedure is based on the principles of the optional pretest orifice meter coefficient check in Section 4.4.1 of Method 5. The alternative calibration procedure is highly desirable for two reasons: (1) it eliminates questions about the possibility of the damage to the metering system occurring during transport and (2) it eliminates travel costs for a retest if the metering system fails the post-test calibration.

5.0 QUALITY ASSURANCE / QUALITY CONTROL

Quality assurance procedures were performed in accordance with those listed in the appropriate test method and the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 3. Complete equipment certification and calibration information is presented in Appendix E. The quality assurance procedures included, but were not limited to the following:

- Inspection of the type-S Pitot tube prior to and following use to confirm proper design criteria specified in EPA Method 2,
- Calibration of the stack temperature sensor against an ASTM thermometer prior to sampling,
- Leak checks of the sampling system after each sample run including the sample train, manometers and Pitot tube lines,
- Calibration of the meter box and dry gas meter on a quarterly basis at a minimum,
- Inspection of the calibrated nozzle prior to and after each sample run to ensure its integrity,
- Assurance that the probe and filter holder heaters operated properly,
- Inspection of all glassware to ensure cleanliness and lack of contaminants, and
- Preparation and analysis of a full set of field blanks.

Appendix A TEST RESULTS

TEST DATA SUMMARY

Client: Sorrento
Test Date: 2-Oct-14
Emissions Unit: Scrubber
Project No.: 203701005

RUN DATA

	Run 1	Run 2	Run 3	Averages
Test Date	2-Oct-14	2-Oct-14	2-Oct-14	
Start Time	9:30 AM	11:59 AM	2:27 PM	
Stop Time	11:37 AM	2:03 PM	4:35 PM	
Area of Stack (ft^2)	20.63	20.63	20.63	
Nozzle Diameter (in.)	0.225	0.225	0.225	
Nozzle Area (ft^2)	0.00028	0.00028	0.00028	
Pitot Tube Calibration Coefficient (C_p)	0.84	0.84	0.84	
Dry Gas Meter Calibration Factor (Y)	0.9870	0.9870	0.9870	
Dry Gas Meter Delta H@ ("H_2O)	2.1670	2.1670	2.1670	
Barometric Pressure ("Hg)	27.40	27.40	27.40	
Sampling Time (min)	120	120	120	120
Total Dry Gas Volume (dcf)	81.6	86.4	85.8	85
Corrected Dry Gas Meter Volume (dscf)	74.6	76.1	74.7	75
Dry Gas Meter Temperature (°F)	64.5	84.2	90.4	79.7
Dry Gas Meter Temperature (°R)	524.5	544.2	550.4	539.7
Average ΔH ("H_2O)	1.67	1.85	1.78	1.77
Isokinetic Variation (%)	97.0	96.2	96.4	96.6

STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE (Method 2)

	Run 1	Run 2	Run 3	Averages
Average Stack Temperature (°F)	111	113	113	112
Average Stack Temperature (°R)	571	573	573	572
Stack Static Pressure ("H_20)	0.52	0.52	0.52	0.52
Stack Gas Pressure ("Hg)	27.44	27.44	27.44	27.44
Average ΔP ("H_2O)	0.63	0.69	0.67	0.66
Average ΔP Square Root	0.78	0.83	0.81	0.81
Stack Gas Velocity (ft/sec)	48.05	51.21	50.34	49.87
Stack Gas Volumetric Flow Rate (acfm)	59,468	63,390	62,306	61,721
Stack Gas Volumetric Flow Rate (scfm)	50,424	53,605	52,639	52,223
Stack Gas Volumetric Flow Rate (dscfm)	47,883	49,283	48,265	48,477

STACK GAS MOLECULAR WEIGHT (Method 3)

	Run 1	Run 2	Run 3	Averages
Net Volume of O_2 (%)	19.9	19.9	19.9	20
Net volume of CO_2 (%)	0.20	0.20	0.20	0.2
Net Volume of N_2 and CO (%)	79.90	79.90	79.90	79.90
Molecular Weight, Dry (lb/lb-mole)	28.83	28.83	28.83	28.83
Molecular Weight, Wet (lb/lb-mole)	28.28	27.95	27.93	28.06

STACK GAS MOISTURE CONTENT (Method 4)

	Run 1	Run 2	Run 3	Averages
Total Water Collected (g)	134.1	191.9	193.9	173.3
Volume of Rinse (ml)	50.0	50.0	50.0	50.0
Net Volume of Water Collected (ml)	84.1	141.9	143.9	123.3
Corrected Volume of Water Collected (scf)	3.958	6.678	6.772	5.802
Water Vapor (B_{WS})	0.0504	0.0806	0.0831	0.0714
Moisture Factor (1- B_{WS})	0.9496	0.9194	0.9169	0.9286
Stack Moisture (%)	5.0	8.1	8.3	7

PARTICULATE DATA SUMMARY

Client: Sorrento
Test Date: 02-Oct-14
Emissions Unit: Scrubber
Project No.: 203701005

EPA Method 5 Test Results

	Run 1	Run 2	Run 3	Averages
Test Date	2-Oct-14	2-Oct-14	2-Oct-14	
Start Time	9:30 AM	11:59 AM	2:27 PM	
End Time	11:37 AM	2:03 PM	4:35 PM	
Corrected DGM (dscf)	74.571	76.136	74.719	75.142
Stack Flow Rate (dscfm)	47,883	49,283	48,265	48,477

Filterable Particulate Laboratory Results (Method 5)

	Run 1	Run 2	Run 3	Averages
Filter Net Mass Gain (g)	0.0049	0.0064	0.0016	0.0043
Net Mass of Filter Blank (g)	0.0000	0.0000	0.0000	0.0000
Total Filter Mass (g)	0.0049	0.0064	0.0016	0.0043
Probe & Nozzle Acetone Rinse Net Mass (g)	0.0011	0.0012	0.0015	0.0013
Probe & Nozzle Acetone Rinse Volume (ml)	88	58	88	78
Probe & Nozzle Acetone Rinse Blank Net Mass (g)	0.0001	0.0001	0.0001	0.0001
Probe & Nozzle Acetone Rinse Blank Volume (ml)	20	20	20	20
Acetone Density (g/ml)	0.79	0.79	0.79	0.79
Probe & Nozzle Rinse Acetone Blank Concentration (g/g)	0.0000	0.0000	0.0000	0.0000
Probe & Nozzle Acetone Rinse Blank Mass (g)	0.0004	0.0003	0.0004	0.0004
Maximum Acetone Rinse Blank Mass (g)	0.0007	0.0005	0.0007	0.0006
Probe & Nozzle Acetone Rinse Mass (g)	0.0007	0.0009	0.0011	0.0009
Filter, Probe, & Nozzle Acetone Rinse Mass (g)	0.00556	0.00731	0.00266	0.00518
Filter, Probe, & Nozzle Acetone Rinse Mass (mg)	5.560	7.31	2.660	5.18

Filterable Particulate Concentrations and Emission Rates (Method 5)

	Run 1	Run 2	Run 3	Averages
Total Filterable Particulate Concentration (mg/dscf)	0.075	0.096	0.036	0.07
Total Filterable Particulate Concentration (gr/dscf)	0.00115	0.00148	0.000548	0.0011
Total Filterable Particulate Emission Rate (lb/lb)	0.471	0.625	0.227	0.44

Ammonia Correction (Method 202)

	Run 1	Run 2	Run 3	Averages
Volume of NH4OH Titrant (ml)	0.0	0.0	0.0	0.0
Normality of Ammonia Hydroxide Titrant (N)	0.00	0.00	0.00	0.00
Molecular Weight of NH3 (g/mol)	17.03	17.03	17.03	17.03
Mass of NH4+ added to Sample from (NH4)2SO4 (mg)	0.00	0.00	0.00	0.00

PARTICULATE DATA SUMMARY

Client: Sorrento
Test Date: 02-Oct-14
Emissions Unit: Scrubber
Project No.: 203701005

Field Train Recovery Blank (Method 202)

	Run 1	Run 2	Run 3	Averages
Inorganic Fraction Blank Net Mass (g)	0.0012	0.0012	0.0012	0.0012
Organic Fraction Blank Net Mass (g)	0.0029	0.0029	0.0029	0.0029
Field Train Recovery Blank Net Mass (g)	0.004100	0.004100	0.004100	0.00410
Field Train Recovery Blank Net Mass (mg)	2.000	2.000	2.000	2.00
Field Train Recovery Blank Net Mass Not to exceed 2.0 mg				

Total Condensable Particulate Matter (Method 202)

	Run 1	Run 2	Run 3	Averages
Mass of Dried Sample, Inorganic (g)	0.0041	0.0061	0.0059	0.0054
Mass of Dried Sample, Inorganic (mg)	4.10	6.10	5.90	5.4
Mass of Dried Sample, Organic (g)	0.0042	0.0083	0.0077	0.0067
Mass of Dried Sample, Organic (mg)	4.200	8.30	7.70	6.7
Total Mass of CPM (g)	0.00830	0.01440	0.01360	0.0121
Total Mass of CPM (mg)	6.30	12.40	11.60	10.1

Total Condensable Particulate Matter Concentrations and Emission Rates (Method 202)

	Run 1	Run 2	Run 3	Averages
Total CPM Concentration (mg/dscf)	0.0845	0.1629	0.155	0.134
Total CPM Concentration (gr/dscf)	0.001304	0.002513	0.00240	0.0021
Total CPM Concentration (lb/hr)	0.54	1.06	0.99	0.9

Filterable and Condensable Concentrations and Emission Rates

	Run 1	Run 2	Run 3	Averages
Particulate Mass (g)	0.0139	0.0217	0.0163	0.017
Particulate Mass (mg)	11.86	19.71	14.26	15.3
Particulate Concentration (mg/dscf)	0.1590	0.2589	0.191	0.203
Particulate Concentration (gr/dscf)	0.00245	0.00400	0.00295	0.0031
Particulate Concentration (lb/hr)	1.01	1.69	1.22	1.3

Appendix B FIELD DATA SHEETS

METHOD 2 - PRELIMINARY STACK GAS VELOCITY TRAVERSE AND CYCLONIC FLOW CHECK

Stack Shape: C=Circular, R=Rectangular	C
Stack Diameter, (in.)	61.5
Number of Traverse Points	24
Stack Cross-Sectional Area (ft^2)	20.6
Barometric Pressure ("Hg)	27.40
Pitot Tube Calibration Coefficient (Cp)	0.84
Stack Static Pressure	0.52

Traverse Point #	ΔP ("H_2O)	√ΔP ("H_2O)	Stack Temp (°F)	Cyclonic Flow Determination		
				ΔP @ 0°	Angle for ΔP=0	Abs. Angle for ΔP=0
1	1.00	1.00	113	0.00	0.00	0.00
2	1.10	1.05	115	0.00	0.00	0.00
3	1.00	1.00	115	0.00	0.00	0.00
4	0.90	0.95	115	0.00	0.00	0.00
5	0.97	0.98	115	0.00	0.00	0.00
6	0.48	0.69	115	0.00	0.00	0.00
7	0.37	0.61	115	0.00	0.00	0.00
8	0.35	0.59	115	0.00	0.00	0.00
9	0.35	0.59	115	0.00	0.00	0.00
10	0.30	0.55	115	0.00	0.00	0.00
11	0.40	0.63	115	0.00	0.00	0.00
12	0.42	0.65	115	0.00	0.00	0.00
13	0.63	0.79	114	0.00	0.00	0.00
14	0.67	0.82	114	0.00	0.00	0.00
15	0.65	0.81	114	0.00	0.00	0.00
16	0.70	0.84	114	0.00	0.00	0.00
17	0.65	0.81	114	0.00	0.00	0.00
18	0.65	0.81	114	0.00	0.00	0.00
19	0.65	0.81	114	0.00	0.00	0.00
20	0.67	0.82	114	0.00	0.00	0.00
21	0.70	0.84	114	0.00	0.00	0.00
22	0.75	0.87	114	0.00	0.00	0.00
23	0.65	0.81	114	0.00	0.00	0.00
24	0.63	0.79	114	0.00	0.00	0.00
Averages	0.65	0.80	114	0.00	0.00	0.00

Combustion/Ambient Source: C=Combustion, A=Ambient	A
Dry Molecular Weight of Stack Gas Estimate (g/g-mol)	29.00
Percent Moisture in Stack Gas (Estimate) (% H_2O)	7.00%
(1-Bws)	0.9300
Wet stack gas molecular weight	28.23
Stack Temperature (°F)	114
Stack Temperature (°R)	574
Stack Static Pressure ("H_20)	0.52
Stack Gas Pressure ("Hg)	27.44
Avg. Delta P (ΔP)	0.65
Avg. of the Sqrt of Delta P (ΔP)	0.80
Stack Gas Velocity (ft/s)	49.19
Stack Gas Volumetric Flow Rate (dscfm)	47,729

Determination of Moisture by Wet Bulb/Dry Bulb

Dry Stack Temperature (°F)	
Dry Stack Temperature (°C)	
Wet Stack Temperature (°F)	
Wet Stack Temperature (°C)	
Stack Saturated Vapor Pressure (in. Hg)	
Stack Vapor Pressure (in. Hg)	
Stack Gas Moisture Content (%)	

JBR

INITIAL VELOCITY DATA

Client: Sorrento	Stack Diameter (in.): 61.5"	Meter Box ID: 6X	Run #: Pre
Unit: Scrubber	Coupling Length (in.)	Meter Y_d: 0.987	Type of Stack (C/R): C
Location: Equal Id	Static Pressure: +.52	Meter ΔH @: 2.167	Diameter Upstream (A):
Date: 10-2-14	Pbar: 27.4	Pitot Tube C_P: 0.84	Diameter Downstream (B):
Technician: DV 6K	Assumed Moisture: 4%	Pitot Tube #:	No. of Ports: 2

Traverse Points			Port Selection AH																	
			A A				B				C				D			
#	W/O Coup	W Coup	T_s (°F)	ΔP ("H_2O)	ΔP@0° ("H_2O)	Angle For ΔP =0	T_s (°F)	ΔP ("H_2O)	ΔP@0° ("H_2O)	Angle For ΔP =0	T_s (°F)	ΔP ("H_2O)	ΔP@0° ("H_2O)	Angle For ΔP =0	T_s (°F)	ΔP ("H_2O)	ΔP@0° ("H_2O)	Angle For ΔP =0
1			113	1.0	~~2.25~~	25	114	.63	.10	5		2.67				1.68		5
2			115	1.1	~~2.57~~	20		.67	.11	10		2.94				1.79		
3				1.0	.31	20		.65	.07	5		2.67				1.74		
4				.9	.17	15		.7	.09	10		2.9				1.87		
5				.97	.22	15		.65	.11	10		2.59				1.74		
6				.48	.07	10		.65	.11	10		1.28				1.74		
7				.37	.06	10		.65	.05	5		.99				1.74		
8				.35	.05	5		.67	.11	10		.93				1.79		
9				.35	0.00	0		.70	.10	10		.93				1.857		
10				.3	.01	0		.75	.04	5		.80				2.00		
11				.4	.00	0		.66	.07	10		1.07				1.74		
12				.42	.00	0		.63	.12	10		1.12				1.68		

Stack Diagram	Port Location	Additional Information
		Wet Bulb Temp. (°F)
		Dry Bulb Temp. (°F)

METHOD 5 PARTICULATE EMISSION CALCULATIONS

Client: Sorrento
Start Time: 9:30 AM
Stop Time: 11:37 AM
Run 1

Test Date: 02-Oct-14
Emission Unit: Scrubber
Project No.: 203701005

Point #	Run Time	ΔP ("H_2O)	ΔH ("H_2O)	Stack Temperature (°F)	Dry Gas Meter (dcf)	Meter Temperature (°F) In	Meter Temperature (°F) Out	Corrected DGM $V_{m(std)}$ (dscf)	Stack Gas Velocity V_s (ft/sec)	Intermediate Isokinetic Rate (%)	DGM Flow Rate (dcf/min)
Initial					361.500						
1	5	0.55	1.47	116	364.950	51	48	3.243	45.88	107.0	0.69
2	10	0.57	1.52	116	367.935	53	49	2.798	46.71	90.6	0.60
3	15	0.61	1.63	116	371.260	56	50	3.106	48.32	97.3	0.66
4	20	0.61	1.63	116	374.570	58	51	3.083	48.32	96.5	0.66
5	25	0.60	1.60	116	377.880	60	52	3.073	47.92	97.0	0.66
6	30	0.55	1.47	116	381.055	61	54	2.938	45.88	96.9	0.64
7	35	0.67	1.78	116	384.450	63	55	3.136	50.64	93.7	0.68
8	40	0.72	1.92	115	388.053	65	57	3.316	52.45	95.5	0.72
9	45	0.69	1.84	114	391.790	65	56	3.442	51.30	101.2	0.75
10	50	0.64	1.79	115	394.185	66	59	2.197	49.45	67.1	0.48
11	55	0.56	1.49	97	398.480	67	60	3.930	45.53	126.3	0.86
12	60	0.56	1.50	95	401.712	67	61	2.954	45.45	94.8	0.65
13	65	0.99	2.64	114	406.090	68	61	4.010	61.45	98.4	0.88
14	70	1.00	2.67	114	410.255	70	62	3.804	61.76	92.9	0.83
15	75	0.99	2.64	114	414.525	72	63	3.889	61.45	95.4	0.85
16	80	0.94	2.51	114	418.710	74	65	3.796	59.88	95.6	0.84
17	85	0.85	2.27	114	422.685	75	65	3.600	56.94	95.3	0.80
18	90	0.71	1.90	114	426.365	76	67	3.320	52.04	96.2	0.74
19	95	0.45	1.20	114	430.010	76	68	3.279	41.43	119.3	0.73
20	100	0.40	1.07	114	432.835	77	69	2.536	39.06	97.9	0.56
21	105	0.37	0.99	114	435.525	78	70	2.410	37.57	96.7	0.54
22	110	0.36	0.96	113	438.200	79	72	2.389	37.02	97.1	0.54
23	115	0.31	0.83	89	440.655	79	72	2.192	33.63	94.0	0.49
24	120	0.31	0.83	89	443.115	79	73	2.194	33.63	94.1	0.49
Max/Avg.	120	0.63	1.67	111	81.615	64		3.110	48.07	97.4	0.68

METHOD 5 PARTICULATE EMISSION CALCULATIONS

Client:	Sorrento	Test Date:	02-Oct-14
Start Time:	9:30 AM	Emission Unit:	Scrubber
Stop Time:	11:37 AM	Project No.:	203701005
Run	1		

Sampling Time, min	120	Meter Calibration Factor, Y	0.9870	H_2O Collected, ml	134.1
Number of Sample Points	24	Nozzle Area, ft^2	0.00028	Net H_2O Collected, V_{lc}, ml	84.1
O_2, %	19.90	Corrected DGM, $V_{m(std)}$, dscf	74.6	Water Vapor Volume, $V_{w(std)}$, scf	3.96
CO_2, %	0.20	Average ΔP, "H_2O	0.63	Water Vapor, B_{ws}	0.0504
N_2 & CO, %	79.90	Average Square Root ΔP	0.78	Moisture Factor, 1- B_{ws}	0.9496
Barometric Pressure	27.40	Average ΔH, "H_2O	1.67	Dry Molecular Weight, M_d, lb/lb-mole	28.83
Static Pressure, P_g, "H_2O	0.52	Stack Temperature, T_s, °R	571	Wet Molecular Weight, M_s, lb/lb-mole	28.28
Stack Pressure, P_s, "Hg	27.44	Meter Temperature, T_m, °R	524		
Pitot Tube Calibration Coefficient, C_p	0.84	Stack Gas Velocity, V_s, ft/sec	48.05	% Isokinetic	97.0

Impinger Data				Mid Test Leak Checks					
Impinger Content	Final Weight (g)	Initial Weight (g)	Net Weight (g)	Time	DGM Start	DGM Final	Difference		
Empty	742.5	615.1	127.4	0:00	0	0	0	Stack Area, A_s, ft^2	20.63
Empty	640.4	642.0	-1.6	0:00	0	0	0	Stack Flow Rate, acf/min	59,468
H_2O	716.1	720.3	-4.2	0:00	0	0	0	Stack Flow Rate, acf/hr	3,568,057
Silica Gel	904.4	891.9	12.5	0:00	0	0	0	Stack Flow Rate, scf/min	50,424
		Sub Total	134.1			Sum	0	Stack Flow Rate, scf/hr	3,025,468
		Sample Line Rinse	50.0					Stack Flow Rate, dscf/min	47,883
		Total	84.1					Stack Flow Rate, dscf/hr	2,872,988

JBR

Client: Sorrento	Meter Box ID: 6X	Stack Diameter (in.): 61.5"	Test Method: EPA M5/202	Impinger	Final	Initial	Net
Unit: Scrubber	Meter Yd: 0.987	Static Pressure: -0.51	Initial Leak: 0.000 @ 15" Hg	#1	742.5	615.1	
Location: Equal. ID	Meter ΔH @: 2.167	P_{bar}: 27.4	Final Leak: 0.000 @ 7" Hg	#2	640.4	642.0	
Date: 10-2-16	Probe #: 6-2	Assumed Moisture: 7%	Filter Appearance: White	#3	716.7	720.3	
Technician: DV 6K	Liner Material: QTZ	ΔH K-Factor: 2.67	Impinger Appearance: Clear	#4	904.4	891.9	
Run #: R1	Pitot Tube C_p: 0.84	Start Time: 0930	Silica Gel Spent (Y/N): N	#5			
Page 1 of 1	Nozzle Diameter (in.): 0.225	End Time: 1137	Filter #:	#6			

Traverse point number	Sampling time (min)	Vacuum (in Hg)	Velocity head (ΔP)	Orifice (ΔH)	Stack temp (°F)	Sample Volume (ft³)	Dry Gas Meter Temp Inlet (°F)	Dry Gas Meter Temp Outlet (°F)	Probe Temp (°F)	Box Temp (°F)	Impinger Exit Temp (°F)	CFM
						361.500						
1	5	1.5	0.55	1.47	116	364.950	51	48	244	243	42	55
2	10	1.5	0.57	1.52	116	367.935	53	49	253	255	42	56
3	15	2.0	0.61	1.63	116	371.260	56	50	250	249	42	56
4	20	2.0	0.61	1.63	116	374.570	58	51	250	250	42	59
5	25	2.0	0.60	1.60	116	377.880	60	52	250	249	44	59
6	30	2.0	0.55	1.47	116	381.055	61	54	250	250	45	60
7	35	2.0	0.67	1.78	116	384.450	63	55	250	250	46	62
8	40	2.0	0.72	1.92	115	388.055	65	57	250	250	46	63
9	45	2.0	0.69	1.84	114	391.790	65	58	250	250	47	63
10	50	2.0	0.64	1.79	115	394.185	66	59	250	250	47	64
11	55	2.0	0.56	1.495	97	398.480	67	60	250	250	47	64
12	60	2.0	0.56	1.50	95	401.712	67	61	250	249	46	65
13	65	1.5	0.99	2.64	114	406.090	68	61	251	251	50	67
14	70	1.5	1.00	2.67	114	410.255	70	62	250	250	46	68
15	75	1.5	0.99	2.64	114	414.525	72	63	250	251	46	69
16	80	1.5	0.94	2.51	114	418.710	74	65	250	251	47	70
17	85	1.5	0.85	2.27	114	422.685	75	65	250	250	48	72
18	90	1.5	0.71	1.90	114	426.365	76	67	250	251	48	72
19	95	1.0	0.45	1.20	114	430.010	76	68	249	249	49	74
20	100	0.0	0.40	1.07	114	432.835	77	69	251	250	50	77
21	105	0.0	0.37	0.99	114	435.525	78	70	251	250	51	79
22	110	0.0	0.36	0.96	113	438.2	79	72	250	250	52	79
23	115	0.0	0.31	0.83	89	440.655	79	72	249	250	53	78
24	120	0.0	0.31	0.83	89	443.115	79	73	250	250	53	79

METHOD 5 PARTICULATE EMISSION CALCULATIONS

Client: Sorrento
Start Time: 11:59 AM
Stop Time: 2:03 PM
Run 2

Test Date: 02-Oct-14
Emission Unit: Scrubber
Project No.: 203701005

Point #	Run Time	ΔP ("H_2O)	ΔH ("H_2O)	Stack Temperature (°F)	Dry Gas Meter (dcf)	Meter Temperature (°F) In	Meter Temperature (°F) Out	Corrected DGM $V_{m(std)}$ (dscf)	Stack Gas Velocity V_s (ft/sec)	Intermediate Isokinetic Rate (%)	DGM Flow Rate (dcf/min)
Initial					443.567						
1	5	1.00	2.67	113	447.765	79	76	3.753	62.07	94.0	0.84
2	10	1.00	2.67	114	452.000	81	77	3.775	62.12	94.7	0.85
3	15	1.00	2.67	115	456.245	83	77	3.777	62.18	94.8	0.85
4	20	0.94	2.51	114	460.470	84	78	3.751	60.23	97.0	0.85
5	25	0.92	2.46	114	464.655	85	79	3.708	59.59	96.9	0.84
6	30	0.81	2.16	114	468.825	86	79	3.688	55.91	102.7	0.83
7	35	0.55	1.47	113	472.125	86	80	2.911	46.03	98.3	0.66
8	40	0.50	1.33	114	475.225	85	80	2.736	43.93	97.0	0.62
9	45	0.47	1.25	113	478.200	85	79	2.627	42.55	96.0	0.59
10	50	0.47	1.25	113	481.165	84	80	2.618	42.55	95.7	0.59
11	55	0.47	1.25	114	484.130	86	80	2.614	42.59	95.6	0.59
12	60	0.37	0.99	91	486.815	86	80	2.365	37.02	95.5	0.54
13	65	0.70	1.87	114	490.375	87	81	3.138	51.97	94.0	0.71
14	70	0.64	1.71	114	493.930	88	82	3.126	49.70	98.0	0.71
15	75	0.64	1.71	114	497.440	89	82	3.084	49.70	96.6	0.70
16	80	0.66	1.76	113	501.000	89	83	3.125	50.42	96.4	0.71
17	85	0.66	1.76	113	504.490	89	84	3.061	50.42	94.4	0.70
18	90	0.64	1.71	114	508.020	90	84	3.093	49.70	96.9	0.71
19	95	0.68	1.82	114	511.540	91	85	3.079	51.23	93.6	0.70
20	100	0.72	1.92	114	515.225	91	85	3.224	52.71	95.3	0.74
21	105	0.72	1.92	113	518.910	91	85	3.224	52.67	95.2	0.74
22	110	0.74	1.98	113	522.670	90	85	3.294	53.39	95.9	0.75
23	115	0.68	1.82	113	526.355	91	86	3.221	51.18	97.8	0.74
24	120	0.64	1.71	111	529.985	91	86	3.172	49.57	99.1	0.73
Max/Avg.	120	0.69	1.85	113	86.418	84		3.173	51.23	96.3	0.72

METHOD 5 PARTICULATE EMISSION CALCULATIONS

Client:	Sorrento	Test Date:	02-Oct-14
Start Time:	11:59 AM	Emission Unit:	Scrubber
Stop Time:	2:03 PM	Project No.:	203701005
Run	2		

Sampling Time, min	120	Meter Calibration Factor, Y	0.9870	H_2O Collected, ml	191.9
Number of Sample Points	24	Nozzle Area, ft^2	0.00028	Net H_20 Collected, V_{lc}, ml	141.9
O_2, %	19.90	Corrected DGM, $V_{m(std)}$, dscf	76.1	Water Vapor Volume, $V_{w(std)}$, scf	6.68
CO_2, %	0.20	Average ΔP, "H_2O	0.69	Water Vapor, B_{ws}	0.0806
N_2 & CO, %	79.90	Average Square Root ΔP	0.83	Moisture Factor, 1- B_{ws}	0.9194
Barometric Pressure	27.40	Average ΔH, "H_2O	1.85	Dry Molecular Weight, M_d, lb/lb-mole	28.83
Static Pressure, P_g, "H_2O	0.52	Stack Temperature, T_s, °R	573	Wet Molecular Weight, M_s, lb/lb-mole	27.95
Stack Pressure, P_s, "Hg	27.44	Meter Temperature, T_m, °R	544		
Pitot Tube Calibration Coefficient, C_p	0.84	Stack Gas Velocity, V_s, ft/sec	51.21	% Isokinetic	96.2

Impinger Data				Mid Test Leak Checks					
Impinger Content	Final Weight (g)	Initial Weight (g)	Net Weight (g)	Time	DGM Start	DGM Final	Difference		
Empty	765.3	589.1	176.2	0:00	0	0	0	Stack Area, A_s, ft^2	20.63
Empty	646.7	646.7	0.0	0:00	0	0	0	Stack Flow Rate, acf/min	63,390
H_2O	705.0	707.4	-2.4	0:00	0	0	0	Stack Flow Rate, acf/hr	3,803,376
Silica Gel	888.8	870.7	18.1	0:00	0	0	0	Stack Flow Rate, scf/min	53,605
		Sub Total	191.9			Sum	0	Stack Flow Rate, scf/hr	3,216,319
		Sample Line Rinse	50.0					Stack Flow Rate, dscf/min	49,283
		Total	141.9					Stack Flow Rate, dscf/hr	2,956,965

JBR

Final
~~Initial~~

Client: Sorrento	Meter Box ID: 6X	Stack Diameter (in.): 61.5"	Test Method: M5/202	Impinger	Final	Initial	Net
Unit: Scrubber	Meter Yd: 0.947	Static Pressure: +0.51	Initial Leak: 0.00508" Hg	#1 753	~~745.5~~	589.1	
Location: Equal ID	Meter ΔH@: 2.167	P_{bar}: 27.4	Final Leak: 0.00508" Hg	#2 646.7	~~644.4~~	646.7	
Date: 10-2-14	Probe #: 6-3	Assumed Moisture: 4%	Filter Appearance: Clean	#3 705.0		707.4	
Technician: DV GM	Liner Material: QTZ	ΔH K-Factor: 2.67	Impinger Appearance: Clear	#4 888.8		870.7	
Run #: R2	Pitot Tube C_p: 0.84	Start Time: 1159	Silica Gel Spent (Y/N): Y	#5			
Page 1 of 1	Nozzle Diameter (in.): 0.225	End Time: 1403	Filter #:	#6			

Traverse point number	Sampling time (min)	Vacuum (in Hg)	Velocity head (ΔP)	Orifice (ΔH)	Stack temp (°F)	Sample Volume (ft³)	Dry Gas Meter Temp Inlet (°F)	Dry Gas Meter Temp Outlet (°F)	Probe Temp (°F)	Box Temp (°F)	Impinger Exit Temp (°F)	CPM
						443.967						
1	5	2.0	1.0	2.67	113	447.765	79	76	252	253	62	65
2	10	2.0	1.0	2.67	114	452.8	81	77	251	258	53	65
3	15	2.0	1.0	2.67	115	456.245	83	77	251	251	51	65
4	20	2.6	0.94	2.51	114	460.470	84	78	250	246	58	65
5	25	3.0	0.92	2.46	114	464.655	85	79	250	249	49	83
6	30	3.0	0.81	2.16	114	468.825	86	79	250	248	49	83
7	35	2.0	0.55	1.47	113	472.125	86	80	249	250	51	83
8	40	2.0	0.50	1.33	114	475.225	85	80	250	250	52	82
9	45	2.0	0.47	1.25	113	478.200	85	79	250	251	51	82
10	50	2.0	0.47	1.25	113	481.165	84	80	250	250	52	82
11	55	2.0	0.47	1.25	114	484.130	85	80	250	249	52	85
12	60	1.5	0.37	0.99	91	486.815	86	80	250	250	53	86
13	65	2.0	0.70	1.87	114	490.375	87	81	251	250	61	88
14	70	2.0	0.64	1.71	114	493.930	88	82	249	248	61	87
15	75	2.0	0.64	1.71	114	497.440	89	82	249	250	61	87
16	80	2.0	0.66	1.76	113	501.000	89	83	250	251	61	88
17	85	2.0	0.66	1.76	113	504.490	89	84	250	250	62	89
18	90	2.0	0.64	1.71	114	508.020	90	84	250	248	61	89
19	95	2.0	0.68	1.82	114	511.540	91	85	250	251	60	89
20	100	2.0	0.72	1.92	114	515.225	91	85	250	249	61	89
21	105	2.0	0.72	1.92	113	518.910	91	85	250	250	61	89
22	110	2.5	0.74	1.98	113	522.670	90	85	250	249	63	89
23	115	2.5	0.68	1.82	113	526.355	91	86	250	250	64	89
24	120	2.0	0.64	1.71	111	529.985	91	86	250	250	63	90

METHOD 5 PARTICULATE EMISSION CALCULATIONS

Client: Sorrento
Start Time: 2:27 PM
Stop Time: 4:35 PM
Run 3

Test Date: 02-Oct-14
Emission Unit: Scrubber
Project No.: 203701005

Point #	Run Time	ΔP ("H_2O)	ΔH ("H_2O)	Stack Temperature (°F)	Dry Gas Meter (dcf)	Meter Temperature (°F) In	Meter Temperature (°F) Out	Corrected DGM $V_{m(std)}$ (dscf)	Stack Gas Velocity V_s (ft/sec)	Intermediate Isokinetic Rate (%)	DGM Flow Rate (dcf/min)
Initial					530.700						
1	5	0.60	1.60	113	534.030	88	86	2.917	48.10	94.5	0.67
2	10	0.57	1.52	113	537.390	89	87	2.937	46.88	97.7	0.67
3	15	0.63	1.68	113	540.755	89	87	2.943	49.29	93.1	0.67
4	20	0.65	1.74	114	544.290	89	87	3.092	50.11	96.4	0.71
5	25	0.63	1.68	114	547.775	91	87	3.042	49.33	96.3	0.70
6	30	0.63	1.68	114	551.265	91	87	3.046	49.33	96.4	0.70
7	35	0.63	1.68	113	554.755	92	87	3.044	49.29	96.3	0.70
8	40	0.68	1.82	113	558.350	92	87	3.136	51.21	95.5	0.72
9	45	0.75	2.00	113	562.080	92	88	3.253	53.78	94.3	0.75
10	50	0.73	1.95	113	565.865	92	88	3.300	53.06	97.0	0.76
11	55	0.72	1.92	113	569.630	92	88	3.282	52.69	97.1	0.75
12	60	0.70	1.87	113	573.333	93	89	3.222	51.95	96.7	0.74
13	65	0.95	2.49	114	577.675	92	89	3.788	60.58	97.7	0.87
14	70	0.96	2.56	113	581.995	92	89	3.769	60.84	96.6	0.86
15	75	0.93	2.49	113	586.310	93	89	3.761	59.88	97.9	0.86
16	80	0.90	2.40	113	590.520	94	90	3.662	58.91	96.9	0.84
17	85	0.85	2.27	113	594.615	94	90	3.561	57.25	97.0	0.82
18	90	0.72	1.92	113	598.405	94	91	3.289	52.69	97.3	0.76
19	95	0.62	1.66	113	601.950	94	90	3.077	48.90	98.1	0.71
20	100	0.52	1.39	112	605.180	94	91	2.799	44.74	97.4	0.65
21	105	0.45	1.20	112	608.300	94	90	2.705	41.62	101.2	0.62
22	110	0.45	1.20	113	611.090	94	90	2.419	41.66	90.5	0.56
23	115	0.40	1.06	113	614.000	93	91	2.522	39.27	100.1	0.58
24	120	0.35	0.93	114	616.500	93	91	2.166	36.77	92.0	0.50
Max/Avg.	120	0.67	1.78	113	85.800	90		3.114	50.34	96.4	0.72

METHOD 5 PARTICULATE EMISSION CALCULATIONS

Client:	Sorrento	Test Date:	02-Oct-14
Start Time:	2:27 PM	Emission Unit:	Scrubber
Stop Time:	4:35 PM	Project No.:	203701005
Run	3		

Sampling Time, min	120	Meter Calibration Factor, Y	0.9870	H_2O Collected, ml	193.9
Number of Sample Points	24	Nozzle Area, ft^2	0.00028	Net H_20 Collected, V_{lc}, ml	143.9
O_2, %	19.90	Corrected DGM, $V_{m(std)}$, dscf	74.7	Water Vapor Volume, $V_{w(std)}$, scf	6.77
CO_2, %	0.20	Average ΔP, "H_2O	0.67	Water Vapor, B_{ws}	0.0831
N_2 & CO, %	79.90	Average Square Root ΔP	0.81	Moisture Factor, 1- B_{ws}	0.9169
Barometric Pressure	27.40	Average ΔH, "H_2O	1.78	Dry Molecular Weight, M_d, lb/lb-mole	28.83
Static Pressure, P_g, "H_2O	0.52	Stack Temperature, T_s, °R	573	Wet Molecular Weight, M_s, lb/lb-mole	27.93
Stack Pressure, P_s, "Hg	27.44	Meter Temperature, T_m, °R	550		
Pitot Tube Calibration Coefficient, C_p	0.84	Stack Gas Velocity, V_s, ft/sec	50.34	% Isokinetic	96.4

Impinger Data				Mid Test Leak Checks					
Impinger Content	Final Weight (g)	Initial Weight (g)	Net Weight (g)	Time	DGM Start	DGM Final	Difference		
Empty	756.8	583.5	173.3	0:00	0	0	0	Stack Area, A_s, ft^2	20.63
Empty	668.2	668.2	0.0	0:00	0	0	0	Stack Flow Rate, acf/min	62,306
H_2O	643.7	642.5	1.2	0:00	0	0	0	Stack Flow Rate, acf/hr	3,738,341
Silica Gel	922.4	903.0	19.4	0:00	0	0	0	Stack Flow Rate, scf/min	52,639
		Sub Total	193.9			Sum	0	Stack Flow Rate, scf/hr	3,158,334
		Sample Line Rinse	50.0					Stack Flow Rate, dscf/min	48,265
		Total	143.9					Stack Flow Rate, dscf/hr	2,895,875

JBR

Client: Sorrento	Meter Box ID: 6X	Stack Diameter (in.): 61.5"	Test Method: M5/202	Impinger	Final	Initial	Net
Unit: Scrubber	Meter Yd: 0.987	Static Pressure: +0.51"	Initial Leak: 0.150 @ 7.5" Hg	#1 78.5	~~588~~	583.5	
Location: Eagle, ID	Meter ΔH @: 2.167	P_{bar}: 27.4	Final Leak: 0.150 @ 7" Hg	#2	668.2	668.5	
Date: 10/2/14	Probe #: 6-2	Assumed Moisture: 4%	Filter Appearance: Clear	#3	643.7	642.5	
Technician: DV, GK	Liner Material: Quartz	ΔH K-Factor: 2.67	Impinger Appearance: clear	#4	922.4	903.0	
Run #: 3	Pitot Tube C_p: 0.84	Start Time: 14:27	Silica Gel Spent (Y/N): Y	#5			
Page 1 of 1	Nozzle Diameter (in.): 0.225	End Time: 1635	Filter #:	#6			

Traverse point number	Sampling time (min)	Vacuum (in Hg)	Velocity head (ΔP)	Orifice (ΔH)	Stack temp (°F)	Sample Volume (ft³)	Dry Gas Meter Temp Inlet (°F)	Dry Gas Meter Temp Outlet (°F)	Probe Temp (°F)	Box Temp (°F)	Impinger Exit Temp (°F)	CPM
						530.700						
1	5	3.0	0.60	1.60	113	534.030	88	86	263	258	~~56~~ 56	~~68~~ 68
2	10	3.0	0.57	1.52	113	537.390	89	87	256	259	~~50~~ 50	~~68~~ 68
3	15	3.5	0.63	1.68	113	540.755	89	87	250	250	48	61
4	20	4.6	0.65	1.74	114	544.290	89	87	250	250	46	61
5	25	3.5	0.63	1.68	114	547.775	91	87	250	244	47	64
6	30	3.5	0.63	1.68	114	551.265	91	87	249	248	51	63
7	35	3.5	0.63	1.68	113	554.755	92	87	249	248	~~59~~ 59	61
8	40	4.0	0.68	1.82	113	558.350	~~88~~ 92	87	250	248	58	65
9	45	4.0	0.75	2.00	113	562.080	92	88	251	250	59	65
10	50	4.0	0.73	1.95	113	565.865	92	88	250	250	61	66
11	55	4.0	0.72	1.92	113	569.650	92	88	250	249	60	66
12	60	4.0	0.70	1.87	113	573.333	93	89	250	252	58	67
13	65	5.0	0.93	2.49	114	577.675	93	89	250	253	59	58
14	70	5.5	0.96	2.56	113	581.995	92	89	249	245	56	56
15	75	5.5	0.93	2.49	113	586.310	93	89	249	247	54	56
16	80	5.5	0.90	2.40	113	590.520	94	90	250	249	52	55
17	85	5.0	0.85	2.27	113	594.615	94	90	250	250	52	57
18	90	4.0	0.72	1.92	113	598.405	94	91	250	250	52	~~57~~
19	95	3.5	0.62	1.66	113	601.950	94	90	250	248	50	57
20	100	3.0	0.52	1.39	112	605.180	94	91	251	253	51	58
21	105	3.0	0.45	1.20	112	608.3	94	90	250	250	52	58
22	110	3.0	0.45	1.20	113	611.09	94	90	251	250	52	59
23	115	3.0	0.40	1.06	113	614	93	91	250	251	53	66
24	120	3.0	.35	0.93	114	616.5	93	91	250	251	54	66

JBR

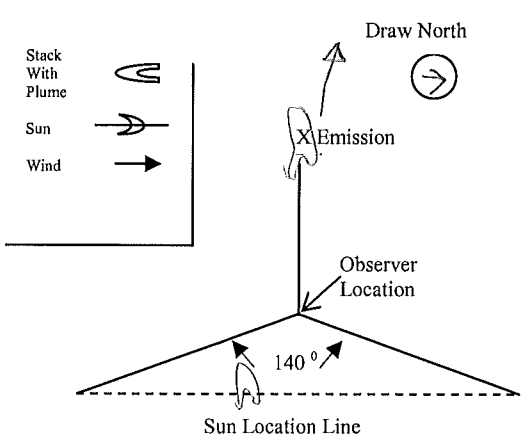
VISIBLE EMISSION OBSERVATION FORM

Company Name:	Somenta
Location:	Legal ID
Phone (Key Contact):	
Source ID:	Scrubber, Dryer
Process Equipment Operating Mode:	Normal
Control Equipment Operating Mode:	Normal
Describe Emission Point:	white Enclosed Arrature w/o roof
Height Above Ground Level:	120'
Height Relative to Observer Start:	120'
Height Relative to Observer End:	120'
Distance from Observer Start:	400'
Distance from Observer End:	400'
Direction from Observer Start:	W
Direction from Observer End:	W
Describe Emissions Start:	Water Vapor
Describe Emissions End:	Water Vapor
Emission Color Start; End:	light Brown
If Water Plume: Attached / Detached	X
Point in the Plume which Opacity was Determined Start:	End of vapor trail
Point in the Plume which Opacity was Determined End:	End of Vapor plume
Describe Plume Background Start:	sky
Describe Plume Background End:	sky
Background Color Start:	Blue
Background Color End:	Blue
Sky Conditions Start:	Pt cldy
Sky Conditions End:	Pt cldy
Wind Speed Start:	0-5MPH
Wind Speed End:	
Wind Direction Start:	W
Wind Direction End:	W
Ambient Temperature Start:	76
Ambient Temperature End:	81
Wet Bulb Temp:	
Relative Humidity (%):	

Date:	Start Time:	End Time:
10-2-14	1005	1004

Sec Min	0	15	30	45	Sec Min	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Source Layout



Observers Name:	Daniel Vandenbirc
Observers Signature:	
Date:	10-2-14
Organization:	Stantec
Certified by:	AZ Smoke School
Date:	
Continued on VEC Form Number:	

JBR

A2

VISIBLE EMISSION OBSERVATION FORM

Company Name: Sorrento	Date: 10-2-14	Start Time: 1217	End Time: 1316

Location: Egal ID

Phone (Key Contact):

Source ID: scrubber

Process Equipment Operating Mode: Normal

Control Equipment Operating Mode: Normal

Describe Emission Point: See Run 1

Height Above Ground Level:	Height Relative to Observer Start:	End:
150'	150'	150'

Distance from Observer Start:	End:	Direction from Observer Start:	End:
375'	375'	NW	NW

Describe Emissions Start: light Brown End: light Brn

Emission Color Start:	End:	If Water Plume: Attached	Detached
light Brn	light Brn	N/A	

Point in the Plume which Opacity was Determined Start: Directly out of stack End: Directly out of stack

Describe Plume Background Start: sky End: sky

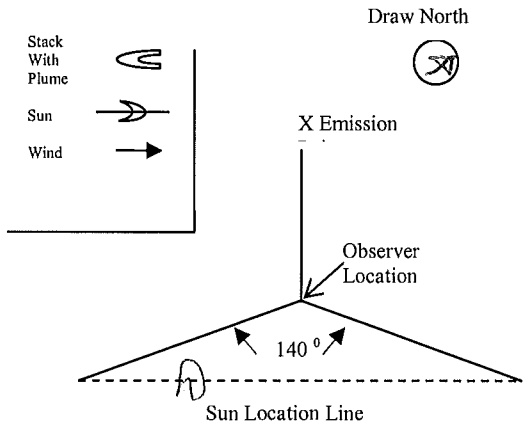
Background Color Start:	End:	Sky Conditions Start:	End:
Blue + white	same	Part Cldy	same

Wind Speed Start:	End:	Wind Direction Start:	End:
0-5mph	same	W	W

Ambient Temperature Start:	End:	Wet Bulb Temp:	Relative Humidity (%):
64°F	66°F		

Sec Min	0	15	30	45	Sec Min	0	15	30	45
1	5	5	5	5	31	5	5	5	5
2	5	5	5	5	32	5	5	5	5
3	5	5	5	5	33	5	5	5	5
4	5	5	5	5	34	5	5	5	5
5	5	5	5	5	35	5	5	5	5
6	5	5	5	5	36	5	5	5	5
7	5	5	5	5	37	5	5	5	5
8	5	5	5	5	38	5	5	5	5
9	5	5	5	5	39	5	5	5	5
10	5	5	5	5	40	5	5	5	5
11	5	5	5	5	41	5	5	5	5
12	5	5	5	5	42	5	5	5	5
13	5	5	5	5	43	5	5	5	5
14	5	5	5	5	44	5	5	5	5
15	5	5	5	5	45	5	5	5	5
16	5	5	5	5	46	5	5	5	5
17	5	5	5	5	47	5	5	5	5
18	5	5	5	5	48	5	5	5	5
19	5	5	5	5	49	5	5	5	5
20	5	5	5	5	50	5	5	5	5
21	5	5	5	5	51	5	5	5	5
22	5	5	5	5	52	5	5	5	5
23	5	5	5	5	53	5	5	5	5
24	5	5	5	5	54	5	5	5	5
25	5	5	5	5	55	5	5	5	5
26	5	5	5	5	56	5	5	5	5
27	5	5	5	5	57	5	5	5	5
28	5	5	5	5	58	5	5	5	5
29	5	5	5	5	59	5	5	5	5
30	5	5	5	5	60	5	5	5	5

Source Layout



Observers Name: Daniel Vandenbers

Observers Signature: [signature] Date: 10-2-14

Organization: Stantec

Certified by: A2 Smoke School Date:

Continued on VEC Form Number:

JBR

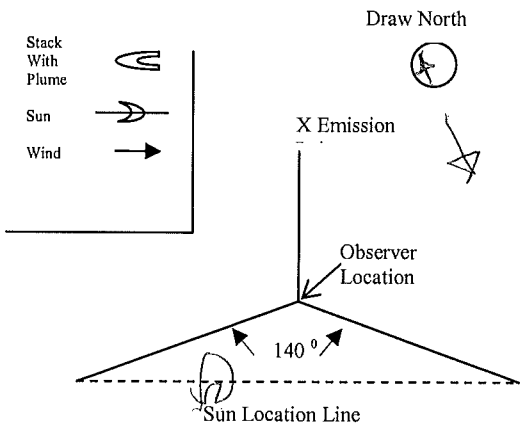
VISIBLE EMISSION OBSERVATION FORM

Run 3

Company Name: Sorrento	Date: 10-2-14	Start Time: 1500	End Time:
Location: Egal ID			
Phone (Key Contact):			
Source ID: Scrubber			
Process Equipment Operating Mode: Normal			
Control Equipment Operating Mode: Normal			
Describe Emission Point: White Buiding on roof			
Height Above Ground Level: 150'	Height Relative to Observer Start: 150' End: 150'		
Distance from Observer Start: 250 yrds End: 250 yrds	Direction from Observer Start: NE End: NE		
Describe Emissions Start: clear End: clear			
Emission Color Start: clear End: clear	If Water Plume: Attached Detached		
Point in the Plume which Opacity was Determined Start: Directly out of stack End: Directly out of stack			
Describe Plume Background Start: Sky End: Sky			
Background Color Start: Blue End: Blue	Sky Conditions Start: Clear End: Clear		
Wind Speed Start: 0-5 mph End: 0-5 mph	Wind Direction Start: S End: S		
Ambient Temperature Start: End:	Wet Bulb Temp:	Relative Humidity (%):	

Sec Min	0	15	30	45	Sec Min	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Source Layout



Observers Name: Daniel Vandenbers	
Observers Signature:	Date: 10-2-14
Organization:	
Certified by:	Date:
Continued on VEC Form Number:	

Appendix C LABORATORY RESULTS

Stantec Consulting Ltd.
Laboratory Analysis Results

Client: Sorrento Lactalice
Unit ID: Scrubber
Method: 5/202

Project: 203701005
Report Date: 10/20/2010

Sample ID	Tin/Filter ID	Run #	Sample Description	Sample Media	Sample Date	Samples Received	Sample Volume (ml)	Final Gross Mass (g)	Final Tare Mass (g)	Net Mass (g)
14-0545	541	1	Inorganic Fraction	H2O	10/02/14	10/06/14	340	2.2377	2.2336	0.0041
14-0546	542	2	Inorganic Fraction	H2O	10/02/14	10/06/14	440	2.2485	2.2424	0.0061
14-0547	543	3	Inorganic Fraction	H2O	10/02/14	10/06/14	385	2.2481	2.2422	0.0059
14-0548	544	1	Organic Fraction	Hexane	10/02/14	10/06/14	95	2.2465	2.2423	0.0042
14-0549	545	2	Organic Fraction	Hexane	10/02/14	10/06/14	155	2.2559	2.2476	0.0083
14-0550	546	3	Organic Fraction	Hexane	10/02/14	10/06/14	155	2.2667	2.2590	0.0077
14-0551	547	1	P/N Rinse	Acetone	10/02/14	10/06/14	88	2.2474	2.2463	0.0011
14-0552	548	2	P/N Rinse	Acetone	10/02/14	10/06/14	58	2.2342	2.2330	0.0012
14-0553	549	3	P/N Rinse	Acetone	10/02/14	10/06/14	88	2.2328	2.2313	0.0015
14-0554	550	N/A	Inorganic Fraction	H2O	10/02/14	10/06/14	195	2.2384	2.2372	0.0012
14-0555	551	N/A	Organic Fraction	Hexane	10/02/14	10/06/14	150	2.2494	2.2465	0.0029
14-0556	4148	1	Filter	Filter	10/02/14	10/06/14	N/A	0.2856	0.2807	0.0049
14-0557	4147	2	Filter	Filter	10/02/14	10/06/14	N/A	0.2887	0.2823	0.0064
14-0558	4158	3	Filter	Filter	10/02/14	10/06/14	N/A	0.2818	0.2802	0.0016
14-0559	555	N/A	Blank	H2O	10/02/14	10/06/14	20	2.2425	2.2424	0.0001
14-0560	556	N/A	Blank	Hexane	10/02/14	10/06/14	20	2.2372	2.2317	0.0055
14-0561	557	N/A	Blank	Acetone	10/02/14	10/06/14	20	2.2325	2.2324	0.0001

EPA Method 3 Gas Analysis Data Form

Client/Facility: Sorrento	Location: Boise ID
Date: 10-2-14	Run Number: R1
Sampling Time: (24-hr Clock) 1803	Sample Type: (Bag, Integrated, Continuous)
Analytical Method: Fyrite	Ambient Temperature: 79°
Technicians: DV	

Run 1

RUN	1		2		3		Average Net Volume	Multiplier	Molecular Weight of Stack Gas (Dry Basis) M_d
GAS	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net			
CO_2		0.2		0.2		0.2	0.2	0.44	
O_2 (net is actual O_2 reading minus actual CO_2 reading)		19.9		19.8		19.9	19.8	0.32	
CO (net is actual CO reading minus actual O_2 reading)		Ø		Ø		Ø	Ø	0.28	
N_2 (net is 100 minus actual CO reading)								0.28	
☐ Initial Leak Check		☑ Final Leak Check						**Total**	

Revision: 12/28/93

EPA Method 3 Gas Analysis Data Form

Client/Facility: Sorrento	Location: Boise, ID
Date: 10-2-14	Run Number: R2
Sampling Time: (24-hr Clock) 1810	Sample Type: (Bag, Integrated, Continuous)
Analytical Method: fyrite	Ambient Temperature: 71°F
Technicians: DV	

RUN	1		2		3		Average Net Volume	Multiplier	Molecular Weight of Stack Gas (Dry Basis) M_d
GAS	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net			
CO_2		0.3		0.2		0.2	0.2	0.44	
O_2 (net is actual O_2 reading minus actual CO_2 reading)		19.8		19.8		19.8	19.8	0.32	
CO (net is actual CO reading minus actual O_2 reading)		Ø		Ø		Ø	Ø	0.28	
N_2 (net is 100 minus actual CO reading)								0.28	
☒ Initial Leak Check			☐ Final Leak Check					**Total**	

Revision: 12/28/93

EPA Method 3 Gas Analysis Data Form

Client/Facility: Sorrento	Location: Boise ID
Date: 10-2-14	Run Number: R3
Sampling Time: (24-hr Clock) 1817	Sample Type: (Bag, Integrated, Continuous)
Analytical Method: Fyrite	Ambient Temperature: 78°C
Technicians: DV	

RUN	1		2		3		Average Net Volume	Multiplier	Molecular Weight of Stack Gas (Dry Basis) M_d
GAS	Actual Reading	Net	Actual Reading	Net	Actual Reading	Net			
CO_2		0.2		0.2		0.3	0.2	0.44	
O_2 (net is actual O_2 reading minus actual CO_2 reading)		19.8		19.9		19.9	19.9	0.32	
CO (net is actual CO reading minus actual O_2 reading)		Ø		Ø		Ø	Ø	0.28	
N_2 (net is 100 minus actual CO reading)								0.28	
☐ Initial Leak Check ☐ Final Leak Check								**Total**	

Revision: 12/28/93

Appendix D FACILITY PROCESS RATES AND OPERATIONAL PARAMETERS

10/2/2014

Wet scrubber sctack testing

Time	Dryer Speed (lbs / hr) Liquid	Dryer speed (finish product) Lbs /hr	High pressure pump %	Wet scrubber flow (gpm)	Wet scrubber pressure (psi) (screen)	Wet scrubber pressure drop (" wc)	Cyclone 1 pressure drop ("wc)	Cyclone 2 pressure drop ("wc)	Wet Scrubber Fan speed (%)	Chamber depression
9:00	22,612	14768.	92	607.0	81.2	7	3.90	3.75	83	-.2
9:15	22,528	14714.	92	600.2	81.4	8	3.90	3.73	92	-.21
9:30	22,531	14716.	92	626.1	85	8	3.94	3.73	86	-.31
9:45	22,578	14746.	92	600.3	78.7	8.5	4.0	3.85	86.5	-.20
10:00	22,600	14761.	92	604.8	80.6	8.5	3.91	3.75	86.3	-.16
10:15	22,565	14797.	92	611.4	76.2	7.0	3.98	3.78	79.8	-.31
10:30	22,518	14707.	92	603.6	82.5	7.0	3.99	3.76	80.5	-.27
10:45	22,606	14765.	92	614.0	79.7	7.0	3.96	3.77	80.24	-.24
11:00	22,578	147 46.	92	599.5	83.6	7.0	4.03	3.86	79.7	-.29
11:15	22,575	147 44.	92	613.1	76.3	6.5	3.96	3.82	79.6	-.26
11:30	22,612	147 68.	92	606.7	82.7	6.5	3.97	3.83	79.9	-.23
11:45	22,609	14767.	92	604.5	78.9	6.5	3.96	3.83	79.3	-.16
12:00	22,578	147 46.	92	605.2	81.7	6.5	4.02	3.81	79.5	-.23
12:15	22,618	14772.	92	605.1	81.24	7.5	3.97	3.78	80.6	-.25
12:30	22,628	14779	92	612.1	81.32	7.5	3.98	3.74	78.80	-.26
12:45	22,559	14734	92	610.2	83.02	5.5	3.88	3.65	79.4	-.22
13:00	22,600	14761	92	599.8	81.7	7.0	4.05	3.73	80.00	-.11
13:15	22,578	14746	92	605.5	80.87	6.0	4.06	3.75	79.7	-.17
13:30	22,531	14716.	91	604.0	77.7	7.0	3.99	3.80	80.11	-.26
13:45	22,512	14703	91	608.7	79.4	5.5	4.01	3.83	79.75	-.23
14:00	22,503	14697.	91	607.6	80.48	7.0	3.99	3.76	79.44	-.24
14:15	22,584	14750.	91	605.5	80.69	5.5	3.97	3.77	79.8	-.34
14:30	22,537	14719.	91	601.9	76.53	7.5	4.04	3.85	79.45	-.24
14:45	22,515	14705	91	603.1	82.1	5.5	4.03	3.78	79.71	-.18
15:00	22,553	14730	91	609.3	81.1	5.25	3.99	3.76	79.55	-.22
15:15	22,565	14708	91	604.8	80.9	5.5	3.95	3.78	79.31	-.20
15:30	22,453	14665	91	609.9	80.2	5.5	3.98	3.72	79.73	-.24
15:45	22,525	14712	91	611.0	79.7	7.0	3.92	3.74	79.2	-.25
16:00	22,490	14689	91	609.2	79.1	7.0	4.00	3.73	78.9	-.24
16:15	22,537	14719.	91	612.2	79.6	7.5	3.90	3.75	79.4	-.22
16:30	22,587	14752.	91	605.5	78.3	6.5	4.04	3.78	79.5	-.18
16:45	22,537	14719.	91	605.2	79.7	6.0	4.01	3.78	79.3	-.23
17:00	22,593	14754.	91	609.1	78.3	7.0	3.95	3.71	79.3	-.23
17:15										

Appendix E QUALITY ASSURANCE AND CALIBRATION DATA

EPA APPROVED ALTERNATIVE METHOD ALT-009

Client:	Sorrento
Test Date:	02-Oct-14
Emissions Unit:	Scrubber
Project No.:	203701005
Meter Box No.:	6X

Run Data

	Run1	Run 2	Run 3	Averages
Test Date	02-Oct-14	02-Oct-14	2-Oct-14	
Start Time	9:30 AM	11:59 AM	2:27 PM	
Stop Time	11:37 AM	2:03 PM	4:35 PM	
Sampling Time, min	120	120	120	
Orifice ΔP, ΔH@, "H_2O	2.1670	2.1670	2.1670	2.1670
Barometric Pressure, P_{bar}, "Hg	27.40	27.40	27.40	27.40
DGM Total, Vm, dcf	81.615	86.418	85.800	84.611
Meter Temperature, T_m, °R	524	544	550	540
Average ΔH, "H_2O	1.67	1.85	1.78	1.77
Average √ΔH, "H_2O	1.28	1.35	1.32	1.32
Dry Molecular Weight, M_d, lb/lb-mole	28.83	28.83	28.83	28.83
Dry Ambient Air Molecular Weight, (lb/lb-mole)	29	29	29	29
Mercury Specific Gravity	13.6	13.6	13.6	13.6
Constant ("Hg/^{0}R) (cfm)^2	0.0319	0.0319	0.0319	0.0319

Alternative Method 5 Post-Test Calibration Results

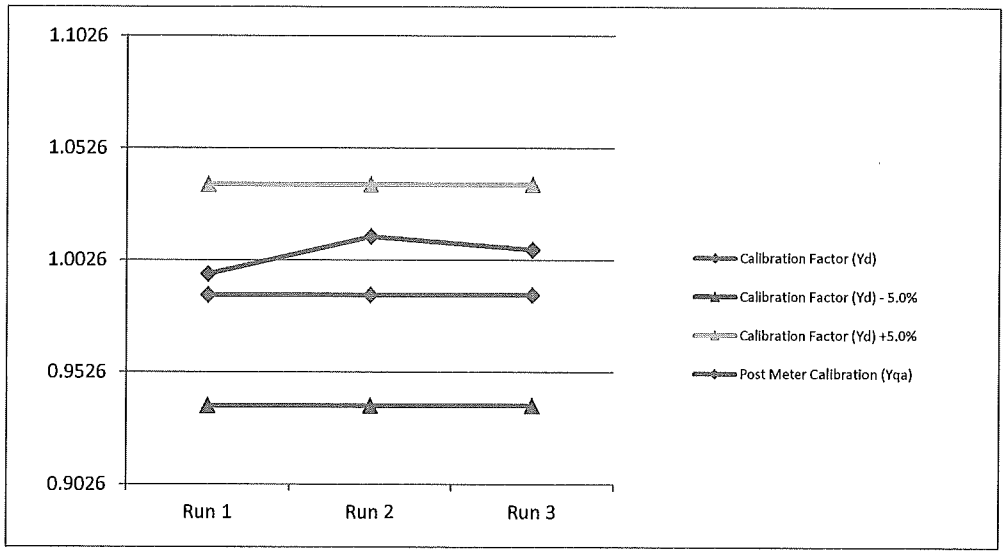
Post Dry Gas Meter Calibration Factor (Y_{qa})	0.9963	1.0131	1.0072	1.0055
Dry Gas Meter Calibration Factor	0.9870	0.9870	0.9870	0.9870
Percent Difference				1.84
Pass/Fail Post Calibration				PASS

Calculations

$$Y_{qa} = \frac{\theta}{V_m}\sqrt{\frac{0.0319 * T_m * 29}{\Delta H @ * \left(P_{bar} + \frac{\Delta H_{avg}}{13.6}\right) * M_d}} * \left(\sqrt{\Delta H}\right)_{avg}$$

Y_{qa}	=	Dry gas meter calibration check valve, (dimensionless)
θ	=	Sampling Time, min
V_m	=	DGM Total, Vm, dcf
T_m	=	Meter Temperature, T_m, °R
P_{bar}	=	Barometric Pressure, P_{bar}, "Hg
0.0319	=	$(20.92/528)(0.75)^2$ ("Hg/^{0}R)(cfm)^2
ΔH_{avg}	=	Average ΔH, "H_2O
ΔH@	=	Orifice ΔP, ΔH@, "H_2O
M_d	=	Dry Molecular Weight, M_d, Lb/lb-mole
29	=	Dry Ambient Air Molecular Weight, (lb/lb-mole)
13.6	=	Mercury Specific Gravity

Alternative Method 5 Post-Test Calibration Results



creating solutions for today's environment

SEMIANNUAL METER BOX FULL TEST CALIBRATION
CRITICAL ORIFICES 5-POINT CALIBRATION (English Units)

Meter Box ID #	5X	
Date	9-Sep-14	
Calibration Technician	X	
Barometric Pressure (in "Hg)	29.8	
Theoretical Critical Vacuum[1] (in "Hg)	14.1	
Critical Orifice Set I.D. #	hz	[IA, HZ or NL]

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
[2]The Critical Orifice Coefficient, K', must be entered in English units, ($ft^3 \times °R^{1/2}$)/(in.Hg*min).

Calibration Data										
Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
Θ min	P_m in H_2O	Vm_i cubic feet (ft^3)	Vm_f cubic feet (ft^3)	Tm_i °F	Tm_f °F		K'	Tm_{amb} °F	Tm_{amb} °F	in "Hg
5.0	0.35	339.500	341.019	79	80	HZ-40	0.2280	80	81	15
5.0	0.72	341.400	343.627	80	80	HZ-48	0.3358	81	82	15
5.0	1.30	347.200	350.163	80	81	HZ-55	0.4449	82	83	15
5.0	2.20	350.900	354.908	81	81	HZ-63	0.6014	83	83	15
5.0	4.10	355.800	361.150	82	82	HZ-73	0.8027	84	84	13

Results								
Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
Vm_{std} cubic feet (ft^3)	Qm_{std} ft^3/min	Vcr_{std} cubic feet (ft^3)	Qcr_{std} ft^3/min	Y	ΔY	$Qm_{std(corr)}$ cfm	ΔH@ in H_2O	ΔΔH@
1.482	0.296	1.461	0.292	0.986	0.002	0.292	2.253	0.085
2.173	0.435	2.150	0.430	0.990	0.006	0.430	2.142	-0.025
2.892	0.578	2.846	0.569	0.984	0.000	0.569	2.212	0.044
3.917	0.783	3.845	0.769	0.982	-0.002	0.769	2.057	-0.110
5.243	1.049	5.128	1.026	0.978	-0.006	1.026	2.172	0.005
				0.984	Y Average		**2.167**	ΔH@ Average

Corrected Flow Rate	Orifice Calibration Factor	Minimum Allowable Calibration Factor	Overall Average Calibration Factor	Maximum Allowable Calibration Factor	Meter Pressure
Q_m ft^3/min	Y	Y_{min}	Y_{avg}	Y_{max}	P_m in H_2O
0.292	0.986	0.964	0.984	1.004	0.35
0.430	0.990	0.964	0.984	1.004	0.72
0.569	0.984	0.964	0.984	1.004	1.30
0.769	0.982	0.964	0.984	1.004	2.20
1.026	0.978	0.964	0.984	1.004	4.10

$$V_{m(std)} = \frac{K_1 V_m (P_{bar} + \frac{\Delta H}{13.6})}{T_m}$$

$$ENGLISH K' = \frac{17.64 V_m Y (P_{bar} + \frac{\Delta H}{13.6}) \sqrt{T_{amb} + 460}}{P_{bar}(T_m + 460)\theta}$$

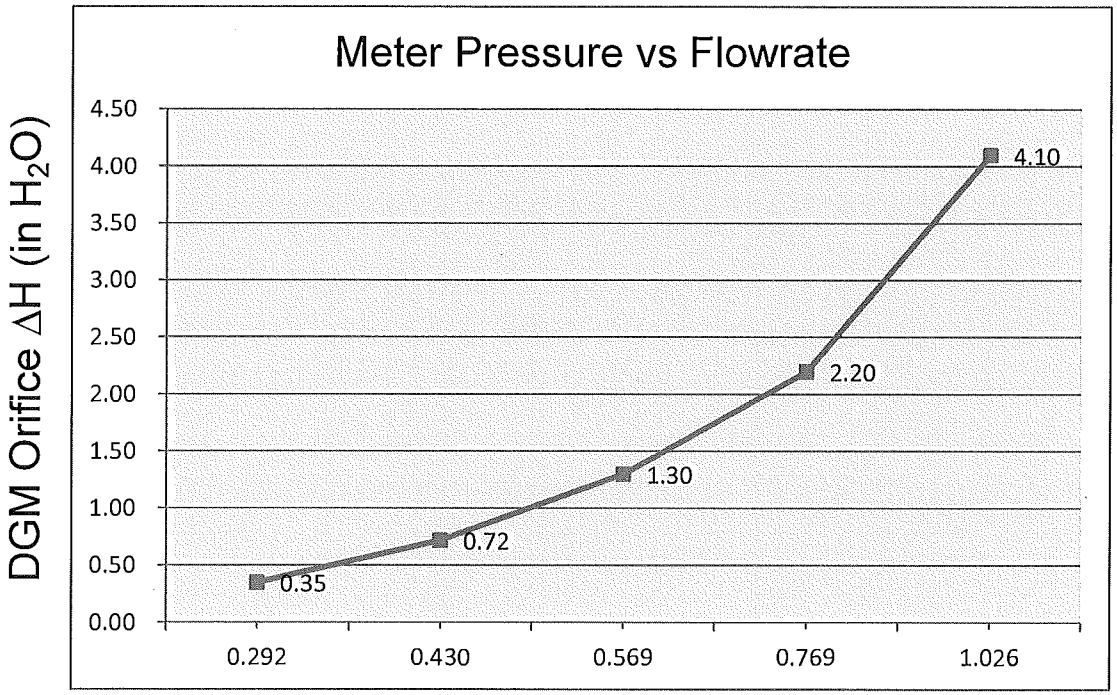
$$DELTA\ H_@' = \frac{0.0319\ \Delta H\ T_m\ \theta^2}{P_{bar}\ Y^2\ V_m^2}$$

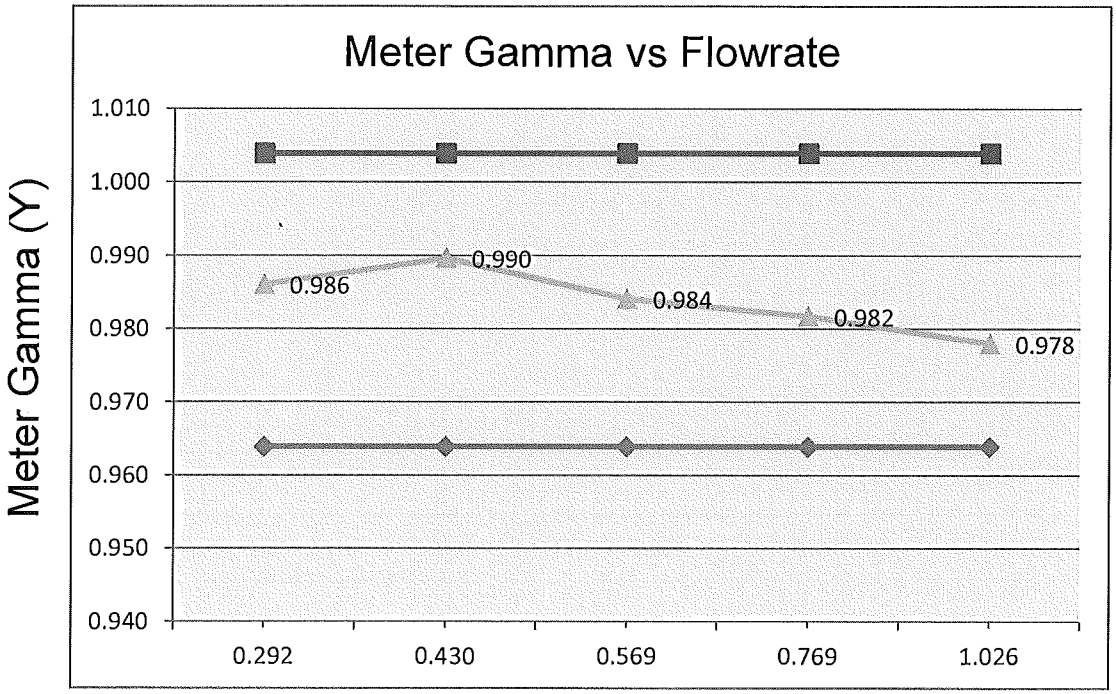
$$V_{cr(std)} = \frac{K' P_{bar} \theta}{T_{amb}}$$

$$Y = \frac{V_{cr(std)}}{V_{m(std)}}$$

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, Appendix A, Method 5, Item 7.2.2 using a set of calibrated critical orifice.

Signature X _____ Date X _____


Meter Pressure vs Flowrate
DGM Orifice ΔH (in H_2O)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.35
0.72
1.30
2.20
4.10
0.292
0.430
0.569
0.769
1.026
Flowrate Standardized & Corrected (CFM)

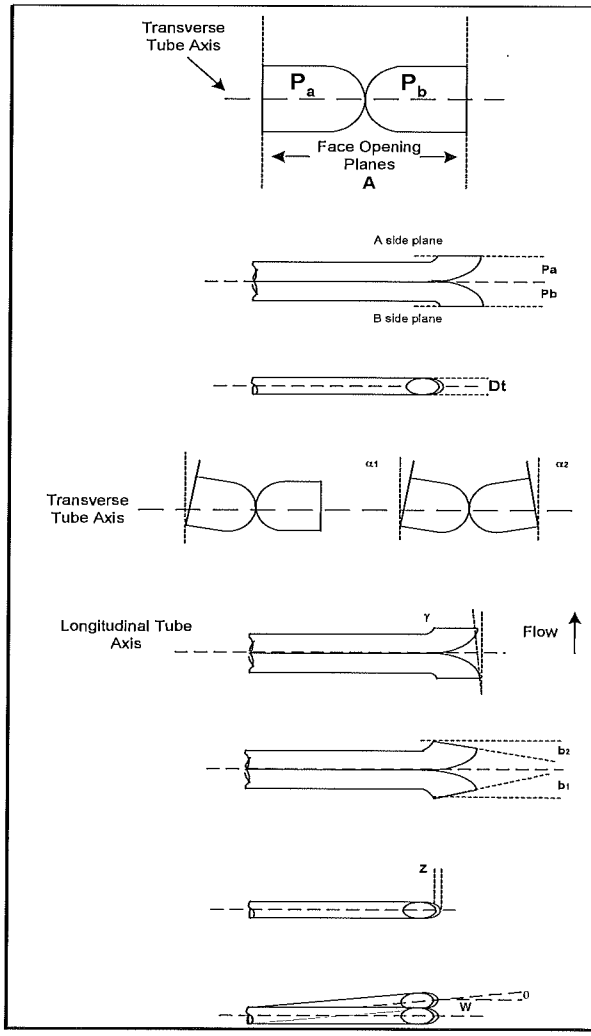

Meter Gamma vs Flowrate
Meter Gamma (Y)
1.010
1.000
0.990
0.980
0.970
0.960
0.950
0.940
0.986
0.990
0.984
0.982
0.978
0.292
0.430
0.569
0.769
1.026
Flowrate Standardized & Corrected (CFM)

creating solutions for today's environment

TYPE S PROBE PITOT TUBE INSPECTION SHEET (Geometric Calibration)

Note: Method 2 provides the criteria for an acceptably constructed Type S pitot tube. However, the procedure for making the nessary measurements is not specified. One approach is given below.

1. Use a vise with the parallels and perpendicular faces. Use an angle-measuring device (analog or digital) for this check.
2. Place the pitot tube in the vise, and level the pitot tube horizontally using the angle-measuring device.
3. Place the angle-measuring device as shown below.
4. Measure distance A, which is P_A plus P_B. Method 2 specifies that $P_A = P_B$, but provides no tolerance for this measurement. Because this measurement is very difficult, it is suggested that $P_A = P_B = A/2$.
5. Measure the external tube diameter (Dt) with a micrometer, machinist's rule, or internal caliper.
6. Record all data as shown on the form below.
7. Calculate dimensions w and z as shown below.



Pitot Tube Number	**6-2**
Level and Perpendicular	**Yes**
Damaged?	**No**
$\alpha 1$ $(-10 \leq \alpha 1 \leq +10)$	**2.0**
$\alpha 2$ $(-10 \leq \alpha 2 \leq +10)$	**2.0**
$\eta o \tau$ ok $(-5 \leq \beta 1 \leq +5)$	**5.0**
$\beta 2$ $(-5 \leq \beta 2 \leq +5)$	**2.0**
γ	**2.0**
θ	**3.0**
$Z = A (\tan \gamma)$ [$\leq$ .32cm (0.125 in.)]	**0.025**
$W = A (\tan \theta)$ [$\leq$ 0.08cm (0.031 in.)]	**0.037**
Dt = [0.48cm $\leq$ 0.95cm (.188 in. $\leq$ .375 in.)]	**0.236**
A = cm	**0.71**
$A/2Dt = (1.05 \leq P_A/Dt \leq 1.50)$	**1.50**

Certification

I certify that the Type S Pitot Tube ID: 6-2 meets or exceeds all specifications, criteria, and applicable design features.

Certified By: *Jesse Allegretto* Date February 3, 2014

creating solutions for today's environment

Thermocouple Calibration Inspection Sheet

Thermocouple ID No.	6-2	**Thermocouple Type**	**K**	T	S
Calibration Date	February 3, 2014	**Technician**	Jesse Allegretto		
Reference Thermometer ID No.	ALTEX Model 222A Serial No. 9925002				

	Reference Temperature (°F)	Reference Temperature (°R)	Thermocouple Temperature (°F)	Thermocouple Temperature (°R)	Difference %
Ice Bath (32 °F, 492 °R)	33	493	33.0	493.0	0.00
Boiling Water (212 °F, 672 °R)	214	674	214.0	674.0	0.00
Hot Oil (360 °F, 820 °R)	360	820	360.0	820.0	0.00
				Average	**0.00**
				Is Percent Difference ≤ 1.50% Yes (Pass) No (Fail)	**PASS**

Comments:

Analytical & Precision Balance Co., Inc.
The Weighing Solution
ANSI/ISO/IEC 17025 Accredited • GSA Contract Holder

CERTIFICATE OF CALIBRATION

ISO 17025 ACCREDITED

International Accreditation Service, Inc.
Calibration Laboratory # CL-104
9830 S. 51st Street, Suite B-103 • Phoenix, Arizona 85044
(480) 598-0321 • FAX (480) 598-0768 • (800) 934-4451
E-mail: info@apscales.com
Website: apscales.com

TEMP 74 F° R.H. 54 %
AZ RSR License #006
AZ RSA License #014790
P.O. # _____
Equipment # N/A

120g x 0.0001g
Capacity/Resolution

±0.0005g
Tolerance Value

Comments:

A specific weight kit is assigned to each APB Certified Calibration Technician. All kits and weight standards have the same NIST Traceability and control #.

NIST TRACEABILITY
Control No. 14020300 1
Expires 2/2015

Client # 955
Customer Name: JBR / Stantec
Bldg. Main
Room Lab
Date 8/26/14
Recall Date 8/15

Mfgr.	Model	Serial No.
AND	GR-120	14242070

Calibration Instructions: Internal Cal. ☒ External Cal. ☐ Standard Cal. Procedure ☒ Handbook 44 ☐

List Weights Used	500mg	1g	60g	120g
1. Prior to Service	0.5000g	1.0000g	60.0003g	120.0005g
Tolerance Error	0	0	0	0
2. After Service	0.5000g	1.0000g	60.0000g	120.0000g

	Weight Used			
Corner Load	50g	Prior to Service	2 +0.0002g	3 +0.0002g
			1 0.0000g	4 0.0000g
Corner Load		After Service	2 +0.0002g	3 +0.0002g
			1 0.0000g	4 0.0000g

*CORNER-LOAD ECCENTRICITY (TYPE B UNCERTAINTY) ☑ *LINEARITY (TYPE A UNCERTAINTY) ☑ *REPRODUCIBILITY (TYPE A UNCERTAINTY) ☑

*This is a Certificate of Calibration not a Combined Uncertainty Report. See below for explanation.[1]

1. Prior to Service: ☒ This instrument was within tolerance and customer specifications
☐ This instrument was NOT within tolerance and customer specifications

2. After Service: ☒ This instrument IS WITHIN TOLERANCE and customer specifications
☐ This instrument is OUT OF TOLERANCE: DO NOT USE THIS INSTRUMENT. Significant out of tolerance may affect end product.

[1]Combined Type A & B Uncertainty Report which includes the adjustment for air buoyancy for the standards used in the calibration process, local acceleration of gravity correction, with estimated standard deviation on repeatability measurements, hysteresis, and worst case eccentricity are provided on a separate report per client's request. The methods used for determining uncertainties in the Combined Uncertainty Report are either the Root Sum Square Statistical Method, Total Collected Added Uncertainty, or an Expanded Uncertainty with a Coverage Factor k = 2. Provided level of confidence: 95%. All measurements were performed with a minimum 4:1 test uncertainty ratio unless otherwise noted in comments section. Measurements reported are traceable to SI units via standards traceable to NIST

LJT
Customer

Technical Representative

Original: Customer
Copy: Vendor

Form # 1987 Rev. 9-12
This form may not be reproduced, except in full, without prior written approval from Analytical & Precision Balance Co., Inc.

Analytical & Precision Balance Co., Inc.
The Weighing Solution
ANSI/ISO/IEC 17025 Accredited • GSA Contract Holder

CERTIFICATE OF CALIBRATION

ISO 17025 ACCREDITED

International Accreditation Service, Inc.
Calibration Laboratory # CL-104
9830 S. 51st Street, Suite B-103 • Phoenix, Arizona 85044
(480) 598-0321 • FAX (480) 598-0768 • (800) 934-4451
E-mail: info@apscales.com
Website: apscales.com

TEMP 74 F° R.H. 54 %
AZ RSR License #006
AZ RSA License #014790
P.O. # _____
Equipment # N/A

250g x 0.0001g
Capacity/Resolution

± 0.0005g
Tolerance Value

Comments:

A specific weight kit is assigned to each APB Certified Calibration Technician. All kits and weight standards have the same NIST Traceability and control #.

NIST TRACEABILITY
Control No. 140203001 Expires 2/2015

LJT
Customer

Technical Representative

Original: Customer
Copy: Vendor

Form # 1987 Rev. 9-12
This form may not be reproduced, except in full, without prior written approval from Analytical & Precision Balance Co., Inc.

Client # 955			
Customer Name: JBR/Stantec	Bldg. Main / Room Lab	Date 8/26/14 / Recall Date 8/15	
Mfgr. Fisher Scientific	Model A-250	Serial No. N010434 3	

Calibration Instructions: Internal Cal. ☒ External Cal. ☐ Standard Cal. Procedure ☒ Handbook 44 ☐

List Weights Used	500mg	1g	125g	250g
1. Prior to Service	0.5000g	1.0000g	125.0041g	250.0084g
Tolerance Error	0	0	+0.0041g	+0.0084g
2. After Service	0.5000g	1.0000g	125.0000g	250.0000g
Corner Load	Weight Used 100g	Prior to Service	2 +0.0003g	3 0.0000g
			1 -0.0004g	4 -0.0004g
Corner Load		After Service	2 +0.0003g	3 0.0000g
			1 -0.0004g	4 -0.0004g

*CORNER-LOAD ECCENTRICITY (TYPE B UNCERTAINTY) ☑ *LINEARITY (TYPE A UNCERTAINTY) ☑ *REPRODUCIBILITY (TYPE A UNCERTAINTY) ☑

*This is a Certificate of Calibration not a Combined Uncertainty Report. See below for explanation.[1]

1. Prior to Service: ☐ This instrument was within tolerance and customer specifications
☒ This instrument was NOT within tolerance and customer specifications

2. After Service: ☒ This instrument IS WITHIN TOLERANCE and customer specifications

☐ This instrument is OUT OF TOLERANCE: DO NOT USE THIS INSTRUMENT. Significant out of tolerance may affect end product.

[1]Combined Type A & B Uncertainty Report which includes the adjustment for air buoyancy for the standards used in the calibration process, local acceleration of gravity correction, with estimated standard deviation on repeatability measurements, hysteresis, and worst case eccentricity are provided on a separate report per client's request. The methods used for determining uncertainties in the Combined Uncertainty Report are either the Root Sum Square Statistical Method, Total Collected Added Uncertainty, or an Expanded Uncertainty with a Coverage Factor k = 2. Provided level of confidence: 95%. All measurements were performed with a minimum 4:1 test uncertainty ratio unless otherwise noted in comments section. Measurements reported are traceable to SI units via standards traceable to NIST

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

1.0 - Stack Gas Parameters

1.1 Absolute Stack Pressure

$P_S = P_{bar} + (P_{static}/13.6)$ $P_S =$ 27.44 in. Hg

P_{bar}	27.40	Ambient barometric pressure, (in. Hg)
P_{static}	0.52	Average stack static pressure, (in. H2O)
13.6	13.6	Conversion factor, (in. H2O/in. Hg)

1.2 Dry Molecular Weight of Stack Gas

$M_d = (\%CO_2 * 0.44) + (\% O_2 * 0.32) + (\%N_2 + CO * 0.28)$ $M_d =$ 28.83 lb/lb-mole

% CO_2	0.20	CO_2 by volume, dry basis, (%)
% O_2	19.90	O_2 by volume, dry basis, (%)
% N_2+ CO	79.90	N_2 by volume, dry basis, (%)

1.3 Wet Molecular Weight of Stack Gas

$M_S = M_d * (1-B_{ws}) + 18.0 * B_{ws}$ $M_S =$ 28.28 lb/lb-mole

M_d	28.83	Molecular weight of stack gas, dry basis, (lb/lb-mole)
B_{ws}	0.050	Water vapor in gas stream, (scf)
18.0	18.0	Molecular weight of water, (lb/lb-mole)

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

1.4 Average Stack Gas Velocity

$V_S = K_P * C_P * (\sqrt{\Delta p})avg * (\sqrt{T_{S(abs)}} / (P_S * M_S))$ $V_S =$ 48.05 ft/sec

K_P	85.49	Velocity equation constant, [(m/sec)((lb/lb-mole)(in. Hg)/((°R)(in. H_2O)))]
C_P	0.84	Pitot tube coefficient
$(\sqrt{\Delta p})$ avg	0.78	Average of the square roots of the velocity head measured by Type S Pitot tube, (in. H2O)
T_S	111	Stack Temperature, (°F)
$T_{S(abs)}$	571	Absolute stack temperature, (°R)
P_S	27.44	Absolute stack pressure, (in. Hg)
M_S	28.28	Molecular weight of stack gas, wet basis, (lb/lb-mole)

1.5 Average Stack Gas Dry Volumetric Flow Rate

$Q\ (dscf/hr) = 3600 * (1-B_{ws}) * V_S * A *((T_{std} * P_S)/(T_{S(abs)} * P_{std}))$ Q = 2,872,988 dscf/hr

$Q\ (dscf/m) = Q(dscf/hr) / 60$ Q = 47,883 dcsf/m

$Q\ (scf/m) = Q(dscf/m) / (1 - B_{ws})$ Q = 50,424 scf/m

3600	3600	Conversion factor, (sec/hr)
B_{ws}	0.050	Water vapor in gas stream, (scf)
V_S	48.05	Average stack gas velocity, (ft/sec)
A	21	Cross-sectional area of stack, (ft^2)
T_{std}	528.0	Standard absolute temperature, (°R)
P_S	27.44	Absolute stack pressure, (in. Hg)
$T_{S(abs)}$	571.0	Absolute stack temperature, (°R)
P_{std}	29.92	Standard pressure, (29.92 in. Hg)
60	60	Conversion Factor, (60 min / hr)

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

1.6 Sample Gas Volume at Standard Conditions

$Vm_{std} = K_1 * Vm * Y * (P_{bar} + (\Delta H/13.6)) / T_m)$ $Vm_{std} =$ 74.571 dscf

V_m	81.615	Volume of metered gas during test run, (ft^3)
Y	0.987	Dry gas meter calibration factor, (dimensionless)
K_1	17.64	Conversion factor, (ft^3/ml)
T_m	64	Average dry gas meter temperature, (°F)
T_m	524	Average dry gas meter temperature, (°R)
P_{bar}	27.4	Ambient barometric pressure, (in. Hg)
ΔH	1.67	Average dry gas meter orifice pressure differential, (in. H2O)
13.6	13.6	Conversion factor, (in. H2O/in. Hg)

1.7 Volume of Water Vapor condensed at Standard Conditions

$V_{w(std)} = K_1 * V_{lc}$ $V_{wc(std)} =$ 3.96 scf

K_1	0.04706	Conversion factor ft^3/ml for English units
V_{lc}	84.1	Total volume of liquid impinger catch, (ml)

1.8 Stack Gas Moisture Fraction by Volume

$$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + Vm_{std}}$$ $B_{ws} =$ 0.0504 scf

$V_{w(std)}$	3.96	Volume of water vapor condensed, (scf)
Vm_{std}	74.571	Volume of metered gas, (scf)

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

2.0 - Filterable Particulate Matter

2.1 Percent of isokinetic sampling

$$I = 100 * T_{s(abs)}*(K_4*Vl_c+((V_m*Y)/T_m)*(P_{bar}+(\Delta H/13.6)))/(60*\Theta*V_s*P_s*A_n)$$

I = 97.0 % Isokinetic

$T_{s(abs)}$	571.0	Absolute stack temperature, (°R)
K_4	0.002669	Coefficient, ((in. Hg)(ft^3))/((ml)(°R))
V_{lc}	84.1	Total volume of liquid collected in impingers and silica gel, (ml)
V_m	81.615	Volume of metered gas during test run, (ft^3)
Y	0.9870	Dry gas meter calibration factor, (dimensionless)
T_m	524.5	Average dry gas meter temperature, (°R)
P_{bar}	27.40	Ambient barometric pressure, (in. Hg)
ΔH	1.67	Average dry gas meter orifice pressure differential, (in. H2O)
Θ	120	Total sampling time, (minutes)
V_s	48.05	Average stack gas velocity, (ft/sec)
P_s	27.44	Absolute stack pressure, (in. Hg)
A_n	0.00028	Cross-sectional area of nozzle, (ft^2)
	0.225	Nozzle diameter, (in.)

2.2 Acetone blank residue concentration, mg/mg.

$$C_a = M_a / (V_a * \rho_a)$$

C_a = 0.0 mg/mg

M_a	0.1	Mass of residue of acetone after evaporation, (mg)
V_a	20	Volume of acetone blank, (ml)
ρ_a	790	Density of acetone, (mg/ml)

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

2.3 Acetone wash blank.

$W_a = C_a * V_{aw} * \rho_a$ $W_a =$ 0.4 mg

C_a	0.0	Acetone blank residue concentration, (mg/mg)
V_{aw}	88.0	Volume of acetone used in wash, (ml)
ρ_a	790	Density of acetone, (mg/ml)

2.4 Maximum allowable acetone wash blank.

$W_{a(allowable)} = \rho_a * V_{aw} * 0.001\%$ $W_{a(allowable)} =$ 0.7 mg

ρ_a	790	Density of acetone, (mg/ml)
V_{aw}	88.0	Volume of acetone used in wash, (ml)
0.001%	0.00001	Maximum percent of the weight of acetone used in wash, (%)

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

2.5 Filterable Particulate matter weight.

$m_n = m_{n(filter)} + (m_{n(p/n)} - W_a)$ $m_n =$ 5.6 mg

$m_{n(filter)}$	4.9	Weight of particulate matter on the filter, (mg)
$m_{n(p/n)}$	1.1	Weight of particulate matter in probe and nozzle rinse, (mg)
Wa	0.4	Weight of residue in acetone wash, (mg)

2.6 Filterable Particulate matter concentration.

$C_s(gr/dscf) = ((K_3) * (m_n)) / Vm_{(std)}$ $C_s =$ 0.00114822 gr/dscf

K_3	0.0154	Conversion factor for English units, (gr/mg)
m_n	5.6	Total mass of particluate matter, (mg)
$Vm_{(std)}$	74.571	Volume of metered gas during test run, dry basis, corrected to standard conditions, (dscf)

2.7 Filterable particulate matter emission rate.

$ER_{filterable} = CF * C_s * Q(dscf/hr)$ $ER_{filterable} =$ 0.471 lb/hr

C_s	0.001148	Concentration of filterable particulate matter in stack gas, dry basis, corrected to standard conditions, (gr/dscf)
CF	1.429E-04	Conversion factor, (lb/gr)
Q(dscf/hr)	2,872,988	Volumetric flow rate of stack gas, (dscf/hr)

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

3.0 - Condensable Particulate Matter

3.1 Mass of ammonia correction.

$m_C = 17.03 * V_t * N$ $m_C =$ 0.0 mg

17.03	17.03	mg/milliequivalents for ammonium ion
V_t	0	Volume of NH_4OH titrant, (ml)
N	0.00	Normality of ammonium hydroxide titrtant

3.2 Mass of field train recovery blank.

$m_{fb} = m_{ib} + m_{ob}$ $m_{fb} =$ 2.0 mg

m_{ib}	1.2	Mass of inorganic CPM in field train recovery blank, (mg)
m_{ob}	2.9	Mass of organic CPM in field train recovery blank, (mg)

3.3 Mass of inorganic CPM.

$m_i = m_r - m_C$ $m_i =$ 4.1 mg

m_r	4.1	Mass of dried sample from inorganic fraction, (mg)
m_C	0	Mass of NH_4^+ added to sample to form ammonium sulfate, (mg)

3.4 Total mass of CPM.

$m_{cpm} = m_i + m_o - m_{fb}$ $m_{cpm} =$ 6.3 mg

m_i	4.1	Mass of inorganic CPM, (mg)
m_o	4.2	Mass of organic CPM, (mg)
m_{fb}	2.0	Mass of total CPM in field train recovery blank, shall not exceed 2.0 mg, (mg)

EPA METHODS 1-5/202 - SAMPLE CALCULATIONS

Client:	Sorrento
Test Date:	10/2/2014
Emissions Unit:	Scrubber
Run No:	1
Project No:	203701005

3.5 Concentration of CPM.

$C_{cpm} = (m_{cpm} / Vm_{(std)}) / 64.80004$ $C_{cpm} =$ 0.001304 gr/dscf

m_{cpm}	6.3	Mass of total condensable PM, (mg)
$Vm_{(std)}$	74.57	Volume of metered gas during test run, dry basis, corrected to standard conditions, (dscf)
64.80004	64.80004	Conversion factor, (mg/gr)

3.6 Condensable particulate matter emission rate.

$ER_{CPM} = CF * C_s * Q(dscf/hr)$ $ER_{CPM} =$ 0.54 lb/hr

C_{cpm}	0.001304	Concentration of condensable particulate matter in stack gas, dry basis, corrected to standard conditions, (gr/dscf)
CF	1.429E-04	Conversion factor, (lb/gr)
Q(dscf/hr)	2,872,988	Volumetric flow rate of stack gas, (dscf/hr)

4.0 - Total Particulate Matter

4.1 Total particulate matter emission rate.

$ER = ER_{filterable} + ER_{CPM}$ $ER =$ 1.01 lb/hr

$ER_{filterable}$	0.4714015	Filterable particulate matter emission rate, (lb/hr)
ER_{CPM}	0.535255	Condensable particulate matter emission rate, (lb/hr)

Arizona Smoke School LLC

Certificate of Completion

This certifies that DANIEL VANDEWEGE
Successfully participated in EPA Method 9
Visible Emissions Training on April 25, 2014 and
is qualified to evaluate Visible Emissions for a
period of six (6) months from the date of
certification.

Instructor

MSE Millennium Science & Engineering, Inc.

1555 Shoreline Drive, Suite 150
Boise, Idaho 83702
Phone: (208) 345-8292
Fax: (208) 344-8007

February 27, 2009

RECEIVED
FEB 27 2009
Department of Environmental Quality
State Air Program

Mr. William Rogers
Air Quality and Permits Manager
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83706

RE: Pre-Permit Construction Approval and Permit to Construct Application, Sorrento Lactalis, Inc., Nampa, Idaho

Dear Mr. Rogers:

Please find enclosed one copy of the Pre-Permit Construction Approval and Permit to Construct Application for the new whey dryer at the Sorrento Lactalis Plant in Nampa, Idaho. Electronic modeling input and output files are included on a compact disc (see Appendix 4). A check to pay the Permit to Construction application fees is also enclosed.

Thank you for your assistance with this project. If you have any questions please call me at (208) 345-8292.

Regards,

Troy D. Riecke, P.E.
Environmental Engineer

Cc: Ms. Wendy York – Sorrento Lactalis, Inc.

RECEIVED

FEB 27 2009

Department of Environmental Quality
State Air Program

Sorrento LACTALIS, INC.

4912 E. FRANKLIN ROAD P.O. BOX 1280 NAMPA, IDAHO 83653-1280
TEL [208] 467-4424 FAX [208] 467-9987

February 23, 2009

Mr. William Rogers
Air Quality and Permits Manager
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706

Re: Application for Pre-Permit Construction, Sorrento Lactalis, Inc., New Whey Dryer, Nampa, Idaho

Dear Mr. Rogers:

Sorrento Lactalis, Inc. proposes to construct a new whey dryer at its plant located at 4912 E. Franklin Rd. in Nampa, Idaho. Sorrento Lactalis intends to begin construction of the plant within 15 days of submittal of this application. Therefore, we request permission for Pre-Permit Construction in accordance with Part 213 of Idaho Rules for the Control of Air Pollution (IDAPA 58.01.01.213). The enclosed PTC application conforms to the January 2001 Idaho Department of Environmental Quality (DEQ) *Pre-Permit Construction Approval Guidance Document*.

The required pre-application meeting was held on January 22, 2009 and was attend by you, Mr. Kevin Schilling (DEQ), Ms. Wendy York (Sorrento Lactalis), Mr. Laurent Guy (Sorrento Lactalis), and Mr. Troy Riecke (MSE). The required public information meeting will be held on March 9, 2009. A copy of the notice announcing this meeting is enclosed with this PTC application.

We have determined that construction of this facility is eligible for Pre-Permit Construction in that the Nampa plant is not a major facility or a major modification, we are not proposing to use offsets or netting, and emissions from the facility are not going to impact air quality related values in a Class I area.

By this application, Sorrento certifies that it will comply with all limitations, operating requirements, monitoring requirements, and reporting requirements

described in the enclosed application. Also, pursuant to Idaho Rules (IDAPA 58.01.01.123), I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.

I appreciate your assistance in moving this project forward on such short notice. Please feel free to call Ms. Wendy York at (208) 463-6674 or Mr. Troy Riecke at (208) 345-8292 if you have any questions.

Sincerely,

Giulio Ferrari
Nampa Plant Manager

cc: Troy Riecke – Millennium Science & Engineering, Inc.

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

1410 North Hilton
Boise, Idaho 83706-1253

RECEIPT

2/27/09
DATE

RECEIVED FROM Millennium Science & Engineering for Sorrento Lactalis

SOURCE
Cash ☐ Check ☒ Money Order ☐ No.

DESCRIPTION	AMOUNT OF PAYMENT
Check # 1017	1000 00
P-000726	

RECEIVED BY

TOTAL RECEIVED 1000 00

PID	OBS	CA	SUB-OBJ	WP	BE

№ 82925

RECEIVED
FEB 27 2009
Department of Environmental Quality
State Air Program

Pre-Permit Construction Approval and Permit to Construct Application

Sorrento Lactalis, Inc.
New Whey Dryer
Nampa, Idaho

February 27, 2009

Prepared for:

Sorrento Lactalis, Inc.
4912 E. Franklin Rd.
Nampa, Idaho 83653

Prepared by:

Millennium Science & Engineering, Inc.
1605 North 13th Street
Boise, Idaho 83702
(208)345-8292

MSE Millennium Science & Engineering, Inc.

Environmental Science & Engineering Solutions for the 21st Century

TABLE OF CONTENTS

Section 1	Process Description	1
Section 2	Process Flow Diagram	4
Section 3	Applicable Requirements	6
Section 4	Emission Estimates	15
Section 5	Facility Classification	21
Section 6	Plot Plan	23
Section 7	Ambient Impact Assessment	25

Appendices

Appendix 1	Emission Calculations and Vendor Supplied Equipment Information
Appendix 2	Copy of Public Meeting Notice
Appendix 3	Modeling Protocol and IDEQ Response
Appendix 4	Model Output and Electronic Copy of Model Input/Output
Appendix 5	Permit to Construct Application
Appendix 6	Pre-Permit Construction Application Checklist

Section 1 – Process Description

1.0 Introduction

Sorrento Lactalis, Inc. proposes to construct a new whey dryer and a natural gas-fired boiler at their existing plant located at 4912 East Franklin Road in Nampa, Idaho. The facility (P-000726) has an existing whey dryer with Permit No. 027-00071. There are also three existing natural gas-fired boilers at the facility that are considered to be exempt from permit to construct requirements since the heat input capacity of each boiler is less than 50 million Btu per hour (MMBtu/hr). This document is intended to provide details required to support a Pre-Permit Construction Approval application along with Permit to Construct Application requirements for the new drying equipment.

1.1 Process Description

Dried whey powder will be manufactured in the new process equipment. Up to 400,000 lb/day of (95.5 percent total solid) dried whey powder will be produced in the new drying process. The following is a description of the new whey drying processes proposed at the plant.

The new dryer will receive whey concentrate at a rate up to 619,176 pounds per day (lb/day), assuming 62 percent solids content, from a new evaporator at the plant. The whey drying process consists of two 12.5 MMBtu/hr natural gas fired burners, a drying chamber, and shaking beds. The two burners heat air that passes into the drying chamber to dry whey. The burners are considered indirect heating devices since the combustion gases do not come in contact with the heated air. Each burner has an exhaust stack (P-2 and P-3) that discharges natural gas combustion products. The heated air dries the whey concentrate as it flows through the drying chamber. The drying chamber exhausts to cyclones where product in air is recovered. The cyclones are considered as process equipment for this application. The purpose of this equipment is to recover solids suspended in air discharged from the dryer, the recovered solids are returned to the process line. The exhaust from the cyclones passes through a venturi air scrubber (P-4) to control discharge of particulate matter from this process. Product from the drying chamber passes over a conditioning belt onto a shaking bed and then to storage silos. Exhaust air from the shaking bed passes through a baghouse (P-5) to recover product and control discharge of particulate matter to the air. The new boiler (P-6) will provide additional heat and steam for processes at the plant. See Figure 1 – Process Flow Diagram for a graphical depiction of the processes to be implemented at the existing cheese plant. The proposed natural gas-fired boiler (P-6) and two dryer burners (P-2 and P-3) are exempt from PTC requirements because they are classified as indirect heating equipment with rated heat input capacity below the threshold of 50 MMBtu/hr.

<u>Control Equipment Maintenance and Operation</u>

The baghouse will use differential pressure transmitters and broken bag detectors to monitor performance. Required baghouse maintenance involves cleaning of the

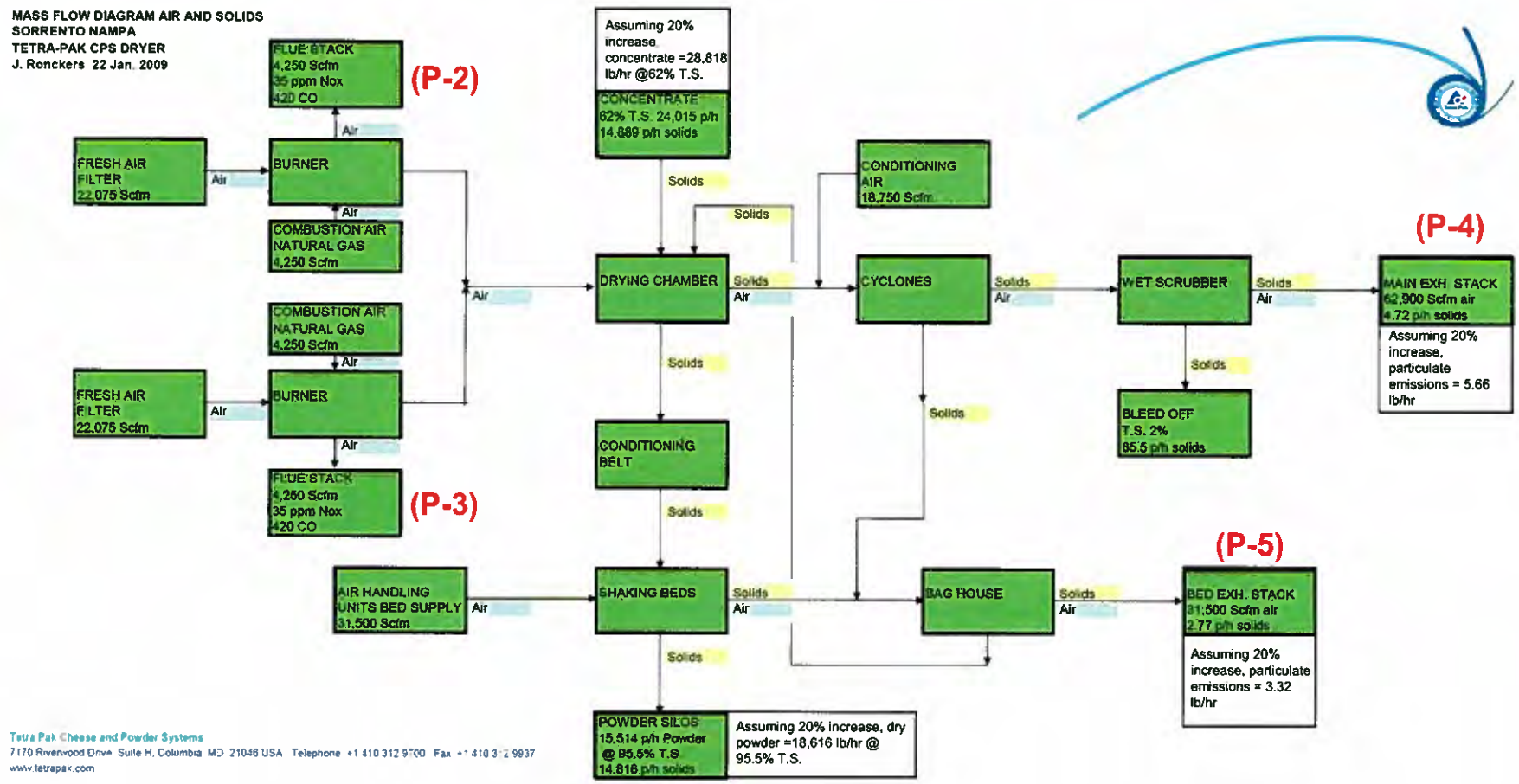
baghouse at least once per year, and replacement of broken bags. Complete bag replacement will be done at the manufacturer's recommended frequency.

The scrubber system will incorporate a density meter to monitor the solids levels in the circulating water as well as a differential pressure transmitter to monitor pressure drop across the unit. The scrubber system will be cleaned at the frequency recommended by the manufacturer.

Process Flow Diagram Clarification

Figure 1 provides a Process Flow Diagram for the proposed whey drying process. The mass throughput values for raw material, dried product, and emission rates provided by TetraPak were inflated by 20% (excluding fuel combustion processes) to allow flexibility for the facility and to provide a safety factor (both the manufacturer stated and inflated values are listed on the process flow diagram). This 20% increase was carried through emission inventory calculations and air dispersion modeling. The maximum theoretical whey concentrate throughput was calculated as 691,632 lb/day and the maximum finished dried product was calculated as 446,803 lb/day. After completing the emission inventory and modeling with the 20% safety factor it was determined by Sorrento Lactalis that a 400,000 lb/day finished product maximum daily throughput corresponding to a maximum whey concentrate input of 619,176 lb/day would be adequate for the new source and they didn't want any additional throughput allowance. For this application, the emission inventory and ambient impact assessment will continue to reflect the 20% safety factor applied to the manufacturer specifications but a finished product throughput limit of 400,000 lb/day (and corresponding whey concentrate input of 619,176 lb/day) will be requested for the facility as permit limit.

Section 2 – Process Flow Diagram



(P-#) represents an emission point.

Note: In order to provide a safety factor for the facility, the manufacturer's design throughput and particulate emission rates were increased by 20%. These changes are noted on the process flow diagram where applicable (green boxes are manufacturer's values and white boxes are the modified values).

Source: Process flow diagram provided by TetraPak, annotated to show emission point labels by Millennium Science & Engineering.

MSE Millennium Science & Engineering, Inc. 1555 Shoreline Dr., Suite 150 Boise, Idaho 83702 (208) 345-8292 (voice) (208) 344-8007 (fax)	**Process Flow Diagram** **New Whey Dryer** Sorrento Lactalis, Inc. 4912 E. Franklin Rd. Nampa, Idaho
02-23-09	**Figure 1**

Section 3 – Applicable Requirements

3.0 Applicable Requirements

Regulations applicable to the proposed facility are discussed in this section.

3.1 Federal Requirements

The following includes the rules and regulations reviewed in preparation of this PTC application.

3.1.1 40 CFR § 52 - Prevention of Significant Deterioration (PSD)

The facility is not a PSD major facility and does not belong to any designated source category, therefore PSD review is not applicable.

3.1.2 40 CFR § 60 - New Source Performance Standards (NSPS)

<u>40 CFR § 60-Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units</u>

Affected Units:
1.) 1200 HP Cleaver Brooks Boiler (P-6)

60.40c – Applicability
The boiler is subject to requirements of Subpart Dc because the boiler is a steam generating unit with heat input capacity greater than 10 million BTU/hr but less than 100 million BTU/hr and will be constructed or modified after June 9, 1989.

Because the boiler will only combust natural gas, the facility will only be subject to the reporting and record keeping requirements listed in § 60.48c.

§ 60.48c Reporting and recordkeeping requirements.
The following information is required to be submitted:

> *(a)* Notification of the date of construction or reconstruction and actual startup. Provide heat input capacity of the facility and the identification of fuels to be combusted in the affected facility.

The following information is required to be recorded and maintained:
(g)(2) Record and maintain records of the amount of each fuel combusted during each calendar month.

Records required under this section are to be maintained by the operator for two years.

The reporting period for the reports required under this subpart is each six-month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.

40 CFR § 60-Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

No affected stationary compression ignition internal combustion engine sources are proposed for this permit action.

3.1.3 40 CFR § 61 - National Emission Standards for Hazardous Air Pollutants (NESHAPs) & Maximum Achievable Control Technology (MACT)

There are no applicable NESHAPs or MACT for this facility.

3.2 State Requirements

Applicable state requirements include the following. All citations refer to specific sections of IDAPA 58.01.01, Rules for the Control of Air Pollution in Idaho.

123. CERTIFICATION OF DOCUMENTS.

All documents, including but not limited to, application forms for permits to construct, application forms for operating permits, progress reports, records, monitoring data, supporting information, testing reports or compliance certifications submitted to the Department shall contain a certification by a responsible official.

128. CONFIDENTIAL INFORMATION

Not applicable as no confidential information is being submitted.

201 - PERMIT TO CONSTRUCT REQUIRED

Affected Units:
1.) TetraPak Whey Dryer Scrubber (P-4)
2.) TetraPak Shaking Bed Baghouse (P-5)

The proposed modification will not be a major modification, it will require a PTC prior to construction.

203. PERMIT REQUIREMENTS FOR NEW AND MODIFIED STATIONARY SOURCES

Affected Units:
1.) TetraPak Whey Dryer Scrubber (P-4)
2.) TetraPak Shaking Bed Baghouse (P-5)

The scrubber (P-4) and baghouse (P-5) are control devices that are required to prevent exceedance of National Ambient Air Quality Standards for PM10. The

following process limit for the new equipment is proposed by the facility to demonstrate compliance for particulate matter emissions:

- Dried whey powder throughput limit = 400,000 lb/day (at 95.5% solids). Measured daily.

The following limit is also required for the facility:

- Operation and maintenance per manufacturer's recommendations of the baghouse (P-5) and scrubber (P-4) to prevent excess emissions of particulate matter.

Combustion emission rates were determined based on maximum rated firing rates and therefore do not require any limitations on operation.

The facility anticipates that the IDEQ will require permit conditions for the plant to protect the National Ambient Air Quality Standards (NAAQS), to comply with the toxic air pollutant (TAP) standards, to comply with the grain loading standard for fuel burning equipment, and the reasonable control of fugitives.

210. DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS

210.01. Identification of Toxic Air Pollutants.

Affected Units:
1.) TetraPak Whey Dryer Burner 1 (P-2)
2.) TetraPak Whey Dryer Burner 2 (P-3)
3.) TetraPak Whey Dryer Scrubber (P-4)
4.) TetraPak Shaking Bed Baghouse (P-5)
5.) 1200 HP Cleaver Brooks Boiler (P-6)

All TAP emitted by these emission units shall be identified. These compounds are listed in Section 4.

210.02. Quantification of Emission Rates

Affected Units:
1.) TetraPak Whey Dryer Burner 1 (P-2)
2.) TetraPak Whey Dryer Burner 2 (P-3)
3.) TetraPak Whey Dryer Scrubber (P-4)
4.) TetraPak Shaking Bed Baghouse (P-5)
5.) 1200 HP Cleaver Brooks Boiler (P-6)

Emission rates of all TAP shall be estimated. Toxic emissions were estimated using emission factors. This analysis is presented in Section 4.

210.03. Quantification of Ambient Concentrations

Affected Units:
1.) TetraPak Whey Dryer Burner 1 (P-2)
2.) TetraPak Whey Dryer Burner 2 (P-3)
3.) TetraPak Whey Dryer Scrubber (P-4)
4.) TetraPak Shaking Bed Baghouse (P-5)
5.) 1200 HP Cleaver Brooks Boiler (P-6)

Modeling of facility-wide emissions was performed as described in Section 7.

210.04. Preconstruction Compliance Demonstration

Affected Units:
1.) TetraPak Whey Dryer Burner 1 (P-2)
2.) TetraPak Whey Dryer Burner 2 (P-3)
3.) TetraPak Whey Dryer Scrubber (P-4)
4.) TetraPak Shaking Bed Baghouse (P-5)
5.) 1200 HP Cleaver Brooks Boiler (P-6)

Preconstruction compliance for each identified TAP is demonstrated by the modeling described in Section 7.

213 - PRE-PERMIT CONSTRUCTION

213.01. Pre-Permit Construction Eligibility

Affected Units:
1.) TetraPak Whey Dryer Scrubber (P-4)
2.) TetraPak Shaking Bed Baghouse (P-5)

The 1200 HP Cleaver Brooks Boiler (P-6) and the TetraPak Whey Dryer Burners (P-2 and P-3) are exempt from permit to construct requirements and therefore were not included in the Pre-Permit Construction elegibility determination. This application includes consideration of these exempt sources in both the emissions inventory and in ambient impact assessment and would qualify for Pre-Permit Construction eligibility if not exempt.

213.01(a): The owner or operator shall apply for a permit to construct.

This application is submitted to satisfy this requirement.

213.01(b): The owner or operator shall consult with Department representatives prior to submitting a pre-permit construction approval application.

This requirement was satisfied by meeting with Mr. William Rogers and Mr. Kevin Schilling on January 22, 2009.

213.01(c): *The owner or operator shall submit a pre-permit construction approval application which must contain, but not be limited to: a letter requesting the ability to construct before obtaining the required permit to construct, a copy of the notice referenced in Subsection 213.02; proof of eligibility; process description(s); equipment list(s); proposed emission limits and modeled ambient concentrations for all regulated air pollutants, such that they demonstrate compliance with all applicable air quality rules and regulations. The models shall be conducted in accordance with Subsection 202.02 and with written Department approved protocol and submitted with sufficient detail so that modeling can be duplicated by the Department.*

These required elements are included in this application package.

213.01(d): *Owners or operators seeking limitations on a source's potential to emit such that permitted emissions will be either below major source levels or below a significant increase must describe in detail in the pre-permit construction application the proposed restrictions and certify in accordance with Section 123 that they will comply with the restrictions, including any applicable monitoring and reporting requirements. The required description of PTE limitations is included in Section 4.*

The required certification is included in the cover letter accompanying this application.

213.02. Permit To Construct Procedures For Pre-Permit Construction
Within ten (10) days after the submittal of the pre-permit construction approval application, the owner or operator shall hold an informational meeting in at least one (1) location in the region in which the stationary source or facility is to be located. The informational meeting shall be made known by notice published at least ten (10) days before the meeting in a newspaper of general circulation in the county(ies) in which the stationary source or facility is to be located. A copy of such notice shall be included in the application.

The required public meeting will be held on March 9, 2009. A copy of the required notice is included in Appendix 2.

214. DEMONSTATION OF PRECONSTRUCTION COMPLIANCE FOR NEW AND RECONSTRUCTED MAJOR SOURCES OF HAZARDOUS AIR POLLUTANTS

The proposed emission sources are not considered Major Facilities so this section does not apply.

220. GENERAL EXEMPTION CRITERIA FOR PERMIT TO CONSTRUCT EXEMPTIONS
222. CATEGORY II EXEMPTION

Affected emission units:
1.) TetraPak Whey Dryer Burner 1 (P-2)
2.) TetraPak Whey Dryer Burner 2 (P-3)
3.) 1200 HP Cleaver Brooks Boiler (P-6)

The TetraPak Whey Dryer Burners 1 and 2 (P-2 and P-3) are indirect heating devices each with heat input capacity of 12.5 MMBtu/hr. The 1200 HP Cleaver Brooks Boiler (P-6) has a heat input capacity of 48.99 MMBtu/hr. These devices combust natural gas, meet the indirect heating classification, and are below the heat input capacity exemption threshold of 50 MMBtu/hr, and therefore qualify for Category II Exemption (IDAPA 58.01.01.222.02.c).

223. EXEMPTION CRITERIA AND REPORTING REQUIREMENTS FOR TOXIC AIR POLLUTANT EMISSIONS.

Not applicable as no exemptions are being claimed.

577. AMBIENT AIR QUALITY STANDARDS FOR SPECIFIC AIR POLLUTANTS.

Compliance with all applicable ambient air quality standards is discussed in Section 7.

578. DESIGNATION OF ATTAINMENT, UNCLASSIFIABLE, AND NONATTAINMENT AREAS.

Not applicable to applicant - designation of attainment, unclassifiable, and nonattainment areas is the responsibility of IDEQ. Current attainment status of the facility location is discussed in Section 5.

585. TOXIC AIR POLLUTANTS NON-CARCINOGENIC INCREMENTS.

Compliance with AACs is addressed in Sections 4 and 7.

586. TOXIC AIR POLLUTANTS CARCINOGENIC INCREMENTS.

Compliance with AACCs is addressed in Sections 4 and 7.

590. NEW SOURCE PERFORMANCE STANDARDS.

Affected Units:

1.) 1200 HP Cleaver Brooks Boiler (P-6)

Compliance with NSPS is discussed in Section 3.1.

591. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS.

Compliance with NESHAPs is discussed in Section 3.1.

625. VISIBLE EMISSIONS.

Affected Units:
1.) TetraPak Whey Dryer Scrubber (P-4)
2.) TetraPak Shaking Bed Baghouse (P-5)

A person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period which is greater than twenty percent (20%) opacity as determined by this section.

This requirement is applicable to all emission units listed above.

650. RULES FOR CONTROL OF FUGITIVE DUST.
All reasonable precautions shall be taken to prevent particulate matter from becoming airborne. In determining what is reasonable, consideration will be given to factors such as the proximity of dust emitting operations to human habitations and/or activities and atmospheric conditions which might affect the movement of particulate matter. Some of the reasonable precautions may include, but are not limited to, the following:
01. Use Of Water Or Chemicals. Use, where practical, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land.
02. Application Of Dust Suppressants. Application, where practical, of asphalt, oil, water or suitable chemicals to, or covering of dirt roads, material stockpiles, and other surfaces which can create dust.
03. Use Of Control Equipment. Installation and use, where practical, of hoods, fans and fabric filters or equivalent systems to enclose and vent the handling of dusty materials.
04. Covering Of Trucks. Covering, when practical, open bodied trucks transporting materials likely to give rise to airborne dusts.
05. Paving. Paving of roadways and their maintenance in a clean condition, where practical. Note: all truck traffic areas will be paved.

675. FUEL BURNING EQUIPMENT -- PARTICULATE MATTER.
And
676. STANDARDS FOR NEW SOURCES.
And
677. STANDARDS FOR MINOR AND EXISTING SOURCES.

Affected units:
1.) TetraPak Whey Dryer Burner 1 (P-2)
2.) TetraPak Whey Dryer Burner 2 (P-3)
3.) 1200 HP Cleaver Brooks Boiler (P-6)

Although these sources are exempt from permit to construct requirements, comparison of these sources to grain loading standards was completed. Compliance with particulate matter emission limits is discussed in Section 4 and/or Appendix 1.

700. PARTICULATE MATTER -- PROCESS WEIGHT LIMITATIONS.
And
710. PARTICULATE MATTER -- PROCESS EQUIPMENT EMISSION LIMITATIONS ON OR AFTER JULY 1, 2000.

Affected Units:
1.) TetraPak Whey Dryer Scrubber (P-4)
2.) TetraPak Shaking Bed Baghouse (P-5)

The maximum raw product input to these processes is 619,176 pounds of whey concentrate (at 62% solids) per day. Based on the equation included in this section, the maximum allowable particulate matter emission rate from these sources is 13.94 lb/hr. Section 4 and Appendix 1 demonstrates compliance with this rule.

775. RULES FOR CONTROL OF ODORS.
And
776. GENERAL RULES.

No emission of odorous gases, liquids or solids into the atmosphere in such quantities as to cause air pollution will be allowed.

Section 4 – Emission Estimates

4.0 Potential to Emit/Emission Estimates/Limitation on Potential to Emit

4.1 Emission Estimates

Emissions were estimated for both proposed and existing equipment to support this application. Emission estimates are summarized in Table 4-1. Calculated emission estimates are included in Appendix 1. Specific discussion regarding potential to emit for each source is presented in the following sections.

4.1.1 Proposed Equipment

Emission rates for proposed equipment were based on a maximum throughput of concentrated whey of 691,632 lb/hr at 62% total solids (this is greater than the facility requested whey concentrate throughput of 619,176 lb/hr; however, it provides a safety factor above the requested amount). Emission rates were assumed to be continuous at maximum production rates for 24 hours per day and 365 days per year (8760 hr/yr) for all equipment.

Emissions from the TetraPak whey drying process were estimated for each point source discharging to the atmosphere: Dryer Burners (P-2 and P-3), Dryer Scrubber (P-4), and Shaking Bed Baghouse (P-5). Emissions from the proposed 1200 HP Cleaver Brooks Boiler (P-6) were also estimated.

TetraPak Whey Dryer – Burner 1 and 2 (P-2 and P-3)

Each Whey Dryer Burner (P-2 and P-3) is fired by natural gas and has a heat input capacity of 12.5 MMBtu/hr (total of 25 MMBtu/hr combined). Each burner has a discharge stack for venting combustion gases. The burners combust natural gas to heat air used in the drying process. The burners are considered indirect heating devices. Emissions for nitrogen oxides (NOx) and carbon monoxide (CO) from these sources were provided by the manufacturer in the form of a performance guarantee. See the Appendix 1 for a copy of the performance guarantee. Emission rates for all other pollutants were calculated by multiplying the burner heat input capacity times the emission factors for natural gas combustion found in EPA AP-42, Chapter 1.4 "Natural Gas Combustion". Emission rates were calculated for both Criteria Pollutants and Toxic Air Pollutants (TAPs). These calculated emission rates represent the potential to emit based on maximum rated natural gas combustion.

TetraPak Whey Dryer Scrubber (P-4)

The Whey Dryer Scrubber (P-4) receives exhaust gas that passes from the drying chamber through cyclones and into the wet scrubber. The scrubber is manufactured by Fisher Klosterman, Inc. and is rated for this application to provide 99% removal efficiency. The scrubber is an emission control device intended to prevent excess emission of particulate matter. Particulate matter with an effective diameter of 10 microns (PM10) is the only regulated air pollutant emitted from this source. The emission rate for this source was provided by TetraPak as part of their design

package. In order to provide a safety factor on the vendor supplied estimates and to allow operational flexibility, a factor of 20% was added to the estimated emissions.

TetraPak Shaking Bed Baghouse (P-5)
Dried product will pass from the dryer into shaking beds for further conditioning. Exhaust air from the shaking beds will pass through a baghouse to prevent excess emissions of particulate matter from this process. The baghouse is an emission control device. The baghouse is a reverse air jet type. PM10 is the only regulated air pollutant emitted from this source. The emission rate for this source was provided by TetraPak as part of their design package. In order to provide a safety factor on the vendor supplied estimates and to allow operational flexibility, a factor of 20% was added to the estimated emissions.

1200 HP Cleaver Brooks Boiler (P-6)
The 1200 HP Cleaver Brooks Boiler (P-6) provides heat and steam to processes at the plant. The boiler has a rated heat input capacity of 48.99 MMBtu/hr and will combust natural gas exclusively. Emissions from this sources were calculated by multiplying the boiler's heat input capacity times the emission factors for natural gas combustion found in EPA AP-42, Chapter 1.4 "Natural Gas Combustion". Emission rates were calculated for both Criteria Pollutants and Toxic Air Pollutants (TAPs). These calculated emission rates represent the potential to emit based on maximum rated natural gas combustion.

4.1.2 Existing Equipment
Although existing equipment is not included as part of this PTC application (already permitted or previously determined to be exempt from PTC requirements), emission estimates for existing equipment were completed to provide a complete emission inventory and to allow facility-wide modeling to be completed for the Full Impact Analysis. Existing equipment includes the Meyers-Sterner Whey Dryer (P-1) and three boilers (P-7, P-8, and P-9).

Meyers-Sterner Whey Dryer (P-1)
The Meyers-Sterner Whey Dryer (P-1) is currently operating at the facility under Permit No. 027-00071. This dryer will continue to operate at the facility as permitted. Emissions from the dryer include natural gas combustion products and particulate matter from the drying process. Emission rates for PM/PM10, NOx, and CO were from the May 30, 2001 Permit to Construct Technical Analysis prepared to support the proposed whey dryer construction. All other emissions estimates were calculated using natural gas fuel combustion emission factors listed in AP-42 Chapter 1.4, "Natural Gas Combustion".

Existing Boilers (P-7, P-8, and P-9)
Three boilers (P-7, P-8, and P-9) are present at the site. They were previously determined to be exempt form PTC requirements and are only presented to here to provide a complete emission inventory and to allow completion of a facility-wide air

dispersion modeling analysis. Emissions from the existing boilers were estimated using emission factors found in AP-42, Chapter 1.4 "Natural Gas Combustion". The three boilers combust natural gas exclusively.

Table 4-1
Summary of Potential Emission Rates

Emission Inventory
Sorrento Lactalis, Inc.
Nampa, Idaho

Proposed Sources

Pollutant	TP Whey Dryer Stack 1 (P-2)		TP Whey Dryer Stack 2 (P-3)		TP Whey Dryer Scrubber (P-4)		TP Shaking Bed Baghouse (P-5)		1200 HP Cleaver Brooks Boilers (P-6)		Total	EL	Total
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(lb/hr)	(ton/yr)
PM_{10}	0.095	0.42	0.095	0.42	5.66	24.8	3.32	14.6	0.37	1.6	9.6		41.8
SO_2	0.0075	0.033	0.008	0.033					0.029	0.13	0.0		0.2
NO_x	0.50	2.2	0.50	2.2					4.9	21.5	5.9		25.8
CO	3.89	17.05	3.89	17.05					4.12	18.02	11.9		52.1
VOC	0.069	0.30	0.069	0.30					0.27	1.2	0.4		1.8
Lead	6.3E-06	0.0	6.3E-06	0.0					2.4E-05	0.0	3.7E-05		0.0
Arsenic	2.5E-06	0.0	2.5E-06	0.0					9.8E-06	0.0	**1.5E-05**	1.5E-06	0.0
Benzene	2.6E-05	0.0	2.6E-05	0.0					1.0E-04	0.0	1.6E-04	8.0E-04	0.0
Benzo(a)pyrene	1.5E-08	0.0	1.5E-08	0.0					5.9E-08	0.0	8.9E-08	2.0E-06	0.0
Cadmium	1.4E-05	0.0	1.4E-05	0.0					5.4E-05	0.0	**8.1E-05**	3.7E-06	0.0
Fluorene	3.5E-08	0.0	3.5E-08	0.0					1.4E-07	0.0	2.1E-07	1.3E-01	0.0
Formaldehyde	9.4E-04	0.0	9.4E-04	0.0					3.7E-03	0.0	**5.5E-03**	5.1E-04	0.0
Naphthalene	7.6E-06	0.0	7.6E-06	0.0					3.0E-05	0.0	4.5E-05	3.3	0.0
Nickel	2.6E-05	0.0	2.6E-05	0.0					1.0E-04	0.0	**1.6E-04**	2.7E-05	0.0
Toluene	4.3E-05	0.0	4.3E-05	0.0					1.7E-04	0.0	2.5E-04	25.0	0.0

Existing Sources

Pollutant	Meyers-Sterner Dryer (P-1)		600 HP Superior Boiler (P-7)		600 HP Cleaver Brooks Boiler (P-8)		800 HP Hurst Boiler (P-9)		Existing Total	EL	Existing Total	Combined Total	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
PM_{10}	1.6	7.0	0.19	0.84	0.19	0.82	0.26	1.1	2.2		9.8	11.8	51.6
SO_2	0.0036	0.016	0.015	0.066	0.015	0.06	0.020	0.088	0.1		0.2	0.1	0.4
NO_x	0.27	1.2	2.5	11.0	2.4	10.7	3.4	14.7	8.6		37.6	14.5	63.5
CO	2.24	9.81	2.11	9.24	2.06	9.01	2.82	12.36	9.2		40.4	21.1	92.5
VOC	0.033	0.14	0.14	0.60	0.13	0.59	0.18	0.81	0.5		2.1	0.9	3.9
Lead	3.0E-06	0.0	1.3E-05	0.0	1.2E-05	0.0	1.7E-05	0.0	4.5E-05		0.0	8.2E-05	0.0
Arsenic	1.2E-06	0.0	5.0E-06	0.0	4.9E-06	0.0	6.7E-06	0.0	1.8E-05	1.5E-06	0.0	3.3E-05	0.0
Benzene	1.3E-05	0.0	5.3E-05	0.0	5.1E-05	0.0	7.1E-05	0.0	1.9E-04	8.0E-04	0.0	3.4E-04	0.0
Benzo(a)pyrene	7.2E-09	0.0	3.0E-08	0.0	2.9E-08	0.0	4.0E-08	0.0	1.1E-07	2.0E-06	0.0	2.0E-07	0.0
Cadmium	6.6E-06	0.0	2.8E-05	0.0	2.7E-05	0.0	3.7E-05	0.0	9.8E-05	3.7E-06	0.0	1.8E-04	0.0
Fluorene	1.7E-08	0.0	7.0E-08	0.0	6.9E-08	0.0	9.4E-08	0.0	2.5E-07	1.3E-01	0.0	4.6E-07	0.0
Formaldehyde	4.5E-04	0.0	1.9E-03	0.0	1.8E-03	0.0	2.5E-03	0.0	6.7E-03	5.1E-04	0.0	1.2E-02	0.1
Naphthalene	3.7E-06	0.0	1.5E-05	0.0	1.5E-05	0.0	2.0E-05	0.0	5.4E-05	3.3	0.0	1.0E-04	0.0
Nickel	1.3E-05	0.0	5.3E-05	0.0	5.1E-05	0.0	7.1E-05	0.0	1.9E-04	2.7E-05	0.0	3.4E-04	0.0
Toluene	2.0E-05	0.0	8.5E-05	0.0	8.3E-05	0.0	1.1E-04	0.0	3.0E-04	25.0	0.0	5.5E-04	0.0

Note: PM10 emission rates for P-4 and P-5 were inflated by 20% above manufacturer's specifications as a safety factor.

4.2 Process Weight Rule

The Process Weight Rule (IDAPA 58.01.01.700) applies to the whey drying operations at this plant. This rule limits the amount of particulate matter (PM) that can be discharged from a source. Appendix 1 includes an estimate of PM emissions from process equipment (excluding emissions from fuel combustion equipment) and summarizes the calculation of the allowable PM discharge according to the Process Weight Rule.

According to the Process Weight Rule analysis summarized in Appendix 1, the process at its capacity of 619,176 pounds per day of whey concentrate (62% solids) is allowed to discharge 13.94 pounds PM per hour from process equipment (excludes fuel burning equipment). The proposed process is only anticipated to generate 8.99 pounds PM per hour; therefore, the anticipated PM loading from the process will meet requirements of the process weight rule.

4.3 Fuel Burning Equipment - Particulate Matter

Particulate matter emission limits are established in IDAPA 58.01.01.675. The limit for new sources combusting natural gas is 0.015 grains per dry standard cubic foot (dscf) corrected for 3% oxygen. The calculated particulate matter loading from proposed fuel burning equipment at the site is 0.005 grains/dscf (see Appendix 1).

4.4 Limitations on Potential to Emit

The scrubber (P-4) and baghouse (P-5) are control devices that are required to prevent exceedance of National Ambient Air Quality Standards for PM10. The following process limit for the new equipment is proposed by the facility to demonstrate compliance for particulate matter emissions:

- Dried whey powder throughput limit = 400,000 lb/day (at 95.5% solids). Measured daily.

The following limit is also required for the facility:

- Operation and maintenance per manufacturer's recommendations of the baghouse (P-5) and scrubber (P-4) to prevent excess emissions of particulate matter.

Combustion emission rates were determined based on maximum rated firing rates and therefore do not require any limitations on operation.

The facility is considered a synthetic minor source since it relies on physical controls to prevent exceedance of the major source classification.

Section 5 – Facility Classification

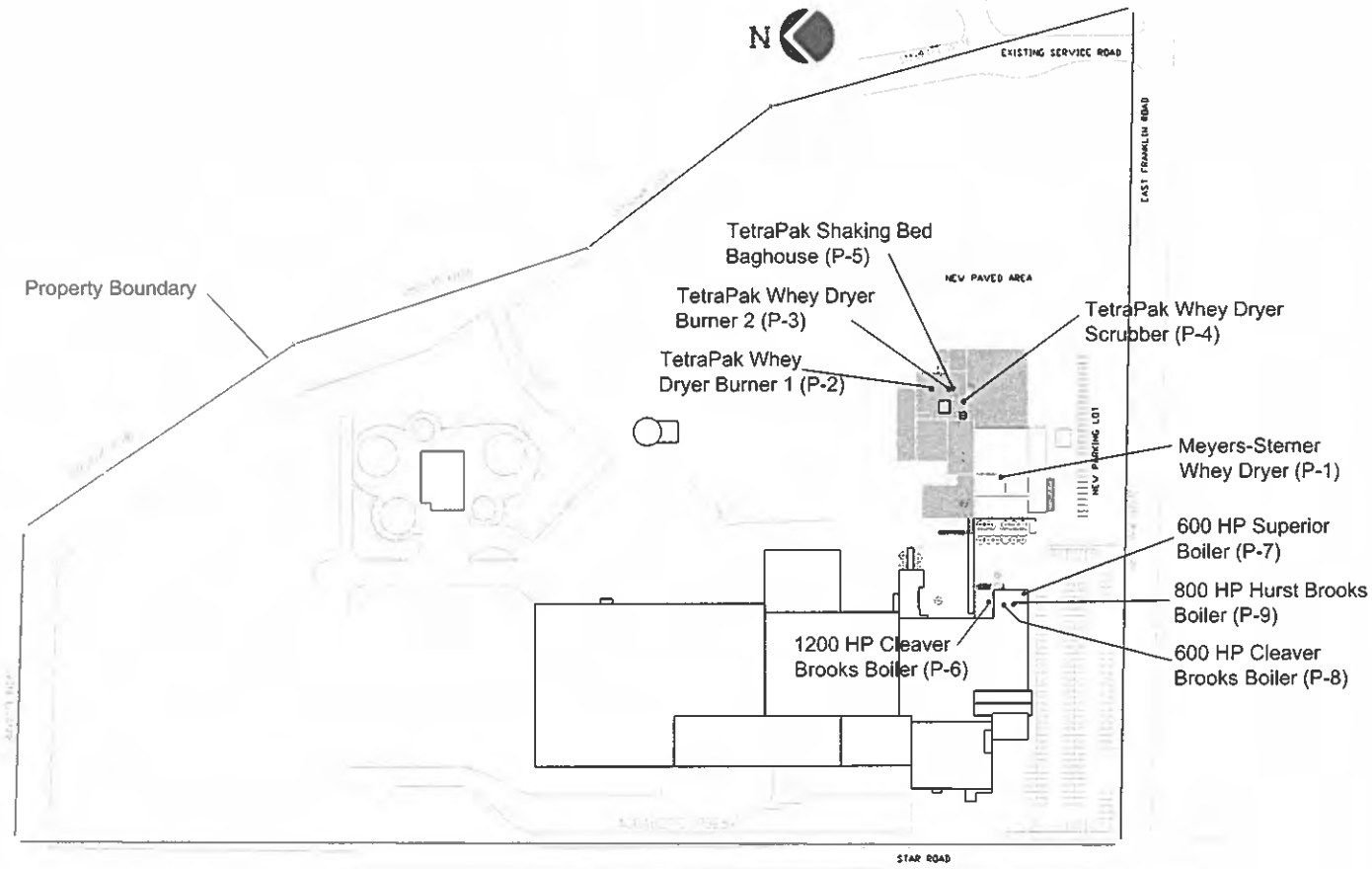
5.0 Facility Classification

The Sorrento Lactalis Facility is located in Nampa, Idaho. This area is considered attainment or unclassified for all criteria pollutants.

The facility is not a designated facility as defined in IDAPA 58.01.01.006.26. The facility is not a major facility as defined IDAPA 58.01.01.008.10. The proposed modification is not a major modification defined in IDAPA 58.01.01.006.55. The primary SIC Code for the facility is 2023 and the NAICS code is 311514.

It is in Air Quality Control Region 64 and Zone 11. There are no Class I areas within 10 km of the facility. PSD is not applicable as discussed in Section 3. Emission inventories are presented in Section 4.

Section 6 - Plot Plan



0 50 100 200
Scale
(feet)

MSE Millennium Science & Engineering, Inc.
1555 Shoreline Drive, Suite 150
Boise, ID 83702
(208) 345-8292 (phone)
(208) 344-8007 (fax)

Plot Plan with Emission Source Locations

Sorrento Lactalis, Inc.
Nampa, Idaho

2-20-09	Figure 2

Section 7 – Ambient Impact Assessment

7.0 Ambient Impact Assessment

Air dispersion modeling was performed to demonstrate compliance with NAAQS for criteria pollutants and Idaho Department of Environmental Quality (IDEQ) screening levels for TAPs in support of this Pre-Permit Construction and PTC Application for the Sorrento Lactalis facility. Modeling was performed according to the Modeling Protocol submitted to the IDEQ on January 23, 3009 (see Appendix 3 for a copy of the modeling protocol and the IDEQ approval letter). A Preliminary Analysis (PA) was completed for the proposed incremental increase of PM10 associated with the proposed equipment; however, the modeled impact exceeded the significant level and therefore a Full Impact Analysis (FIA) was required to evaluate facility-wide emissions.

7.1 Model Description / Justification

Air dispersion modeling was performed using the Environmental Protection Agency (EPA) AERMOD model (version 07026). Building downwash was accounted for in the model. Building dimensions were entered into the Building Parameter Input Program to calculate appropriate building profiles to import into AERMOD. Model output printouts are included in Appendix 4 and input/output files are included as electronic files on an enclosed compact disc.

7.2 Emission and Source Data

A total of nine point sources were modeled for the FIA. The modeled sources included the five new sources: Whey Dryer Stacks #1 (P-2) and #2 (P-3), Whey Dryer Scrubber (P-4), Shaking Bed Baghouse (P-5), and 1200 HP Cleaver Brooks Boiler (P-6) and four existing sources: Meyers-Sterner Dryer (P-1), 600 HP Superior Boiler (P-7), 600 HP Cleaver Brooks Boiler (P-8), and 800 HP Hurst Boiler (P-9). Three criteria pollutants (PM_{10}, CO, and NOx) were modeled from these sources (incremental increase associated with proposed equipment for SOx and lead were below the modeling thresholds listed in Table 1 of the State of Idaho Air Quality Modeling Guidelines). The estimated emission rates for the toxic air pollutants (TAPs): arsenic, cadmium, formaldehyde, and nickel that result from the combustion of natural gas in the dryers and boilers exceeded the Emission Screening Limits (EL) and were therefore modeled. Table 7-1 summarizes the emission source characteristics used in the ambient impact analysis. All modeling was performed using the maximum potential to emit.

Stack diameter, discharge elevation, and stack orientation were obtained from contractor provided drawings. Stack discharge temperature and flow rate were provided by TetraPak for the new whey dryer flue stacks 1 and 2 (P-2 and P-3), new whey dryer scrubber exhaust (P-4), and the new whey dryer shaking bed baghouse (P-5). These are basis of design operating parameters and are considered to be the actual values to be maintained in the system. The stack discharge temperature and flow rate for the existing Myers-Sterner Dryer were obtained from the July 19, 2001 Technical Memorandum by Ken Hanna, IDEQ. Discharge temperatures for existing

boilers were conservatively estimated as the low range of typical values for similar boilers. Stack gas discharge flow rates for the boilers were calculated using natural gas "F" Factors from Table 19-1 of EPA Method 19.

7.3 Receptor Network

A receptor network was established so that ambient concentrations could be evaluated. The first step in this process was to determine the location of the ambient air boundary and the second step was to assign receptor locations within the ambient air zone.

7.3.1 Ambient Air Boundary

The ambient air boundary was established as the facility's property line. See Figure 2 – Site Plan for location of the ambient air boundary (Section 6).

7.3.2 Receptors

Receptors were established to determine maximum ambient air concentrations. A receptor grid with approximately 100 meter spacing was established across the entire evaluated area. Within 300 meters of the ambient air boundary, receptors were established every 25 meters. Along the facility's property boundary, receptors were established every 10 meters. No receptors were established within the facility's controlled property boundary (ambient air boundary).

7.4 Elevation Data

Where available, topography elevation data from site drawings were used as inputs to the model. Available site elevations included discharge elevations, rooftop elevations, and ground surface elevations in vicinity of buildings. Receptor elevations were determined from topography information obtained from the USGS as a 7.5 minute digital elevation model (DEM). AERMAP was used to pre-process this data for use in AERMOD.

7.5 Meteorological Data

Preprocessed meteorological data (surface and upper air) from the Boise airport was provided by the IDEQ. This data was processed by IDEQ using AERMET; the output files provided by the IDEQ were used as inputs to the AERMOD model for this site.

7.6 Land Use Classification

The facility is industrial while the surrounding land is a mix of open space/agricultural and industrial land uses. The Air dispersion modeling was performed using a "rural" classification.

7.7 Surface Characteristics

Surface characteristics of the meteorological monitoring station were evaluated and incorporated into the AERMET processing performed by the IDEQ. These surface characteristics appear to be similar to the Sorrento site and were assumed to be representative for this project.

Table 7-1
Emission Source Characteristics

Emission Source	Stack ID	Stack Height (ft)	Stack Diam. (ft)	Exhaust Temp. (°F)	Stack Gas Vel. (m/s)	Emission Rates (lb/hr)						
						PM_{10}	NOx	CO	As	Cd	Formald-ehyde	Ni
Meyers-Sterner Whey Dryer	P-1	78	3.17	160	11.58	1.6	0.27	2.24	1.20E-6	6.60E-6	4.50E-4	1.26E-5
TetraPak Whey Dryer Burner 1	P-2	136	1.5	241	17.71	0.095	0.499	3.89	2.50E-6	1.38E-5	9.38E-4	2.63E-5
TetraPak Whey Dryer Burner 2	P-3	136	1.5	241	17.71	0.095	0.499	3.89	2.50E-6	1.38E-5	9.38E-4	2.63E-5
TetraPak Whey Dryer Scrubber	P-4	136	5.17	104	17.74	5.66	--	--	--	--	--	--
TetraPak Shaking Bed Baghouse	P-5	136	3.67	126	18.32	3.32	--	--	--	--	--	--
1200 HP Cleaver Brooks Boiler	P-6	38	3.0	325	10.10	0.372	4.89	4.12	9.80E-6	5.39E-5	3.67E-3	1.03E-4
600 HP Superior Boiler	P-7	35	2.17	275	9.26	0.19	2.51	2.11	5.02E-6	2.76E-5	1.88E-3	5.27E-5
600 HP Cleaver Brooks Boiler	P-8	31	2.0	275	10.64	0.186	2.45	2.06	4.90E-6	2.69E-5	1.84E-3	5.14E-5
800 HP Hurst Boiler	P-9	38	2.5	275	9.34	0.255	3.36	2.82	6.72E-6	3.70E-5	2.52E-3	7.06E-5

7.8 Background Concentrations

Table 7-2 summarizes the criteria pollutant background concentrations. Criteria pollutant background concentrations were provided by Kevin Schilling of the IDEQ.

7.9 Evaluation of Compliance With Standards

To determine compliance with NAAQS, the applicable background concentrations were added to the maximum predicted ambient concentrations determined from air dispersion modeling to result in total ambient concentrations. These total ambient air concentrations were compared to the NAAQS. Table 7-2 summarizes the air dispersion modeling results and compares the total predicted ambient air concentration to the applicable NAAQS. See Appendix 4 for graphical output from air dispersion modeling. Based on this evaluation, no NAAQS are predicted to be exceeded by emissions from the sources, if operated and configured as proposed in this application.

Table 7-2
Results of Ambient Impact Assessment for Criteria Pollutants
(All Concentrations in Units of $\mu g/m^3$)

Pollutant	Averaging Period	Maximum Air Dispersion Model Output	Compliance Demonstration		
			Background	Total	NAAQS
PM10	24 hr, 2nd high	25.46	84	109	150
	Annual	7.94	27	35	50
NOx	Annual	34.72	32	67	100
CO	1 hr, 2nd high	308.8	10,200	10,509	40,000
	8 hr, 2nd high	137.9	3,400	3,538	10,000

7.10 Evaluation of Ambient Impact Assessment for TAPs

Although TAPs modeling is only required for the proposed incremental increase associated with the modification, TAPs modeling was completed for the entire facility as a conservative measure. The maximum model output values were compared to Acceptable Ambient Concentration for Carcinogens (AACC) values for each TAP. Table 7-3 summarizes the results of air dispersion modeling performed to evaluate the ambient impact for TAPs. None of the AACC were exceeded by any of the maximum predicted ambient air concentrations; therefore, the predicted ambient impact from TAP emissions is acceptable.

Table 7-3
Results of Ambient Impact Assessment for Toxic Air Pollutants
(All Concentrations in Units of $\mu g/m^3$)

Pollutant	Averaging Period	Maximum Air Dispersion Model Output	Idaho AACC
Arsenic	Annual, 1st high	7.0E-5	2.3E-4
Cadmium	Annual, 1st high	3.9E-4	5.6E-4
Formaldehyde	Annual, 1st high	2.7E-2	7.7E-2
Nickel	Annual, 1st high	7.5E-4	4.2E-3

Appendix 1

Emission Calculations and Vendor Supplied Equipment Information

Particulate Matter Emissions Analysis
Whey Drying Operations
Sorrento Lactalis

	Output (lb/hr)
Source	
P-4 TetraPak Whey Dryer - Scrubber Exhaust	5.66
P-5 TetraPak Shaking Bed - Baghouse Exhaust	3.32
Total (to ambient):	8.99

Process Weight Rule (IDAPA 58.01.01.700)

$E=1.10 \times PW^{0.25}$

	Maximum
PW (concentrate/day @ 62% soliids) =	619,176
PW (concentrate/hr @ 62% solids) =	25,799
E (lb PM/hr) =	**13.94**

Specific Equipment Emissions Guarantees

Tetra Pak CPS guarantees (i) that the combined PM 10 emissions from the dryer shall be less than 8.5 lbs/hr, based on an hourly average; (ii) that the NO_x emission rate shall be less than 0.91 lbs/hr (for two burners at a total of 22.8 MBTUH) and (iii) that the CO emission rate shall be less than 7.1 lbs/hr (for two burners at a total of 22.8 MBTUH). Emissions are sampled and tested in accordance with accepted EPA standards current at the time the Contract is signed.

Source: E-mail from Jim King, Director of Corporate Engineering, Sorrento Lactalis, Inc., October 9, 2008.

Emission Factor Calculations Based on TetraPak Emissions Guarantee:

Tetra Pak Whey Dryer Burners 1 and 2 (P-2 and P-3)

Guaranteed Heat Input Capacity:	22.8	MMBtu/hr (both burners combined)
Heat Input Capacity per Burner	11.4	MMBtu/hr/burner
Manufacturer Rated Max Heat Input Capacity	12.5	MMBtu/hr/burner
Guaranteed NOx Emissons (both burners):	0.91	lb/hr @22.8 MMBtu/hr
Guaranteed NOx Emissions (single burner):	0.455	lb/hr @11.4 MMBtu/hr
Corrected NOx Emission Rate:	**0.499**	**lb/hr @ 12.5 MMBtu/hr**
Guaranteed CO Emissons (both burners):	7.1	lb/hr @22.8 MMBtu/hr
Guaranteed CO Emissions (single burner):	3.55	lb/hr @11.4 MMBtu/hr
Corrected CO Emission Rate:	**3.89**	**lb/hr @ 12.5 MMBtu/hr**

Criteria Air Pollutant Emissions
TetraPak Whey Dryer - Burner 1 (P-2)

Combustion Source Characteristics

Dryer Manufacturer	TetraPak
Burner Model	Eclipse Winnox1000
Input Heat Capacity (BTU/hr)	12,500,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	12,500
Annual Fuel Consumption (scf/yr)	109,500,000

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data

Stack ID	P-2
Stack Height (ft)	136
Stack Diameter (ft)	1.50
Exit Gas Temperature (°F)	241
Standard Flow Rate (scfm)	4,250
Wet Actual Flow Rate (acfm)	6,161
Stack Velocity (m/s)	17.71
Fd (dscf stack gas/BTU)	0.00871
Grain Loading Flow Rate (dscfm)	2,313

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	See PM		0.095	0.4	0.01
SO_2	NG Combustion	0.6	$lb/10^6$ scf	0.008	0.0	0.0009
NO_x	NG Combustion	See Note (a)		0.499	2.2	0.063
CO	NG Combustion	See Note (a)		3.893	17.0	0.490
VOC	NG Combustion	5.5	$lb/10^6$ scf	0.069	0.3	0.009
Lead	NG Combustion	0.0005	$lb/10^6$ scf	6.25E-06	0.0	7.88E-07

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	7.6	$lb/10^6$ scf	0.095	0.4	0.01
Beryllium	NG Combustion	<1.2E-5	$lb/10^6$ scf	1.50E-07	0.0	1.89E-08
Mercury	NG Combustion	2.60E-04	$lb/10^6$ scf	3.25E-06	0.0	4.10E-07

PM Grain Loading Standard[c]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.095	0.005	0.015	yes

Notes:

(a) The emission rates for NOx and CO are from manufacturer supplied performance guarantee (attached). The Emission factors for the remaining pollutants are from natural gas fuel combustion emission factors AP-42 Chapter 1.4, "Natural Gas Combustion".

(b) IDAPA 58.01.01.677, computed for fuel combusting equipment only, excludes particulate emissions associated with the whey drying process.

Toxic Air Pollutant Emissions
TetraPak Whey Dryer - Burner 1 (P-2)

Combustion Source Characteristics

Manufacturer	TetraPak
Burner Model	Eclipse Winnox1000
Input Heat Capacity (BTU/hr)	12,500,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	12,500
Annual Fuel Consumption (scf/yr)	109,500,000

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	2.50E-06	3.15E-07	1.50E-06
Barium	4.40E-03	lb/10^6 scf	5.50E-05	6.93E-06	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	2.63E-05	3.31E-06	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	1.50E-07	1.89E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	1.50E-08	1.89E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	1.38E-05	1.73E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	1.75E-05	2.21E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	1.05E-06	1.32E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	1.06E-05	1.34E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	1.50E-05	1.89E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	3.50E-08	4.41E-09	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	9.38E-04	1.18E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	2.25E-02	2.84E-03	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	4.75E-06	5.99E-07	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	3.25E-06	4.10E-07	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	1.38E-05	1.73E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	7.63E-06	9.61E-07	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	2.63E-05	3.31E-06	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	3.25E-02	4.10E-03	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	3.00E-07	3.78E-08	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	4.25E-05	5.36E-06	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	2.88E-05	3.62E-06	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	3.63E-04	4.57E-05	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Criteria Air Pollutant Emissions
TetraPak Whey Dryer - Burner 2 (P-3)

Combustion Source Characteristics

Dryer Manufacturer	TetraPak
Burner Model	Eclipse Winnox1000
Input Heat Capacity (BTU/hr)	12,500,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	12,500
Annual Fuel Consumption (scf/yr)	109,500,000

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data

Stack ID	P-3
Stack Height (ft)	136
Stack Diameter (ft)	1.50
Exit Gas Temperature (°F)	241
Standard Flow Rate (scfm)	4,250
Wet Actual Flow Rate (acfm)	6,161
Stack Velocity (m/s)	17.71
Fd (dscf stack gas/BTU)	0.00871
Grain Loading Flow Rate (dscfm)	2,313

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	See PM		0.095	0.4	0.01
SO_2	NG Combustion	0.6	$lb/10^6$ scf	0.008	0.0	0.0009
NO_x	NG Combustion	See Note (a)		0.499	2.2	0.063
CO	NG Combustion	See Note (a)		3.893	17.0	0.490
VOC	NG Combustion	5.5	$lb/10^6$ scf	0.069	0.3	0.009
Lead	NG Combustion	0.0005	$lb/10^6$ scf	6.25E-06	0.0	7.88E-07

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	7.6	$lb/10^6$ scf	0.095	0.4	0.01
Beryllium	NG Combustion	<1.2E-5	$lb/10^6$ scf	1.50E-07	0.0	1.89E-08
Mercury	NG Combustion	2.60E-04	$lb/10^6$ scf	3.25E-06	0.0	4.10E-07

PM Grain Loading Standard[c]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.095	0.005	0.015	yes

Notes:

(a) The emission rates for NOx and CO are from manufacturer supplied performance guarantee (attached). The Emission factors for the remaining pollutants are from natural gas fuel combustion emission factors AP-42 Chapter 1.4, "Natural Gas Combustion".

(b) IDAPA 58.01.01.677, computed for fuel combusting equipment only, excludes particulate emissions associated with the whey drying process.

Toxic Air Pollutant Emissions
TetraPak Whey Dryer - Burner 2 (P-3)

Combustion Source Characteristics

Manufacturer	TetraPak
Burner Model	Eclipse Winnox1000
Input Heat Capacity (BTU/hr)	12,500,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	12,500
Annual Fuel Consumption (scf/yr)	109,500,000

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	2.50E-06	3.15E-07	1.50E-06
Barium	4.40E-03	lb/10^6 scf	5.50E-05	6.93E-06	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	2.63E-05	3.31E-06	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	1.50E-07	1.89E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	1.50E-08	1.89E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	1.38E-05	1.73E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	1.75E-05	2.21E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	1.05E-06	1.32E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	1.06E-05	1.34E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	1.50E-05	1.89E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	3.50E-08	4.41E-09	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	9.38E-04	1.18E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	2.25E-02	2.84E-03	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	4.75E-06	5.99E-07	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	3.25E-06	4.10E-07	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	1.38E-05	1.73E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	7.63E-06	9.61E-07	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	2.63E-05	3.31E-06	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	3.25E-02	4.10E-03	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	3.00E-07	3.78E-08	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	4.25E-05	5.36E-06	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	2.88E-05	3.62E-06	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	3.63E-04	4.57E-05	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Data 111-7
9/10/07

Eclipse Winnox Burners

Model WX1000

Version 1

Main Specifications

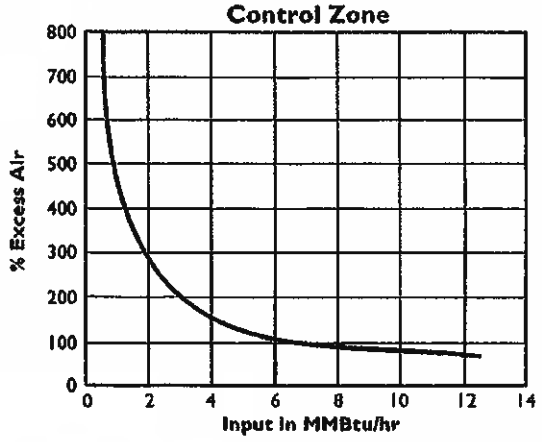
PARAMETER		SPECIFICATIONS	
Blower Type		Packaged blower	Remote blower
Maximum input, MMBTU/hr (kW)	Chamber pressure "WC (mbar)	Nominal (60 Hz)	Pressure at air inlet 1.5 psig (100 mbar)
Note. *Capacities given without air filter.* *Contact factory for chamber pressures outside the given range, or varying chamber pressure conditions.*	-5.0 (-12.5)	9.7 (2840)	13.6 (3985)
	-3.0 (-7.5)	9.2 (2694)	13.2 (3868)
	0.0	**8.5 (2490)**	**12.5 (3660)**
	1.0 (2.5)	8.25 (2416)	12.2 (3575)
	2.0 (5.0)	7.98 (2337)	12.0 (3516)
Minimum input, BTU/hr (kW)	Natural Gas Propane, Butane	300,000 (88) 400,000 (117)	
Fuel inlet pressure at ratio regulator, psi (mbar) 1)	Maximum Minimum	3.0 (207) 1.0 (69)	5.0 (345) 2.0 (138)
Maximum chamber temperature, °F (°C) Note: Tube and plug temperatures should be reduced 150°F when using propane or butane.		Standard combustion tube: 1100 (593) High temp. combustion tube: 1400 (760)	
Flame Length		Flame is inside tube at all inputs	
Excess Air, % at high fire		40-70%	
Piping		N.P.T. burner piping available	
Flame detection		Flame Rod or U.V. Scanner	
Fuels 2)		Natural gas, Propane and Butane.	
Weight, lbs (kg)		1435 (651)	1135 (515)

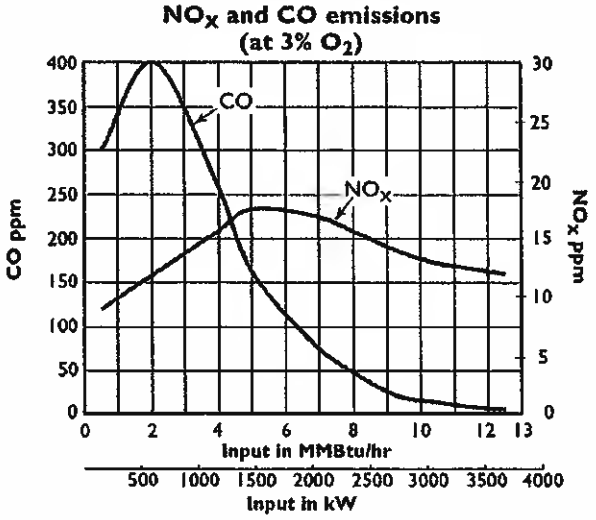
1) For proper performance, this pressure must be kept constant across the burner operating range.
2) See Design Guide for more information about typical fuel composition and properties.

- All information is based on laboratory testing. Different chamber size and conditions will affect data.
- Maximum inputs for packaged blower versions are given for the standard combustion air blower without an inlet air filter.
- All inputs are based on gross calorific values and standard conditions: one atmosphere, 70° F (21° C)
- Eclipse reserves the right to change the construction and/or configuration of our products at any time without being obliged to adjust earlier supplies accordingly.

ECLIPSE®
Innovative Thermal Solutions

Performance Graphs
Winnox WX1000





Input at low fire changes with ratio regulator adjustment.

Secondary by-pass fuel setting:

FUEL	ΔP "w.c. (mbar)*
Nat. Gas	4.0 (10.0)
Propane	4.0 (10.0)
Butane	4.0 (10.0)

* Measured between Tap "E" and the chamber @ low fire.

NO_x and CO emission data is given for:
- Ambient combustion air (~70 °F, 20 °C)
- Less than 1000 °F (540 °C) firing chamber
- Minimal process air velocity
- Low fire input adjusted to 300,000 BTU/hr (88 kW)
- Neutral chamber pressure
- Natural gas
- 70% Excess Air

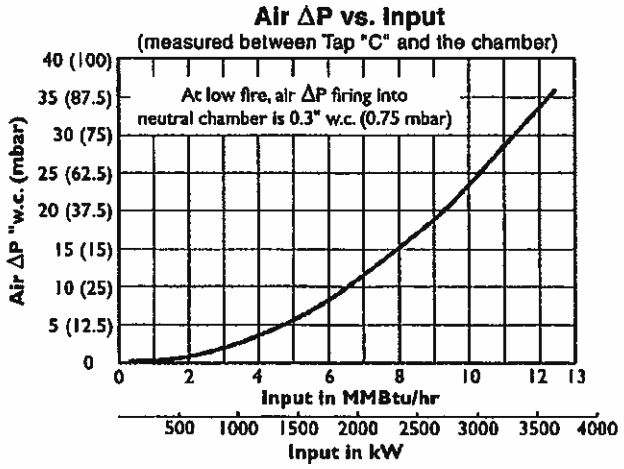
Emissions are influenced by:
- Chamber conditions
- Fuel type
- Firing rate
- Ratio regulator adjustments
- Combustion air temperature
- Excess Air

CO emission is largely influenced by chamber conditions. Contact your local Eclipse Combustion representative for an estimate of CO emission on your application.

Fuel / Input Measurement

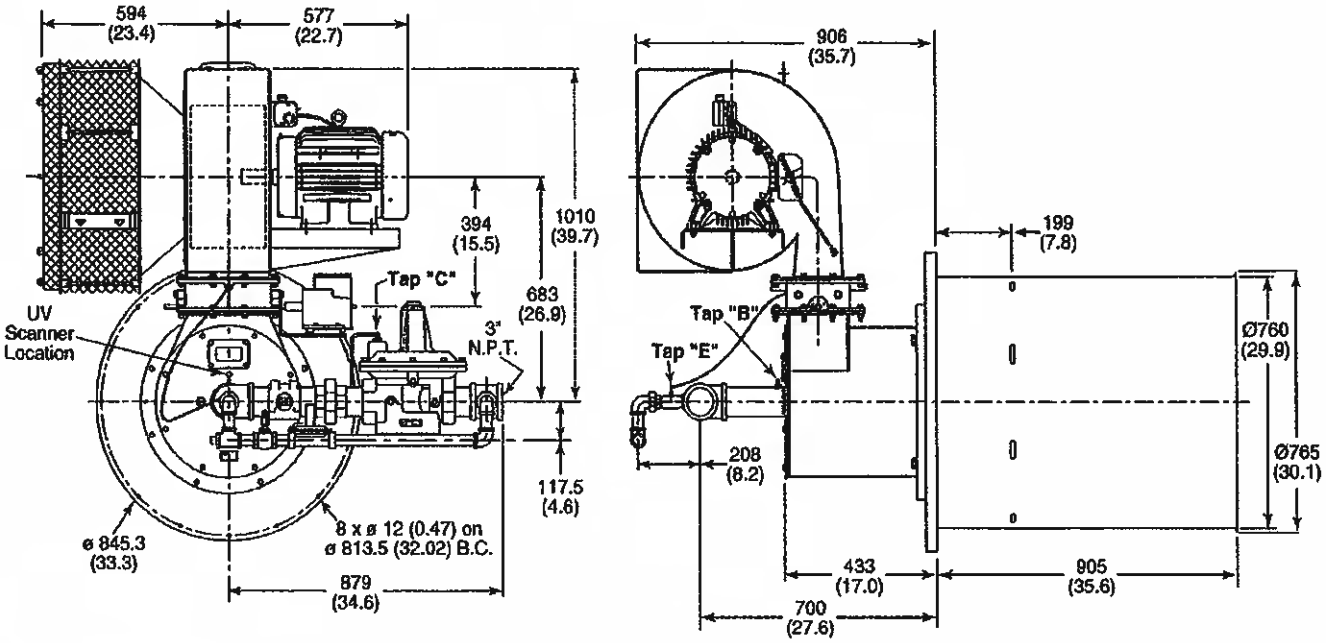
System design must include fuel flow measurement upstream of the burner. Recommended is the Eclipse 12-5 FOM (Fuel Orifice Meter) assembly number 302050-5 for natural gas. See Bulletin 930 for details.

Insure burner inlet pressures are met.



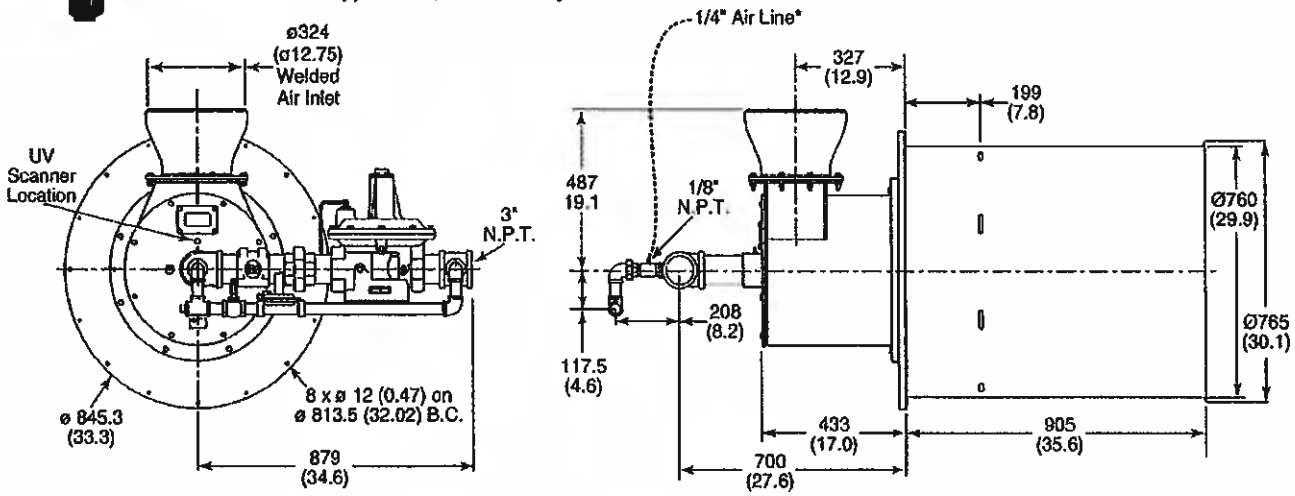
Dimensions
WX1000

Packaged Blower — Dimensions in mm (in)



Remote Blower

Note: For Remote Blower applications, consult factory.



* Recommended customer supplied 1/4" air line from upstream of the air control valve.

Particulate Matter Emissions
Whey Dryer Scrubber Exhaust (P-4)

Source Characteristics	
Manufacturer	Fisher Klosterman, Inc.
Model	MS-1200 Scrubber, SS316
Size	120" Diameter
Type	Venturi Scrubber
Nampa Barometric Pressure (mm Hg)	696.11

Stack Data [b]	
Stack ID	P-4
Stack Height (ft)	136
Stack Diameter (ft)	5.170
Exit Gas Temperature (°F)	104
Standard Flow Rate (scfm)	62,900
Wet Actual Flow Rate (acfm)	73,358
Stack Velocity (m/s)	17.74

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	Process	See Note (a)		5.66	24.8	0.71

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	Process	See PM_{10}		5.66	24.8	0.71

Notes:

(a) Emissions information for PM/PM10 from TetraPak and the scrubber manufacturer. Listed values were inflated by a factor of 20% above the manufacturer specifications as a safety factor and to provide operational flexibility.

(b) Stack parameters were provided by TetraPak and the scrubber manufacturer. Flowrates and temperature based on design operating conditions. Wet actual flowrate from process flow diagram provided by TetraPak. This value is considered to be representative of typical design operating conditions.

WET SCRUBBER SORRENTO NAMPA ID

Manufacturer : Fisher_Klosterman Inc.
Model : MS-1200 Scrubber, SS316
Seize : Diameter 120 " Type : Venturi Scrubber

Design Data: Maximum

	Inlet	Outlet
Gas Flow, ACFM:	82,500	79,537
Temperature, Deg.F:	154	104
Pressure, PSIA:	14.5	14.068
Dust Loading, Gr/ACF	0.110	
Dust Specific Gravity:	1.55	
Humidity, #/WV/#DG:	0.0380	0.0505
Pressure Drop, In. WC:	12	
Liquid injection rate, GPM:	556 (Maximum 2% solids, if recycled)	
Liquid discharge rate, GPM:	7.7	
Fresh make up water, GPM:	15.15	
Control devices :	dP measurement over venturi. Circulation washing liquid flow Circulation washing liquid density	

Aerodynamic particle size distribution at scrubber inlet:

Stoke's equivalent dia., Micron	Weight % smaller than
3.0	6.0
6.0	27.0
10	40.0
50	95.0

Fractional Efficiency:

Stoke's equivalent dia., Micron %	Efficiency by weight
0.8	70.7
1.0	81.4
1.4	92.3
4.7	99.5

Calculated overall efficiency = 99 %

1. Performance is based on particle sizes expressed in Stoke's equivalent diameter as determined by the Bahco Micro-particle classifier as specified in ASME Power test code # 28
The particles size does not represent the actual size of the particle, but it represents particles terminal velocity equivalent to stoke's diameter.

Tetra Pak Cheese and Powder Systems
7170 Riverwood Drive, Suite H, Columbia, MD 21046 USA Telephone: +1 410 312 9700 Fax: +1 410 312 9937 www.tetrapak.com

Particulate Matter Emissions
Shaking Bed Baghouse Exhaust (P-5)

Source Characteristics	
Manufacturer	TetraPak
Model	13-243-14
Type	Reversed Air Jet
Nampa Barometric Pressure (mm Hg)	696.11

Stack Data [b]	
Stack ID	P-5
Stack Height (ft)	136
Stack Diameter (ft)	3.670
Exit Gas Temperature (°F)	126
Standard Flow Rate (scfm)	31,500
Wet Actual Flow Rate (acfm)	38,171
Stack Velocity (m/s)	18.32

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	Process	See Note a		3.32	14.6	0.42

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	Process	See PM_{10}		3.32	14.6	0.42

Notes:
(a) Emissions information for PM/PM10 from TetraPak and the scrubber manufacturer. Listed values were inflated by a factor of 20% above the manufacturer specifications as a safety factor and to provide operational flexibility.
(b) Stack parameters were provided by TetraPak and the scrubber manufacturer. Flowrates and temperature based on design operating conditions. Wet actual flowrate from process flow diagram provided by TetraPak. This value is considered to be representative of typical design operating conditions.

BAG HOUSE SORRENTO NAMPA ID

Manufacturer : Tetra Pak CPS.
Model : 13-243-14 Type : Reversed air jet

Design Data:

Gas Flow, ACFM:	77,200
Temperature, Deg.F:	126
Dust Loading, Gr/ACF	11.3
Dust Specific Gravity p/cf:	41
Humidity, #/WV/#DG:	0.017
Pressure Drop, In. WC:	10 (max)
Bag diameter inch :	6
Bag Length ft :	14
Number of bags	243
Air to Cloth ratio f/min:	7.48
Bag material	Polyester Micro Denier 16 oz/sq yard
Control devices :	dP measurement over bags.
	dP measurement pulsing air

Aerodynamic particle size distribution at Bag house inlet:

Stoke's equivalent dia., Micron	Weight % smaller than
3.0	6.0
6.0	27.0
10	40.0
50	95.0

Fractional Efficiency:

Stoke's equivalent dia., Micron %	Efficiency by weight
0.7	99.62
1.0	99.92
2	99.93
3	99.97
> 3	100

Calculated overall efficiency = 99.9 %

Tetra Pak Cheese and Powder Systems
7170 Riverwood Drive, Suite H, Columbia, MD 21046 USA Telephone: +1 410 312 9700 Fax: +1 410 312 9937 www.tetrapak.com

Criteria Air Pollutant Emissions
1200 HP Cleaver Brooks Boiler (P-6)

Combustion Source Characteristics

Boiler Manufacturer	Cleaver Brooks (or Equivalent)
Burner Model	CBL 1200 (or Equivalent)
Input Heat Capacity (BTU/hr)	48,989,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	48,989
Annual Fuel Consumption (scf/yr)	429,143,640

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data [c]

Stack Height (ft)	38.0
Stack Diameter (ft)	3.0
Exit Gas Temperature (°F)	325
Wet Actual Flow Rate (acfm)	14,062
Wet Standard Flow Rate (wscfm)	8,663
Dry Standard Flow Rate (dscfm)	7,112
Grain Loading Flow Rate (dscfm)	9,066
Stack Velocity (m/s)	10.10
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.372	1.6	0.047
SO_2	NG Combustion	0.6	lb/10^6 scf	0.029	0.1	0.004
NO_x	NG Combustion	100	lb/10^6 scf	4.899	21.5	0.617
CO	NG Combustion	84	lb/10^6 scf	4.115	18.0	0.518
VOC	NG Combustion	5.5	lb/10^6 scf	0.269	1.2	0.034
Lead	NG Combustion	0.0005	lb/10^6 scf	2.45E-05	0.0	3.09E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.372	1.631	4.69E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	5.88E-07	0.000	7.41E-08
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.27E-05	0.000	1.60E-06

PM Grain Loading Standard[b]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.372	0.005	0.015	yes

Notes:

(a) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion", unless otherwise noted.

(b) IDAPA 58.01.01.677

(c) Stack parameters were determined as follows: discharge temperature = conservative assumption based on other similar projects, flowrate (wet actual) based on EPA Method 19 F_w factor (converted from standard conditions to actual conditions), stack height and diameter = actual (details provided on construction drawings).

Toxic Air Pollutant Emissions
1200 HP Cleaver Brooks Boiler (P-6)

Combustion Source Characteristics

Boiler Manufacturer	Cleaver Brooks (or Equivalent)
Burner Model	CBL 1200 (or Equivalent)
Input Heat Capacity (BTU/hr)	48,989,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	48,989
Annual Fuel Consumption (scf/yr)	429,143,640

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data

Stack Height (ft)	38.0
Stack Diameter (ft)	3.00
Exit Gas Temperature (°F)	325
Wet Actual Flow Rate (acfm)	14,062
Wet Standard Flow Rate (wscfm)	8,663
Dry Standard Flow Rate (dscfm)	7,112
Grain Loading Flow Rate (dscfm)	9,066
Stack Velocity (m/s)	10.10
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	9.80E-06	1.23E-06	1.50E-06
Barium	4.40E-03	lb/10^6 scf	2.16E-04	2.72E-05	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	1.03E-04	1.30E-05	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	5.88E-07	7.41E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	5.88E-08	7.41E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	5.39E-05	6.79E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	6.86E-05	8.64E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	4.12E-06	5.18E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	4.16E-05	5.25E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	5.88E-05	7.41E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	1.37E-07	1.73E-08	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	3.67E-03	4.63E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	8.82E-02	1.11E-02	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	1.86E-05	2.35E-06	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	1.27E-05	1.60E-06	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	5.39E-05	6.79E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	2.99E-05	3.77E-06	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	1.03E-04	1.30E-05	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	1.27E-01	1.60E-02	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	1.18E-06	1.48E-07	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	1.67E-04	2.10E-05	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	1.13E-04	1.42E-05	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	1.42E-03	1.79E-04	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Boiler 4 - CBL. 200. 1200. 150ST

Table A5-3. CBL Input Ratings (4-Pass Boilers)

Boiler Square Foot Heating Surface	4000	4500	5000	5500	6000	6500	7000	7500
Approximate Fuel Consumption D								
Horsepower (5 sq.ft./bhp)	800	900	1000	1100	1200	1300	1400	1500
Natural Gas A (cfh)	32659	36741	40824	44906	48989	53071	57153	61236
No. 2 Oil B (gph)	233.3	262.4	291.6	320.8	349.9	379 1	408.2	437.4
No. 6 Oil C (gph)	217.7	244 9	272 2	299 4	326.6	353 8	381.0	408 2
Horsepower (4 sq.ft./bhp)	1000	1100	1200	1300	1500	1600	1700	1800
Natural Gas A (cfh)	40824	44906	48989	53071	57153	65317	69399	73481
No. 2 Oil B (gph)	291.6	320.8	349 9	379.1	437.4	466.6	495.7	524.9
No. 6 Oil C(gph)	272.2	299.4	326 6	353.8	408.2	435.4	462.6	489 9

Note:
A. Natural gas based on heating value of 1000 BTU/cu.ft
B. No. 2 oil based on heating value of 140,000 BTU/gal.
C. No. 6 oil based on heating value of 150,000 BTU/gal.
D. Ratings based on nominal 82% efficiency.

Example Calculations – Boiler Emission Estimates

1. Wet Standard Stack Flow Rate = (Q_{ws}) = (F_w) (Input Heat Capacity of Boiler)

$$F_{w(Natural\ Gas)} = 0.01061\, wscf\ stack\ gas / BTU \quad (40\, CFR\, 60, App\ A, Meth.19, Table\, 19-1)$$

For 1200 HP Cleaver Brooks Boiler (P-6):

$$Q_{ws} = (0.01061\, wscf\ stack\ gas / BTU)\left(48{,}989{,}000 \frac{BTU}{hr}\right)\left(\frac{1hr}{60\min}\right) = 8{,}663\, \text{wscf/min}$$

2. Dry Standard Stack Flow Rate = (Q_{ds}) = (F_d) (Input Heat Capacity of Boiler)

$$F_d = (0.00871\, dscf / BTU) \quad (40\, CFR, App\ A, Meth\, 19, Table\, 19-1)$$

For 1200 HP Cleaver Brooks Boiler (P-6):

$$Q_{ds} = (0.00871\ dscf / BTU)\left(48{,}989{,}000 \frac{BTU}{hr}\right)\left(\frac{1hr}{60\min}\right) = 7{,}112\ \text{dscf/min}$$

3. Dry Standard Stack Flow Rate Corrected for 3% O_2 and Altitude = $(Q_{ds,O_2,AL}) = (Q_{ds})\left(\frac{20.9}{20.9-3}\right)\left(\frac{P_S}{P_A}\right)$

P_S = Standard Barometric Pressure = 760 mm Hg
P_A = Actual Barometric Pressure = 696.11 mm Hg (approximate barometric pressure for site)

For 1200 HP Cleaver Brooks Boiler (P-6):

$$Q_{ds,O_2,AL} = (7{,}112\, dscf / \min)\left(\frac{20.9}{20.9-3}\right)\left(\frac{760\, mm\ Hg}{696.11\, mm\ Hg}\right) = 9{,}066\ \text{dscf/min}$$

4. Wet Actual Stack Flow Rate = (Q_{wa}) = $\left(Q_{ws}\right)\left(\frac{P_S}{P_A}\right)\left(\frac{T_A}{T_S}\right)$

T_S=Standard Temperature= 273.15 K
T_A=Actual Temperature= 435.93 K (Boiler stack gas)

For Boiler:

$$Q_{wa} = (8{,}663 wscf/\min)\left(\frac{760\,mm\,Hg}{696.11\,mm\,Hg}\right)\left(\frac{435.93K}{293.15K}\right) = 14{,}062\,\text{wscf/min}$$

5. Volume Fuel Combusted = (V_c) = (Product Consumption Rate)(Hours of Operation)

For 1200 HP Cleaver Brooks Boiler (P-6):

$$V_C = \left(48{,}989\,\frac{scf}{hr}\right)(8{,}760\,hour) = 429.1\,x10^6\,scf$$

6. Potential Emissions

Potential Emission Rate of Contaminant = (M_x) = (EF)(fuel consumption rate)
EF = Emission Factor, provided by equipment vendor or from AP-42.

For 1200 HP Cleaver Brooks Boiler (P-6):

$$M_{PM_{10}} = \left(7.6\,\frac{lb}{10^6\,scf}\right)\left(48{,}989{,}000\,\frac{BTU}{hr}\right)\left(\frac{1scf}{1{,}000BTU}\right) = 0.372\,\frac{lb}{hr} = 0.0469\,\frac{g}{s}$$

$$= \frac{\left(0.372\,\frac{lb}{hr}\right)\left(24\,\frac{hr}{day}\right)\left(365\,\frac{day}{yr}\right)}{2000\,\frac{lb}{ton}} = 1.6\,\frac{ton}{yr}$$

7. Particulate Matter Grain Emission Rate =

$$\left(PM_g\right) = \left(M_{pm}\left[\frac{g}{s}\right]\right)\left(\frac{15.43grain}{1g}\right)\left(\frac{60S}{1\min}\right)$$

For 1200 HP Cleaver Brooks Boiler:

$$PM_g\left(0.0469\,\frac{g}{s}\right)\left(\frac{15.43grain}{1g}\right)\left(\frac{60s}{1\min}\right) = 43.42\,\frac{grain}{\min}$$

8. Grain Loading Concentration Corrected to 3% O_2 and Altitude (C_{pm}) = $\frac{PM_g}{Q_{ds,O_2,AL}}$

For 1200 HP Cleaver Brooks Boiler (P-6):

$$C_{PM} = \frac{43.42 \frac{grain}{\min}}{9{,}066 \frac{dscf}{\min}} = 4.8x10^{-3} \frac{grain}{dscf}$$

Criteria Air Pollutant Emissions
Meyers-Sterner Dryer (P-1)

Combustion Source Characteristics [b]

Dryer Manufacturer	Meyers-Sterner Whey Dryer
Burner Model	6 MMBtu/hr
Input Heat Capacity (BTU/hr)	6,000,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	6,000
Annual Fuel Consumption (scf/yr)	52,560,000

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data [b]

Stack ID	P-1
Stack Height (ft)	78
Stack Diameter (ft)	3.17
Exit Gas Temperature (°F)	160
Wet Actual Flow Rate (acfm)	18,000
Stack Velocity (m/s)	11.58
Fd (dscf stack gas/BTU)	0.00871
Grain Loading Flow Rate (dscfm)	1,110

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion + Process	See Note (a)		1.600	7.0	0.20
SO_2	NG Combustion	0.6	lb/10^6 scf	0.004	0.0	0.0005
NO_x	NG Combustion	See Note (a)		0.270	1.2	0.034
CO	NG Combustion	See Note (a)		2.240	9.8	0.282
VOC	NG Combustion	5.5	lb/10^6 scf	0.033	0.1	0.004
Lead	NG Combustion	0.0005	lb/10^6 scf	3.00E-06	0.0	3.78E-07

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion + Process	See PM_{10}		1.600	7.0	0.20
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	7.20E-08	0.0	9.07E-09
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.56E-06	0.0	1.97E-07

PM Grain Loading Standard[c]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[c] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.046	0.005	0.015	yes

Notes:

(a) Emissions for PM/PM10, NOx, and CO were from the May 30, 2001 Permit to Construct Technical Analysis prepared to support the proposed whey dryer construction. All other emissions estimates from natural gas fuel combustion emission factors AP-42 Chapter 1.4, "Natural Gas Combustion".

(b) Source and stack details are from the May 30, 2001 Permit To Construct Technical Analysis prepared to support permitting of a proposed whey dryer at the Sorrento Lactalis plant.

(c) IDAPA 58.01.01.677, computed for fuel combusting equipment only, excludes particulate emissions associated with the milk drying process.

Toxic Air Pollutant Emissions
Meyers-Sterner Dryer (P-1)

Combustion Source Characteristics

Boiler Manufacturer	Meyers-Sterner Whey Dryer
Burner Model	6 MMBtu/hr
Input Heat Capacity (BTU/hr)	6,000,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	6,000
Annual Fuel Consumption (scf/yr)	52,560,000

Toxic Air Pollutants					
Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	1.20E-06	1.51E-07	1.50E-06
Barium	4.40E-03	lb/10^6 scf	2.64E-05	3.33E-06	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	1.26E-05	1.59E-06	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	7.20E-08	9.07E-09	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	7.20E-09	9.07E-10	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	6.60E-06	8.32E-07	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	8.40E-06	1.06E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	5.04E-07	6.35E-08	3.30E-03
Copper	8.50E-04	lb/10^6 scf	5.10E-06	6.43E-07	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	7.20E-06	9.07E-07	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	1.68E-08	2.12E-09	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	4.50E-04	5.67E-05	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	1.08E-02	1.36E-03	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	2.28E-06	2.87E-07	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	1.56E-06	1.97E-07	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	6.60E-06	8.32E-07	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	3.66E-06	4.61E-07	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	1.26E-05	1.59E-06	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	1.56E-02	1.97E-03	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	1.44E-07	1.81E-08	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	2.04E-05	2.57E-06	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	1.38E-05	1.74E-06	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	1.74E-04	2.19E-05	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Criteria Air Pollutant Emissions
600 HP Superior Boiler (P-7)

Combustion Source Characteristics	
Boiler Manufacturer	Superior
Burner Model	600
Input Heat Capacity (BTU/hr)	25,106,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	25,106
Annual Fuel Consumption (scf/yr)	219,928,560

Site Information	
Nampa Barometric Pressure (mm Hg)	696.11

Stack Data [c]	
Stack Height (ft)	35.0
Stack Diameter (ft)	2.17
Exit Gas Temperature (°F)	275
Wet Actual Flow Rate (acfm)	6,747
Wet Standard Flow Rate (wscfm)	4,440
Dry Standard Flow Rate (dscfm)	3,645
Grain Loading Flow Rate (dscfm)	4,646
Stack Velocity (m/s)	9.26
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.191	0.8	0.024
SO_2	NG Combustion	0.6	lb/10^6 scf	0.015	0.1	0.002
NO_x	NG Combustion	100	lb/10^6 scf	2.511	11.0	0.316
CO	NG Combustion	84	lb/10^6 scf	2.109	9.2	0.266
VOC	NG Combustion	5.5	lb/10^6 scf	0.138	0.6	0.017
Lead	NG Combustion	0.0005	lb/10^6 scf	1.26E-05	0.0	1.58E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.191	0.836	2.40E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	3.01E-07	0.000	3.80E-08
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	6.53E-06	0.000	8.22E-07

PM Grain Loading Standard[b]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.191	0.005	0.015	yes

Notes:

(a) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion", unless otherwise noted.

(b) IDAPA 58.01.01.677

(c) Stack parameters were determined as follows: discharge temperature = conservative assumption based on other similar projects, flowrate (wet actual) based on EPA Method 19 Fw factor (converted from standard conditions to actual conditions), stack height and diameter = actual (details provided on construction drawings).

Toxic Air Pollutant Emissions
600 HP Superior Boiler (P-7)

Combustion Source Characteristics

Boiler Manufacturer	Superior
Burner Model	600
Input Heat Capacity (BTU/hr)	25,106,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	25,106
Annual Fuel Consumption (scf/yr)	219,928,560

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data

Stack Height (ft)	35.0
Stack Diameter (ft)	2.17
Exit Gas Temperature (°F)	275
Wet Actual Flow Rate (acfm)	6,747
Wet Standard Flow Rate (wscfm)	4,440
Dry Standard Flow Rate (dscfm)	3,645
Grain Loading Flow Rate (dscfm)	4,646
Stack Velocity (m/s)	9.26
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	5.02E-06	6.33E-07	1.50E-06
Barium	4.40E-03	lb/10^6 scf	1.10E-04	1.39E-05	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	5.27E-05	6.64E-06	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	3.01E-07	3.80E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	3.01E-08	3.80E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	2.76E-05	3.48E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	3.51E-05	4.43E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	2.11E-06	2.66E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	2.13E-05	2.69E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	3.01E-05	3.80E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	7.03E-08	8.86E-09	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	1.88E-03	2.37E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	4.52E-02	5.69E-03	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	9.54E-06	1.20E-06	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	6.53E-06	8.22E-07	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	2.76E-05	3.48E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	1.53E-05	1.93E-06	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	5.27E-05	6.64E-06	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	6.53E-02	8.22E-03	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	6.03E-07	7.59E-08	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	8.54E-05	1.08E-05	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	5.77E-05	7.28E-06	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	7.28E-04	9.17E-05	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Boiler 2 - 4-5-3004

MOHAWK 3 PASS STEAM BOILER

SUPERIOR BOILER WORKS, Inc
3524 EAST FOURTH ST. HUTCHINSON, KANSAS 67501 (316) 662-6693

FORM CAT4SB
ISSUED: 6-15-99

RATINGS: STEAM 15/150 PSIG — Sea Level To 2000' — 5 sq.ft./BoHP

NOMINAL BOILER HORSEPOWER	30	40	50	60	70	80	100	125	150	200	250	300	350	400	500	600	700	750	800	900	1000
UNIT MODEL NUMBER	156	205	253	304	353	402	508	625	751	1024	1276	1506	1758	2007	2506	3004	3502	3753	4005	4502	5000
OUTPUT MBH	1005	1339	1674	2009	2343	2678	3348	4184	5021	6695	8369	10043	11716	13390	16738	20085	23432	25106	26780	30128	33475
STEAM LB/HR (#2)	1035	1380	1725	2070	2415	2760	3450	4312	5175	6900	8625	10350	12075	13800	17250	20700	24150	25875	27600	31050	34500
INPUT GAS (1,000 BTU) FT^3	1256	1673	2092	2511	2928	3347	4185	5230	6276	8368	10461	12553	14645	16737	20922	25106	29290	31382	33475	37660	41843
OIL (140,000 BTU) GAL.	8.97	11.95	14.94	17.93	20.91	23.91	29.88	37.35	44.83	59.77	74.72	89.66	104.60	119.55	149.44	179.33	209.21	224.16	239.10	269 00	298.88
OIL (150,000 BTU) GAL.	NA	NA	NA	NA	19.52	22.31	27.89	34.86	41.53	55.78	69.73	83.68	97.62	111.57	139.47	167.37	195.26	209.21	223 16	251.06	278.95

DATA:

HEATING SURFACE FT^2	156	205	253	304	353	402	508	625	751	1024	1276	1506	1758	2007	2506	3004	3502	3753	4005	4502	5000
FURNACE VOLUME FT^3	8.38	11.05	13.71	16.68	18.58	21.29	27.18	40.07	48.45	54.81	68.57	94.01	110.02	113.79	142.69	170.70	196.19	210.48	224.10	240.86	273.16
STEAM STORAGE VOL. FT^3	3.87	5.21	8.75	10.65	11.01	12.62	16.14	21.52	26.02	27.94	34.96	47.96	56.13	60.76	76.20	92.57	120.21	133.15	141.76	152.36	169.25
DISENGAGING AREA FT^2	13.12	17.67	21.25	25.86	23.49	26.93	34.43	36.75	44.44	43.53	54.46	65.75	76.95	73.20	91.79	99.25	114.51	120.32	128.10	137.68	152.94
WATER CAPACITY NWL GAL.	347	467	515	627	658	754	963	989	1196	1316	1647	2071	2424	2586	3243	3400	4336	5138	5471	5792	6434
WATER WEIGHT NWL LBS.	2882	3883	4287	5217	5474	6274	8007	8226	9946	10950	13699	17226	20160	21508	26971	28276	36062	42739	45504	48174	53515
WATER CAPACITY FULL GAL.	375	506	581	707	741	849	1083	1150	1390	1526	1909	2430	2844	3041	3813	4123	5235	6135	6532	6932	7701
WATER WEIGHT FULL LBS.	3123	4207	4831	5880	6160	7060	9010	9565	11565	12689	15875	20211	23654	25290	31714	34297	43545	51027	54328	57658	64050
SHIPPING WEIGHT 15 PSIG (#3)	5000	5800	6500	7200	8400	9000	10500	12600	14100	17500	20200	25600	28200	31200	36700	41600	48200	54200	56400	60600	65200
SHIPPING WEIGHT 150 PSIG (#3)	5200	6100	6900	8100	9000	9700	11200	13300	14800	19300	22400	27300	30200	33200	38500	45500	52400	58000	60500	65000	70000

STANDARD FEATURES:

1. Units Designed And Fabricated To ASME Boiler And Pressure Vessel Code Requirements. Section IV-15 psig. Section I-150 psig.
2. Insulated With 2"-8 Lb. Density Mineral Fiber Insulation.
3. Jacket Material 22 Gauge Galvanized-Phosphate Coated Steel.
4. Davited Doors: Front: 353 And Larger
   Rear: All Units
5. Rear Access Plug: 15" Dia: 353 Thru 3502.
   19" Dia: 3753 Thru 5000.
6. Handholes: 3" x 4" Low Pressure-(5) 156 Thru 508.
   (4) 625 Thru 5000.
   High Pressure-(5) 156 Thru 205.
   (4) 253 Thru 5000.
7. Manway: 12" x 16" Low Pressure-(1) 625 Thru 5000.
   High Pressure-(1) 253 Thru 5000.
8. Surface Blowdown Connection.

STANDARD TRIM (BOILER)

1. ASME Safety Valve(s).
2. Water Column w/Water Level Gauge Glass, Try Cocks (As Req'd), Low Water Cutoff / Pump Control, Blowdown Valve.
3. Operating Pressure Control.
4. High Limit Pressure Control (Manual Reset).
5. Firing Rate Control (Hi-Lo-Off Or Modulating Firing Only).
6. Pressure Gauge w/Shutoff And Inspectors Gauge Cocks.
7. Control Circuit Terminal Strips.

Notes:

1. All Units Manufactured To UL Listing Procedures.
2. Steam Output-Based On Steam From And At 212F.
3. Shipping Weights Are Based On Units With Natural Gas Burners-Weights Of Units For Air Atomized Oil Or Combination Gas/Oil Firing Will Be Higher.

Criteria Air Pollutant Emissions
600 HP Cleaver Brooks Boiler (P-8)

Combustion Source Characteristics

Boiler Manufacturer	Cleaver Brooks
Burner Model	600
Input Heat Capacity (BTU/hr)	24,494,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	24,494
Annual Fuel Consumption (scf/yr)	214,567,440

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data [c]

Stack Height (ft)	31.0
Stack Diameter (ft)	2.00
Exit Gas Temperature (°F)	275
Wet Actual Flow Rate (acfm)	6,583
Wet Standard Flow Rate (wscfm)	4,331
Dry Standard Flow Rate (dscfm)	3,556
Grain Loading Flow Rate (dscfm)	4,533
Stack Velocity (m/s)	10.64
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.186	0.8	0.023
SO_2	NG Combustion	0.6	lb/10^6 scf	0.015	0.1	0.002
NO_x	NG Combustion	100	lb/10^6 scf	2.449	10.7	0.309
CO	NG Combustion	84	lb/10^6 scf	2.057	9.0	0.259
VOC	NG Combustion	5.5	lb/10^6 scf	0.135	0.6	0.017
Lead	NG Combustion	0.0005	lb/10^6 scf	1.22E-05	0.0	1.54E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.186	0.815	2.35E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	2.94E-07	0.000	3.70E-08
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	6.37E-06	0.000	8.02E-07

PM Grain Loading Standard[b]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.186	0.005	0.015	yes

Notes:

(a) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion", unless otherwise noted.

(b) IDAPA 58.01.01.677

(c) Stack parameters were determined as follows: discharge temperature = conservative assumption based on other similar projects, flowrate (wet actual) based on EPA Method 19 Fw factor (converted from standard conditions to actual conditions), stack height and diameter = actual (details provided on construction drawings).

Toxic Air Pollutant Emissions
600 HP Cleaver Brooks Boiler (P-8)

Combustion Source Characteristics

Boiler Manufacturer	Cleaver Brooks
Burner Model	600
Input Heat Capacity (BTU/hr)	24,494,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	24,494
Annual Fuel Consumption (scf/yr)	214,567,440

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data

Stack Height (ft)	31.0
Stack Diameter (ft)	2.00
Exit Gas Temperature (°F)	275
Wet Actual Flow Rate (acfm)	6,583
Wet Standard Flow Rate (wscfm)	4,331
Dry Standard Flow Rate (dscfm)	3,556
Grain Loading Flow Rate (dscfm)	4,533
Stack Velocity (m/s)	10.64
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	4.90E-06	6.17E-07	1.50E-06
Barium	4.40E-03	lb/10^6 scf	1.08E-04	1.36E-05	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	5.14E-05	6.48E-06	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	2.94E-07	3.70E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	2.94E-08	3.70E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	2.69E-05	3.39E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	3.43E-05	4.32E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	2.06E-06	2.59E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	2.08E-05	2.62E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	2.94E-05	3.70E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	6.86E-08	8.64E-09	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	1.84E-03	2.31E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	4.41E-02	5.56E-03	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	9.31E-06	1.17E-06	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	6.37E-06	8.02E-07	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	2.69E-05	3.39E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	1.49E-05	1.88E-06	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	5.14E-05	6.48E-06	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	6.37E-02	8.02E-03	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	5.88E-07	7.41E-08	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	8.33E-05	1.05E-05	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	5.63E-05	7.10E-06	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	7.10E-04	8.95E-05	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

BOILER 1 CBL.700.600.150

Table A1-1. Model CB-LE Steam Boiler Ratings

BOILER HP	125	150	200	250	300	350	400	500	600	700	750	800
	RATINGS SEA LEVEL TO 700 FT											
Rated Steam Cap. (lbs/hr from and @ 212 °F)	4313	5175	6900	8625	10350	12075	13800	17250	20700	24150	25875	27600
Btu Output (1000 Btu/hr)	4184	5021	6695	8369	10043	11716	13390	16738	20085	23432	25106	26779
	APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY											
Light Oil (gph)[A]	36.4	43.7	58.3	72.9	87.5	102.1	116.6	145.8	175.0	204.1	218.7	233.3
Natural Gas (cfh) MBtu	5103	6124	8165	10206	12247	14288	16329	20412	24494	28576	30618	32659
Gas (Therm/hr)	51.0	61.2	81.7	102.1	122.5	142.8	163.3	204.2	245.0	285.8	306.2	326.6
	POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ											
Blower Motor hp	Refer to Tables A1-9 and A1-10											
Oil Pump Motor, hp No. 2 Oil	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1	1
Air Compressor Motor hp (Oil firing Only)	3	3	3	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2

NOTES:
A. Based on 140,000 Btu/gal

Table A1-2. Model CB-LE Hot Water Boiler Ratings

BOILER HP	125	150	200	250	300	350	400	500	600	700	750	800
	POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ											
Rated Cap. Btu Output (1000 Btu/hr)	4184	5021	6695	8369	10043	11716	13390	16738	20085	23432	25106	26779
	APPROXIMATE FUEL CONSUMPTON AT RATED CAPACITY											
Light Oil (gph)[A]	36.4	43.7	58.3	72.9	87.5	102.1	116.6	145.8	175.0	204.1	218.7	233.3
Natural Gas (cfh) MBtu	5103	6124	8165	10206	12247	14288	16329	20415	24494	28576	30618	32659
Gas (Therm/hr)	51.0	61.2	81.7	102.1	122.5	142.9	163.3	204.2	245.0	285.8	306.2	326.6
	POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ											
Blower Motor hp	Refer to Tables A1-9 and A1-10											
Oil Pump Motor, hp No. 2 Oil	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1	1
Air Compressor Motor hp (Oil firing Only)	3	3	3	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2

NOTES:
A. Based on 140,000 Btu/gal.

Criteria Air Pollutant Emissions
800 HP Hurst Boiler (P-9)

Combustion Source Characteristics

Boiler Manufacturer	Hurst
Burner Model	Scotch Marine 200 Series - 800 HP
Input Heat Capacity (BTU/hr)	33,600,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	33,600
Annual Fuel Consumption (scf/yr)	294,336,000

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data [c]

Stack Height (ft)	38.0
Stack Diameter (ft)	2.50
Exit Gas Temperature (°F)	275
Wet Actual Flow Rate (acfm)	9,030
Wet Standard Flow Rate (wscfm)	5,942
Dry Standard Flow Rate (dscfm)	4,878
Grain Loading Flow Rate (dscfm)	6,218
Stack Velocity (m/s)	9.34
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.255	1.1	0.032
SO_2	NG Combustion	0.6	lb/10^6 scf	0.020	0.1	0.003
NO_x	NG Combustion	100	lb/10^6 scf	3.360	14.7	0.423
CO	NG Combustion	84	lb/10^6 scf	2.822	12.4	0.356
VOC	NG Combustion	5.5	lb/10^6 scf	0.185	0.8	0.023
Lead	NG Combustion	0.0005	lb/10^6 scf	1.68E-05	0.0	2.12E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.255	1.118	3.22E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	4.03E-07	0.000	5.08E-08
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	8.74E-06	0.000	1.10E-06

PM Grain Loading Standard[b]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.255	0.005	0.015	yes

Notes:

(a) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion", unless otherwise noted.

(b) IDAPA 58.01.01.677

(c) Stack parameters were determined as follows: discharge temperature = conservative assumption based on other similar projects, flowrate (wet actual) based on EPA Method 19 Fw factor (converted from standard conditions to actual conditions), stack heigh

Toxic Air Pollutant Emissions
800 HP Hurst Boiler (P-9)

Combustion Source Characteristics

Boiler Manufacturer	Hurst
Burner Model	Scotch Marine 200 Series - 800 HP
Input Heat Capacity (BTU/hr)	33,600,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,000
Max Hourly Fuel Consumption (scf/hr)	33,600
Annual Fuel Consumption (scf/yr)	294,336,000

Site Information

Nampa Barometric Pressure (mm Hg)	696.11

Stack Data

Stack Height (ft)	38.0
Stack Diameter (ft)	2.50
Exit Gas Temperature (°F)	275
Wet Actual Flow Rate (acfm)	9,030
Wet Standard Flow Rate (wscfm)	5,942
Dry Standard Flow Rate (dscfm)	4,878
Grain Loading Flow Rate (dscfm)	6,218
Stack Velocity (m/s)	9.34
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	6.72E-06	8.47E-07	1.50E-06
Barium	4.40E-03	lb/10^6 scf	1.48E-04	1.86E-05	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	7.06E-05	8.89E-06	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	4.03E-07	5.08E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	4.03E-08	5.08E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	3.70E-05	4.66E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	4.70E-05	5.93E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	2.82E-06	3.56E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	2.86E-05	3.60E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	4.03E-05	5.08E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	9.41E-08	1.19E-08	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	2.52E-03	3.18E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	6.05E-02	7.62E-03	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	1.28E-05	1.61E-06	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	8.74E-06	1.10E-06	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	3.70E-05	4.66E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	2.05E-05	2.58E-06	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	7.06E-05	8.89E-06	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	8.74E-02	1.10E-02	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	8.06E-07	1.02E-07	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	1.14E-04	1.44E-05	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	7.73E-05	9.74E-06	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	9.74E-04	1.23E-04	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

BOILER 3-S-4000-150-26

SCOTCH MARINE **DRYBACK 200 SERIES** SPECIFICATION DATA CHART

BOILER SPECIFICATIONS (ALL DIMENSIONS ARE IN INCHES) - CONTINUED

	BOILER HORSEPOWER			125	150	200	250	300	350	400	500	600	700	800	
	HEATING SURFACE	FIRESIDE	SQ FT	625	750	1000	1250	1500	1750	2000	2500	3000	3500	4000	
	STEAM OUTPUT	FROM & @212°F	LB HR	4312	5175	6900	8625	10350	12075	13800	17250	20700	24150	27600	
	GROSS OUTPUT		MBH	4184	5021	6695	8369	10042	11716	13390	16738	20085	23432	26780	
	FIRING RATE GAS	1 000 BTU	CFH	5250	6300	8400	10500	12600	14700	16800	21000	25200	29400	33600	
	FIRING RATE LP GAS	91 500 BTU	GPH	57 3	68 8	91 8	114 7	137 7	160 6	183 6	229 5	275 4	321	367	
	FIRING RATE No 2 oil	140,000 BTU	GPH	37 5	45	60	75	90	105	120	150	180	210	240	
	FIRING RATE #5 & #6 OIL	156 000 BTU	GPH	35	42	56	70	84	98	112	140	168	196	224	
A	*NOTE 1 STEAM OUTLET SIZE	150 PSI	IN	4	4	4	6	6	6	6	6	8	8	8	A
A	*NOTE 2 STEAM OUTLET SIZE	15 PSI	IN	8	8	8	10	10	10	12	12	12	12	12	A
B	*NOTE 3 WATER SUPPLY SIZE	30 PSI	IN	6	8	8	8	10	10	10	12	12	12	12	B
C	*NOTE 3 WATER RETURN SIZE	30 PSI	IN	8	6	6	6	8	10	10	10	10	12	12	C
D	FEEDWATER CONNECTION		IN	1 1/2	1 1/2	2	2	2	2	2	2	2	2	2	D
E	BLOWDOWN CONNECTION (VESSEL)	BOTTOM	IN	(2) 1 1/2	(2) 1 1/2	(2) 2	(2) 2	(2) 2	(2) 2	(2) 2	(2) 2	(2) 2	(2) 2	(2) 2	E
F	STACK OUTLET SIZE OD		IN	16	16	20	20	20	24	24	24	26	26	30	F
G	FURNACE OD		IN	26	26	34	34	34	42	42	42	48	48	48	G
H	SHELL ID		IN	60	60	75 5	75 5	75 5	90	90	90	102	102	102	H
I	WIDTH WITHOUT TRIM		IN	68 5	68 5	84 5	84 5	84 5	99	99	99	111	111	111	I
J	WIDTH WITH TRIM		IN	73	73	89	89	89	105	105	105	118	118	118	J
K	LENGTH FRONT TO REAR		IN	175	195	164	195	216	177	189	224	246	246	278	K
L	LENGTH OVERALL		IN	214	234	210	244	262	223	236	274	270	300	331	L
M	SKID LENGTH		IN	174	198	168	192	216	168	180	229	246	264	288	M
N	SKID WIDTH		IN	48	48	60	60	60	70	70	70	78	78	78	N
O	STEAM SUPPLY LOCATION		IN	70	82	60	85	84	75	79	102	84	99	84	O
P	WATER SUPPLY LOCATION		IN	48	48	39	48	54	39	48	54	60	60	60	P
Q	WATER RETURN LOCATION		IN	120	132	117	138	150	117	132	162	150	180	204	Q
R	BLOWDOWN LOCATION	15 PSI & UP	IN	26 - 112	26 - 130	27 - 94	27 - 125	33 - 135	27 - 99	30 - 108	30 - 144	39 - 120	39 - 150	39 - 174	R
S	1 1/4" SURFACE BLOW OFF CONNECTION		IN	52	64	61	64	60	60	65	78	66	80	65	S
T	STACK OUTLET LOCATION		IN	25	29	34	27	30	25	25	29	36	40	49	T
U	SUPPLY HEIGHT		IN	82	82	100 1/2	100 1/2	100 1/2	115	115	115	127	127	127	U
V	STACK HEIGHT		IN	84	84	102 1/2	102 1/2	102 1/2	116	116	116	128	128	128	V
W	SHELL TO FLOOR HEIGHT		IN	15	15	18	18	18	18	18	18	18	18	18	W
X	BURNER PROJECTION		IN	36	36	42	42	42	42	43	45	48	48	48	X
Y	DOOR SWING		IN	34	34	43	43	43	50	50	50	57	57	57	Y
AA	TUBE REMOVAL	REAR	IN	118	138	103	134	155	105	117	153	141	171	193	AA
BB	TUBE REMOVAL	FRONT	IN	131	151	112	143	164	119	131	167	152	182	209	BB
	WATER CAPACITY @ NWL		GAL	800	1142	1274	1908	1815	1684	1872	2349	2739	3240	3687	
	WATER CAPACITY FLOODED		GAL	1180	1326	1547	1939	2204	2133	2364	2968	3427	4048	4607	
	APPROX SHIPPING WEIGHT (HIGH PRESS)	150 PSI & UP	LBS	15000	16500	17900	25700	28000	32000	33900	39900	48800	55400	59800	
	APPROX SHIPPING WEIGHT (LOW PRESS)	15 & 30 PSI	LBS	14300	15600	16500	23800	25250	31000	33000	38800	48700	54300	57900	
	BOILER HORSEPOWER			125	150	200	250	300	350	400	500	600	700	800	

NOTE 13" & ABOVE ARE 300# ANSI FLANGE • NOTE 24" & ABOVE ARE 150# ANSI FLANGE • 70 HP & LARGER 12" X 16" MANWAY • DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE CERTIFIED DRAWINGS AVAILABLE ON REQUEST

Appendix 2

Copy of Public Meeting Notice

PUBLIC MEETING NOTICE - AIR POLLUTION PERMIT TO CONSTRUCT

PUBLIC MEETING NOTICE - AIR POLLUTION PERMIT TO CONSTRUCT APPLICATION: SORRENTO LACTALIS WHEY DRYER AND EVAPORATOR

Nampa, ID - Sorrento Lactalis, Inc. is holding a public meeting to answer questions regarding its Air Pollution Permit to Construct Application for a new Whey Dryer and Evaporator at its facility in Nampa, ID. The meeting will be held at Sorrento Lactalis, Inc, 4912 E. Franklin Road in Nampa on Monday, March 9, 2009 at 9 a.m.

February 26, 27, 28, 2009
March 1, 2, 3, 4, 5, 6, 7, 2009
06560993

Appeared in: ***Idaho Press Tribune*** on 02/26/2009 and 02/27/2009

Back

Appendix 3

Modeling Protocol and IDEQ Response

MSE Millennium Science & Engineering, Inc.

1555 Shoreline Drive, Suite 150
Boise, Idaho 83702
Phone: (208) 345-8292
Fax: (208) 344-8007

January 23, 2009

Mr. Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706

Re: Protocol for Air Dispersion Modeling to Support Pre-Permit Construction Approval and PTC Application, Sorrento Lactalis, 4912 E Franklin Rd., Nampa, Idaho

Dear Kevin:

Please find attached our proposed Air Modeling Protocol for air dispersion modeling that will be completed to support a Pre-Permit Construction Approval and PTC application for construction of a new whey dryer and boiler at the Sorrento Lactalis plant located at 4912 E Franklin Rd in Nampa, Idaho. The format of this document follows the format suggested in the December 31, 2002 "State of Idaho Air Quality Modeling Guideline."

We request that you review and approve this protocol. We will then proceed with modeling following the approved protocol. Please contact me at (208) 345-8292 or tdriecke@mse-env.com if you have any questions regarding this modeling protocol.

Sincerely,

Troy Riecke

Troy Riecke, P.E.
Project Engineer

cc: William Rogers – Idaho DEQ
Wendy York – Sorrento Lactalis

Modeling Protocol – Whey Dryer
Sorrento Lactalis, Nampa Facility

1.0 Purpose

Air dispersion modeling is proposed to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) for criteria pollutants and Idaho Department of Environmental Quality (IDEQ) standards for TAPs in support of a Pre-Permit Construction Approval and PTC application for a proposed whey dryer and boiler to be constructed and operated at the existing Sorrento Lactalis facility located at 4912 E. Franklin Rd, Nampa, Idaho.

2.0 Model Description / Justification

Air dispersion modeling will be performed using the Environmental Protection Agency (EPA) AERMOD model.

3.0 Emission and Source Data

New sources include a new whey dryer (Tetra Pak) and boiler (Cleaver Brooks). The whey dryer will include two flue stacks and a shaking bed stack with discharge of natural gas combustion products and a main exhaust with discharge of particulate matter from the drying process. Existing sources include a whey dryer and three boilers. Table 1 provides a list of the emission sources and the pollutants that will be modeled at the site and Table 2 provides emission source configuration and operational parameters.

Table 1
Emission Sources and Pollutants to be Modeled

Emission Source	ID	Criteria Pollutants				Toxic Air Pollutants (TAPs)				
		PM_{10}	NO_x	CO	SO_x	As	Benz-ene	Cd	CH_2O	Ni
Preliminary Analysis										
TP Whey Dryer – Stack 1	P-2	X	X	X		Y	Y	Y	Y	Y
TP Whey Dryer – Stack 2	P-3	X	X	X		Y	Y	Y	Y	Y
TP Whey Dryer – Main Exhaust	P-4	X								
TP Whey Dryer – Bed	P-5	X								
1200 HP Boiler – Cleaver Brooks	P-6	X	X	X		Y	Y	Y	Y	Y
Full Impact Analysis (in addition to sources listed for Preliminary Analysis) – If Required										
Existing Dryer - Myers Sterner	P-1	X	X	X		Y	Y	Y	Y	Y
Existing 600 HP Boiler – Superior	P-7	X	X	X		Y	Y	Y	Y	Y
Existing 600 HP Boiler – Cleaver Brooks	P-8	X	X	X		Y	Y	Y	Y	Y
Existing 800 HP Boiler - Hurst	P-9	X	X	X		Y	Y	Y	Y	Y

Note: an "X" represents that the pollutant will be modeled for that source and a "Y" represents toxic air pollutants that will be modeled if estimated emission rates exceed the applicable emission limit (EL).

Table 2
Emission Source Configuration and Operational Parameters (Preliminary)

Emission Source	ID	Discharge Elevation (ft ASL)	Stack Diameter (ft)	Stack Temperature (°F)	Stack Gas Flow (ACFM)	Stack Orientation
Preliminary Analysis						
TP Whey Dryer – Stack 1	P-2	2,650	1.5	241	6,350	vertical
TP Whey Dryer – Stack 2	P-3	2,650	1.5	241	6,350	vertical
TP Whey Dryer – Main Exhaust	P-4	2,650	5.17	104	77,200	vertical
TP Whey Dryer – Bed	P-5	2,650	3.67	126	40,900	vertical
1200 HP Boiler – Cleaver Brooks	P-6	2,552	3.0	325	14,064	vertical
Full Impact Analysis (in addition to sources listed for Preliminary Analysis) – If Required						
Existing Dryer - Myers Sterner	P-1	2,592	3.17	160	18,000	vertical
Existing 600 HP Boiler – Superior	P-7	2,549	2.17	275	6,460	vertical
Existing 600 HP Boiler – Cleaver Brooks	P-8	2,545	2.0	275	6,583	vertical
Existing 800 HP Boiler - Hurst	P-9	2,552	2.5	275	9,032	vertical

3.1 Basis for Stack Parameters

Stack diameter, discharge elevation, and stack orientation were obtained from contractor provided drawings. Stack discharge temperature and flow rate were provided by TetraPak for the new whey dryer flue stacks 1 and 2 (P-2 and P-3), new whey dryer main exhaust (P-4), and the new whey dryer shaking bed (P-5). These are basis of design operating parameters and are considered to be the actual values to be maintained in the system. The stack discharge temperature and flow rate for the existing Myers Sterner Dryer were obtained from the July 19, 2001 Technical Memorandum by Ken Hanna, IDEQ. Discharge temperatures for existing boilers were conservatively estimated as the low range of typical values for similar boilers. Stack gas discharge flow rates for the boilers were calculated using natural gas "F" Factors from Table 19-1 of EPA Method 19.

4.0 Receptor Network

A receptor network will be established so that ambient concentrations can be evaluated. The first step in this process is to determine the location of the ambient air boundary and the second step is to assign receptor locations within the ambient air zone.

4.1 Ambient Air Boundary

The ambient air boundary will be the facility's property line. The majority of the property is fenced. The un-fenced portion of the property is not open to the public. Neither a gift shop nor restaurant is located on the premises.

4.2 Receptors

Receptors will be established to determine maximum ambient air concentrations. A receptor grid with approximately 300 feet spacing will be established across the entire evaluated area. Receptors along the ambient air boundary will be spaced approximately 100 feet apart. No receptors will be established within the facility's controlled property boundary.

5.0 Elevation Data

Topography data for the site will be obtained from the USGS as a 7.5 minute digital elevation model (DEM). AERMAP will be used to preprocess the data for use in AERMOD.

6.0 Meteorological Data

Meteorological data (surface and upper air) from the Boise airport, provided by the IDEQ, will be used for modeling. This data should reasonably represent the meteorological conditions of the Nampa plant. The model input height for the anemometer will be established at 20 feet.

7.0 Land Use Classification

The facility is industrial while the surrounding land is a mix of open space/agricultural and commercial land uses. Air dispersion modeling will be performed using a "rural" classification.

8.0 Background Concentrations

Background ambient air concentrations for criteria pollutants will provided by the IDEQ.

9.0 Evaluation of Compliance With Standards

Modeling will begin with a Preliminary Analysis (PA). The PA will be completed for the proposed new sources (whey dryer and boiler). The maximum modeled ambient concentration associated with the new sources will be compared to the Significant Contribution Levels (SCL) found in IDAPA 58.01.01.006.102. If the PA is below the SCL then no additional modeling is necessary. If the PA exceeds the SCL then a Full Impact Analysis (FIA) will be completed. The FIA will include all existing and proposed emission sources at the site. For the criteria pollutants, the applicable background concentrations will be added to the predicted ambient concentrations determined from air dispersion modeling to compute total ambient concentrations. These total ambient concentrations will be compared to the NAAQS. If total ambient concentrations exceed the NAAQS, the emission source will be modified (*e.g.*, operational controls, emission controls, modification of stack configuration) and the emission sources will be remodeled until no exceedance of the NAAQS occurs.

For the toxic air pollutants, predicted ambient air concentrations will be compared to applicable AAC and AACC listed in IDAPA 58.01.01.585 and 586, respectively. If an applicable AAC or AACC is exceeded by a predicted ambient air concentration, the risk associated with that exceedance will be considered and discussed with the Idaho DEQ.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

January 26, 2009

Troy Riecke, P.E.
Millennium Science & Engineering, Inc.
Boise, Idaho

RE: Modeling Protocol for Modifications to the Sorrento Lactalis Facility

Troy:

DEQ received your dispersion modeling protocol on January 23, 2009. The modeling protocol was submitted on behalf of Sorrento Lactalis (Sorrento). The modeling protocol proposes methods and data for use in the ambient impact analyses of a Permit to Construct application for modifications proposed to Sorrento's facility located in Nampa, Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: The protocol provided justification of stack parameters to be used in the modeling analyses. The source of such data is adequate and the parameters appear to be within reasonably expected ranges.

- Comment 2: The proposed receptor grid appears reasonable. However, it is the applicant's responsibility to use a sufficiently tight receptor network such that the maximum modeled concentration is reasonably resolved. If DEQ conducts verification modeling analyses with a tighter receptor grid and compliance with standards is no longer demonstrated, the permit will be denied.

- Comment 3: Background concentrations for any cumulative NAAQS analyses were based on small town/suburban default values generated by DEQ, except for 24-hour PM10, which was based on airshed modeling results. The following are reasonably conservative background concentration values that should be used with any cumulative NAAQS analyses: PM10 24-hr = 84 $\mu g/m^3$, annual = 27 $\mu g/m^3$; SO2 3-hr = 42 $\mu g/m^3$, 24-hr = 26 $\mu g/m^3$, annual = 8 $\mu g/m^3$; CO 1-hr = 10,200 $\mu g/m^3$, 8-hr = 3,400 $\mu g/m^3$; NO2 annual = 32 $\mu g/m^3$.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files (including BPIP and AERMAP input and output files) are submitted with an analysis report. If DEQ provided model-ready meteorological data files, then these do not need to be resubmitted to DEQ with the application. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling

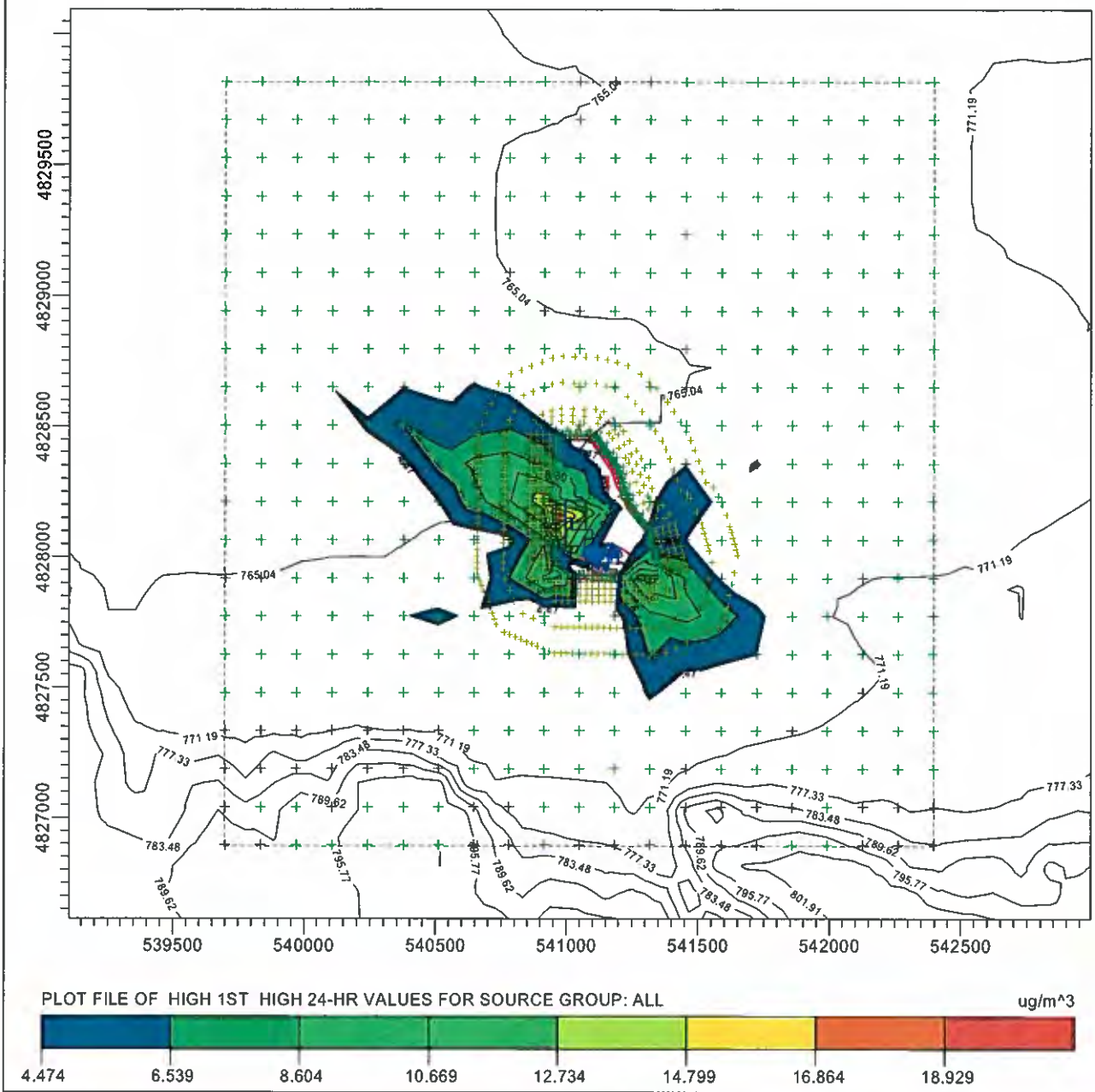
Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

Appendix 4

Model Output and Electronic Copy of Model Input/Output

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



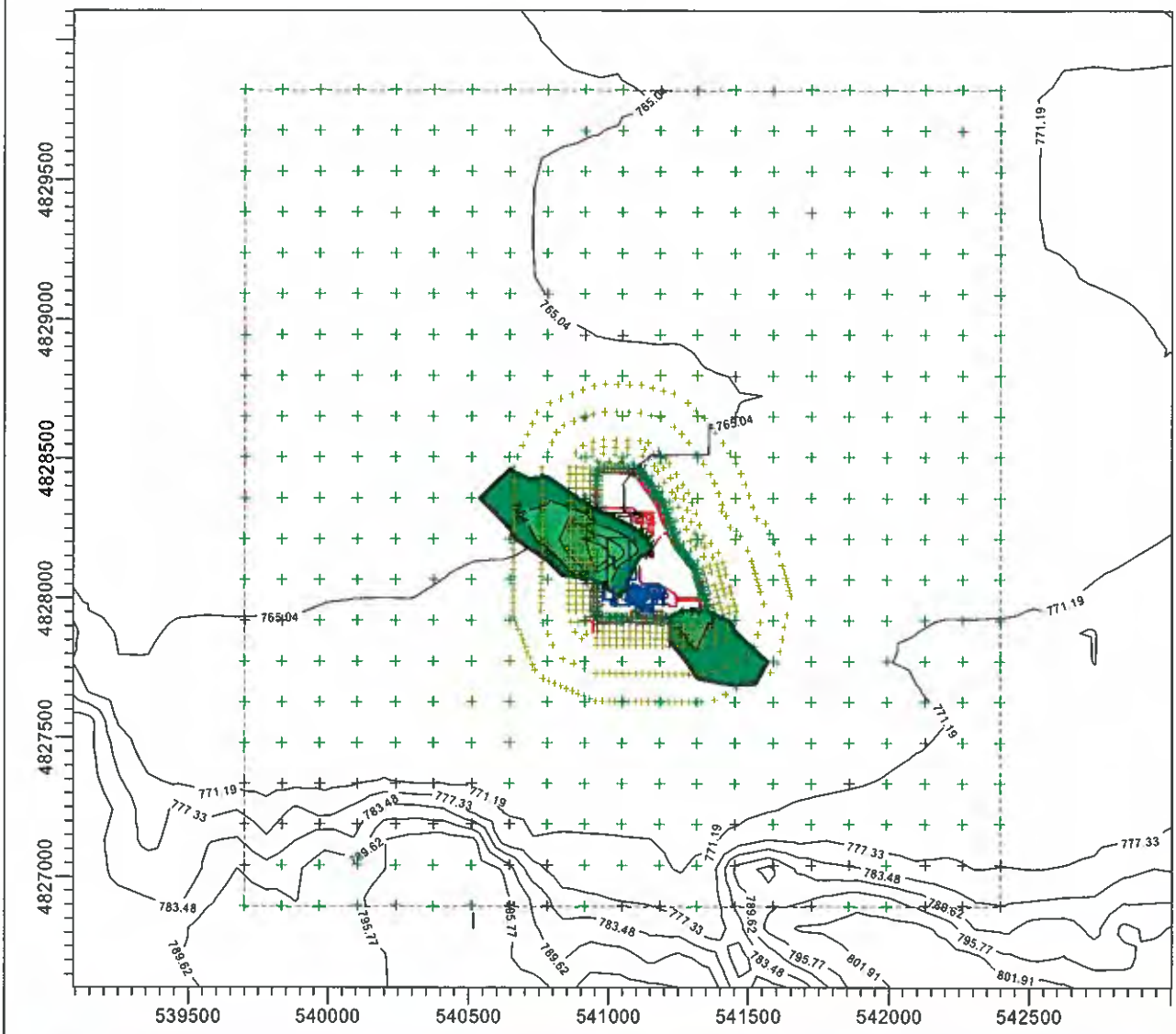
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1988 24hr 1st high Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,728	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	18.92918 ug/m^3	2/26/2009	Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\S-PM88-3.isc

PROJECT TITLE

Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

1.768 | 2.639 | 3.509 | 4.379 | 5.249 | 6.119 | 6.990 | 7.860

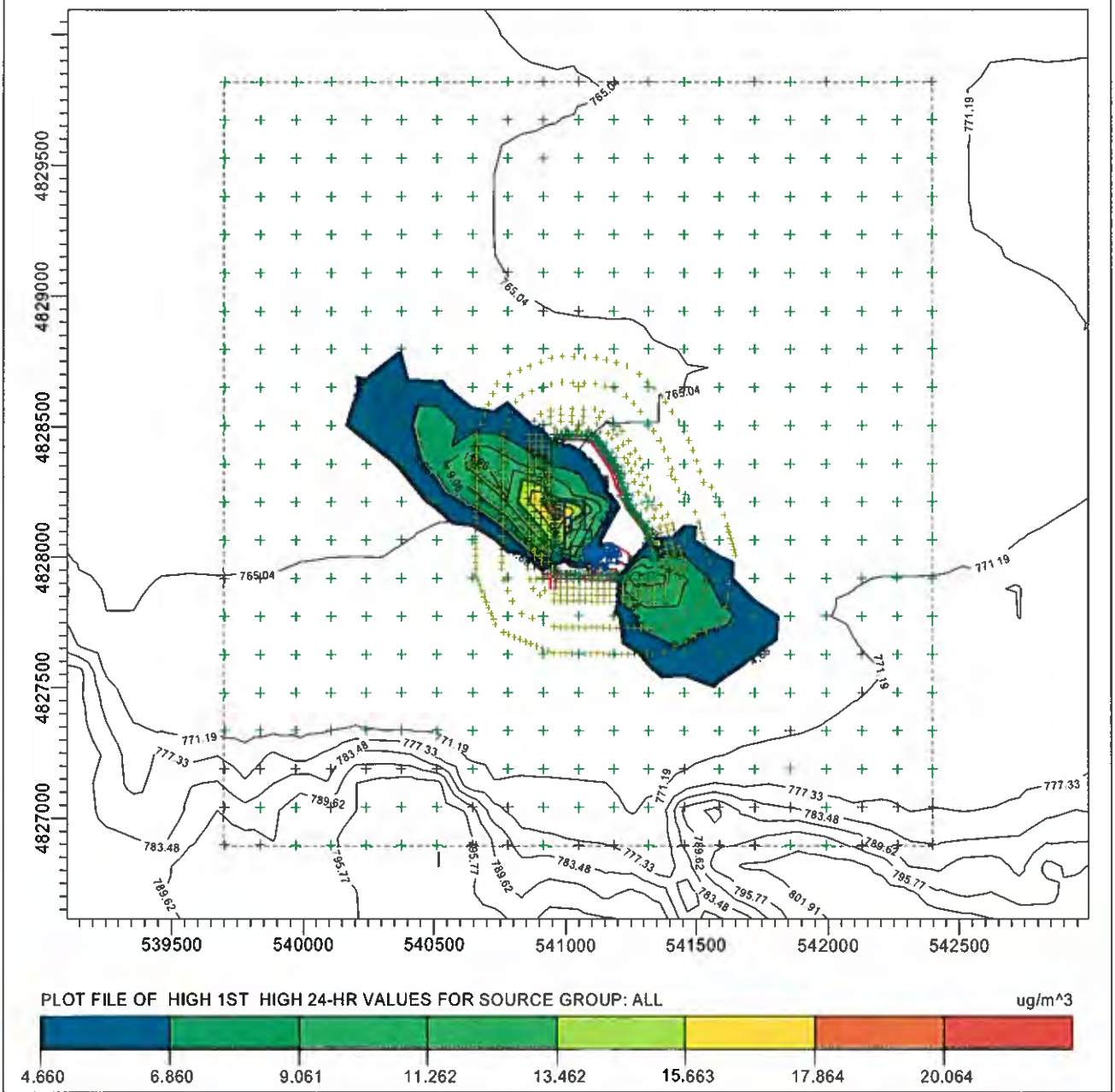
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1988 Annual Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 0.5 km	
	MAX: 5.11308 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\S-PM88-3.isc

PROJECT TITLE:

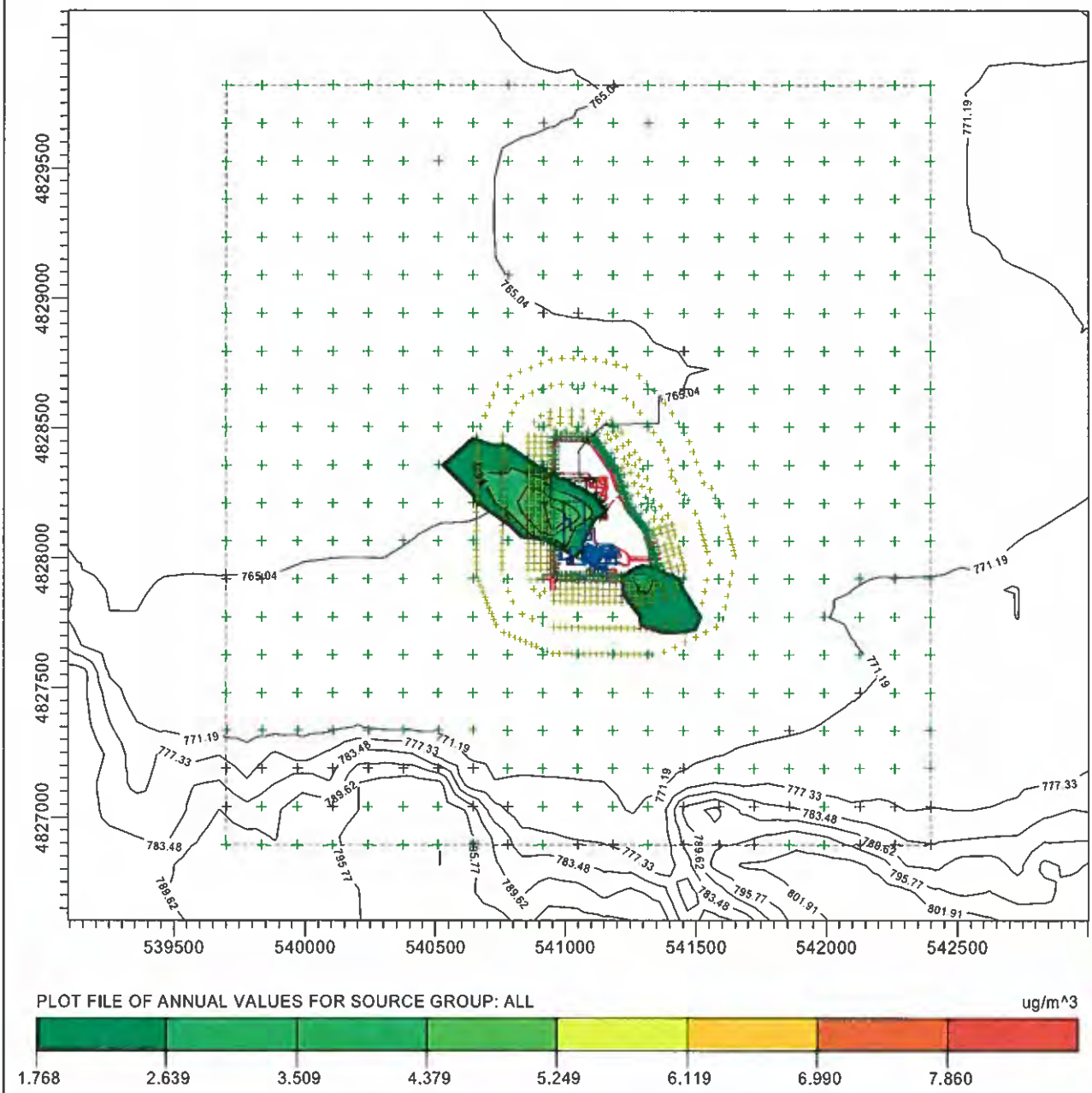
Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1989 24hr 1st high Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE:	SCALE: 1:23,728	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	20.06429 ug/m^3	2/26/2009	Sorrento Lactalis

PROJECT TITLE:

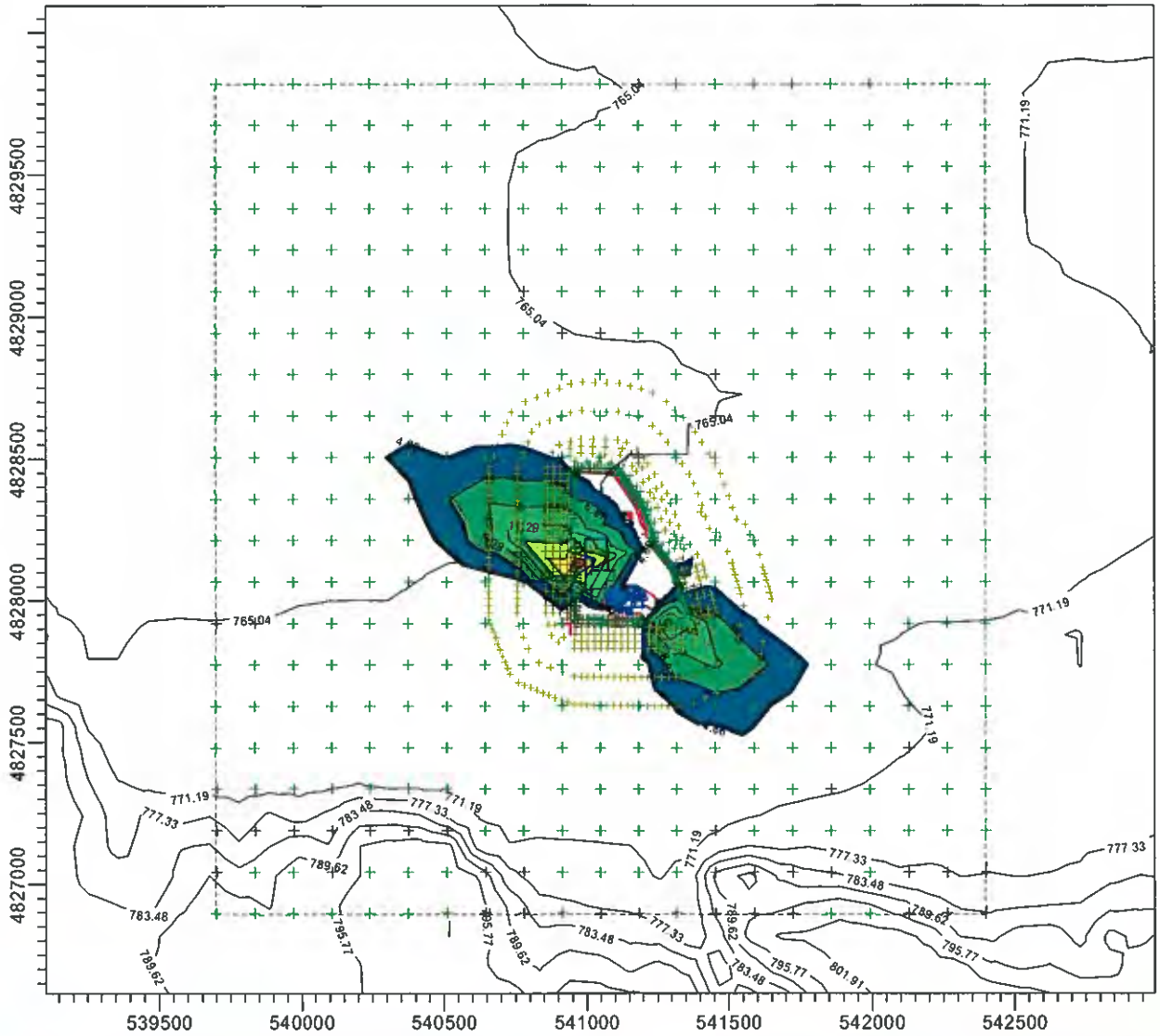
Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



COMMENTS:	SOURCES:	COMPANY NAME	
PM10 1989 Annual Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 0 0.5 km	
	MAX: 5.13084 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

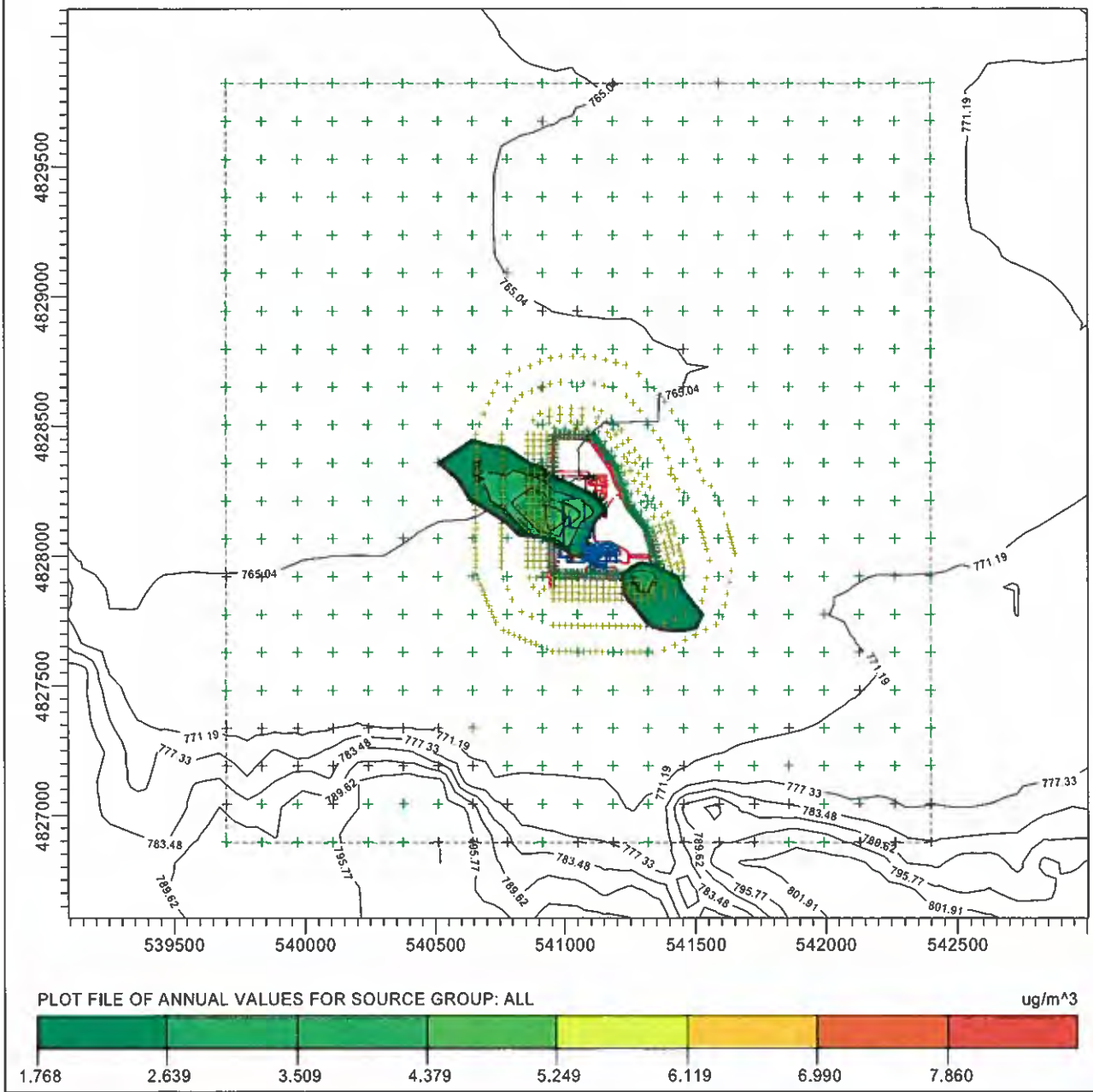
ug/m^3

4.663 6.871 9.079 11.288 13.496 15.704 17.912 20.121

COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1990 24hr 1st high Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,728	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	20.12064 ug/m^3	2/26/2009	Sorrento Lactalis

PROJECT TITLE

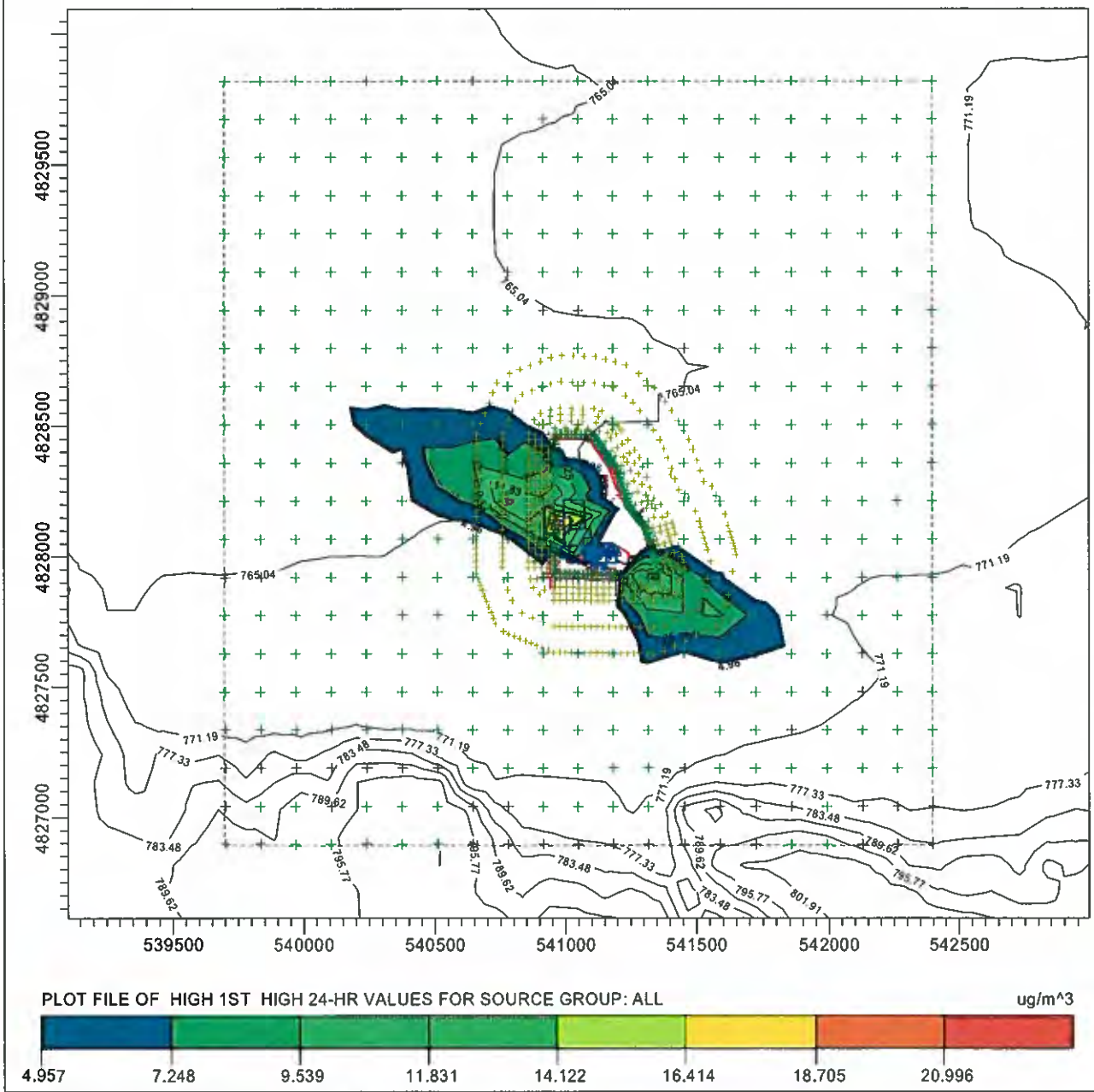
Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1990 Annual Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 0.5 km	
	MAX: 5.19944 ug/m^3	DATE: 2/26/2009	PROJECT NO. Sorrento Lactalis

PROJECT TITLE

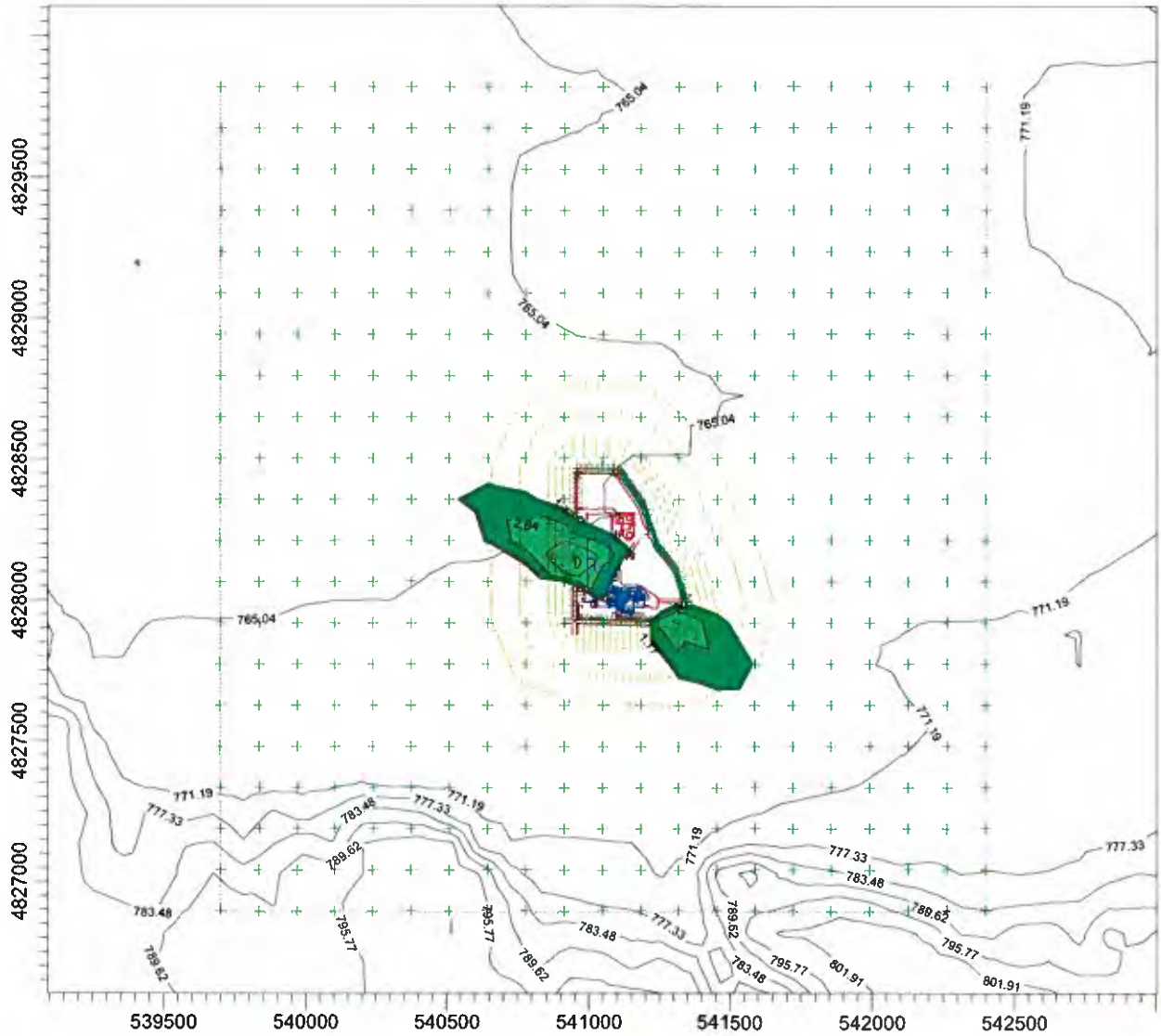
Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1991 24hr 1st high Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,728	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.
	20.99625 ug/m^3	2/26/2009	Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

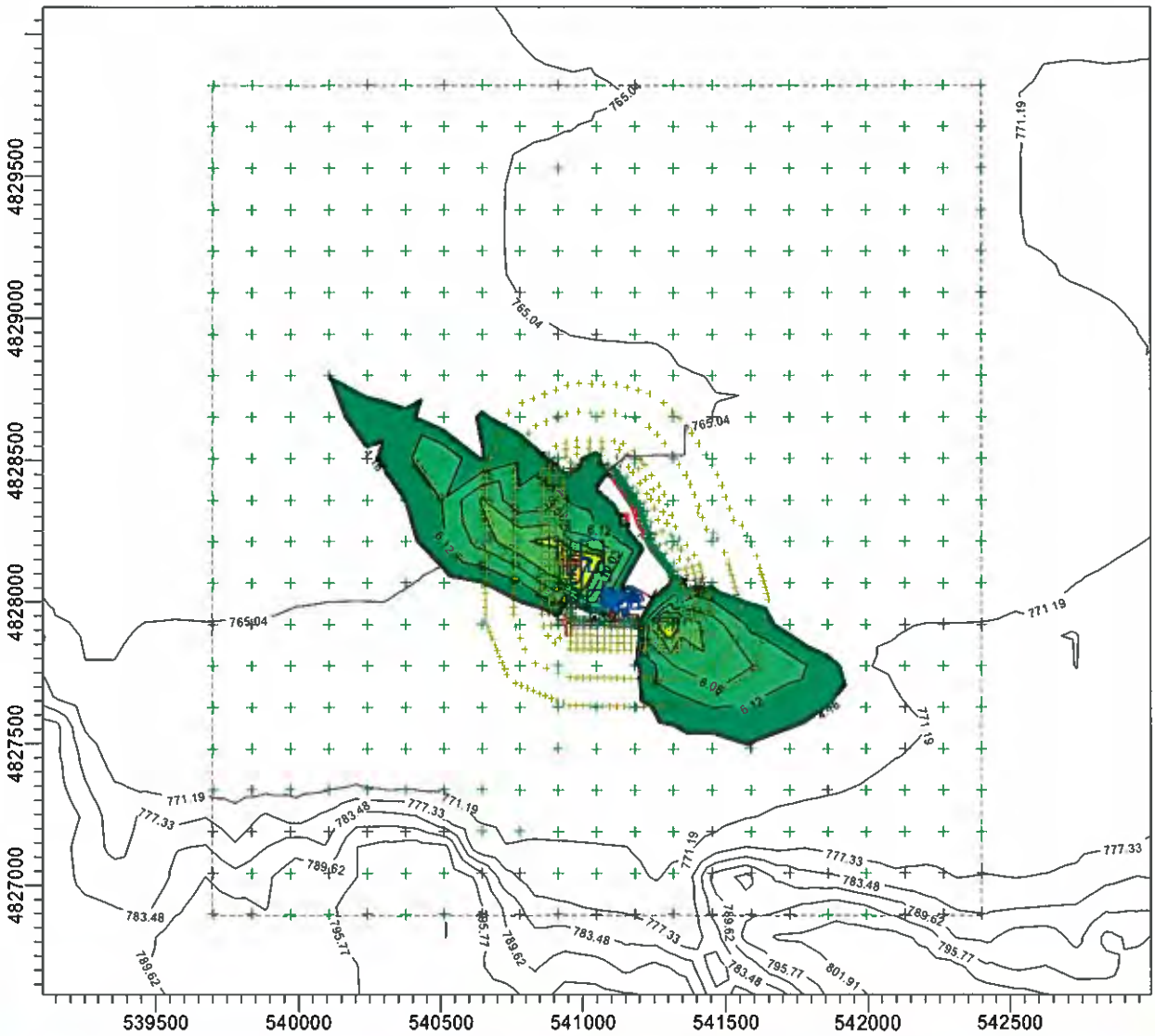
ug/m^3

1.768 | 2.639 | 3.509 | 4.379 | 5.249 | 6.119 | 6.990 | 7.860

COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1991Annual Preliminary Analysis	5	**Millennium Science & Engineering, Inc.**	
	RECEPTORS:	MODELER:	
	1077	**Troy Riecke**	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	4.56595 ug/m^3	**2/27/2009**	**Sorrento Lactalis**

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

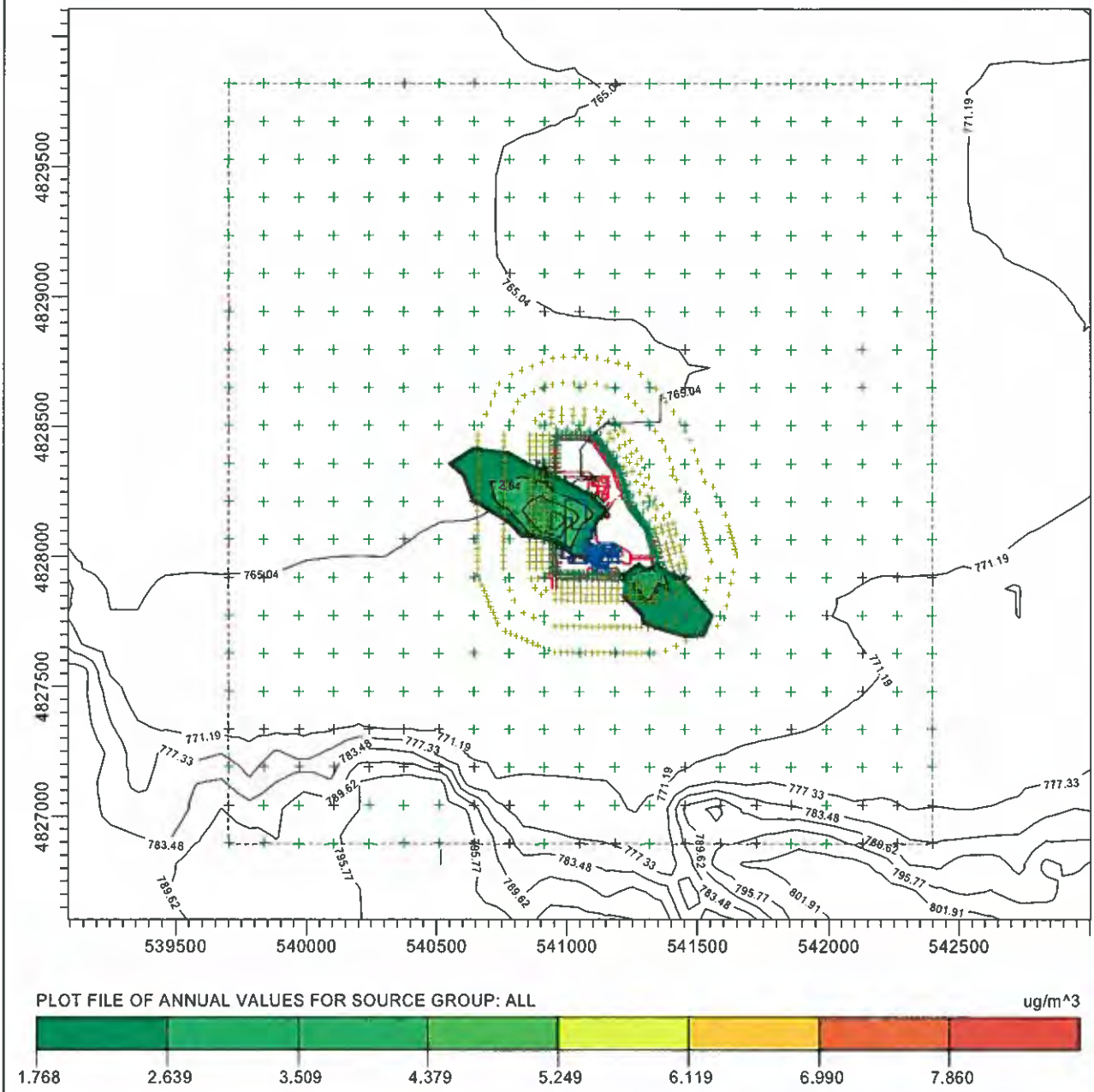
ug/m^3

4.161 | 6.118 | 8.075 | 10.032 | 11.989 | 13.946 | 15.903 | 17.860

COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1992 24 hr 1st high Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,728	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	17.86009 ug/m^3	2/26/2009	Sorrento Lactalis

PROJECT TITLE

Sorrento Lactalis - Pre-Permit Construction Application
Preliminary Analysis



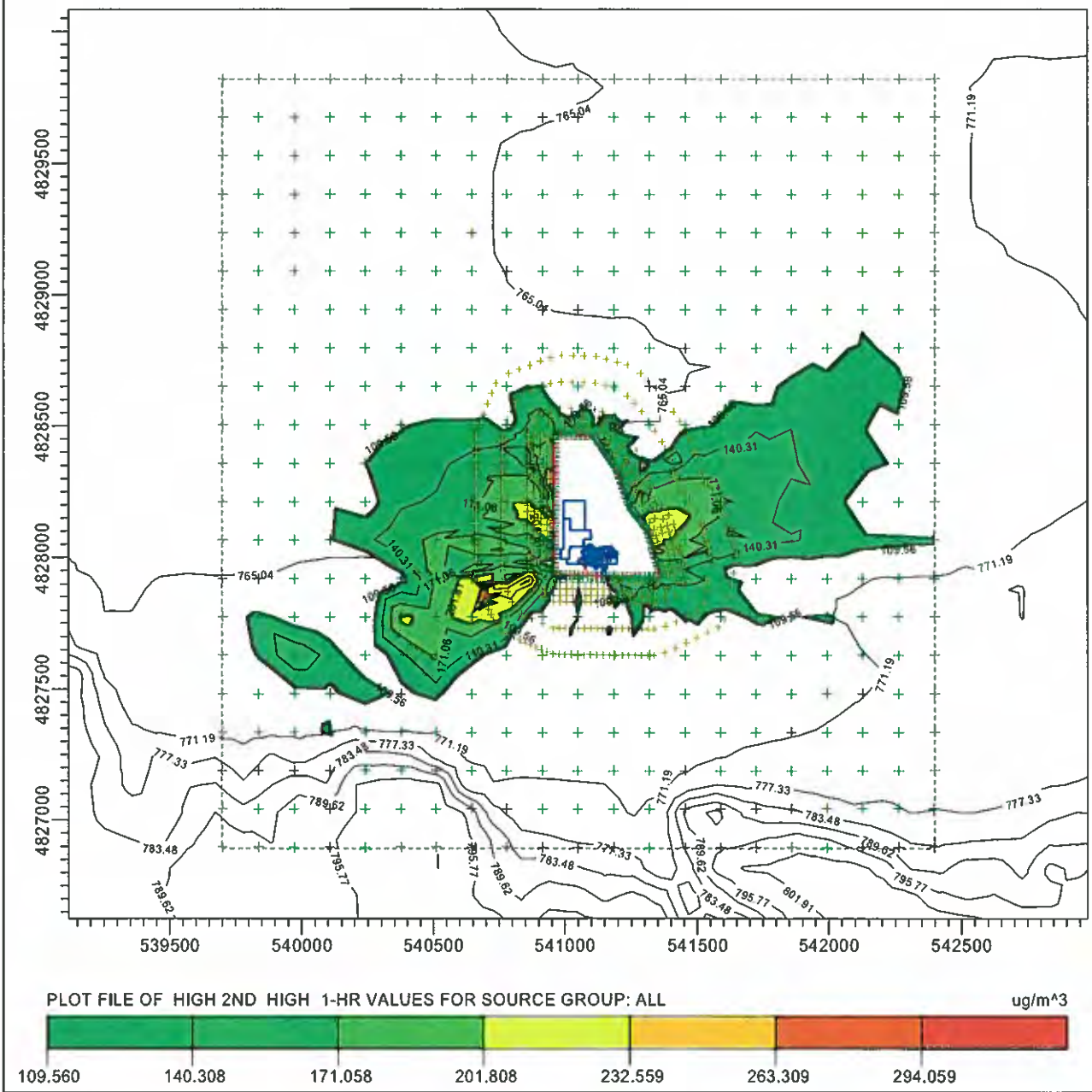
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1992 Annual Preliminary Analysis	5	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 0.5 km	
	MAX: 4.90966 ug/m^3	DATE: 2/27/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\S-PM92-3.isc

PROJECT TITLE:

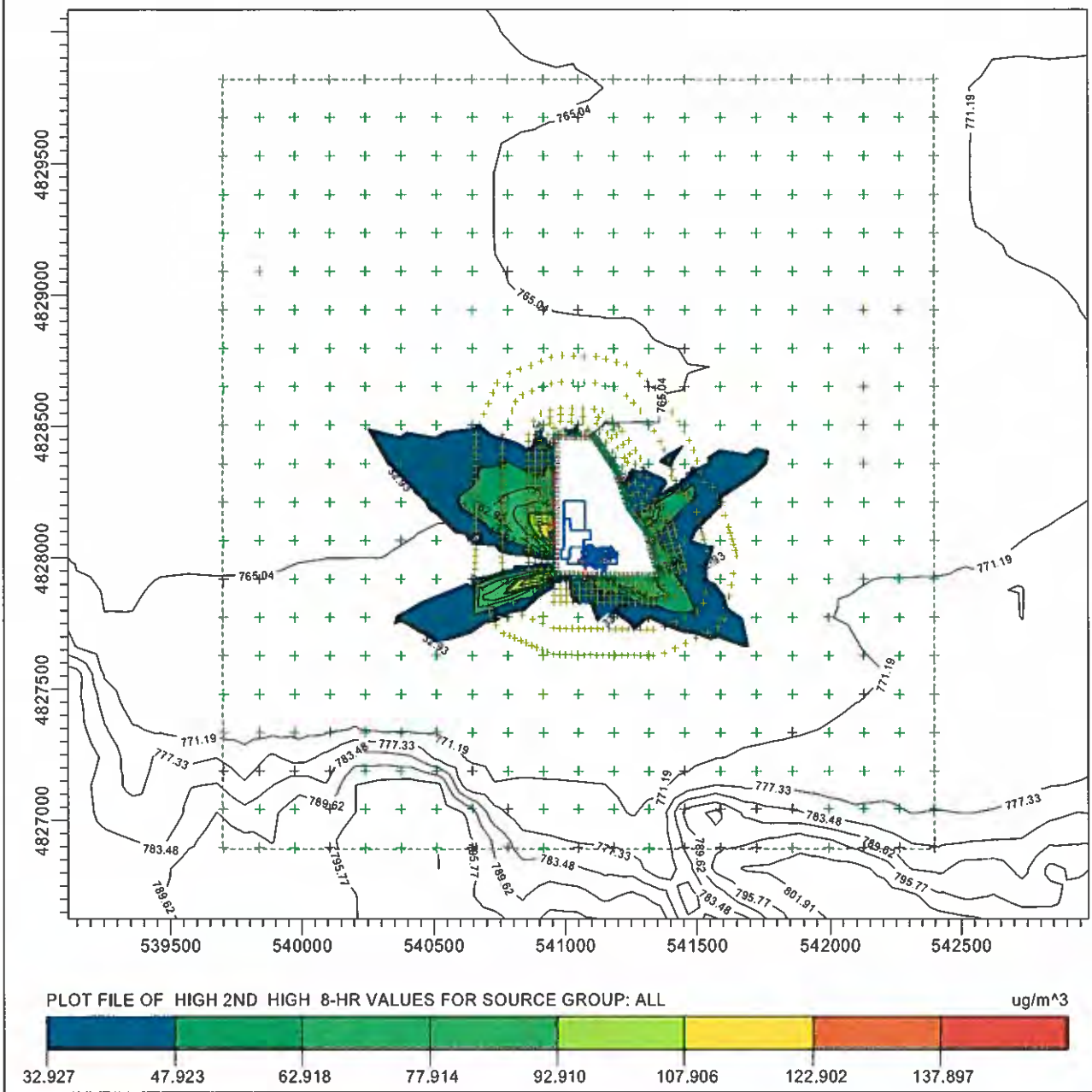
Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1988, 1 hr-2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 — 0 0.5 km	
	MAX: 294.0592 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

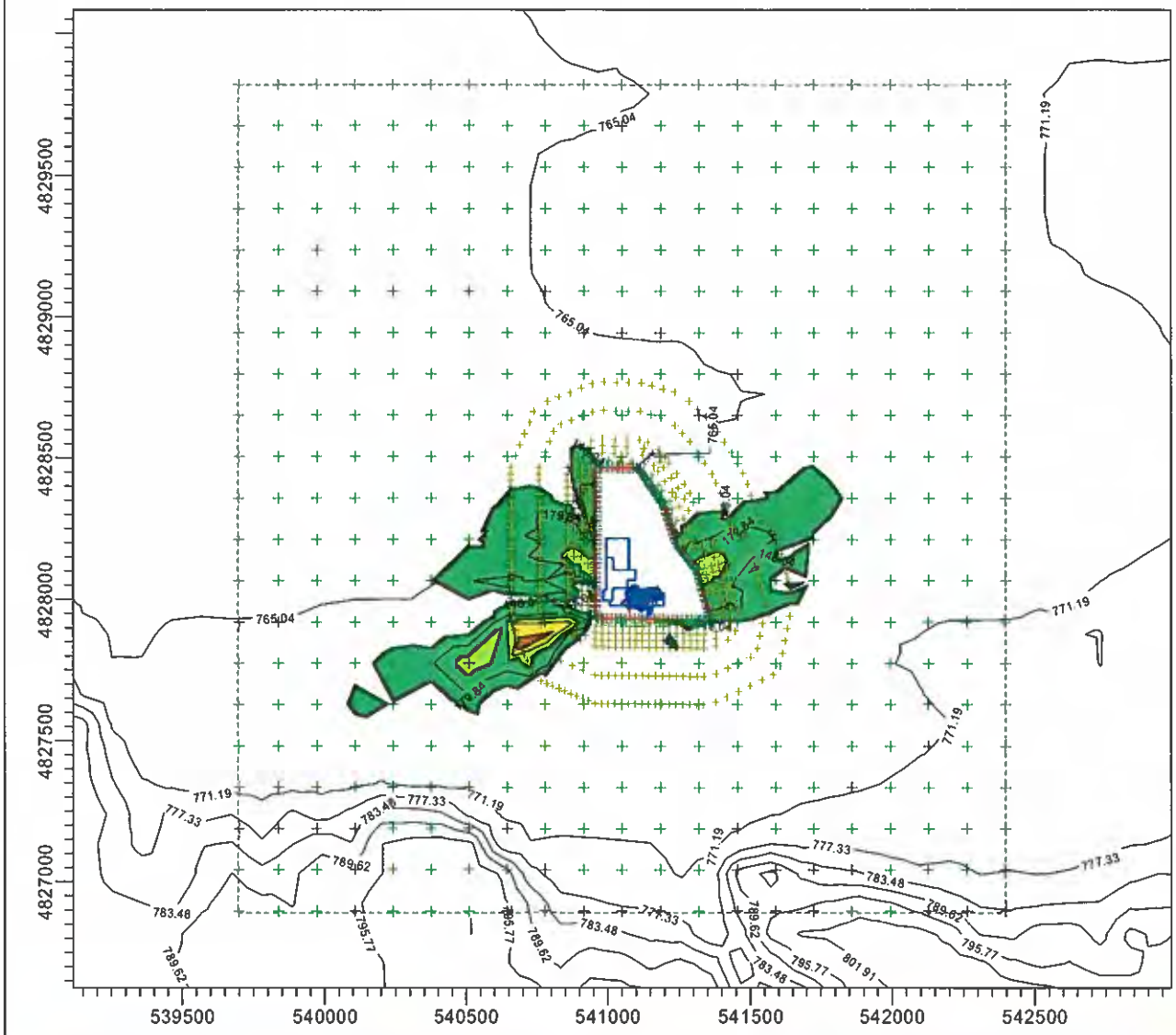
Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1988, 8 hr-2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 — 0 0.5 km	
	MAX: 137.89737 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

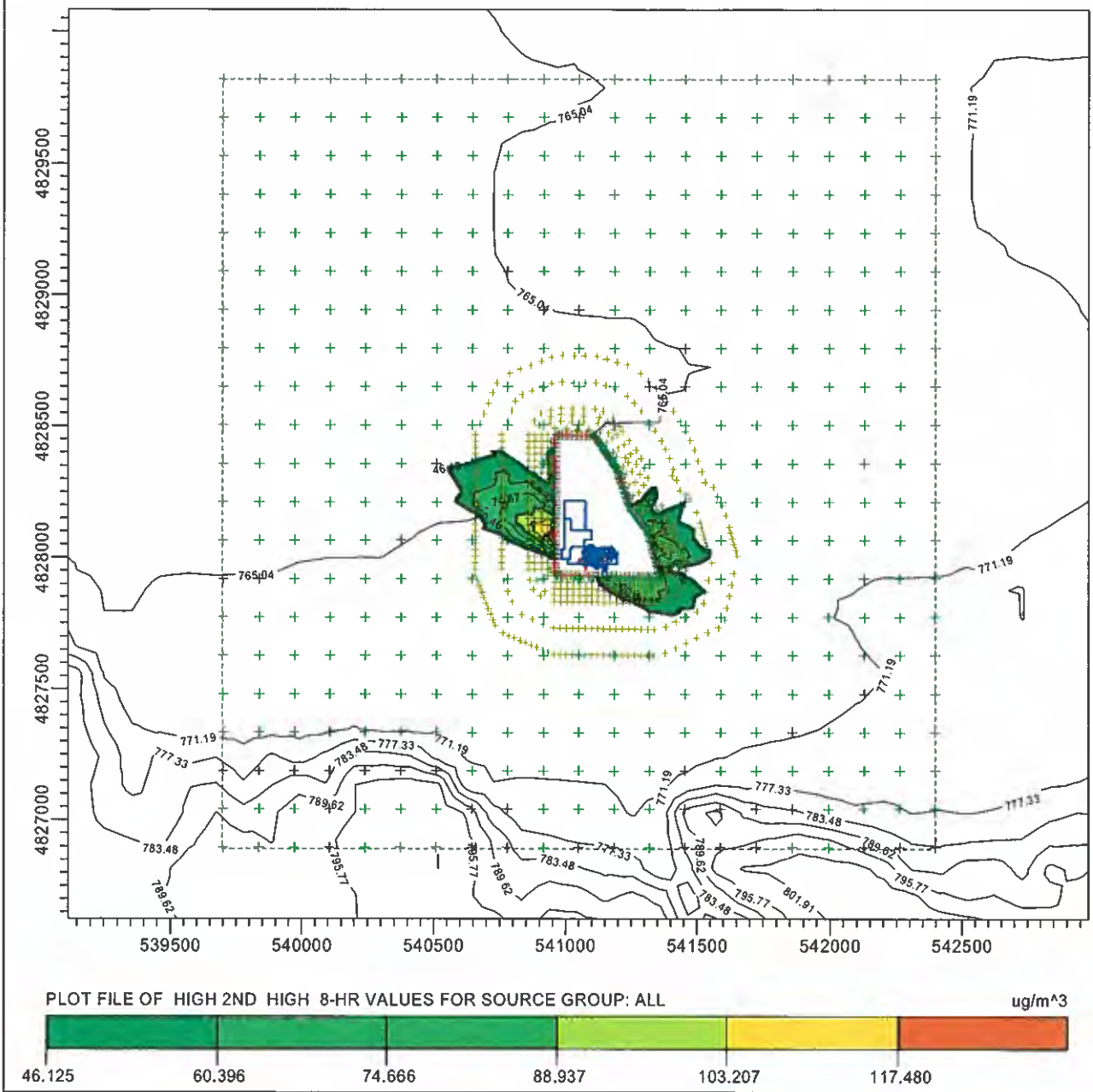
ug/m^3

148.037 179.839 211.641 243.442 275.244 307.045

COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1989, 1hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 0 0.5 km	
	MAX: 307.04547 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



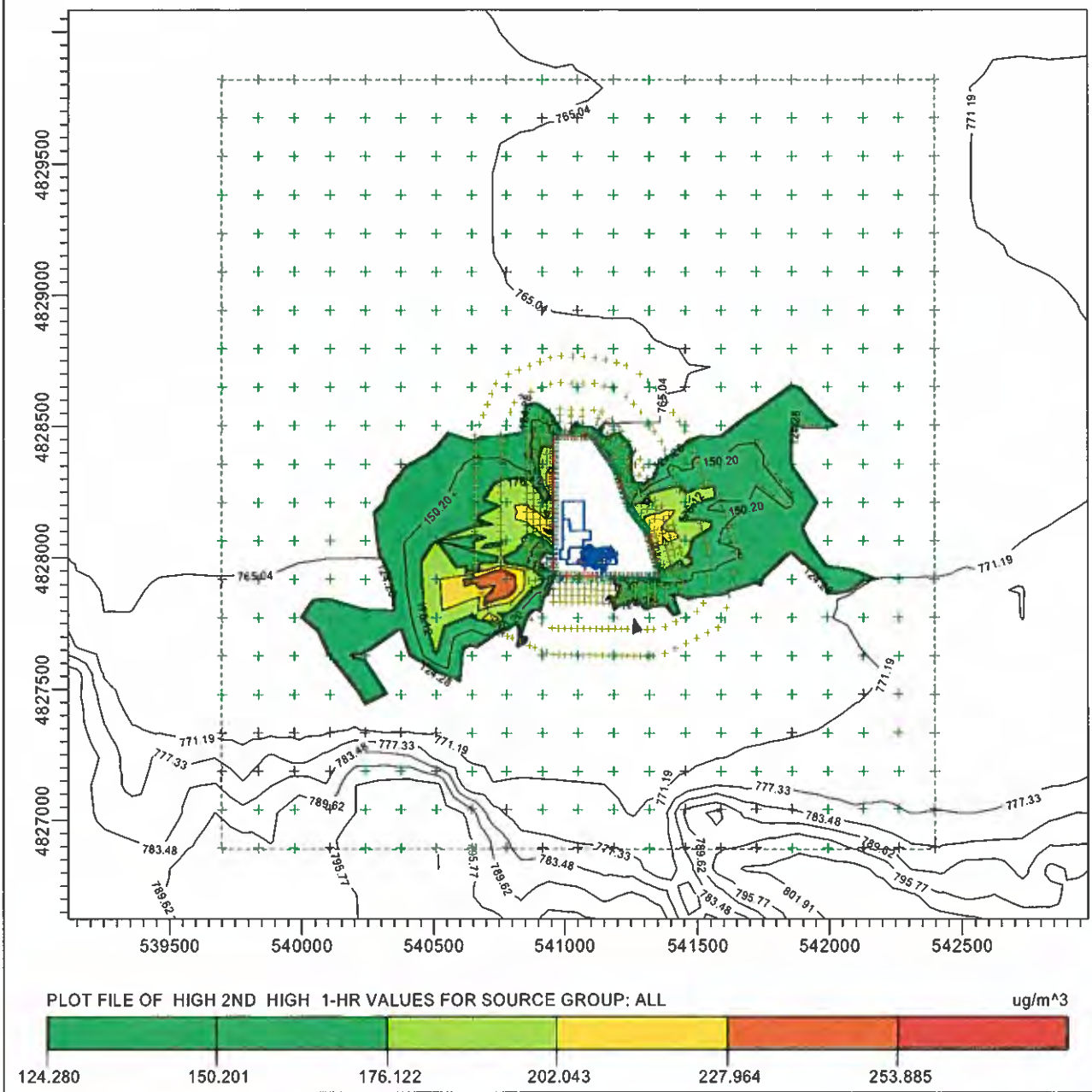
COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1989, 8hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 (0 – 0.5 km)	
	MAX: 131.74829 ug/m^3	DATE: 2/26/2009	PROJECT NO. Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\CO89.isc

PROJECT TITLE:

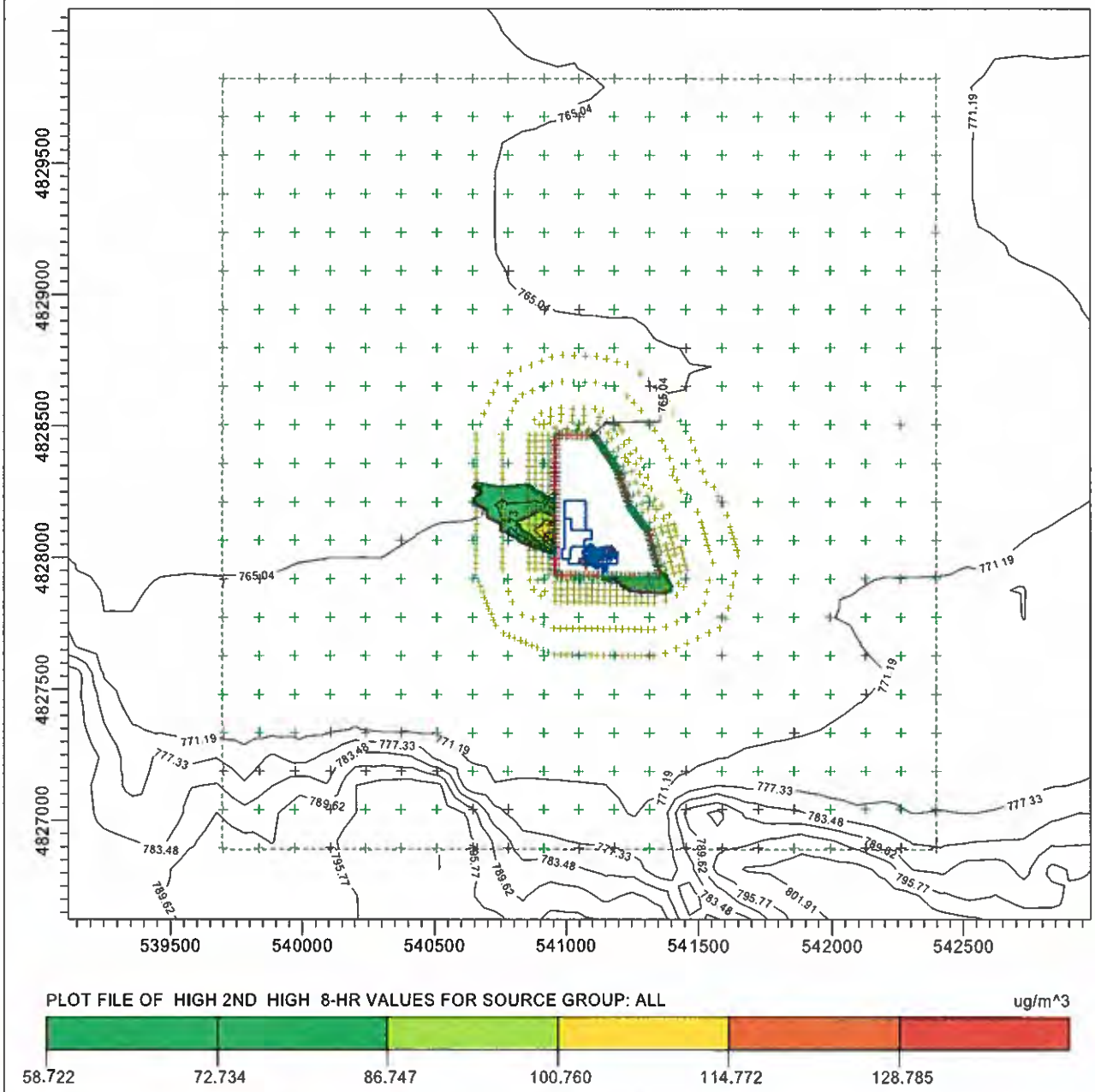
Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1990 1hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 (0 – 0.5 km)	
	MAX: 253.88474 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE

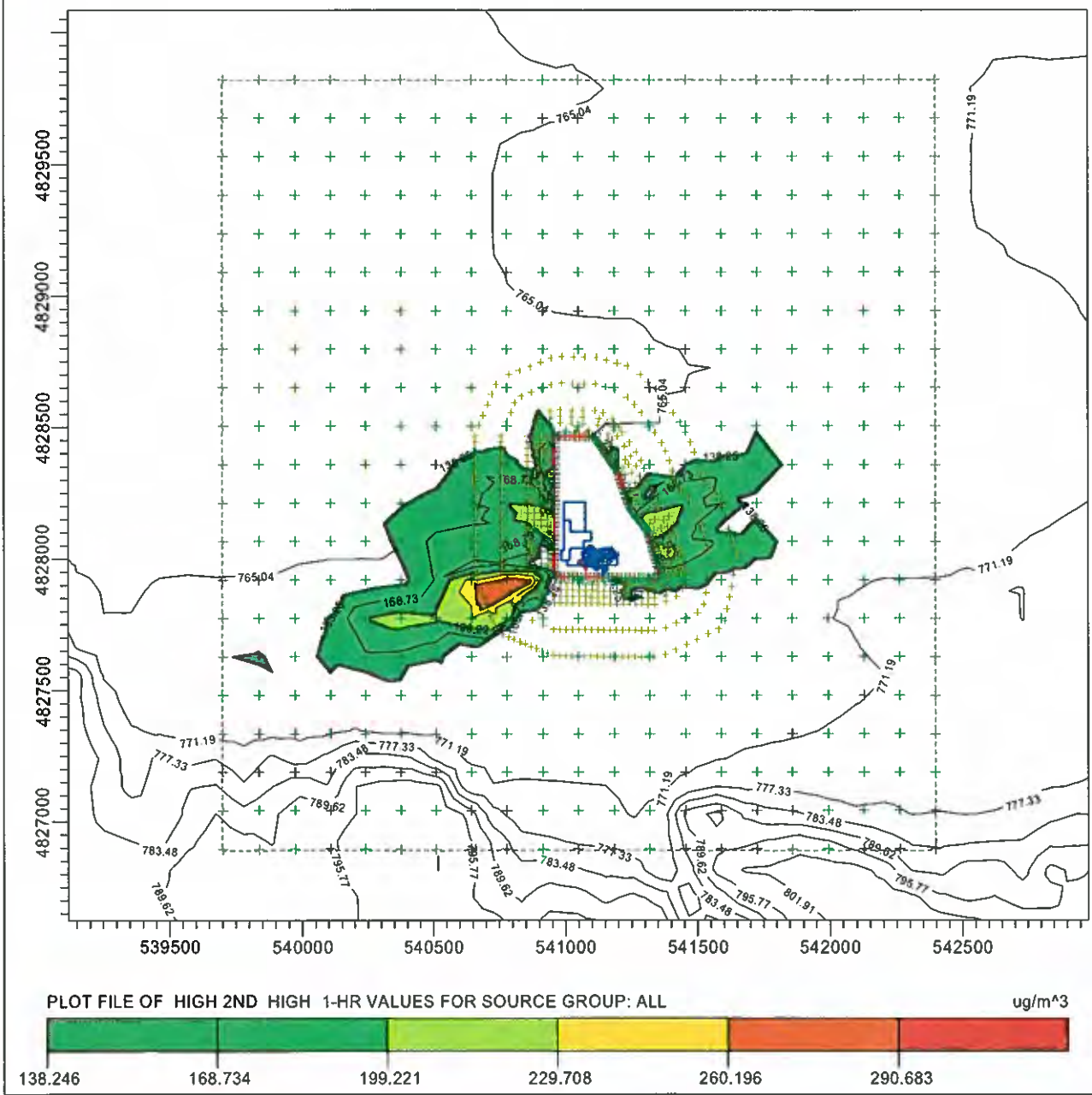
Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1990 8hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 (0 – 0.5 km)	
	MAX: 128.78494 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



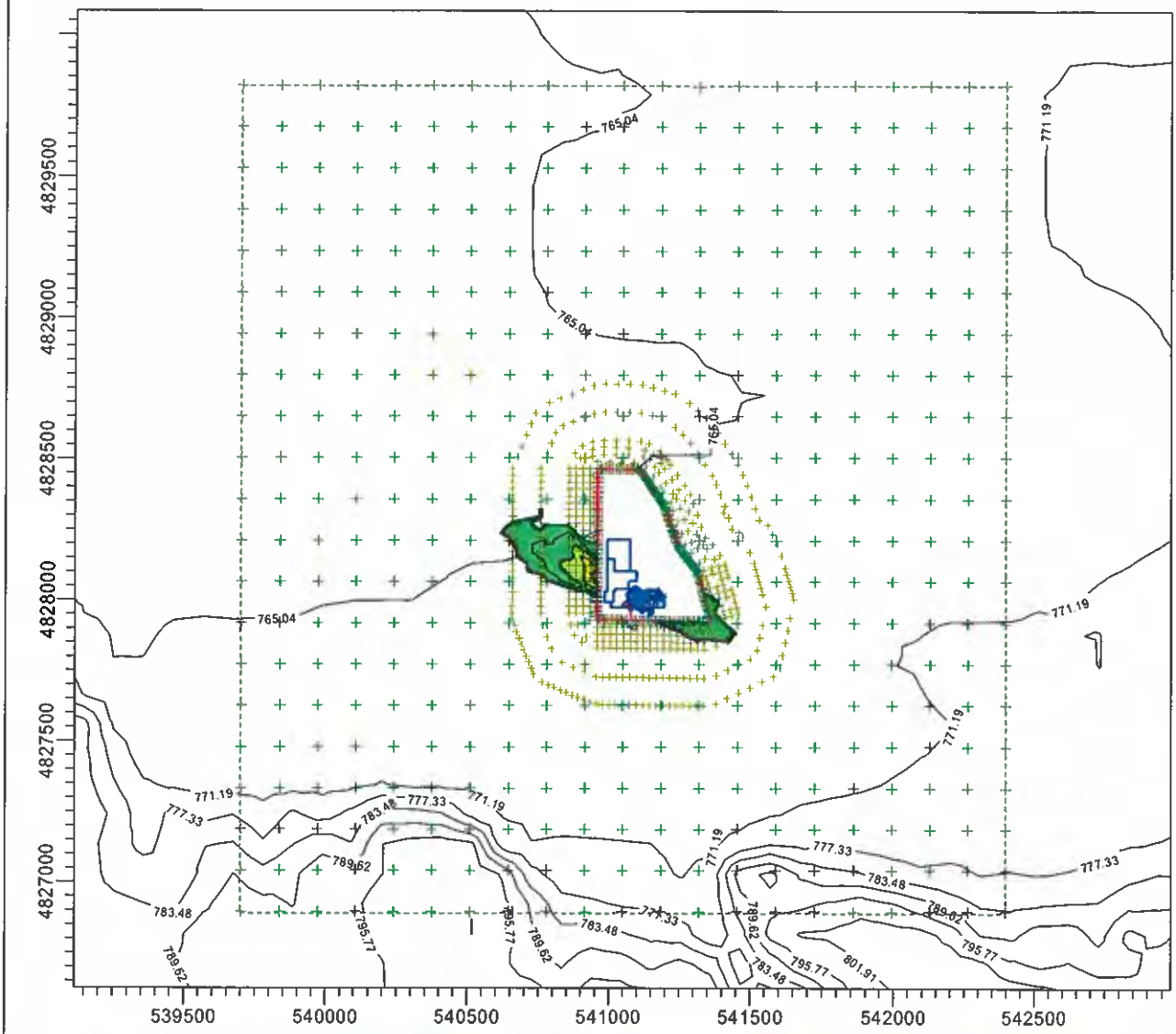
COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1991 1hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 — 0 0.5 km	
	MAX: 290.68311 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\CO91.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 8-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

61.784 | 76.585 | 91.385 | 106.185 | 120.985 | 135.785

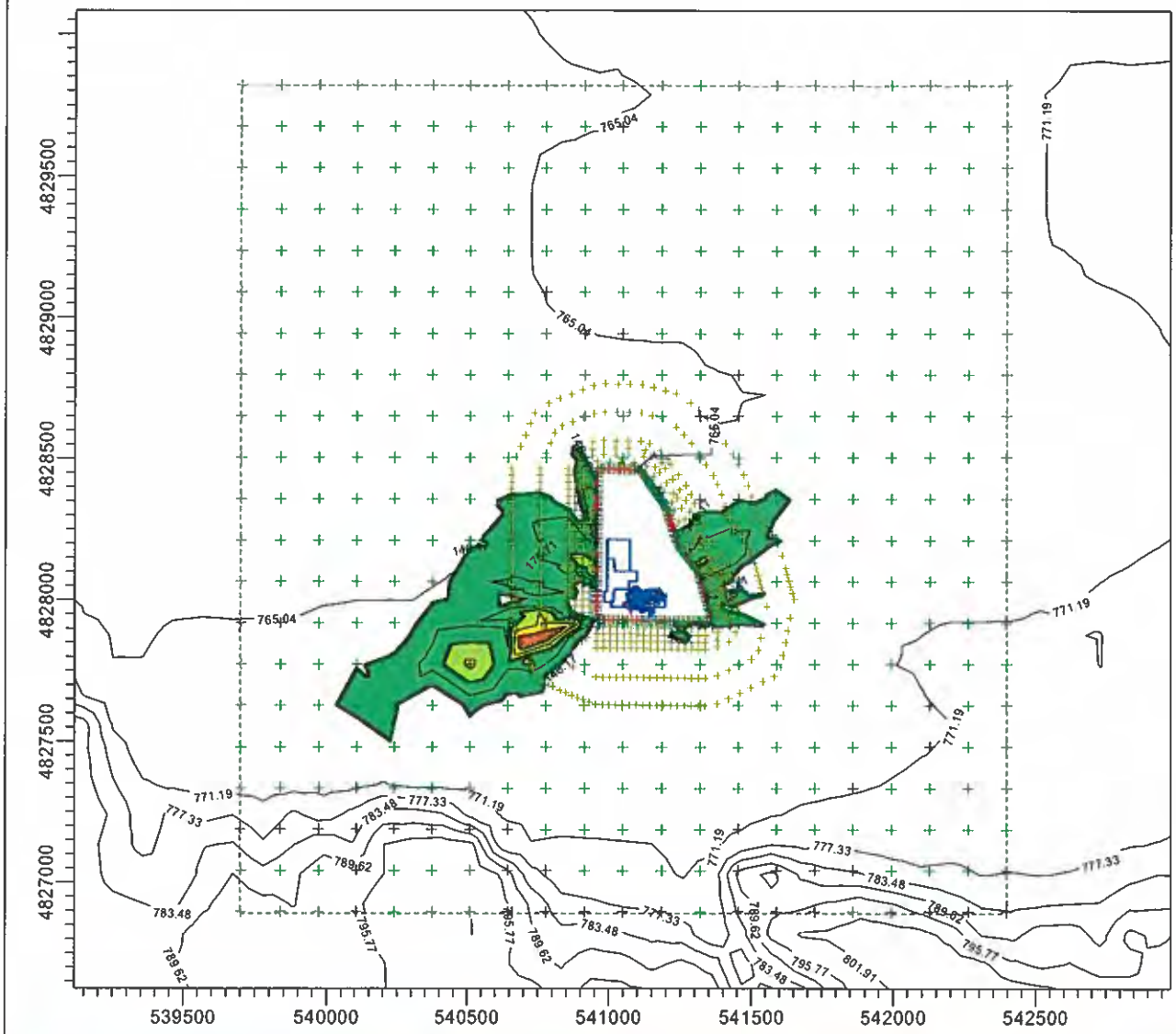
COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1991 8hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 (0 – 0.5 km)	
	MAX: 135.78545 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\CO91.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

146.175 | 178.709 | 211.244 | 243.779 | 276.314 | 308.848

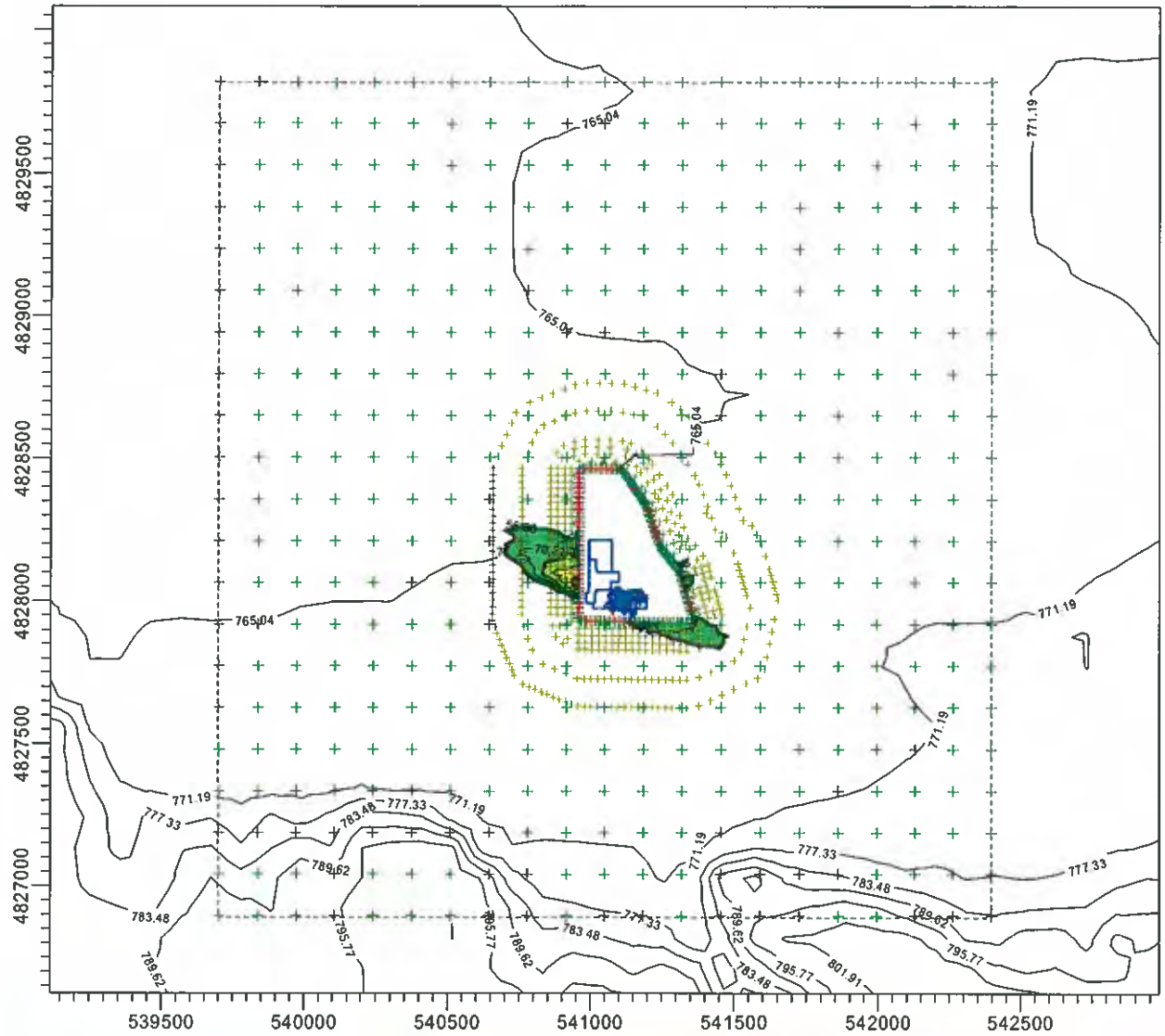
COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1992 1hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 — 0 — 0.5 km	
	MAX: 308.84839 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\CO92.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 8-HR VALUES FOR SOURCE GROUP: ALL

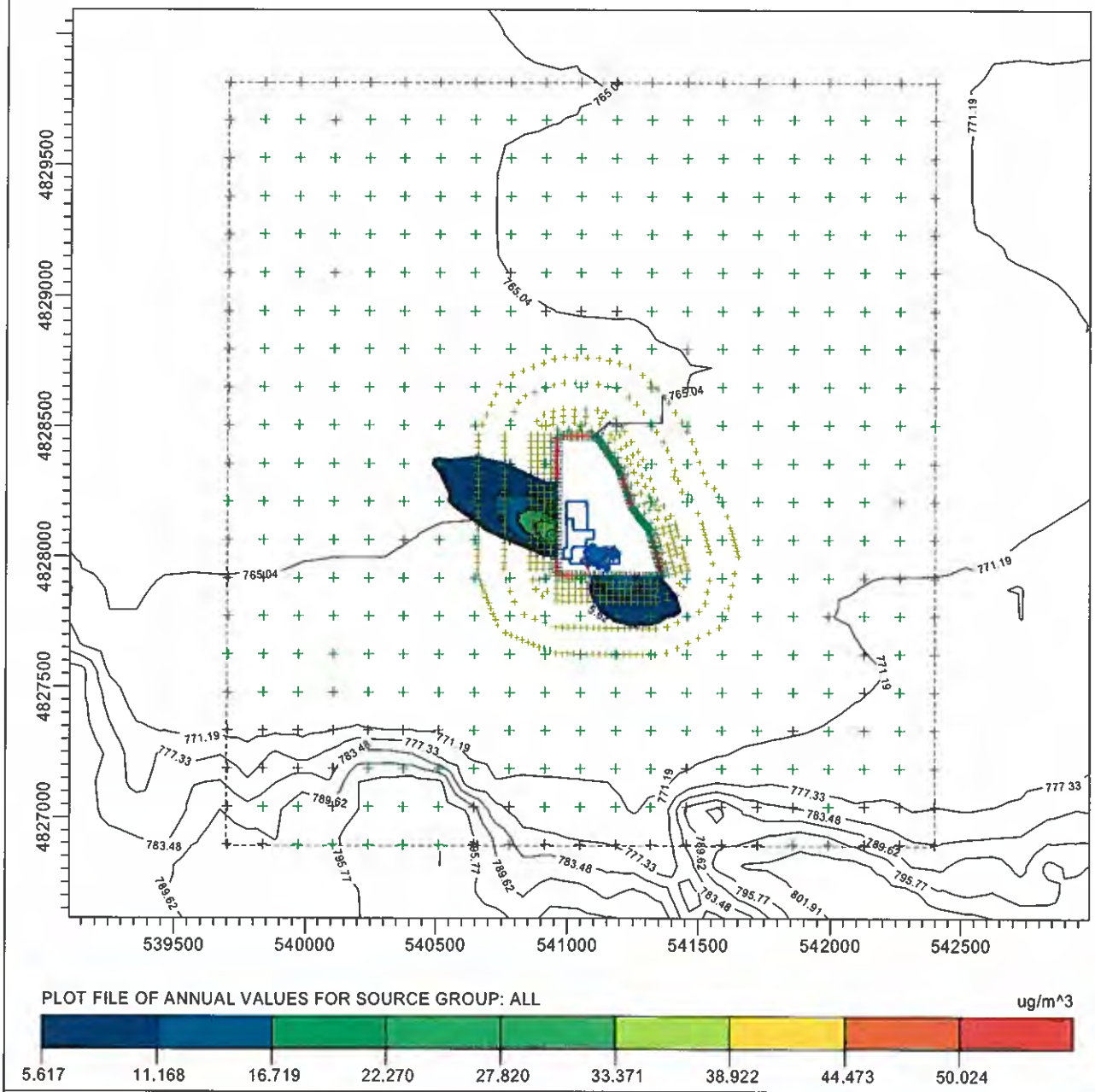
ug/m^3

56.878 | 70.369 | 83.861 | 97.353 | 110.844 | 124.336

COMMENTS:	SOURCES:	COMPANY NAME:	
CO 1992 8hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,581 — 0 0.5 km	
	MAX: 124.33585 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



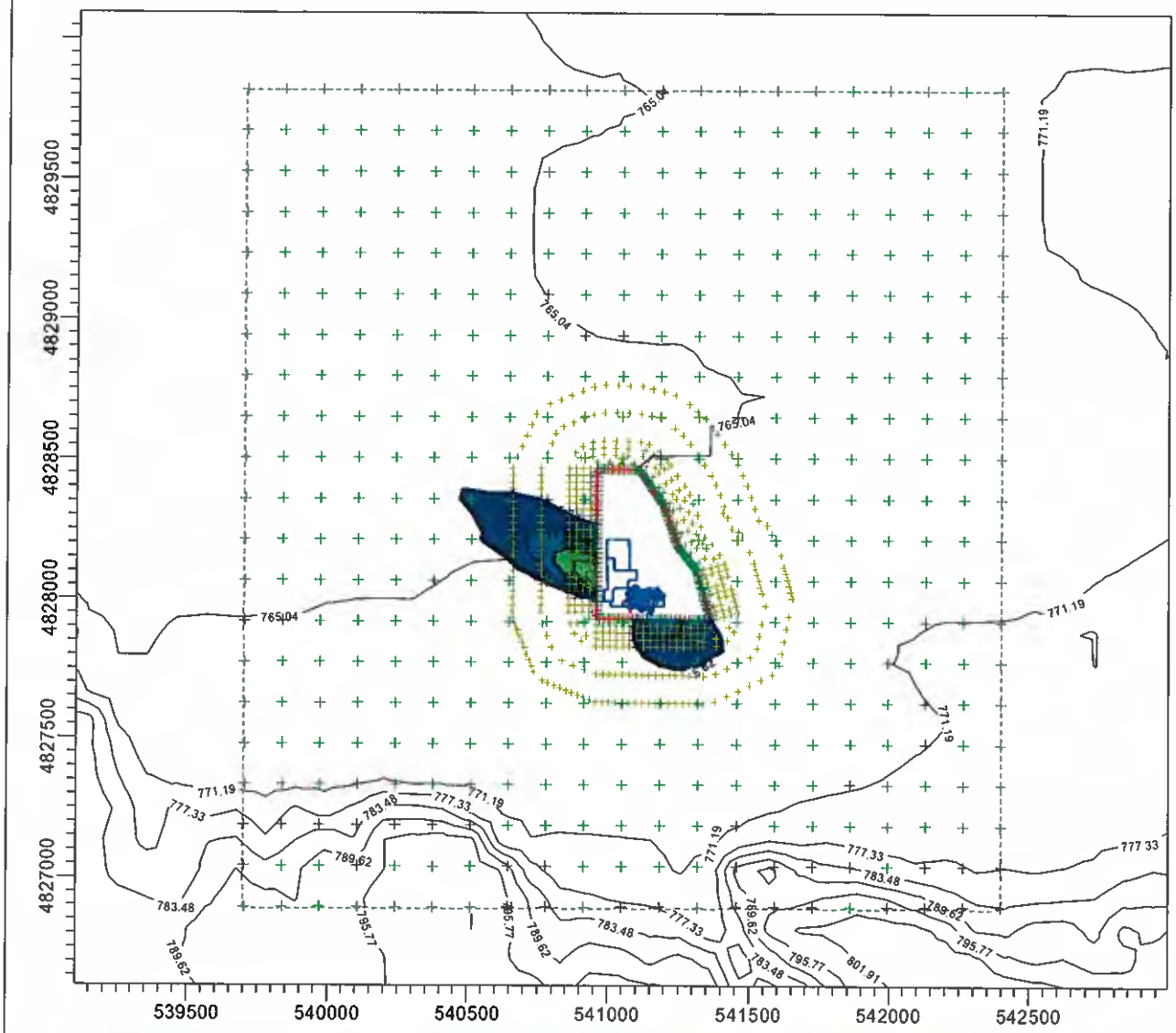
COMMENTS:	SOURCES:	COMPANY NAME:	
NOx 1988	9	**Millennium Science & Engineering, Inc.**	
	RECEPTORS: **1077**	MODELER: **Troy Riecke**	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: **Concentration**	SCALE: 1:23,728 — 0 — 0.5 km	
	MAX: **34.72248 ug/m^3**	DATE: **2/26/2009**	PROJECT NO.: **Sorrento Lactalis**

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\NOx88-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



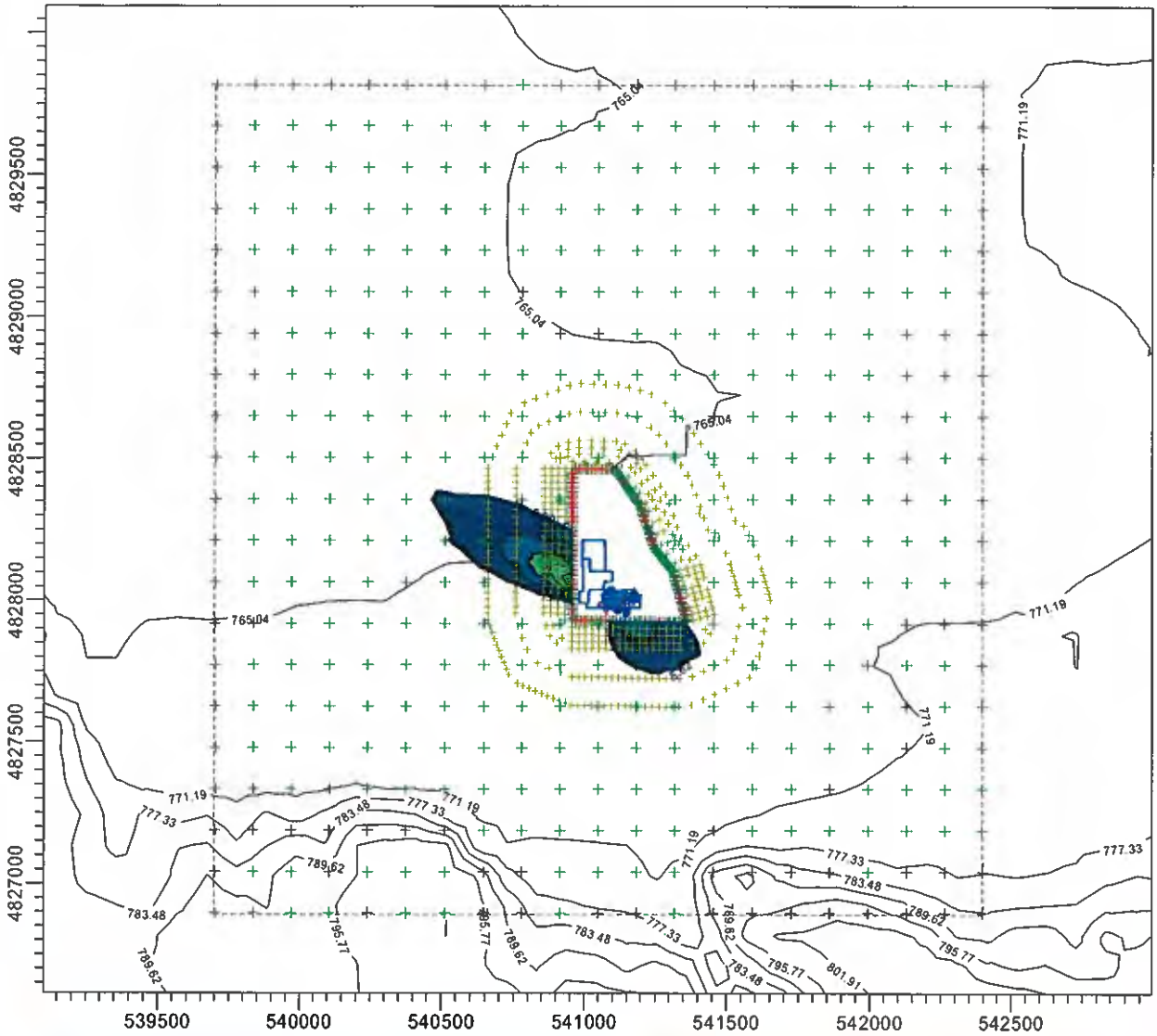
COMMENTS:	SOURCES:	COMPANY NAME:	
NOx 1989	9	**Millennium Science & Engineering, Inc.**	
	RECEPTORS: **1077**	MODELER: **Troy Riecke**	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: **Concentration**	SCALE: 1:23,728 0 0.5 km	
	MAX: **34.57079 ug/m^3**	DATE: **2/26/2009**	PROJECT NO. **Sorrento Lactalis**

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\NOx89-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

5.617 | 11.168 | 16.719 | 22.270 | 27.820 | 33.371 | 38.922 | 44.473 | 50.024

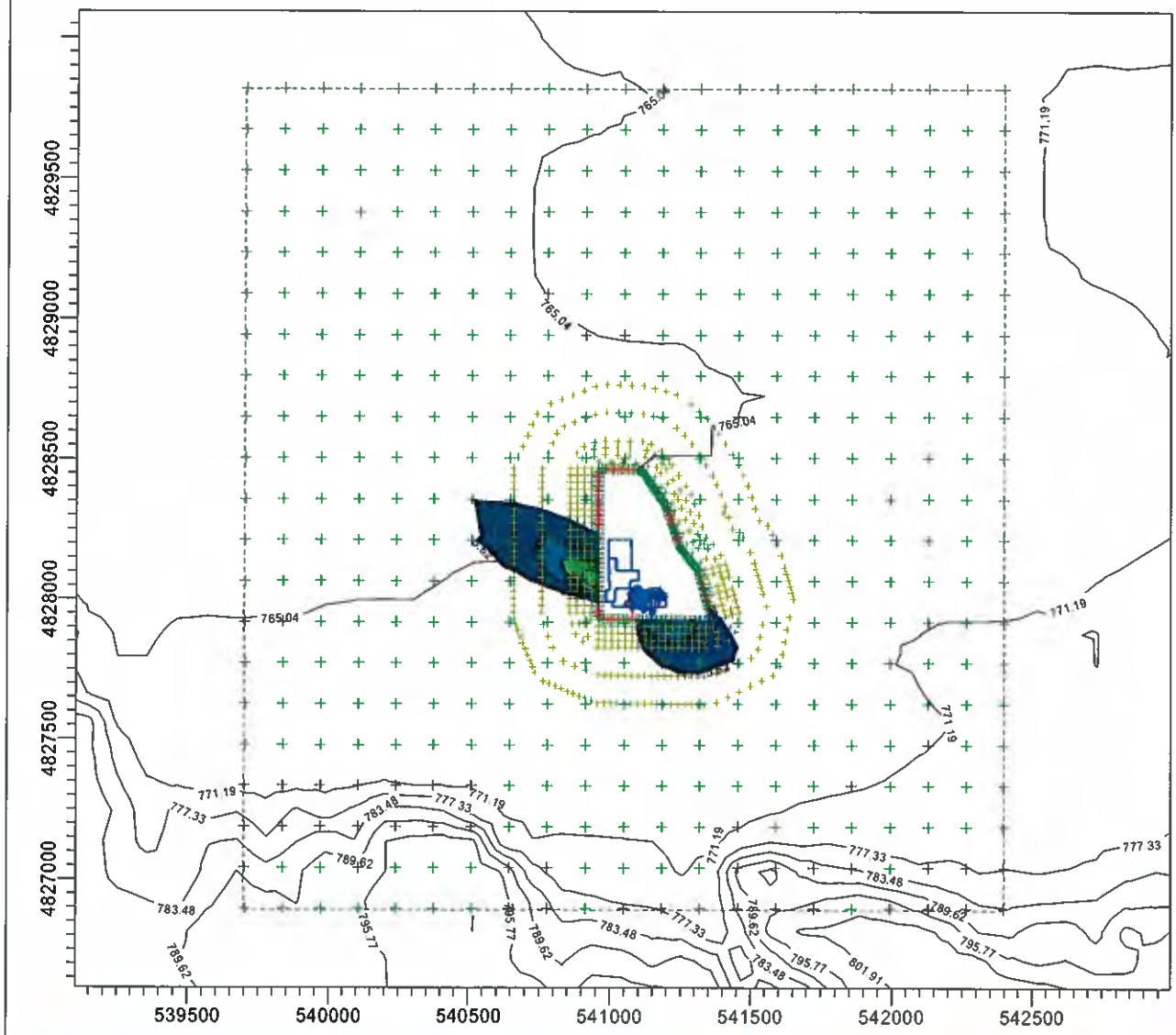
COMMENTS:	SOURCES:	COMPANY NAME:	
NOx 1990	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,728 — 0 — 0.5 km	
	MAX: 33.7728 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\NOx90-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

5.617 | 11.168 | 16.719 | 22.270 | 27.820 | 33.371 | 38.922 | 44.473 | 50.024

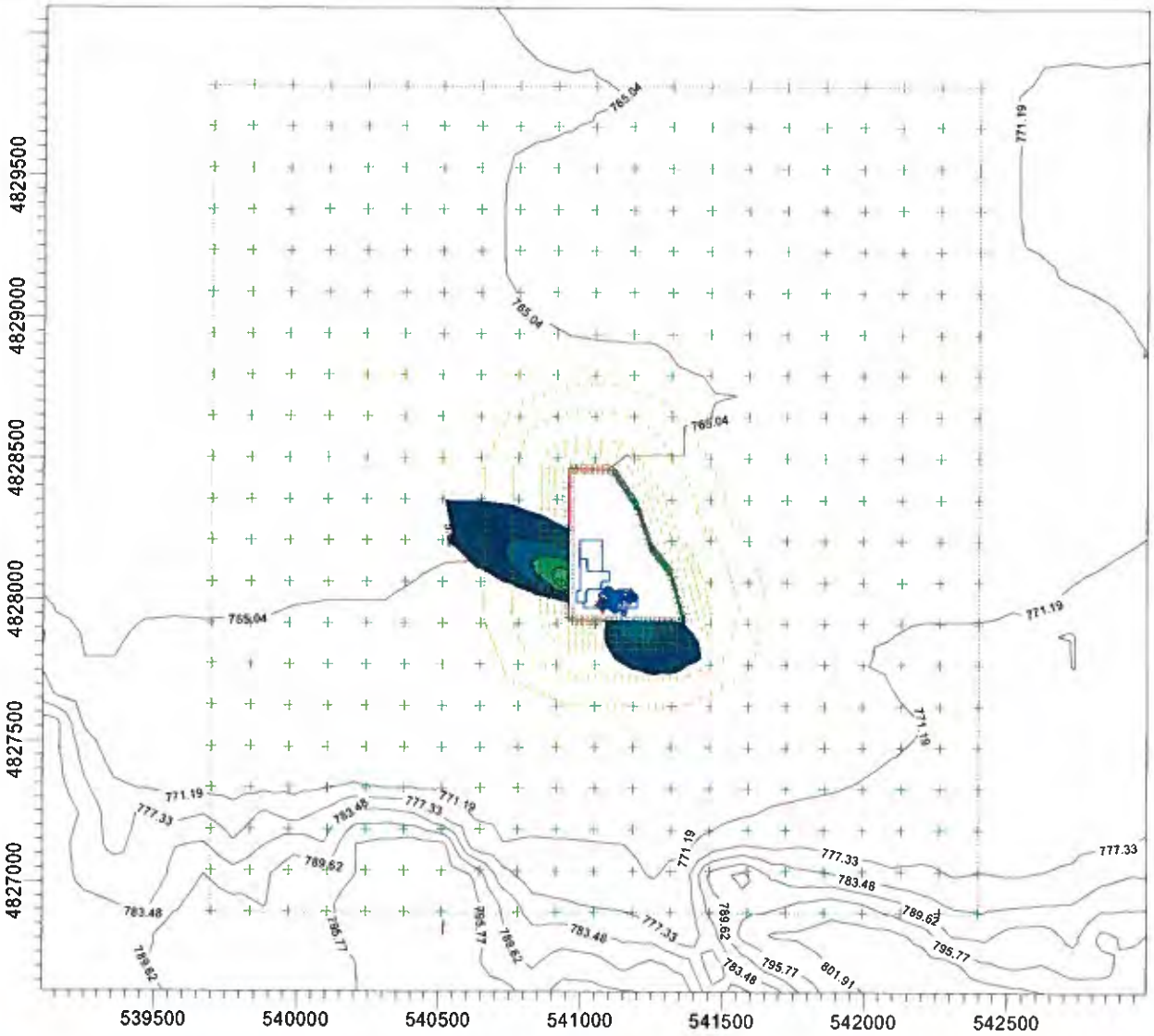
COMMENTS:	SOURCES:	COMPANY NAME:	
NOx 1991	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,728 (0 – 0.5 km)	
	MAX: 29.43932 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\NOx91-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

5.617 | 11.168 | 16.719 | 22.270 | 27.820 | 33.371 | 38.922 | 44.473 | 50.024

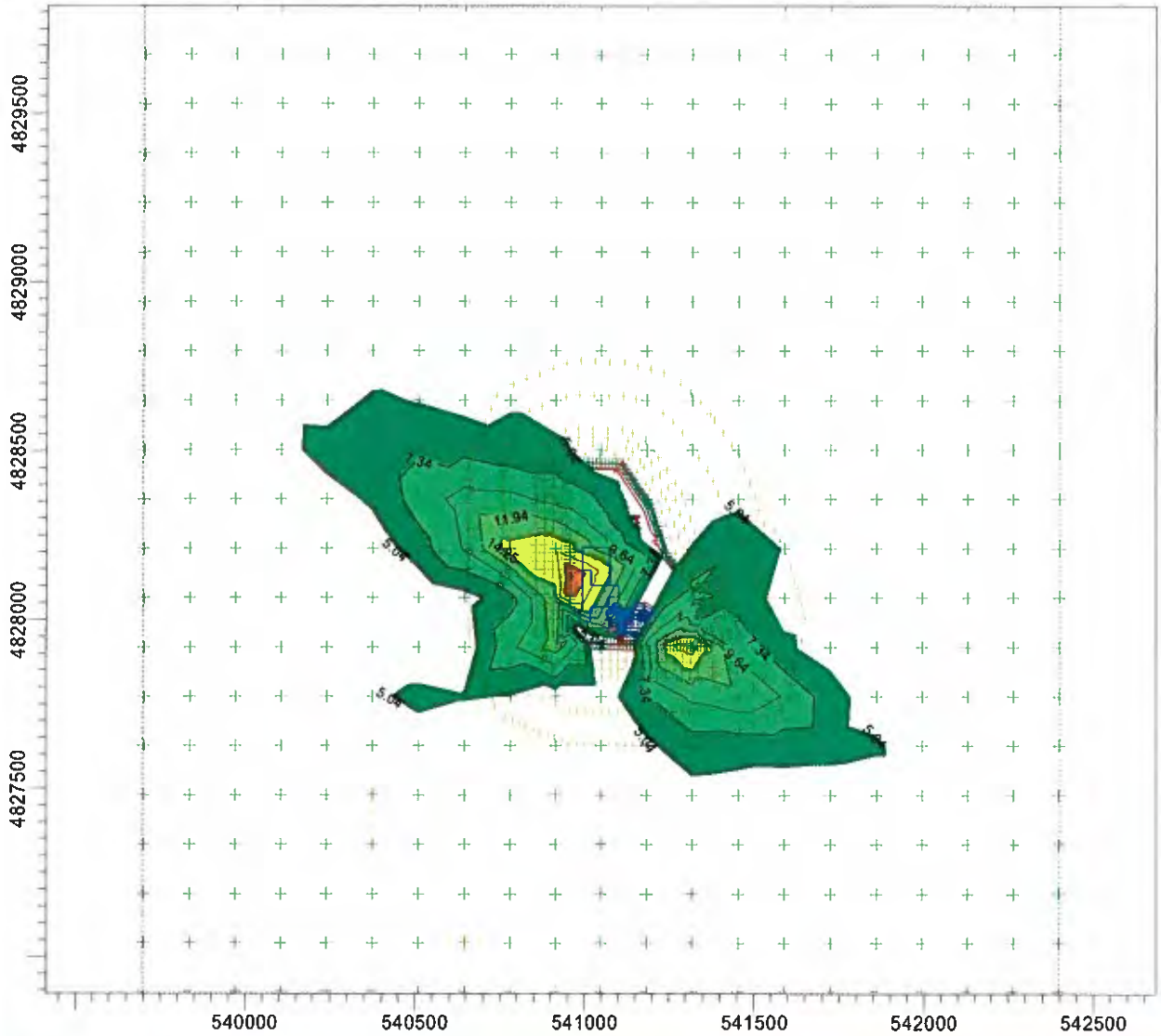
COMMENTS:	SOURCES:	COMPANY NAME:	
NOx 1992	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,728 — 0 — 0.5 km	
	MAX: 31.60384 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\NOx92-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

5.037 7.339 9.642 11.945 14.247 16.550 18.853 21.155

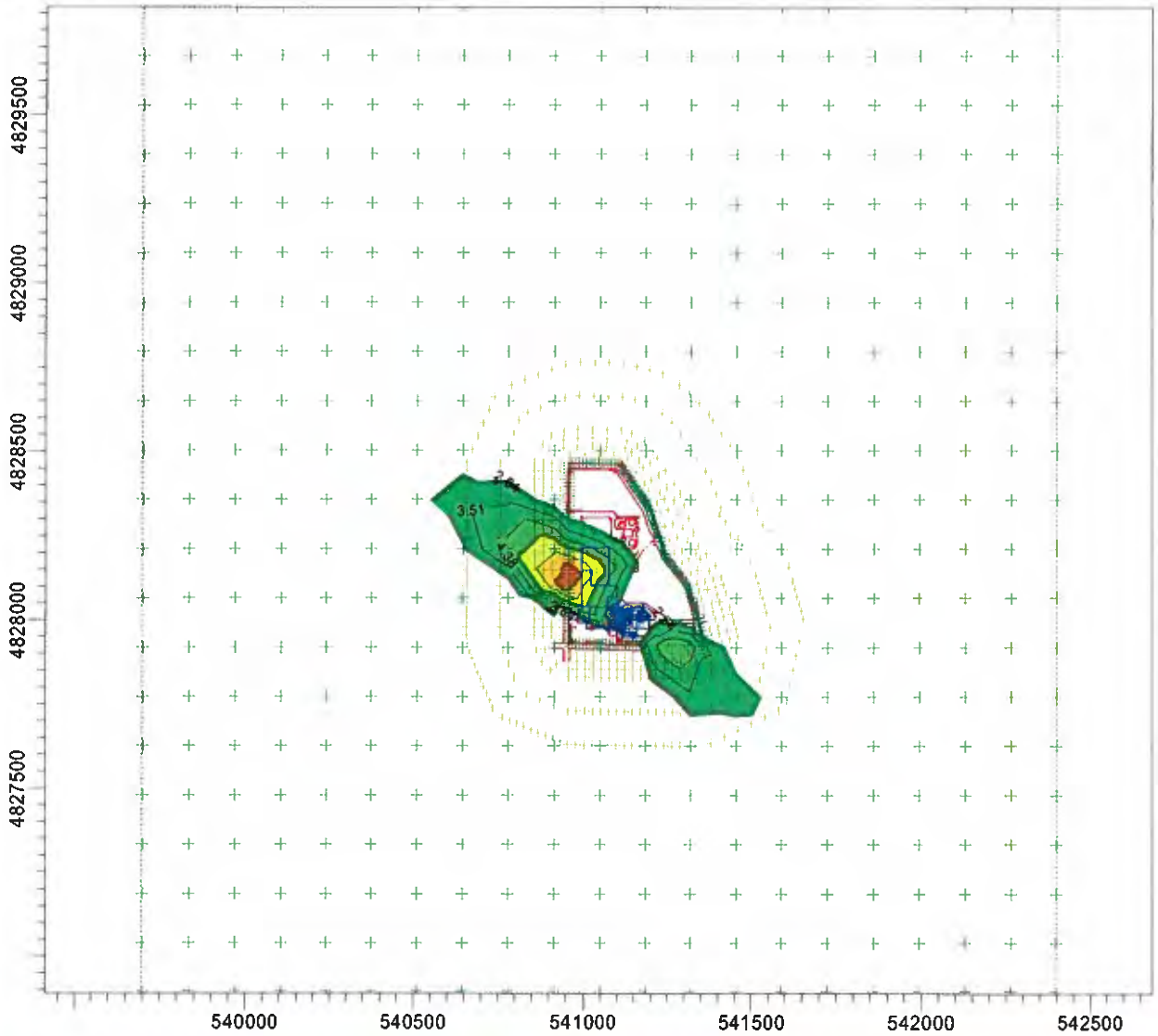
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1988 24hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 21.64435 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\pm88-3.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

2.639 3.509 4.379 5.249 6.119 6.990 7.860

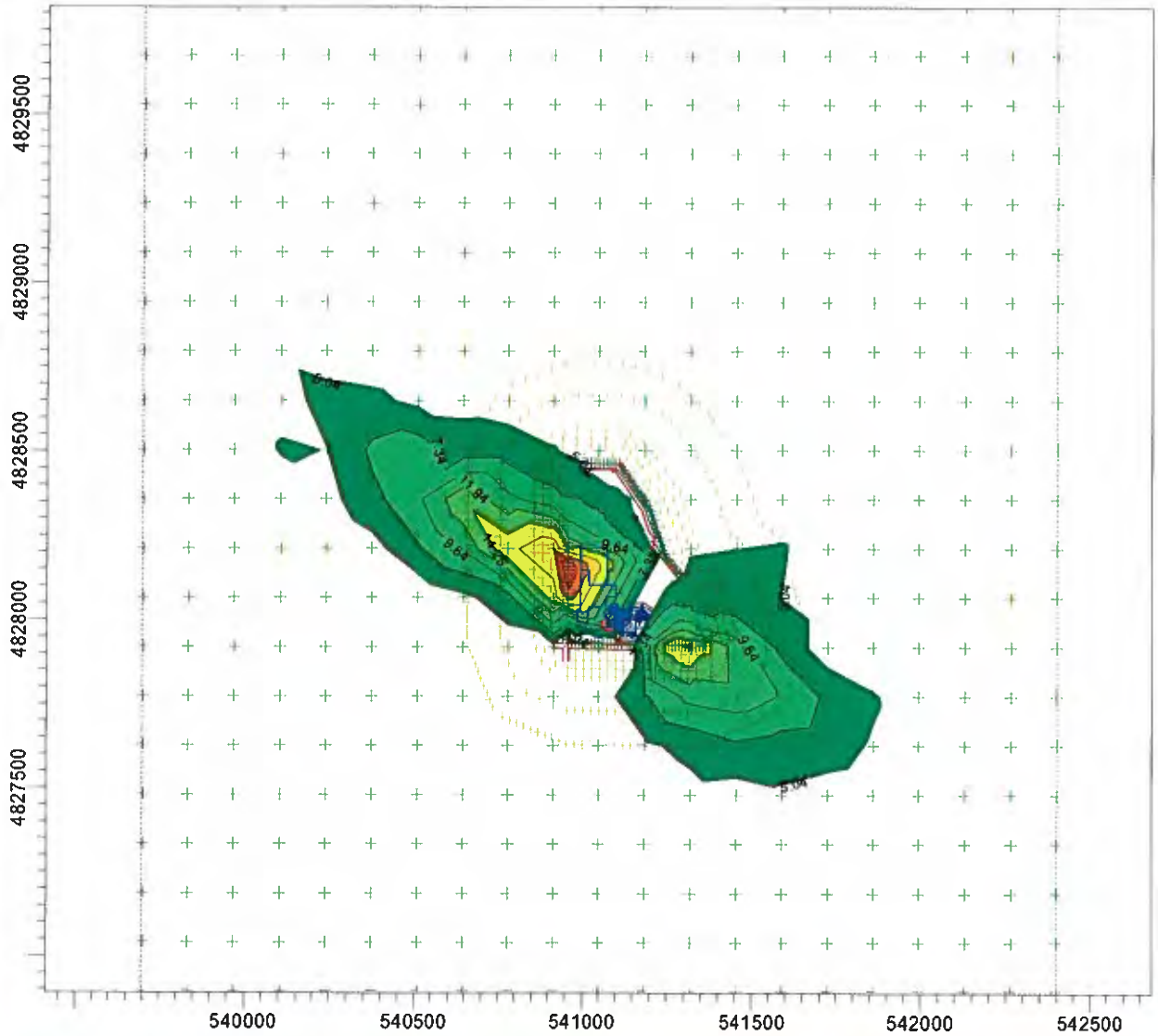
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1988 Annual	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 7.8014 ug/m^3	DATE: 2/26/2009	PROJECT NO. Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\pm88-3.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

5.037 | 7.339 | 9.642 | 11.945 | 14.247 | 16.550 | 18.853 | 21.155

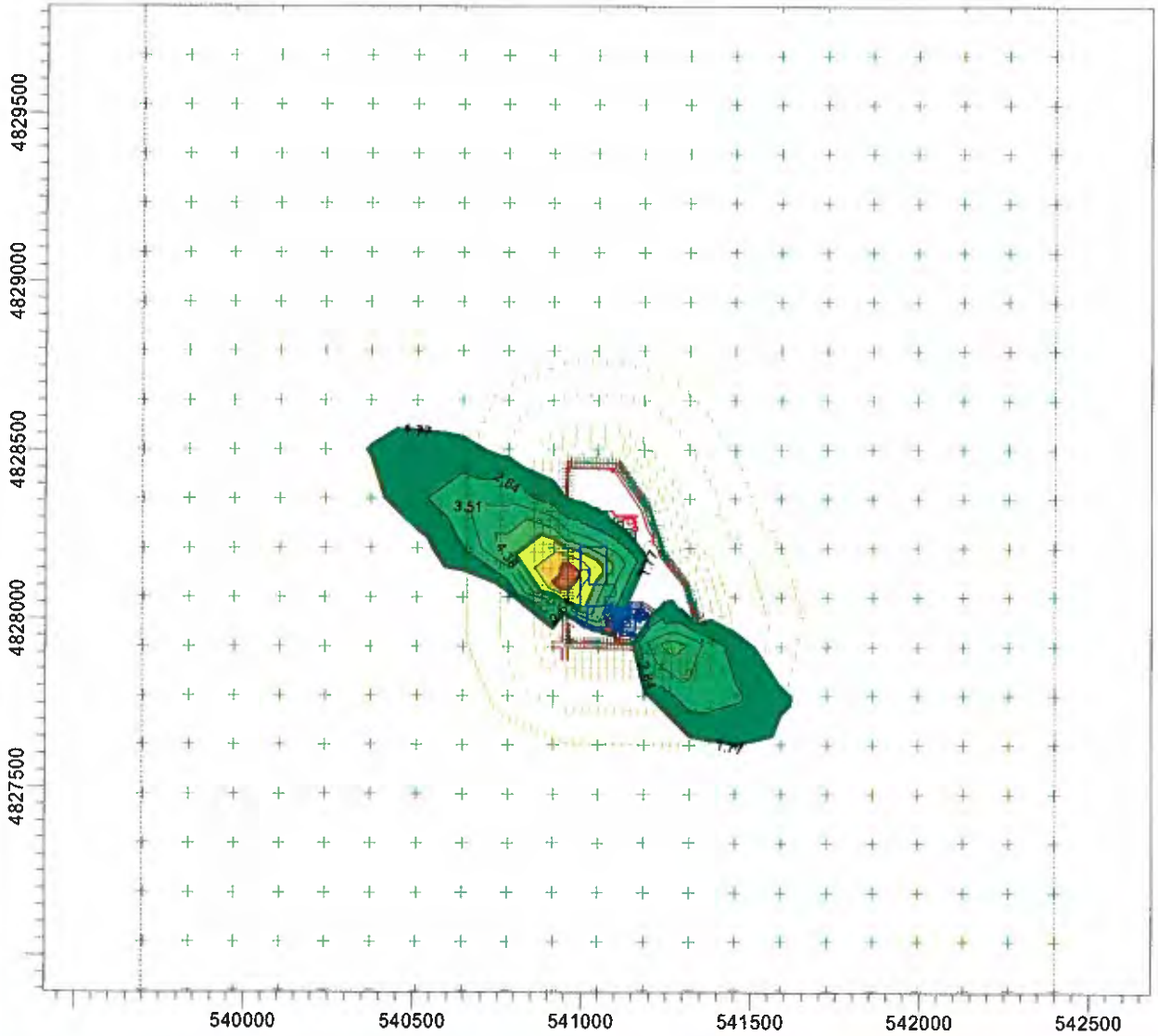
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1989 24hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE:	SCALE: 1:19,956	
	Concentration	0 — 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	22.85133 ug/m^3	2/26/2009	Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\pm89-3.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

1.768 2.639 3.509 4.379 5.249 6.119 6.990 7.860

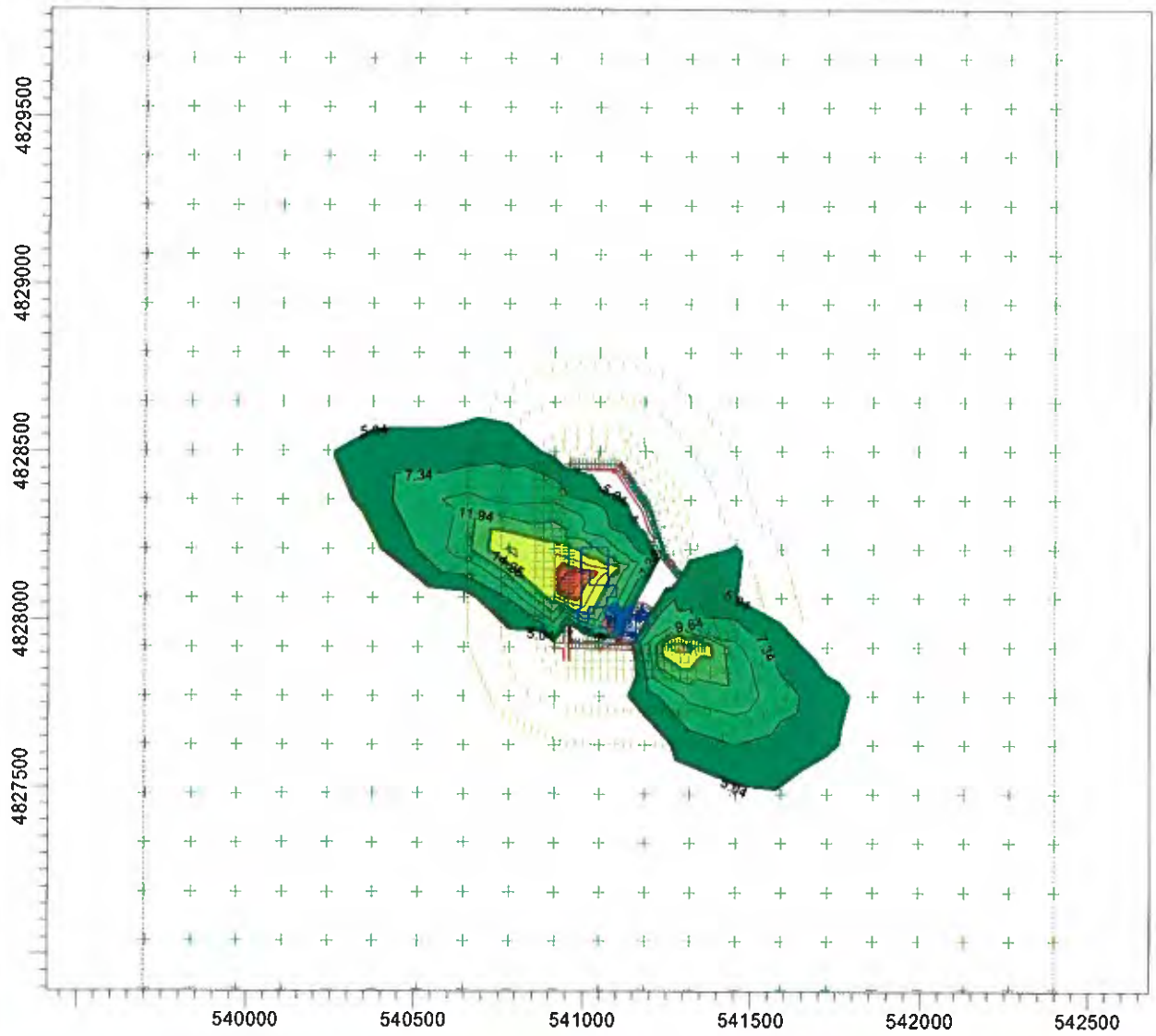
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1989 annual	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 — 0 — 0.5 km	
	MAX: 7.84434 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\pm89-3.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

5.037 7.339 9.642 11.945 14.247 16.550 18.853 21.155

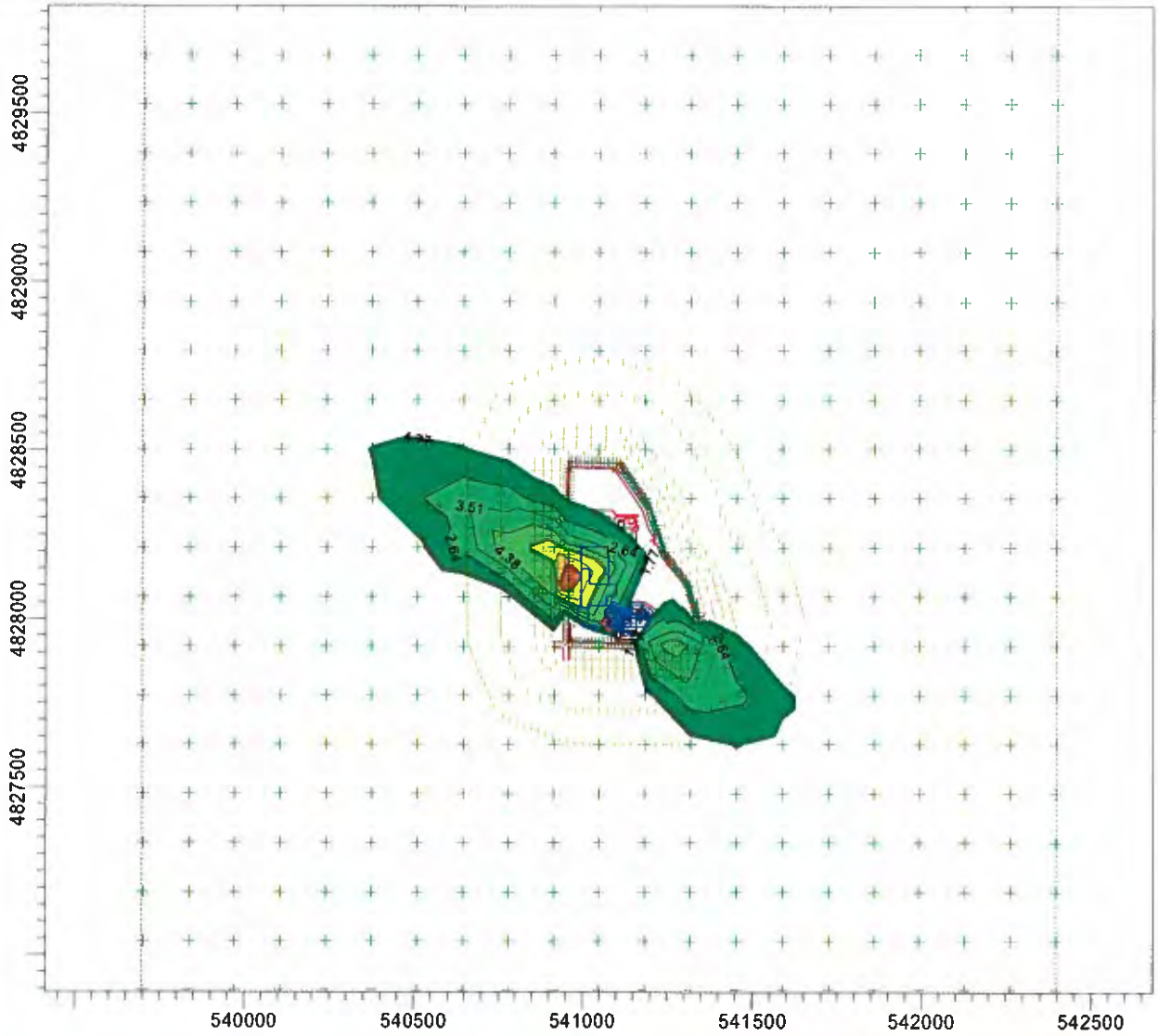
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1990 24hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 25.45908 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\pm90-3.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

1.768 2.639 3.509 4.379 5.249 6.119 6.990 7.860

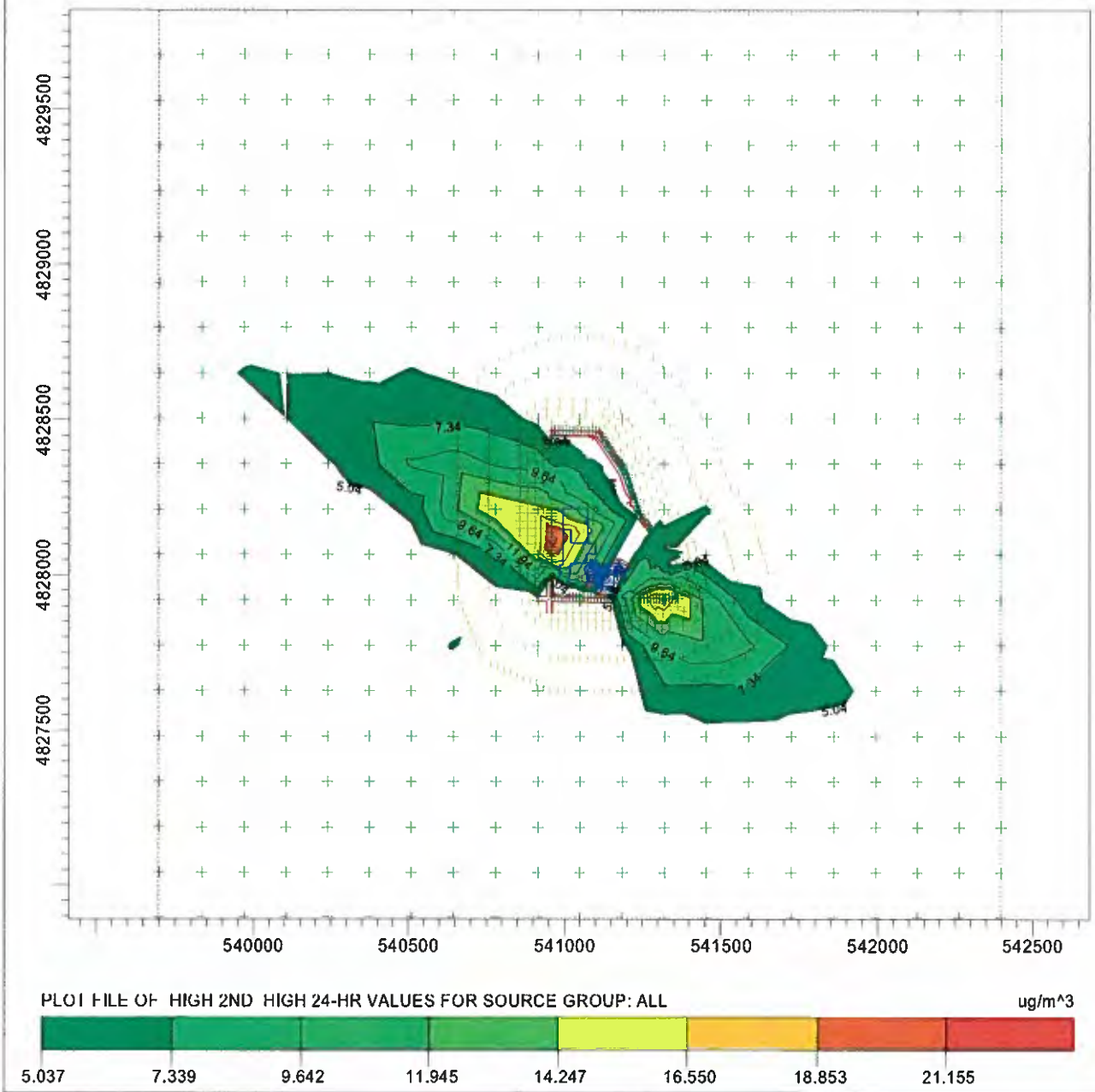
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1990 Annual	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 7.93578 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\pm90-3.isc

PROJECT TITLE:

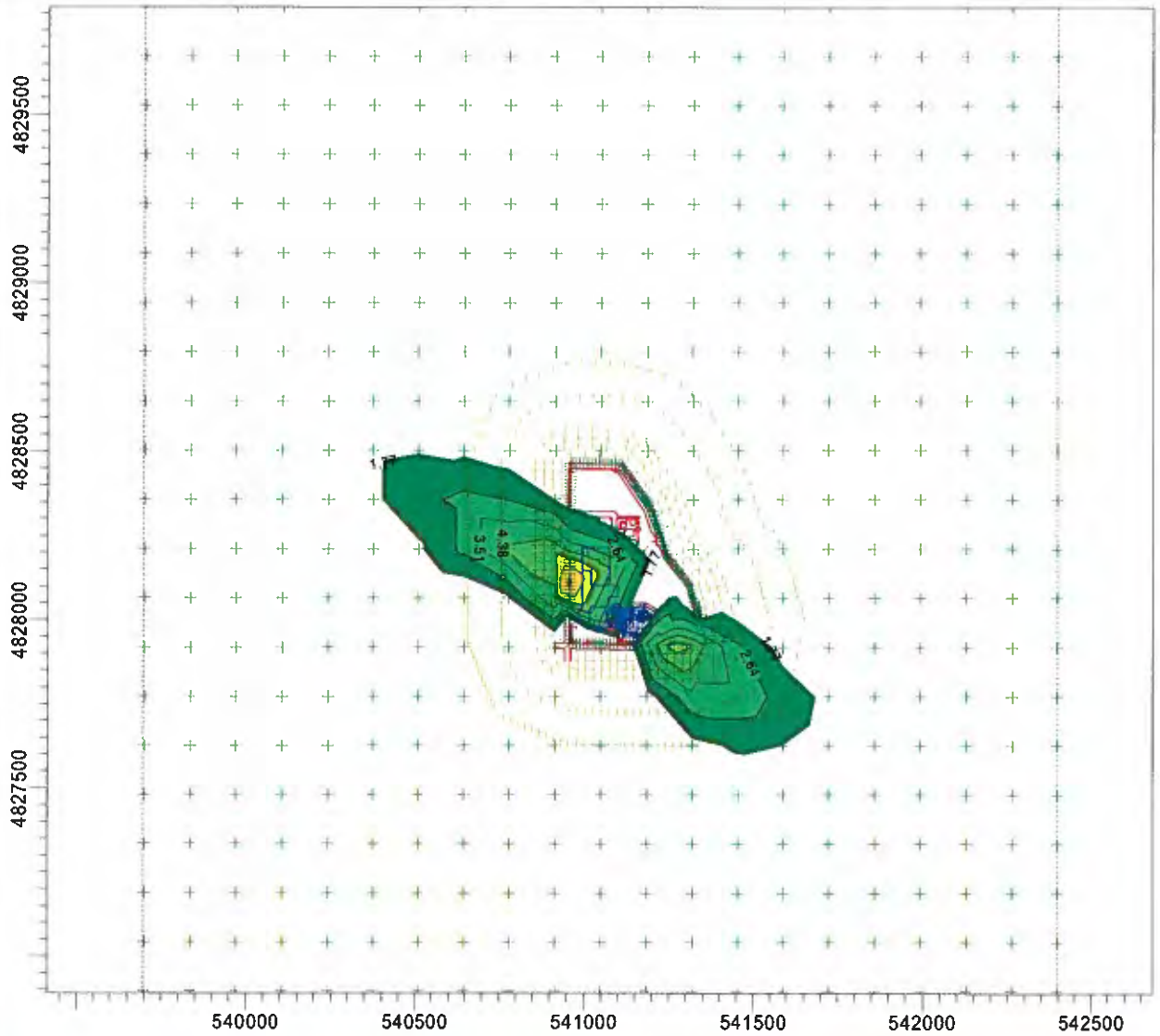
Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1991 24hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 22.11807 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

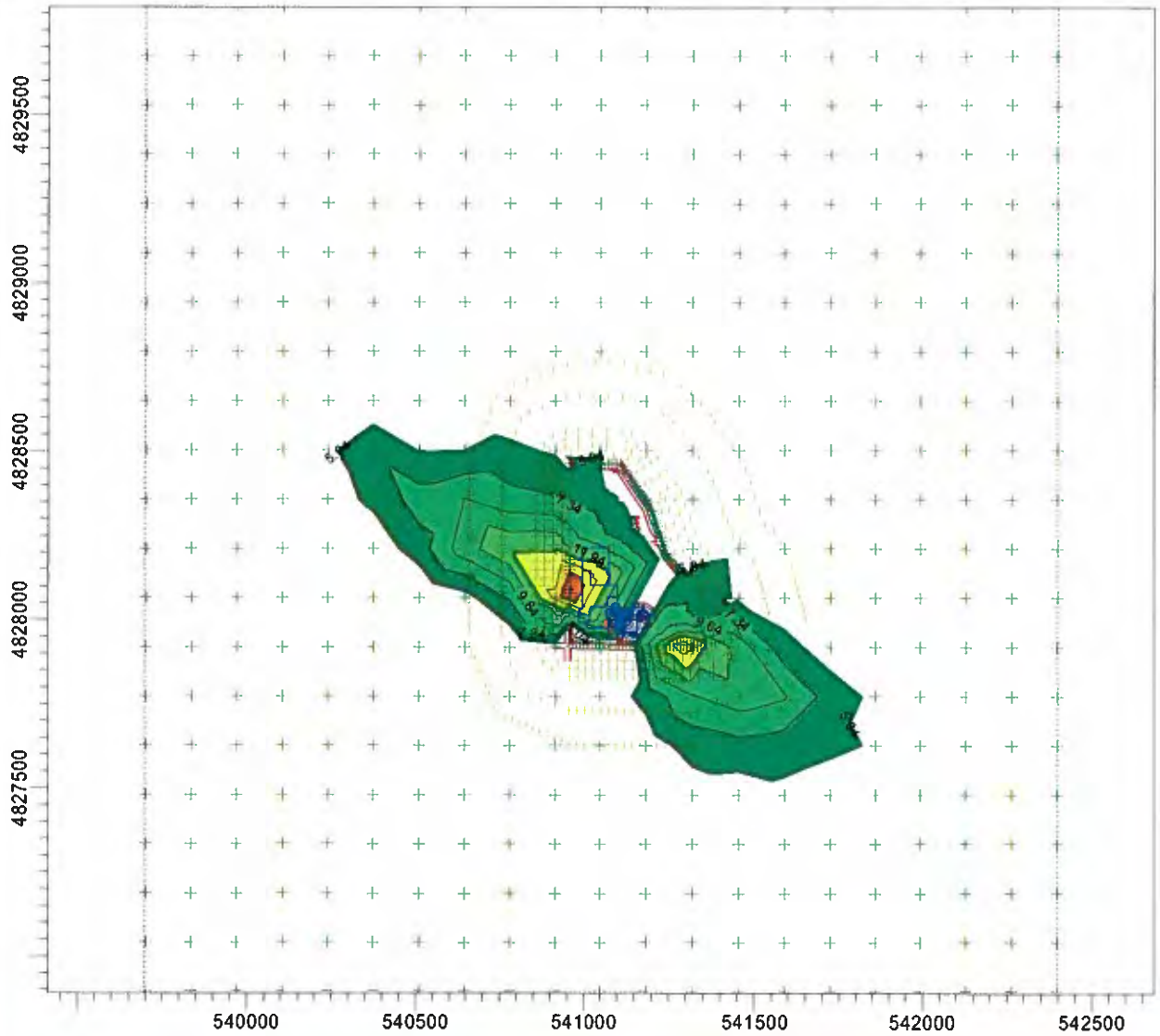
ug/m^3

1.768 2.639 3.509 4.379 5.249 6.119 6.990 7.860

COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1991 Annual	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 7.0808 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

5.037 7.339 9.642 11.945 14.247 16.550 18.853 21.155

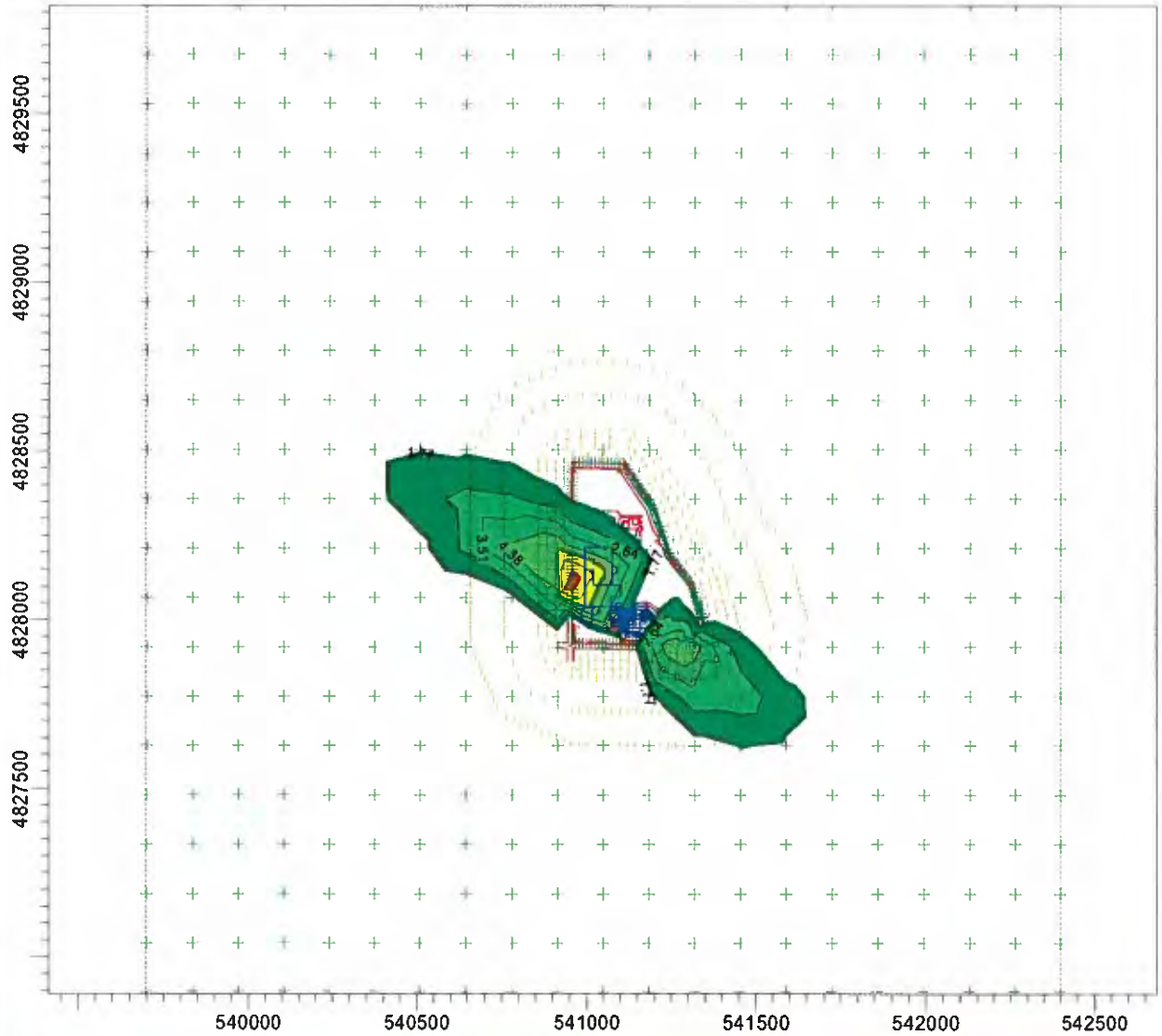
COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1992 24hr 2nd high	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 21.67205 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\pm92-3.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

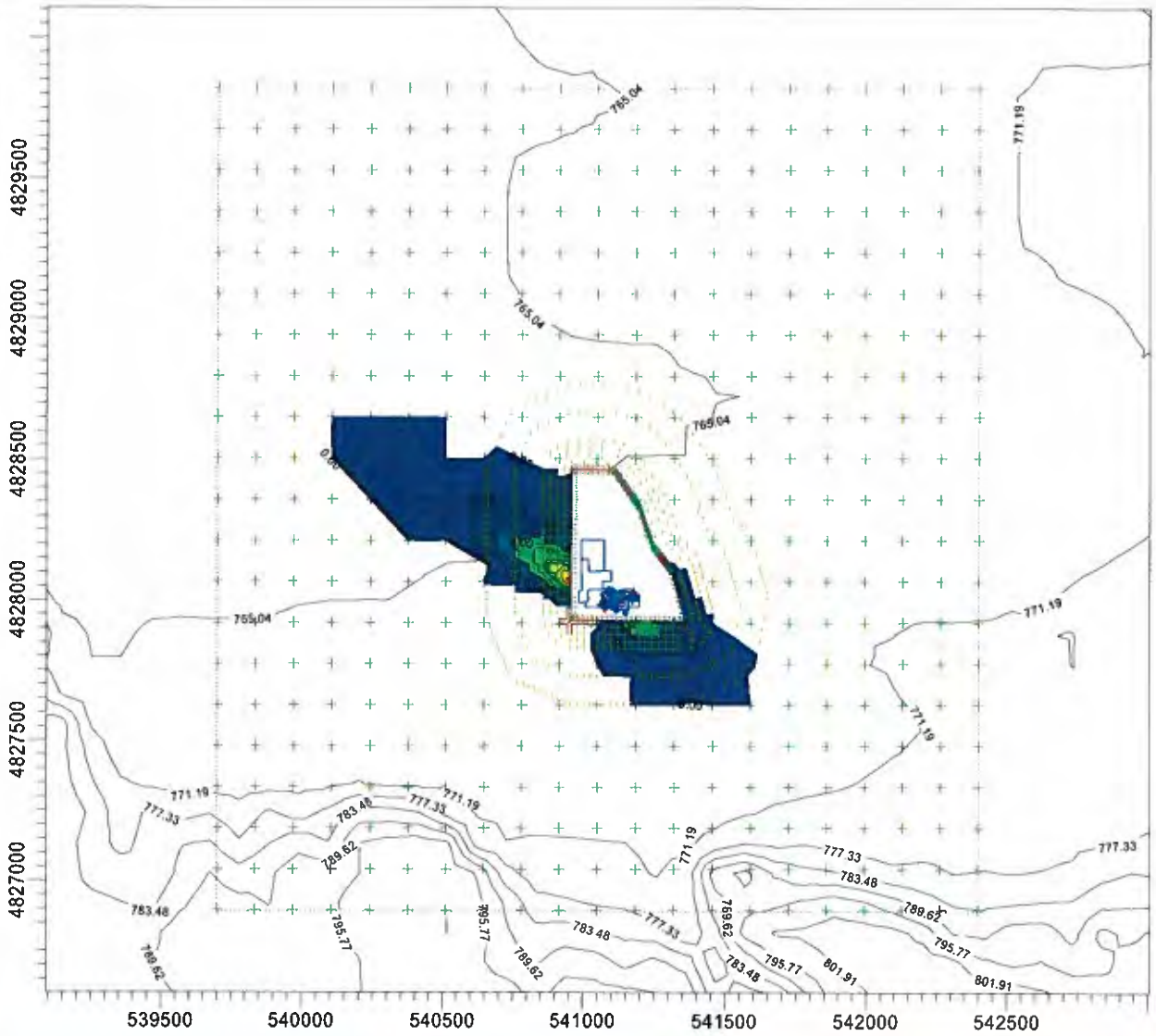
ug/m^3

1.768 2.639 3.509 4.379 5.249 6.119 6.990 7.860

COMMENTS:	SOURCES:	COMPANY NAME:	
PM10 1992 Annual	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:19,956 0 0.5 km	
	MAX: 7.53999 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

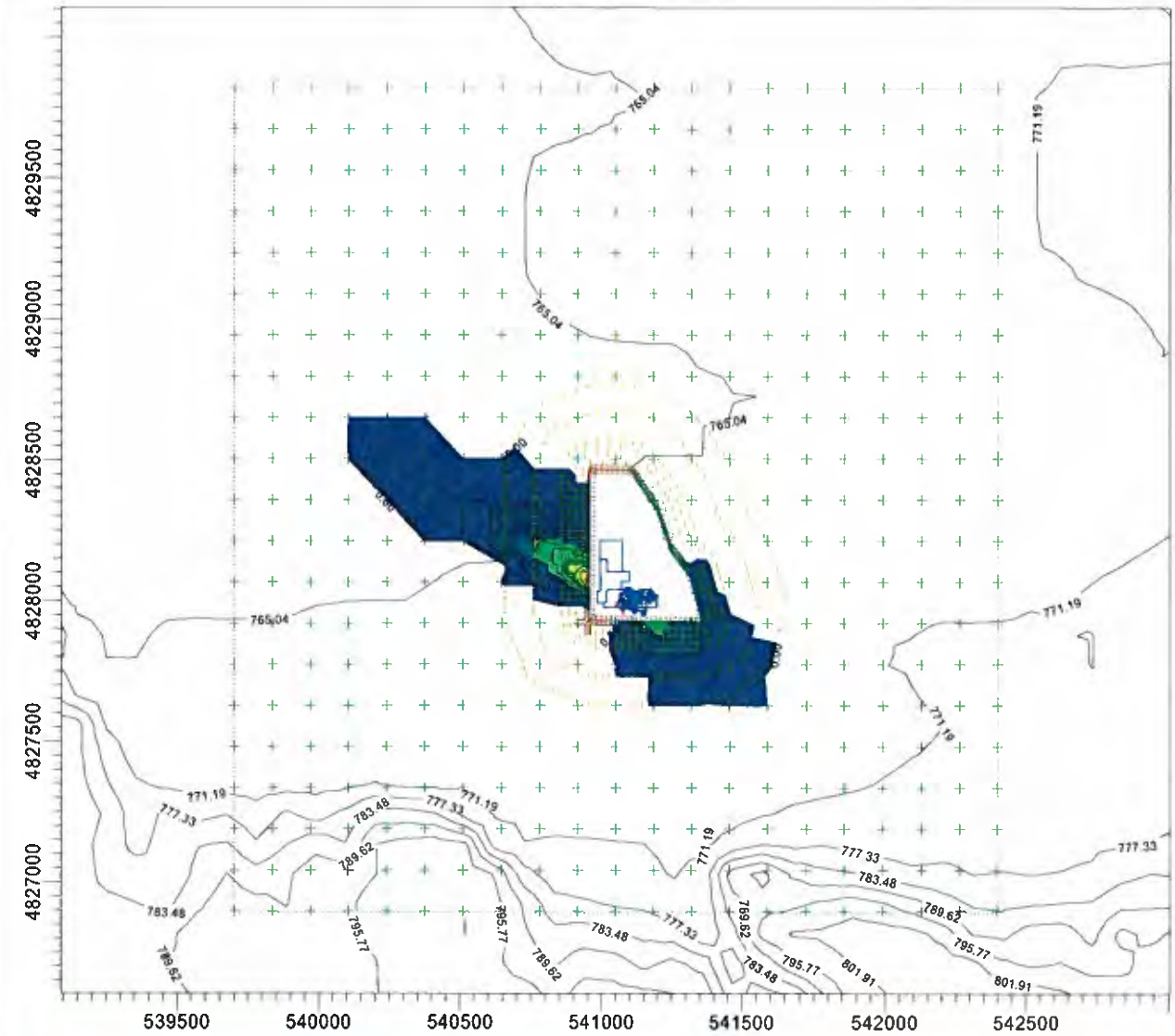
COMMENTS:	SOURCES:	COMPANY NAME:	
Arsenic - 1988	9	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	7E-5 ug/m^3	2/26/2009	Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\As88-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

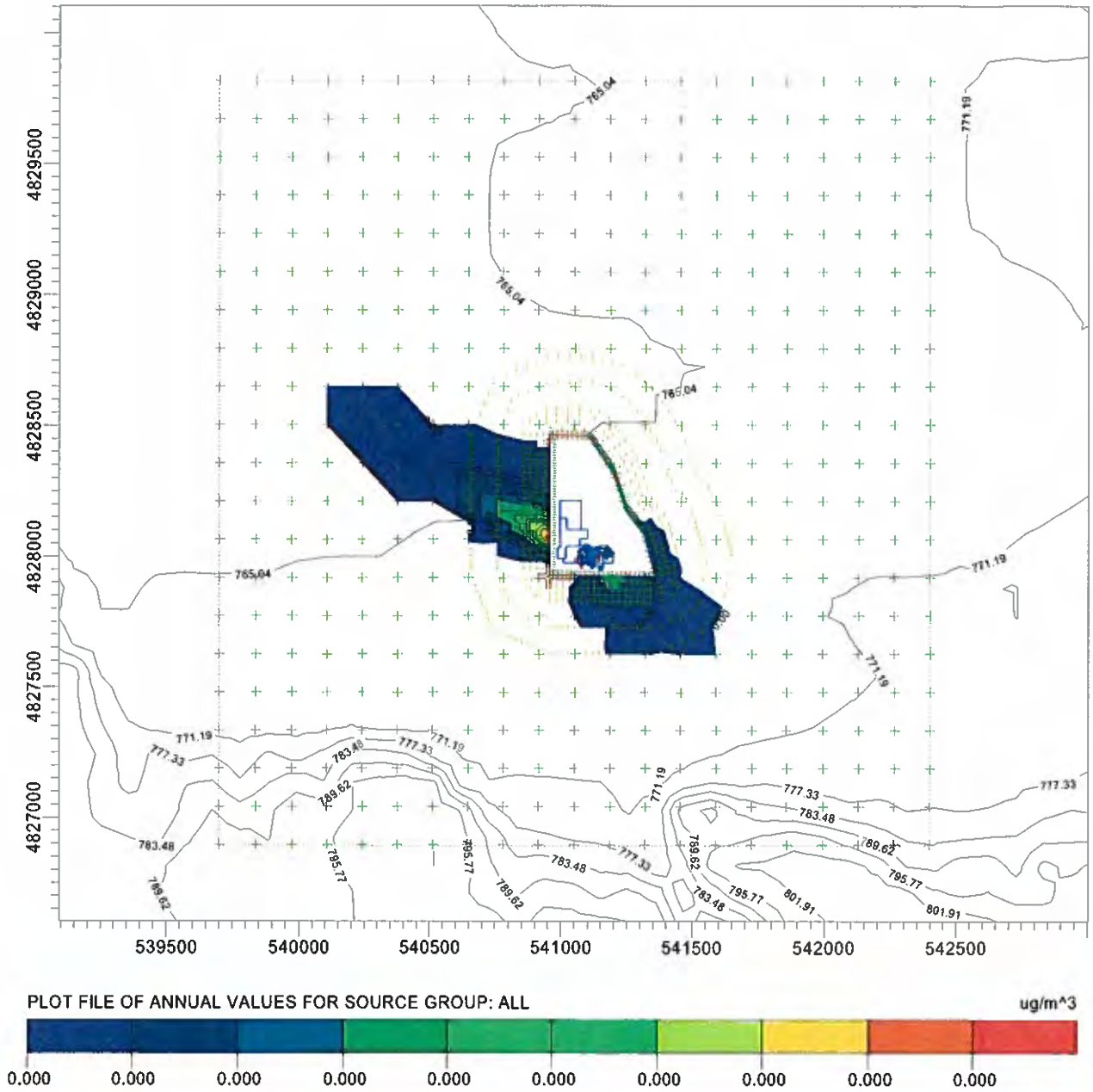
COMMENTS:	SOURCES:	COMPANY NAME:	
Arsenic 1989	9	**Millennium Science & Engineering, Inc.**	
	RECEPTORS:	MODELER:	
	1077	**Troy Riecke**	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	7E-5 ug/m^3	**2/26/2009**	**Sorrento Lactalis**

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\As89-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



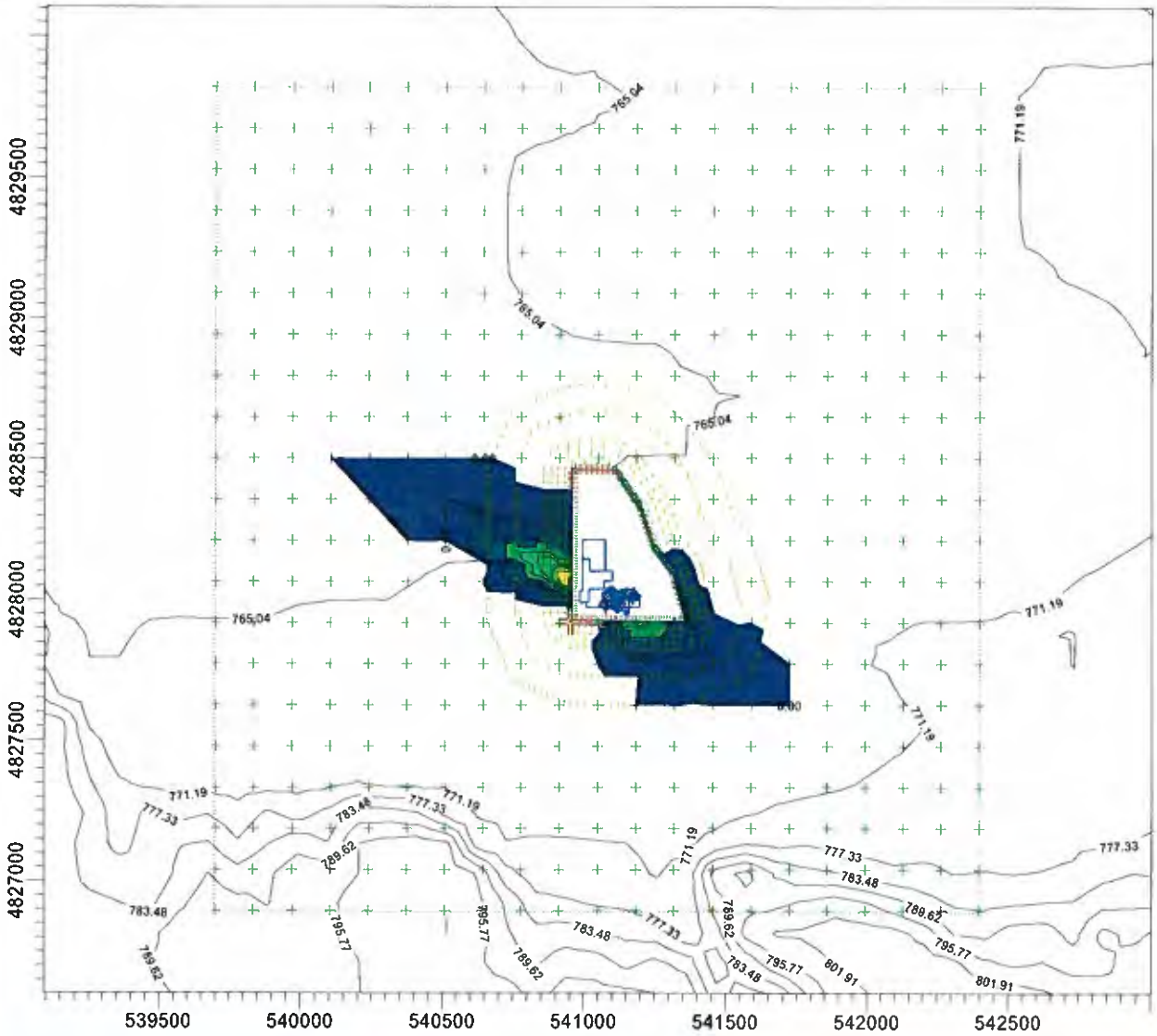
COMMENTS:	SOURCES:	COMPANY NAME:	
Arsenic 1990	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE 1:23,875 0 0.5 km	
	MAX: 7E-5 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\As90-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

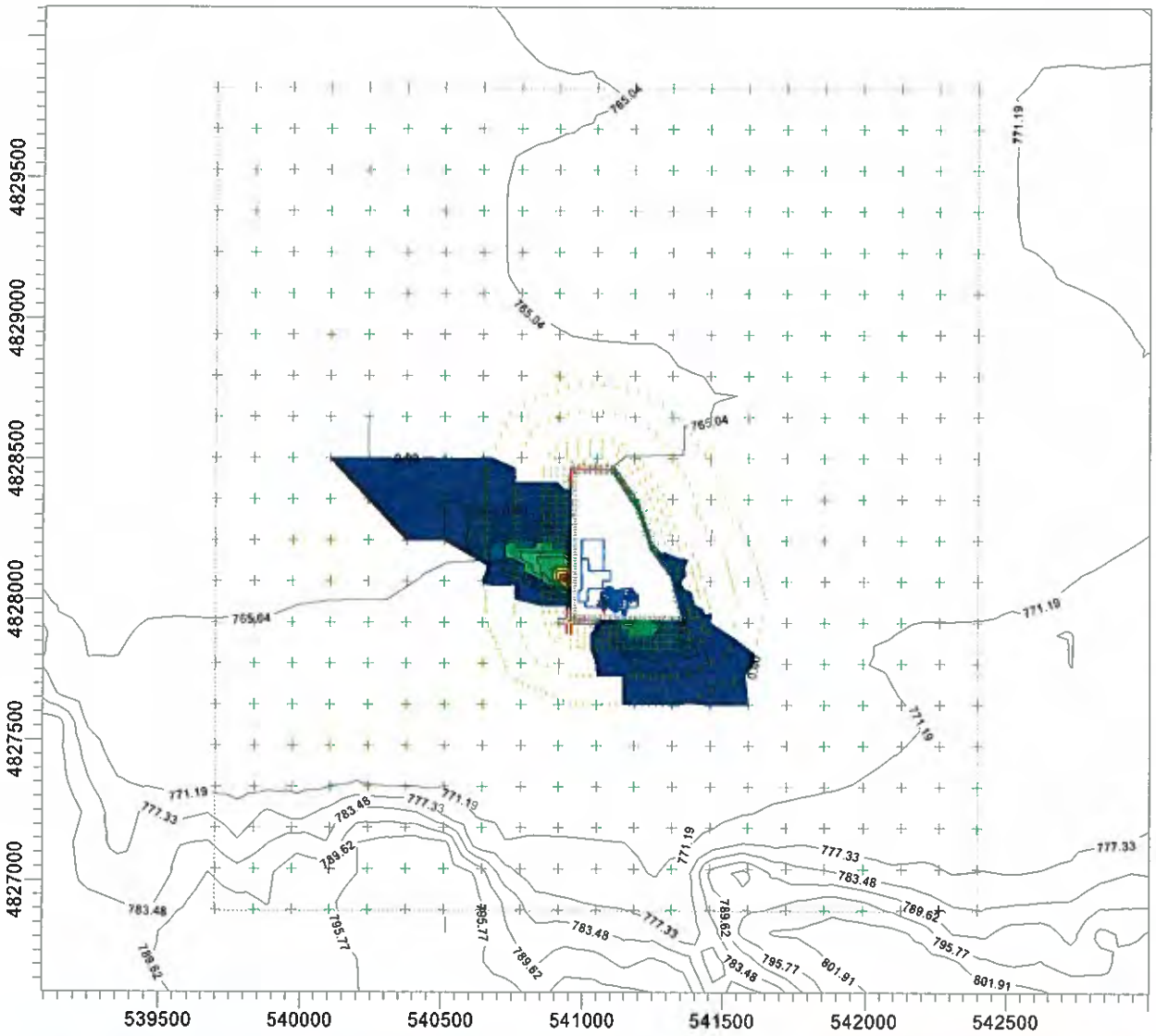
COMMENTS:	SOURCES:	COMPANY NAME:	
Arsenic 1991	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 0 0.5 km	
	MAX: 6E-5 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\As91-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

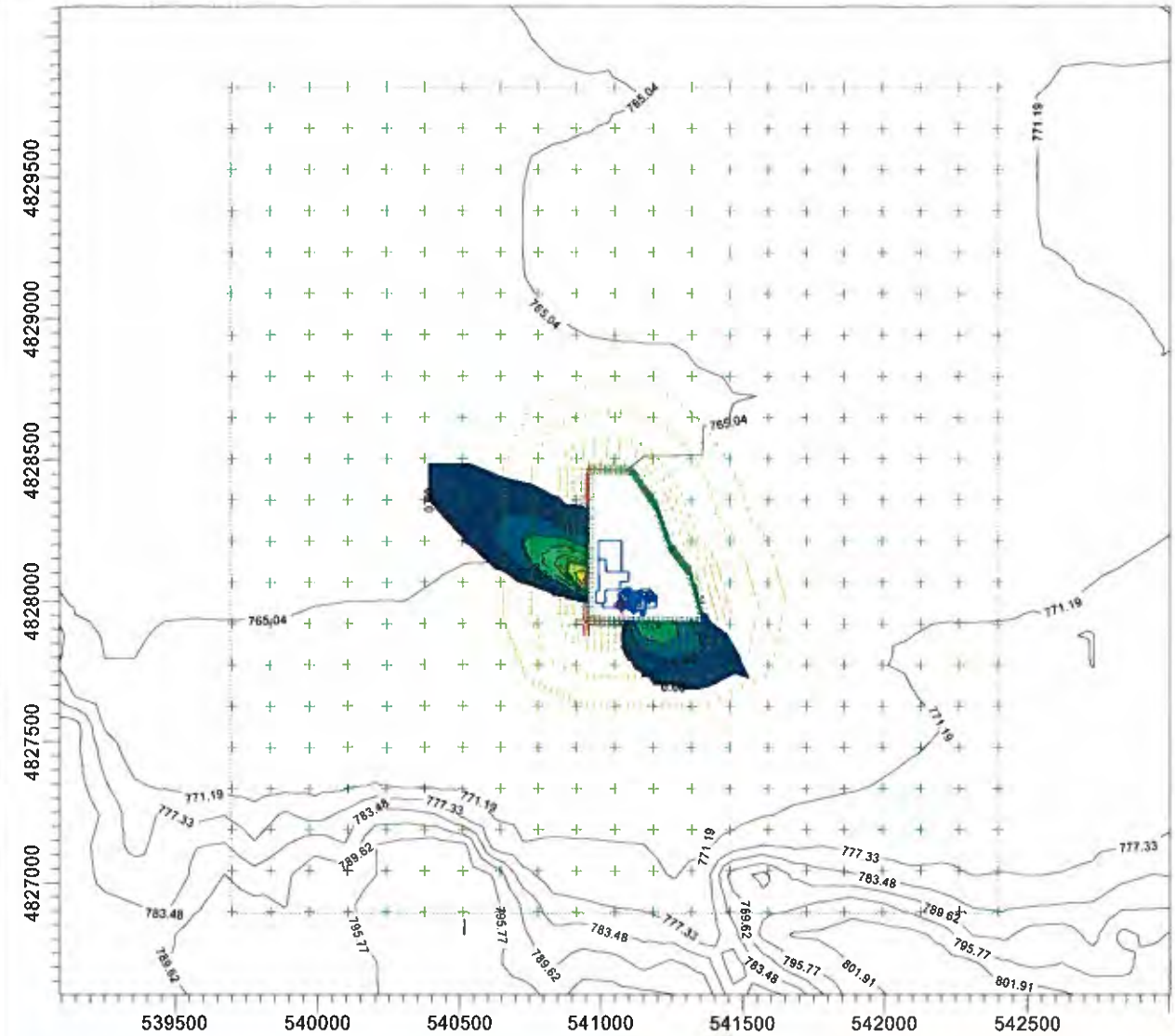
COMMENTS:	SOURCES:	COMPANY NAME:	
Arsenic 1992	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 — 0.5 km	
	MAX. 6E-5 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\As92-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

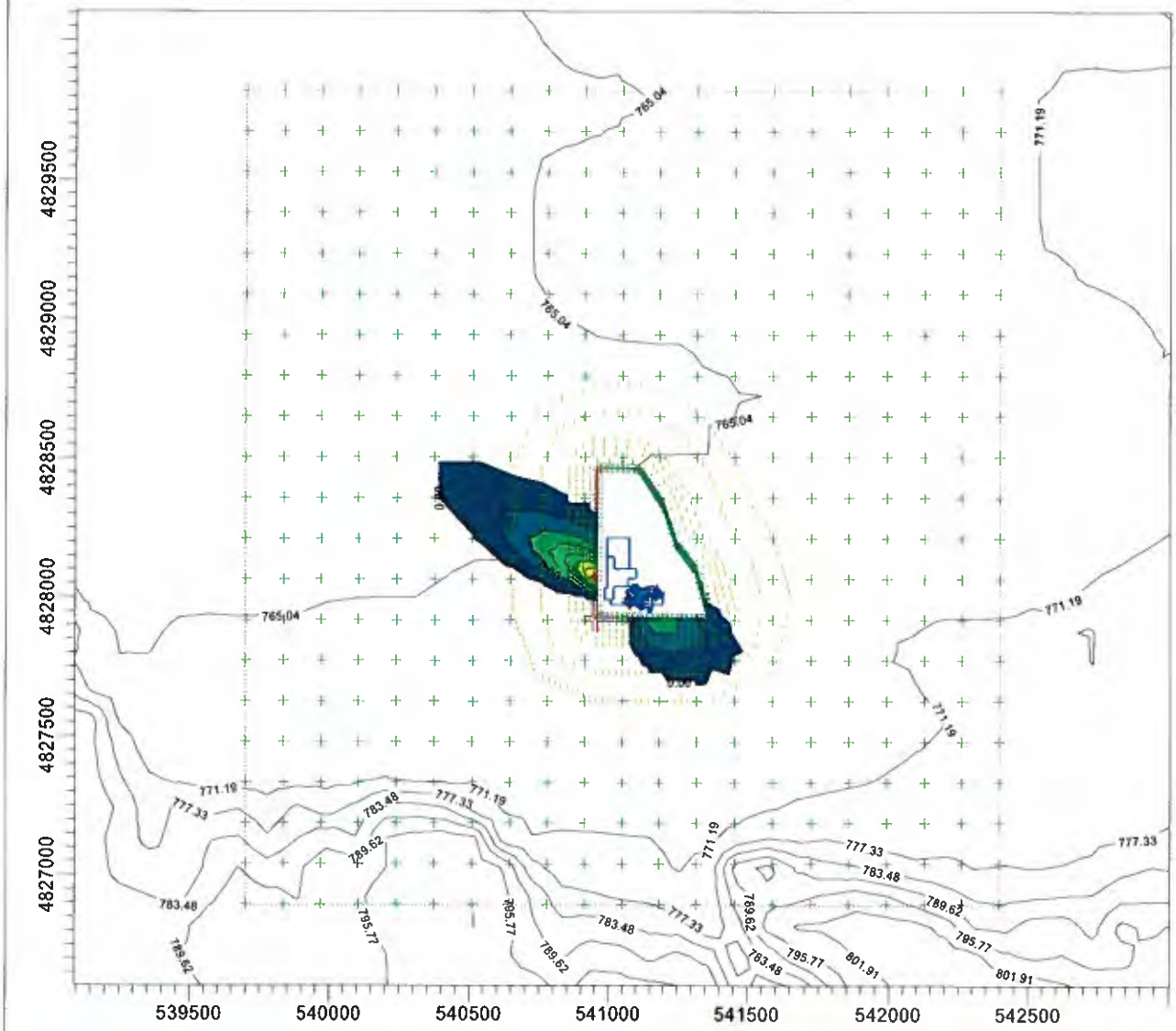
ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

COMMENTS:	SOURCES:	COMPANY NAME:	
Cadmium 1988	9	**Millennium Science & Engineering, Inc.**	
	RECEPTORS:	MODELER:	
	1251	**Troy Riecke**	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	0.00039 ug/m^3	**2/26/2009**	**Sorrento Lactalis**

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

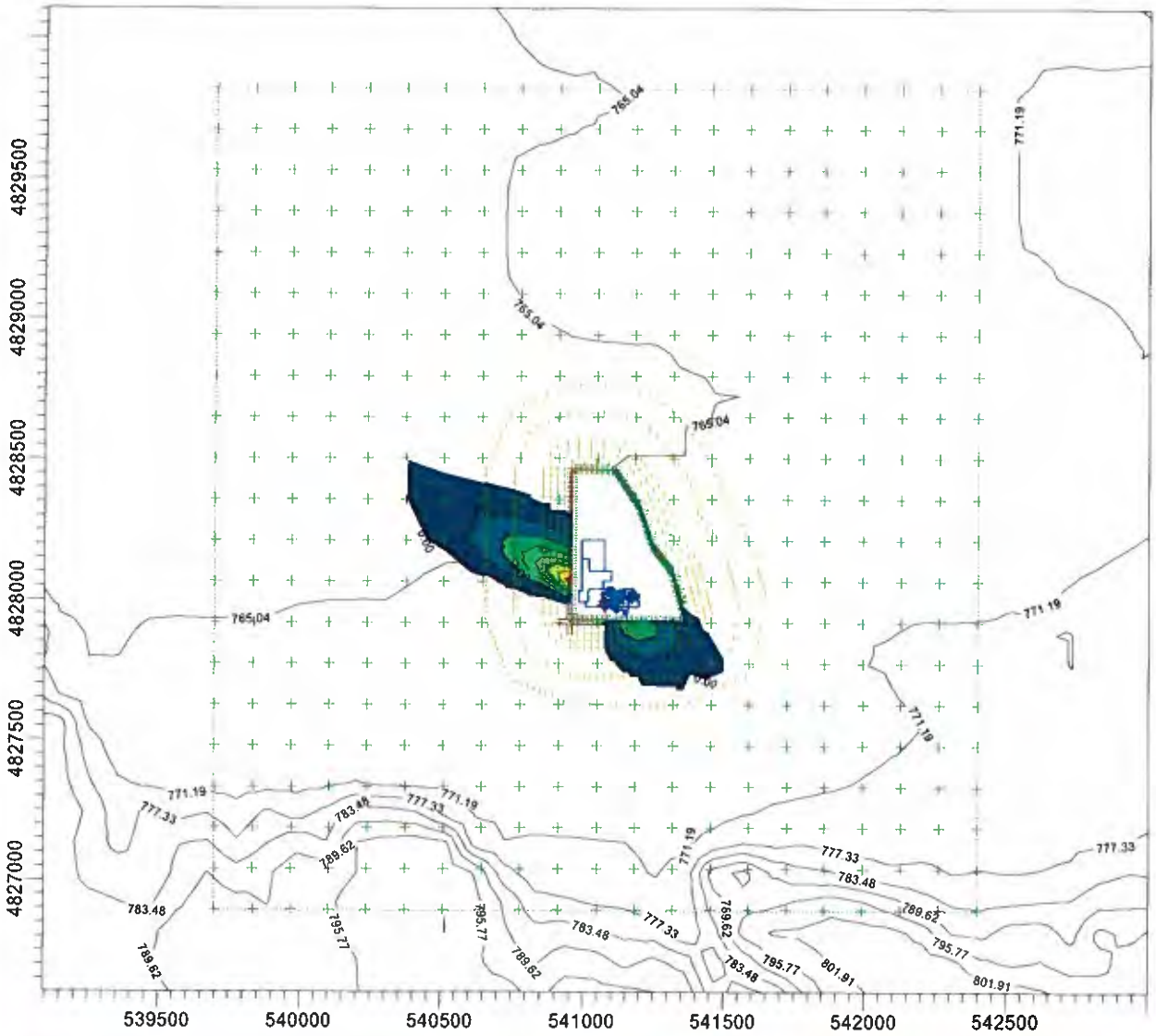
COMMENTS:	SOURCES:	COMPANY NAME:	
Cadmium 1989	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1251	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 0.5 km	
	MAX: 0.00039 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\Cd89-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

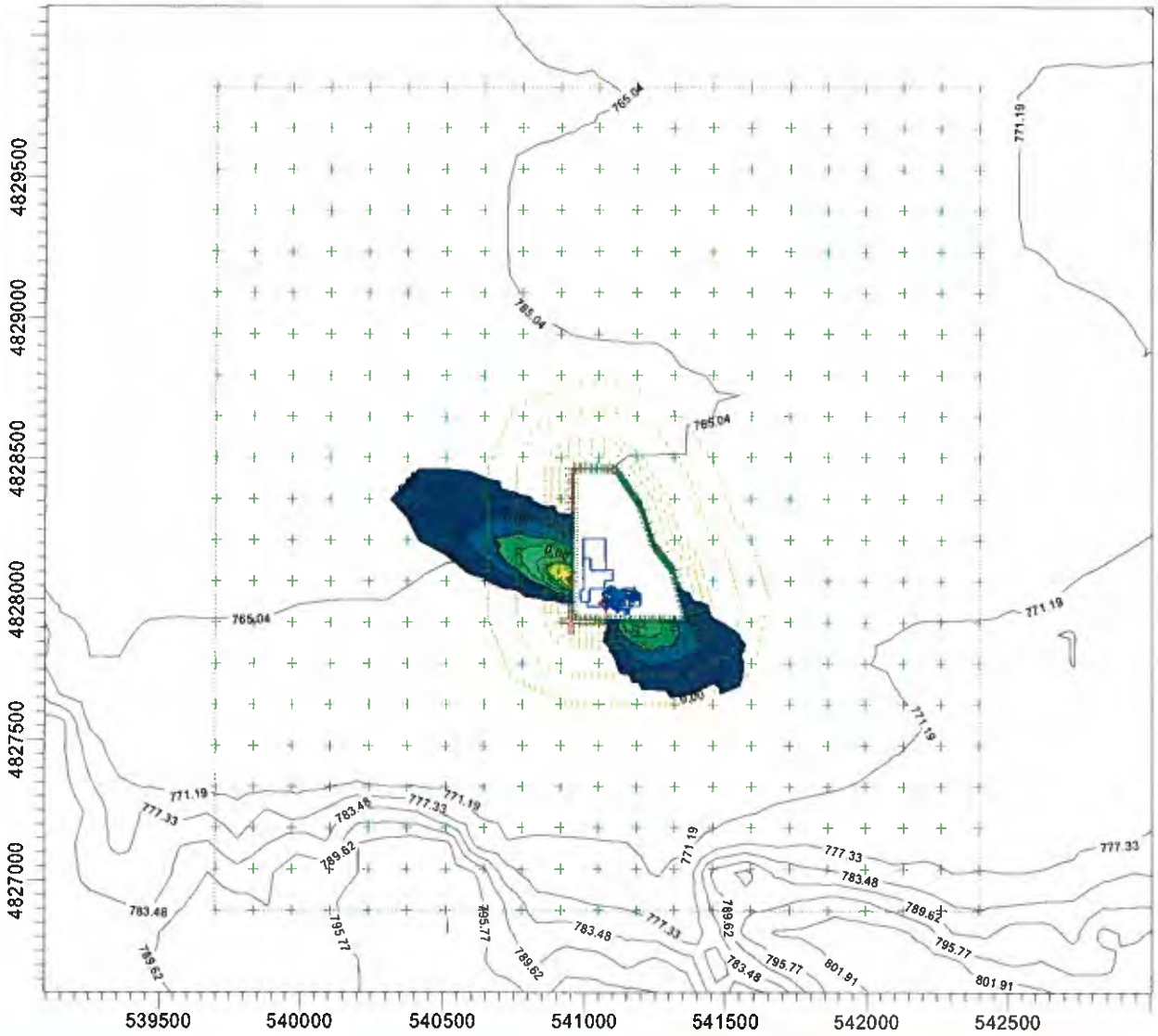
COMMENTS:	SOURCES:	COMPANY NAME:	
Cadmium 1990	9	**Millennium Science & Engineering, Inc.**	
	RECEPTORS:	MODELER:	
	1251	**Troy Riecke**	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	0.00038 ug/m^3	**2/26/2009**	**Sorrento Lactalis**

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\Cd90-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

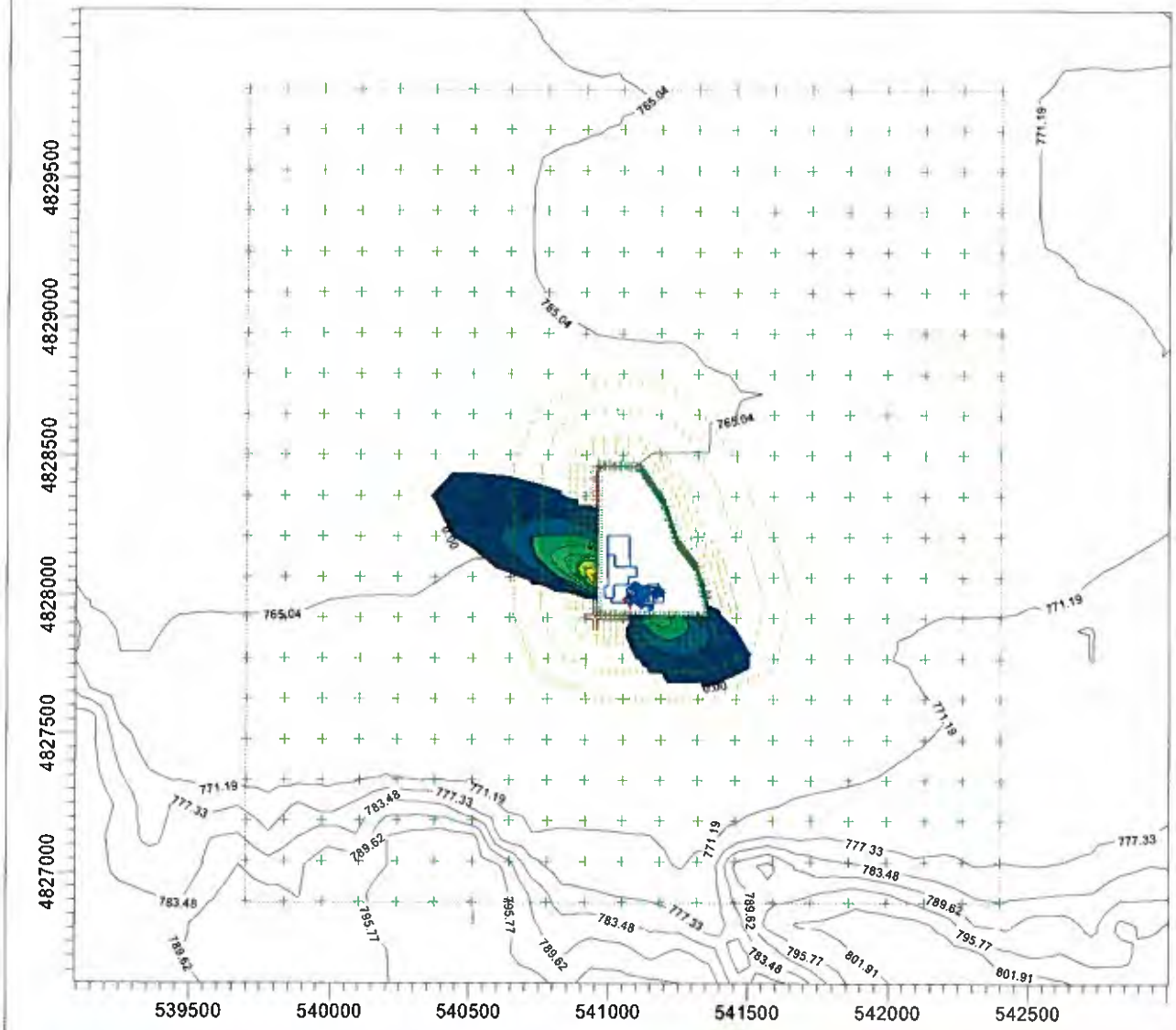
ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

COMMENTS:	SOURCES:	COMPANY NAME:	
Cadmium 1991	9	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1251	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	0.00033 ug/m^3	2/26/2009	Sorrento Lactalis

PROJECT TITLE

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

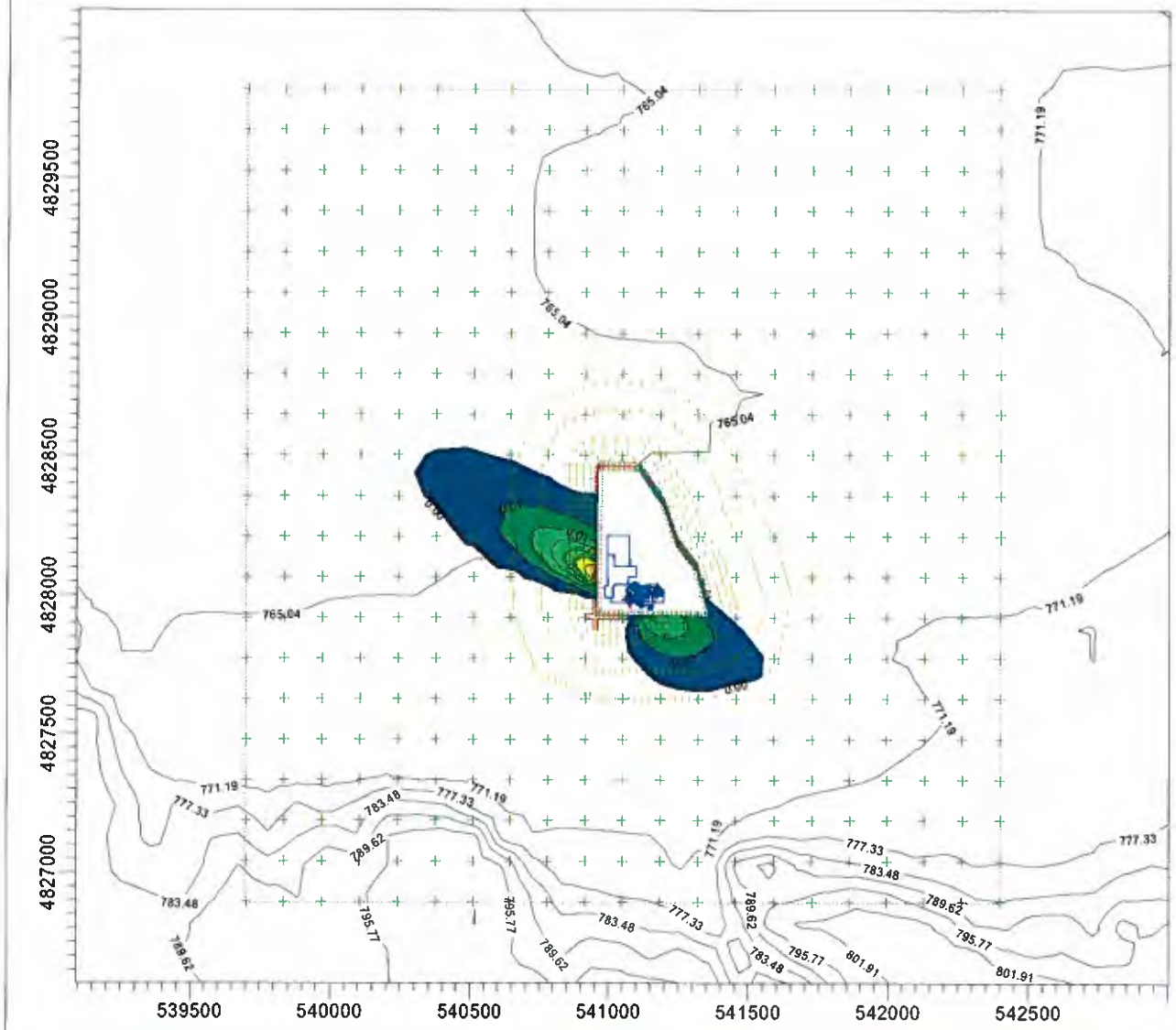
COMMENTS:	SOURCES:	COMPANY NAME:	
Cadmium 1992	9	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1251	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	0.00036 ug/m^3	2/26/2009	Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\Cd92-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.003 0.006 0.009 0.012 0.015 0.018 0.021 0.024 0.027

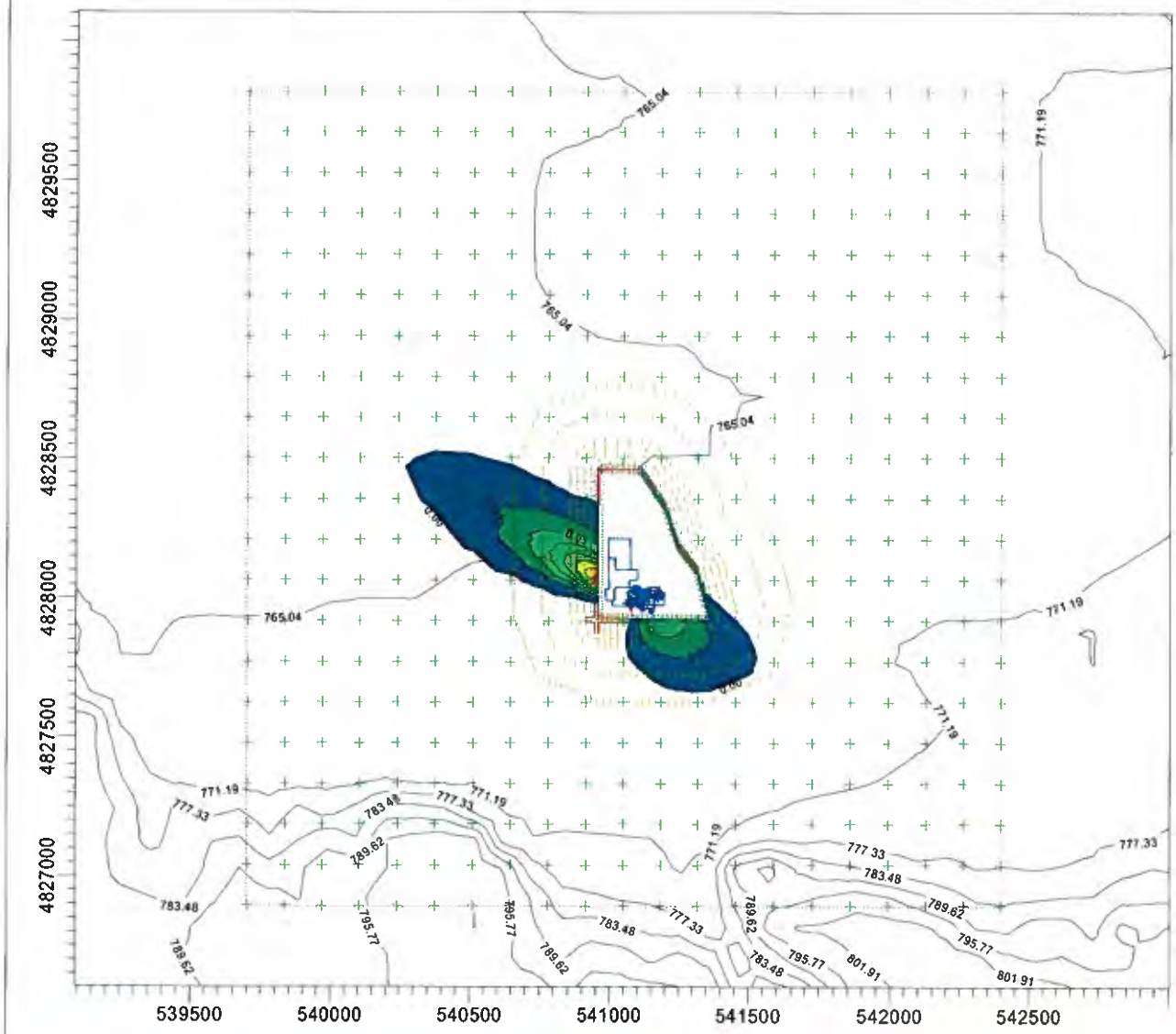
COMMENTS:	SOURCES:	COMPANY NAME:	
Formaldehyde 1988	9	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	0.02661 ug/m^3	2/26/2009	Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\FO88-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.003 0.006 0.009 0.012 0.015 0.018 0.021 0.024 0.027

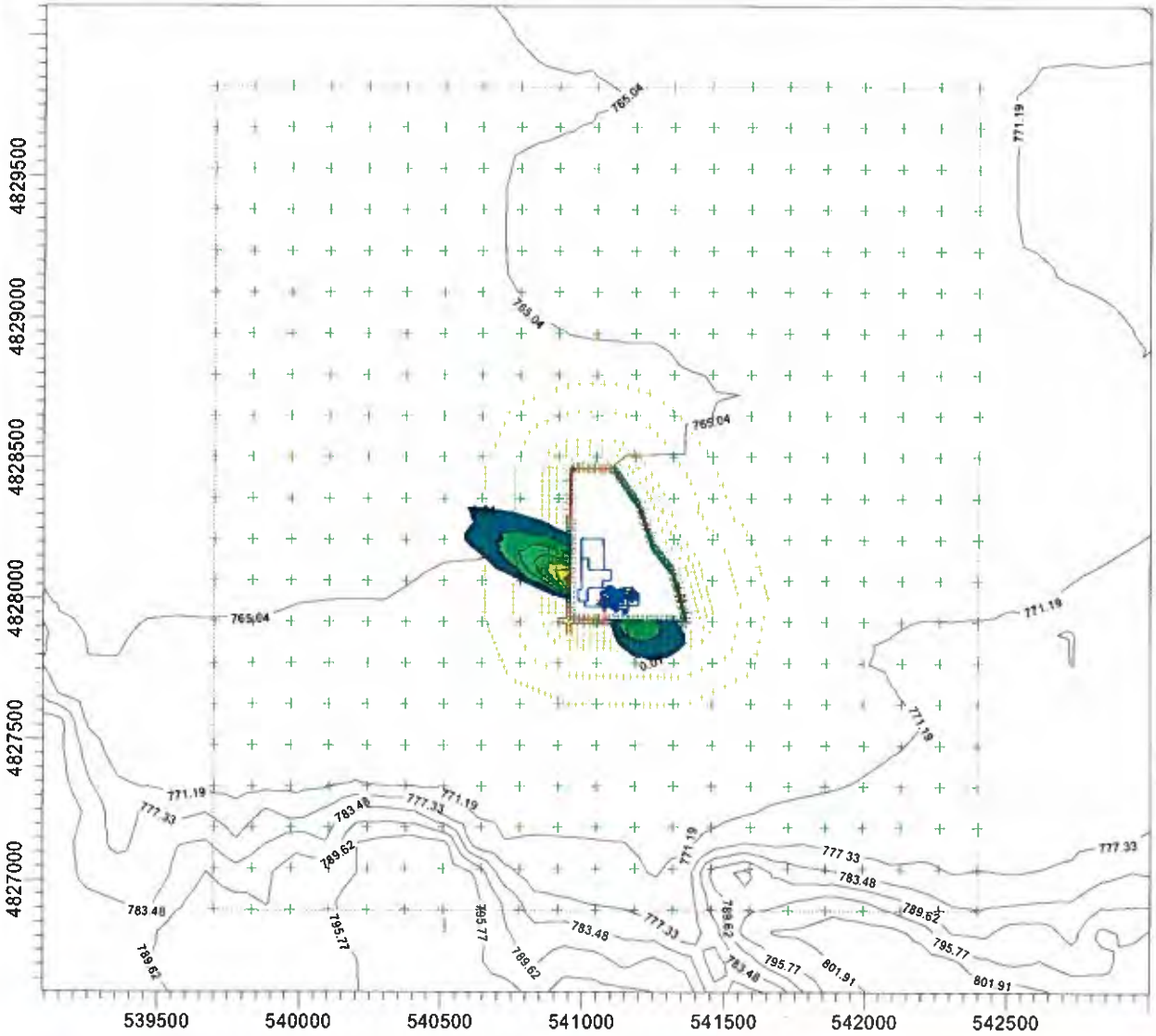
COMMENTS:	SOURCES:	COMPANY NAME:	
Formaldehyde 1989	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 0 0.5 km	
	MAX: 0.02653 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\FO89-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.006 0.009 0.012 0.014 0.017 0.020 0.023 0.026

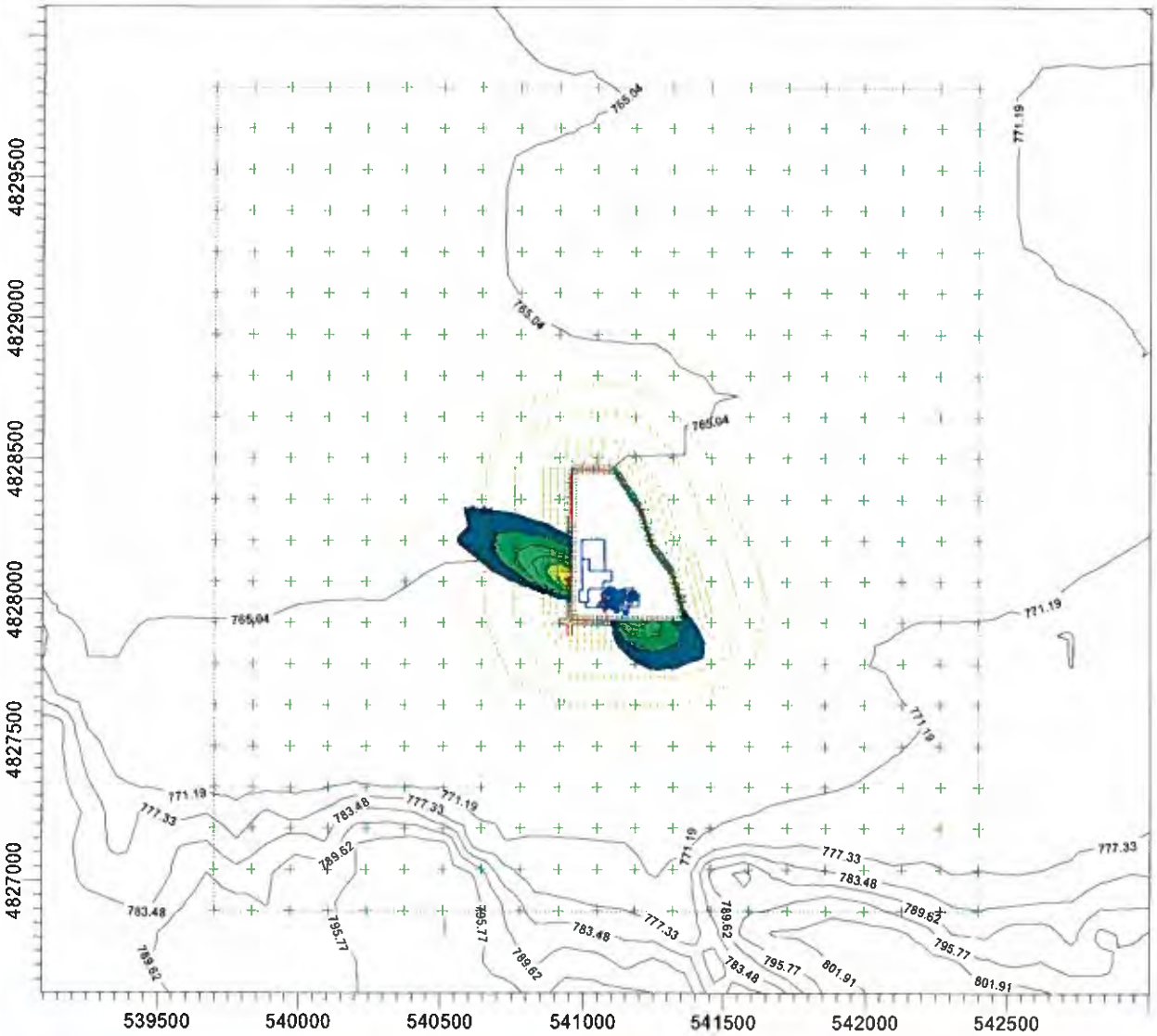
COMMENTS:	SOURCES:	COMPANY NAME:	
Formaldehyde 1990	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 — 0.5 km	
	MAX: 0.02588 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\FO90-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.005 0.008 0.010 0.013 0.015 0.018 0.020 0.023

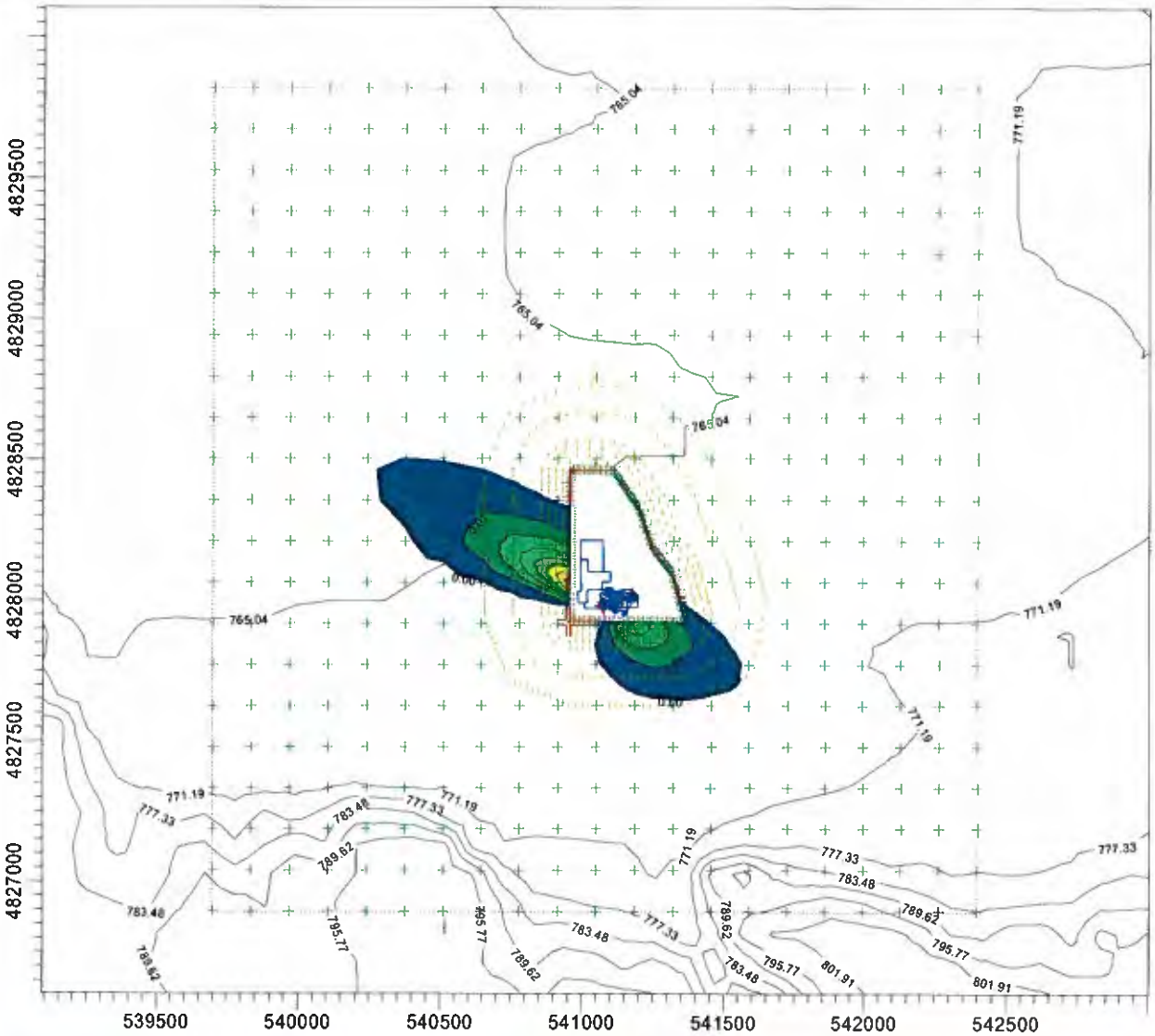
COMMENTS:	SOURCES:	COMPANY NAME:	
Formaldehyde 1991	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 0.5 km	
	MAX: 0.02264 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\FO91-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.003 0.005 0.008 0.011 0.013 0.016 0.019 0.022 0.024

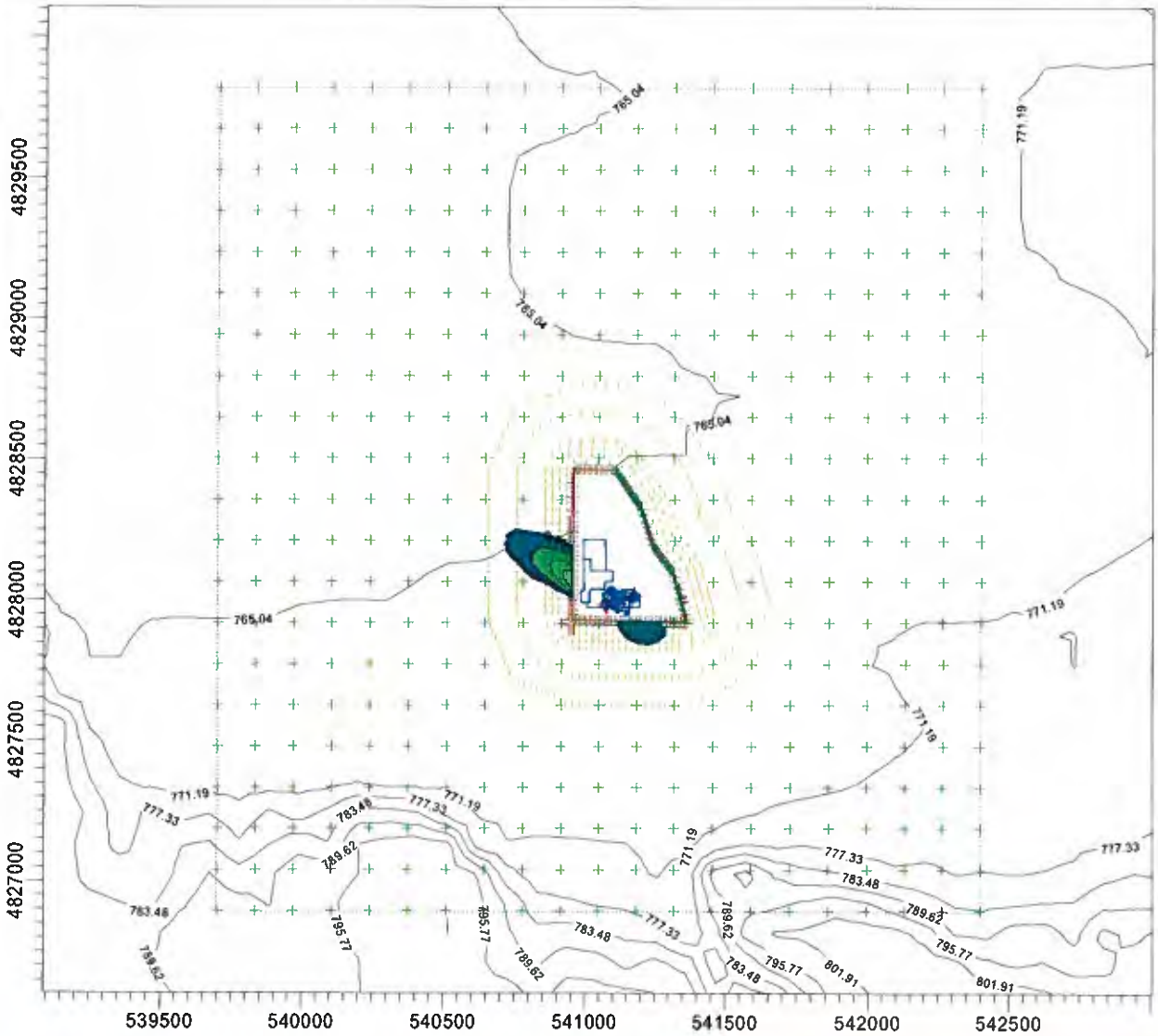
COMMENTS:	SOURCES:	COMPANY NAME:	
Formaldehyde 1992	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 (0 – 0.5 km)	
	MAX: 0.02422 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\FO92-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

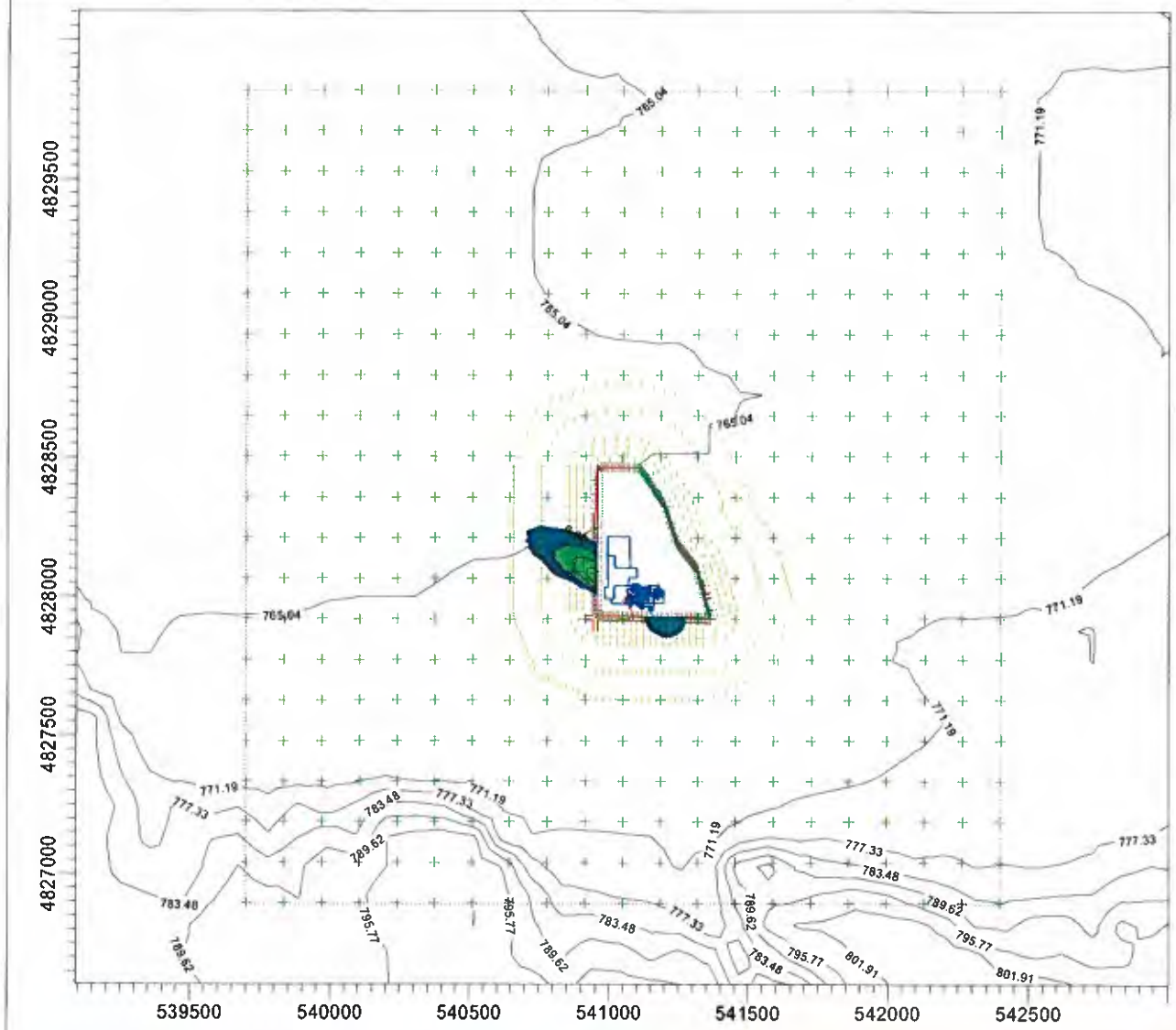
ug/m^3

0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001

COMMENTS:	SOURCES:	COMPANY NAME:	
Nickel 1988	9	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	0.00075 ug/m^3	2/26/2009	Sorrento Lactalis

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001

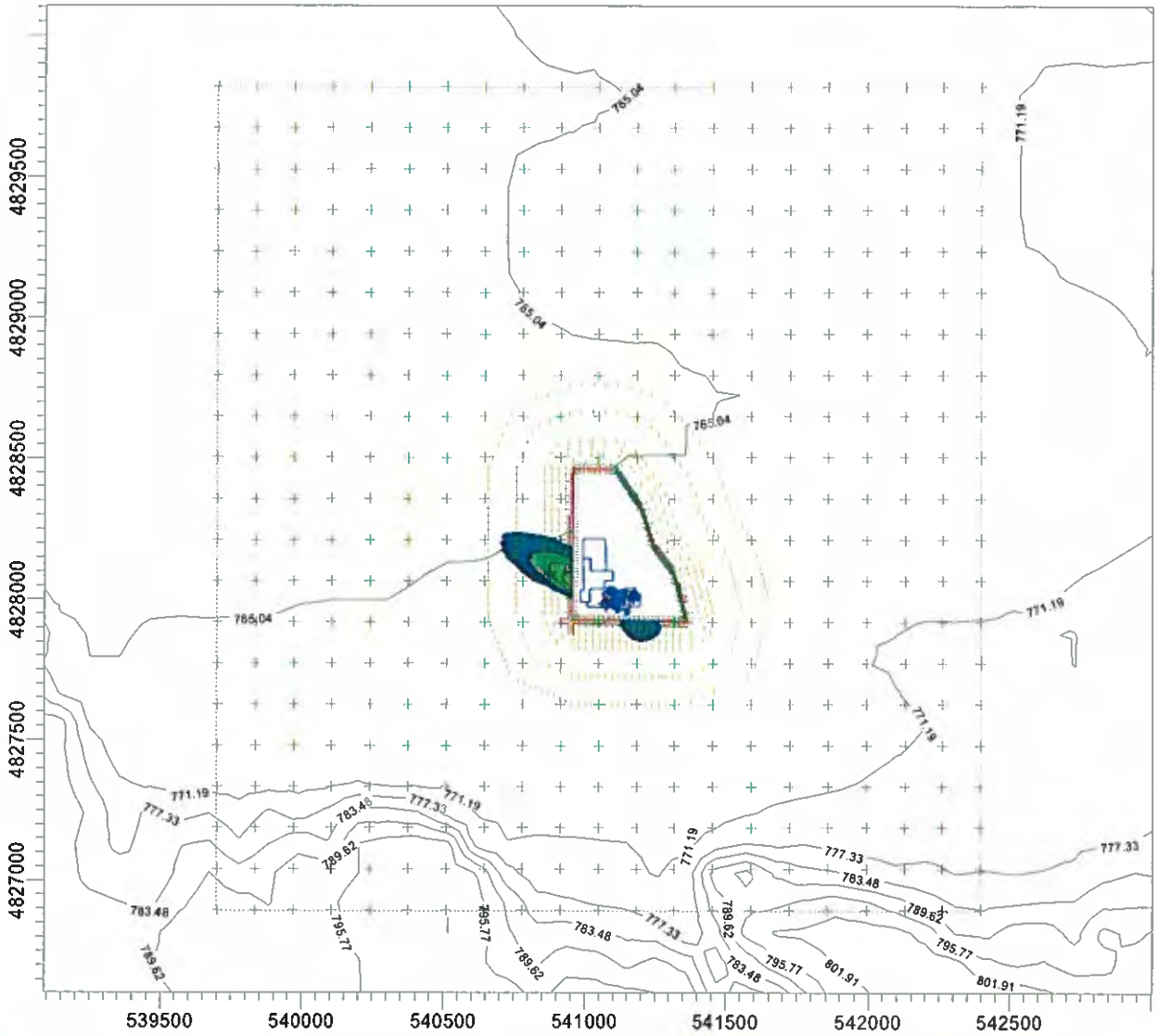
COMMENTS:	SOURCES:	COMPANY NAME:	
Nickel 1989	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 (0 – 0.5 km)	
	MAX: 0.00074 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\Ni89-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001

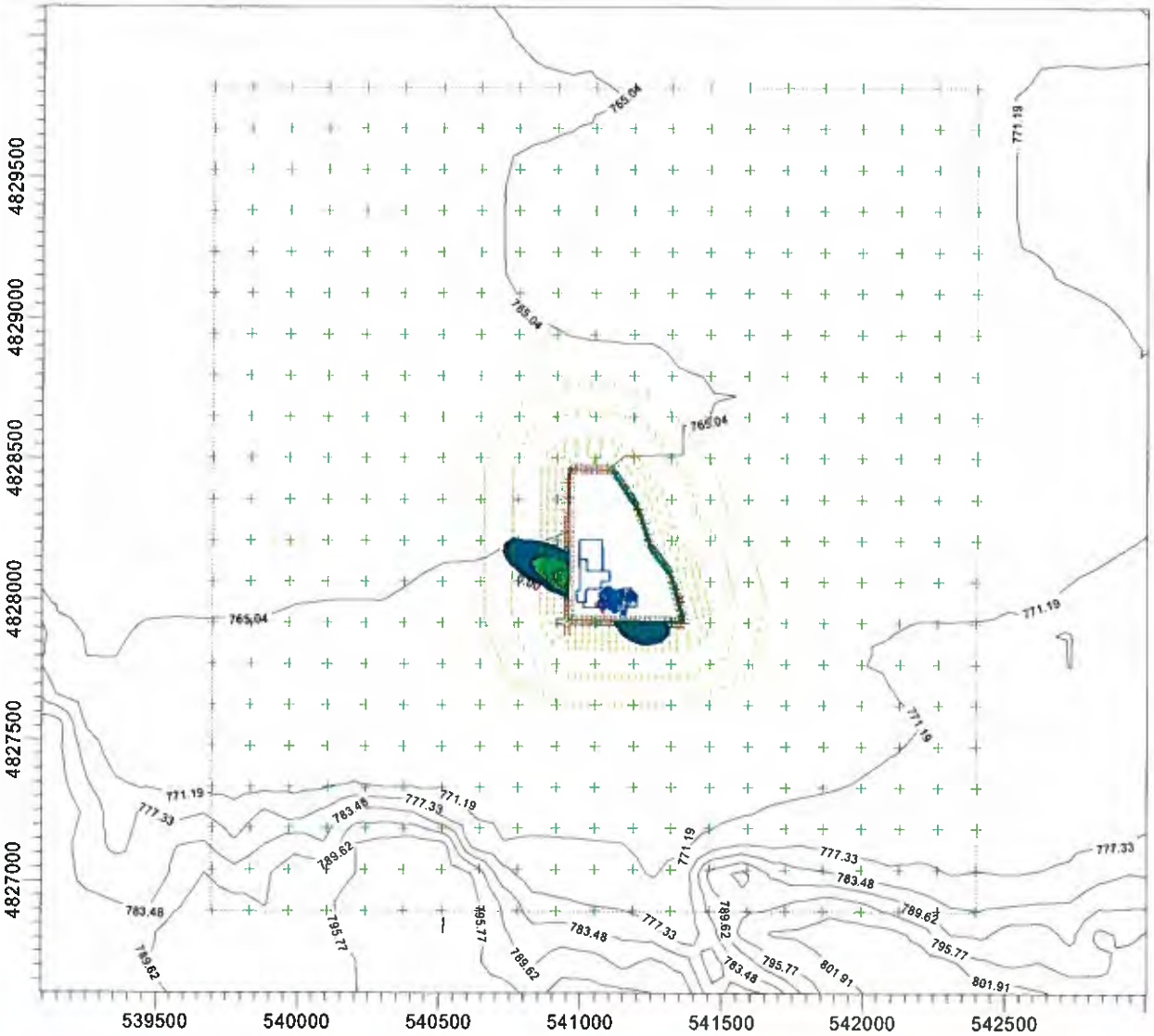
COMMENTS:	SOURCES:	COMPANY NAME:	
Nickel 1990	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 — 0 — 0.5 km	
	MAX: 0.00072 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\Ni90-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001

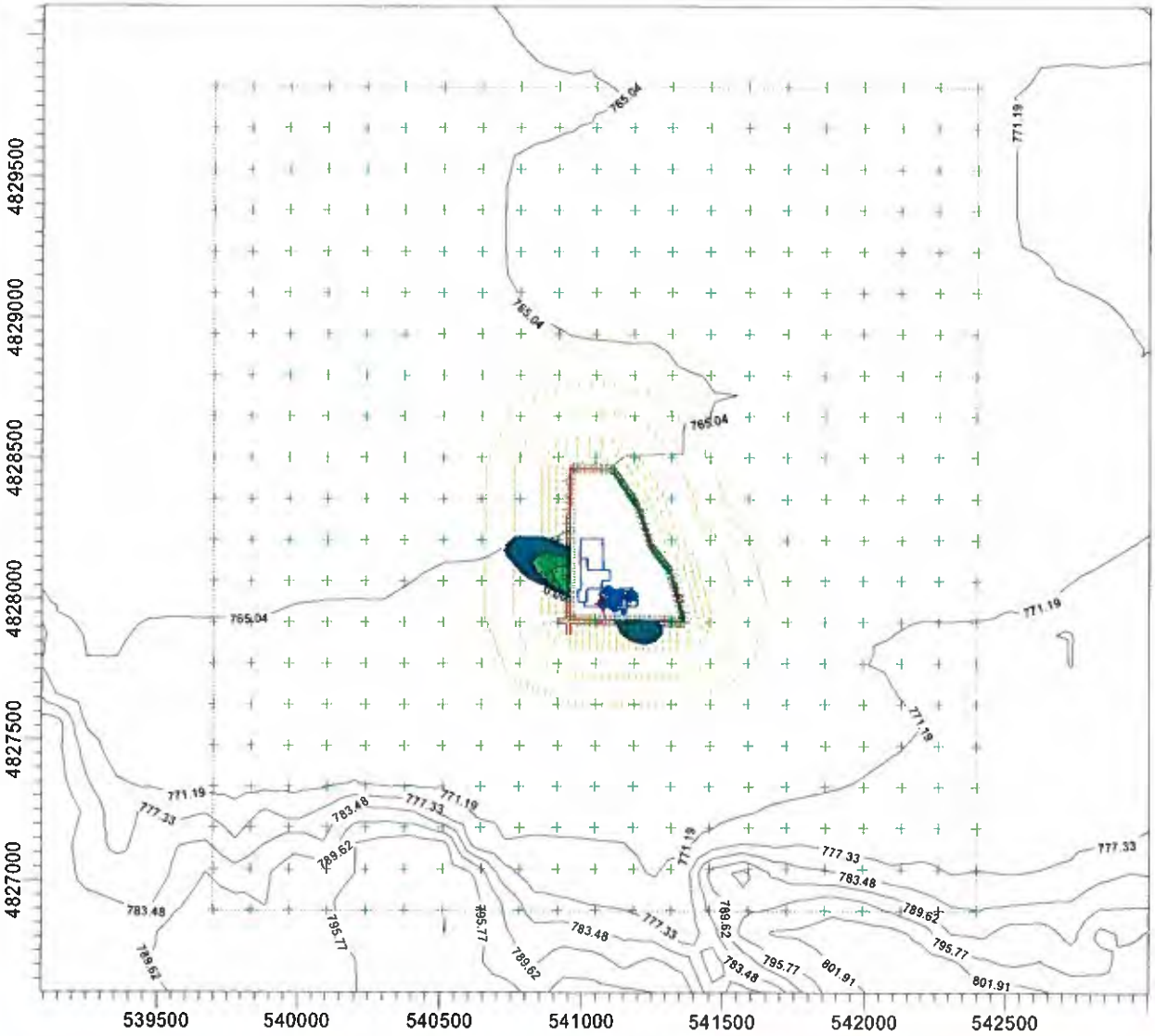
COMMENTS:	SOURCES:	COMPANY NAME:	
Nickel 1991	9	Millennium Science & Engineering, Inc.	
	RECEPTORS:	MODELER:	
	1077	Troy Riecke	MSE Millennium Science & Engineering, Inc.
	OUTPUT TYPE:	SCALE: 1:23,875	
	Concentration	0 0.5 km	
	MAX:	DATE:	PROJECT NO.:
	0.00063 ug/m^3	2/26/2009	Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\Ni91-2.isc

PROJECT TITLE:

Sorrento Lactalis - Pre-Permit Construction Application
Full Impact Analysis



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001

COMMENTS:	SOURCES:	COMPANY NAME:	
Nickel 1992	9	Millennium Science & Engineering, Inc.	
	RECEPTORS: 1077	MODELER: Troy Riecke	MSE Millennium Science & Engineering, Inc
	OUTPUT TYPE: Concentration	SCALE: 1:23,875 0 0.5 km	
	MAX: 0.00068 ug/m^3	DATE: 2/26/2009	PROJECT NO.: Sorrento Lactalis

ISC-AERMOD View - Lakes Environmental Software

C:\Models\Projects\Sorrento\Ni92-2.isc

Appendix 5

Permit to Construct Application

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Cover Sheet for Air Permit Application – Permit to Construct **Form CSPTC**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name: Sorrento Lactalis, Inc.

2. Facility Name: 3. Facility ID No. P-000726

4. Brief Project Description - One sentence or less: Construction of a new whey dryer.

PERMIT APPLICATION TYPE

5. ☐ New Source ☒ New Source at Existing Facility ☐ PTC for a Tier I Source Processed Pursuant to IDAPA 58.01.01.209.05.c
☐ Unpermitted Existing Source ☐ Facility Emissions Cap ☐ Modify Existing Source: Permit No.:____ Date Issued:____
☐ Required by Enforcement Action: Case No.:____

6. ☒ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms		DEQ Verify
☒	☐	Form CSPTC – Cover Sheet		☐
☒	☐	Form GI – Facility Information		☐
☒	☐	Form EU0 – Emissions Units General		☐
☐	☒	Form EU1– Industrial Engine Information	Please specify number of EU1s attached: ____	☐
☐	☒	Form EU2– Nonmetallic Mineral Processing Plants	Please specify number of EU2s attached: ____	☐
☐	☒	Form EU3– Spray Paint Booth Information	Please specify number of EU3s attached: ____	☐
☐	☒	Form EU4– Cooling Tower Information	Please specify number of EU3s attached: ____	☐
☒	☐	Form EU5 – Boiler Information	Please specify number of EU4s attached: 1	☐
☐	☒	Form CBP– Concrete Batch Plant	Please specify number of CBPs attached: ____	☐
☐	☒	Form HMAP – Hot Mix Asphalt Plant	Please specify number of HMAPs attached: ____	☐
☐	☒	PERF – Portable Equipment Relocation Form		☐
☐	☒	Form AO – Afterburner/Oxidizer		☐
☐	☒	Form CA – Carbon Adsorber		☐
☐	☒	Form CYS – Cyclone Separator		☐
☐	☒	Form ESP – Electrostatic Precipitator		☐
☒	☐	Form BCE– Baghouses Control Equipment		☐
☐	☒	Form SCE– Scrubbers Control Equipment		☐
☒	☐	Form VSCE – Venturi Scrubber Control Equipment		☐
☐	☒	Form CAM – Compliance Assurance Monitoring		☐
☒	☐	Forms EI-CP1 - EI-CP4– Emissions Inventory– criteria pollutants	(Excel workbook, all 4 worksheets)	☐
☒	☐	PP – Plot Plan		☐
☒	☐	Forms MI1 – MI4 – Modeling	(Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability		☐

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	Sorrento Lactalis, Inc.
2. Facility Name (if different than #1)	
3. Facility I.D. No.	P-000726
4. Brief Project Description:	Install new whey dryer at existing cheese plant.
FACILITY INFORMATION	
5. Owned/operated by: (√ if applicable)	☐ Federal government ☐ County government ☐ State government ☐ City government
6. Primary Facility Permit Contact Person/Title	Wendy York / Safety and Environmental Manager
7. Telephone Number and Email Address	(208) 463-6674 wyork@sorrentolactalis.com
8. Alternate Facility Contact Person/Title	Wes Clark / Fluids/Whey Plant Manager
9. Telephone Number and Email Address	(208) 463-6617 wclark@sorrentolactalis.com
10. Address to which permit should be sent	P.O. Box 1280
11. City/State/Zip	Nampa, ID 83653
12. Equipment Location Address (if different than #10)	4912 E. Franklin Rd.
13. City/State/Zip	Nampa, ID 83653
14. Is the Equipment Portable?	☐ Yes ☒ No
15. SIC Code(s) and NAISC Code	Primary SIC: 2023 Secondary SIC (if any): NAICS: 311514
16. Brief Business Description and Principal Product	The facility will dry whey to produce powder.
17. Identify any adjacent or contiguous facility that this company owns and/or operates	None
PERMIT APPLICATION TYPE	
18. Specify Reason for Application	☐ New Facility ☒ New Source at Existing Facility ☐ Unpermitted Existing Source ☐ Modify Existing Source: Permit No.:_____ Date Issued: _____ ☐ Permit Revision ☐ Required by Enforcement Action: Case No.:_____
CERTIFICATION	
IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.	
19. Responsible Official's Name/Title	Giulio Ferrari, Nampa Plant Manager
20. RESPONSIBLE OFFICIAL SIGNATURE	Date: 2/23/09
21. ☒ Check here to indicate you would like to review a draft permit prior to final issuance.	

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis, Inc.		P-000726

4. Brief Project Description: Construction of new whey dryer.

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	TETRAPAK WHEY DRYER BURNER 1
6.	EU ID Number:	P-2
7.	EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8.	Manufacturer:	TETRAPAK
9.	Model:	ECLIPSE WINNOX1000
10..	Maximum Capacity:	12.5 MMBTU/HR
11.	Date of Construction:	4-1-09
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HOURS/YR
23.	Maximum Operation:	8760 HOURS/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis, Inc.		P-000726

4. Brief Project Description: Construction of new whey dryer.

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	TETRAPAK WHEY DRYER BURNER 2
6.	EU ID Number:	P-3
7.	EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source – Previous Permit #: Date Issued:
8.	Manufacturer:	TETRAPAK
9.	Model:	ECLIPSE WINNOX1000
10..	Maximum Capacity:	12.5 MMBTU/HR
11.	Date of Construction:	4-1-09
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HOURS/YR
23.	Maximum Operation:	8760 HOURS/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis, Inc.		P-000726

4. Brief Project Description: Construction of new whey dryer.

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	TETRAPAK WHEY DRYER
6.	EU ID Number:	P-4
7.	EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8.	Manufacturer:	TETRAPAK
9.	Model:	
10..	Maximum Capacity:	25,799 LB/HR WHEY CONCENTRATE (62% TOTAL SOLIDS)
11.	Date of Construction:	4-1-09
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:	Wet Scrubber (P-4)
15. Date of Installation:	4-1-09 16. Date of Modification (if any):
17. Manufacturer and Model Number:	Fisher Klosterman, Inc. / MS-1200 Scrubber, SS316
18. ID(s) of Emission Unit Controlled:	P-4
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☒ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency	99					

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HOURS/YR
23.	Maximum Operation:	8760 HOURS/YR

REQUESTED LIMITS

24.	Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, indicate all that apply below)
	☐ Operation Hour Limit(s):	
	☒ Production Limit(s):	400,000 LB/DAY DRY PRODUCT
	☐ Material Usage Limit(s):	
	☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
	☒ Other:	REQUIREMENT TO OPERATE AND MAINTAIN SCRUBBER
25.	Rationale for Requesting the Limit(s):	THROUGHPUT LIMIT AND SCRUBBER REQUIRED TO PREVENT EXCESS EMISSIONS.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis, Inc.		P-000726

4. Brief Project Description: Construction of new whey dryer.

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	TETRAPAK Shaking Bed
6.	EU ID Number:	P-5
7.	EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8.	Manufacturer:	TETRAPAK
9.	Model:	
10..	Maximum Capacity:	25,799 LB/HR WHEY CONCENTRATE (62% TOTAL SOLIDS)
11.	Date of Construction:	4-1-09
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:	Baghouse (P-5)
15. Date of Installation:	4-1-09 16. Date of Modification (if any):
17. Manufacturer and Model Number:	TETRAPAK / 13-243-14
18. ID(s) of Emission Unit Controlled:	P-5
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☒ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency	99.9					

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HOURS/YR
23.	Maximum Operation:	8760 HOURS/YR

REQUESTED LIMITS

24.	Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, indicate all that apply below)
	☐ Operation Hour Limit(s):	
	☒ Production Limit(s):	400,000 LB/DAY DRY PRODUCT
	☐ Material Usage Limit(s):	
	☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
	☒ Other:	REQUIREMENT TO OPERATE AND MAINTAIN BAGHOUSE
25.	Rationale for Requesting the Limit(s):	THROUGHPUT LIMIT AND BAGHOUSE REQUIRED TO PREVENT EXCESS EMISSIONS.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
Sorrento Lactalis, Inc.		P-000726

4. Brief Project Description: Construction of new whey dryer.

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	1200 HP CLEAVER BROOKS BOILER
6.	EU ID Number:	P-6
7.	EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8.	Manufacturer:	CLEAVER BROOKS
9.	Model:	1200 HP
10..	Maximum Capacity:	48.99 MMBTU/HR
11.	Date of Construction:	4-1-09
12.	Date of Modification (if any):	
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:

15. Date of Installation: 16. Date of Modification (if any):

17. Manufacturer and Model Number:

18. ID(s) of Emission Unit Controlled:

19. Is operating schedule different than emission units(s) involved? ☐ Yes ☐ No

20. Does the manufacturer guarantee the control efficiency of the control equipment? ☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	8760 HOURS/YR
23.	Maximum Operation:	8760 HOURS/YR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s): NO LIMIT REQUIRED, EXEMPT SOURCE (LISTED FOR INFORMATION ONLY)

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3 Facility ID No:
Sorrento Lactalis, Inc.		P-000726

4. Brief Project Description: Construction of a new whey dryer.

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: ☒ New Unit ☐ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:

6. Use of Boiler: ☒ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other:

7. Boiler ID Number: P-6	8. Rated Capacity: ☒ 48.99 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 4-1-09	10. Manufacturer: Cleaver Brooks	11. Model: 1200 HP
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		48,989		
17. Actual Consumption Rate		48,898		
18. Fuel Heat Content (Btu/unit, LHV)		1000		
19. Sulfur Content wt%				
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	
26. Operating Schedule (hours/day, months/year, etc.):	8760 hr/yr
27. NSPS Applicability: ☒ Yes ☐ No	If Yes, which subpart: Dc

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Baghouse Control Equipment - **Form BCE**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION			
1. Company Name:	Sorrento Lactalis, Inc.	2. Facility Name:	3. Facility ID No.: P-000726
4. Brief Project Description:	Construction of new whey dryer.		

EMISSION UNIT ID				BAGHOUSE			BAGS			
5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Emission Unit	EU ID No.	CE ID No.	Stack ID No.	Baghouse Manufacturer	Baghouse Model No.	Type	Type	Size (Dia x Ht)	No. of Bags	Air to Cloth
Shaking Bed Baghouse	P-5	P-5	P-5	TetraPak CPS	13-243-14	Reversed Air Jet	Polyester Micro Denier	6" x 14'	243	7.48

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Venturi Scrubber Control Equipment - **Form VSCE**
Revision 2
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION					
1. Company Name:	Sorrento Lactalis, Inc.	2. Facility Name:		3. Facility ID No.:	P-000726
4. Brief Project Description:	Construction of a new whey dryer.				

EMISSION UNIT ID				SCRUBBER						
5.	6.	7.	8.	9.	10.	11.	12.	13	14.	15.
Emission Unit	EU ID No.	CE ID No.	Stack ID No.	Manufacturer Name	Model No.	Efficiency (PM_{10}@70%, SO_2@50%, etc.)	Basis for Efficiency (i.e., guarantee, source test, etc.)	Design Scrubbing Liquid Flow (gpm)	Design Pressure Drop (in H_2O)	Design pH (for acid gas control)
Whey Dryer Scrubber	P-4	P-4	P-4	Fisher Klosterman, Inc.	MS-1200 Scrubber SS316	PM @ 99%	Vendor calculation	Injection rate = 556 Discharge Rate = 7.7 Fresh Make Up Water = 15.15	12	NA

Describe the maintenance required to assure the scrubber operates as designed (i.e. frequency of inspection, nozzle inspection, nozzle cleaning, etc.). (Provide an attachment if necessary.) Maintenance requirements to be provided by manufacturer and will be incorporated into O&M Manual. Monitoring to ensure correct operation will include: pressure drop across venturi, circulation washing liquid flowrate, and circulation washing liquid density.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION
Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	**Sorrento Lactalis, Inc.**
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of a new whey dryer.

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	**Stack ID**	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
Meyers-Sterner Dryer	P-1	1.60	7.00	0.00	0.02	0.27	1.20	2.24	9.80	0.03	0.14	0.00	0.00
TP Whey Dryer Burner 1	P-2	0.10	0.42	0.01	0.03	0.50	2.20	3.89	17.05	0.07	0.30	0.00	0.00
TP Whey Dryer Burner 2	P-3	0.10	0.42	0.01	0.03	0.50	2.20	3.89	17.05	0.07	0.30	0.00	0.00
TP Whey Dryer Scrubber	P-4	5.66	24.80										
TW Shaking Bed Baghouse	P-5	3.32	14.60										
1200 HP Cleaver Brooks Boiler	P-6	0.37	1.60	0.03	0.13	4.90	21.50	4.12	18.00	0.27	1.20	0.00	0.00
600 HP Superior Boiler	P-7	0.19	0.84	0.02	0.07	2.50	11.00	2.11	9.20	0.14	0.60	0.00	0.00
600 HP Cleaver Brooks Boiler	P-8	0.19	0.82	0.02	0.06	2.40	10.70	2.10	9.00	0.13	0.59	0.00	0.00
800 HP Hurst Boiler	P-9	0.26	1.10	0.02	0.09	3.40	14.70	2.80	12.40	0.18	0.81	0.00	0.00
name of the emissions unit10													
name of the emissions unit11													
name of the emissions unit12													
name of the emissions unit13													
name of the emissions unit14													
name of the emissions unit15													
name of the emissions unit16													
name of the emissions unit17													
name of the emissions unit18													
name of the emissions unit19													
name of the emissions unit20													
name of the emissions unit21													
(insert more rows as needed)													
Total		11.78	51.60	0.10	0.43	14.47	63.50	21.15	92.50	0.89	3.94	0.00	0.00

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION
Revision 2
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of a new whey dryer.

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	Fugitive ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Fugitive Source(s)													
NA - No fugitive sources identified													
name of fugitive source2													
name of fugitive source3													
name of fugitive source4													
name of fugitive source5													
name of fugitive source6													
name of fugitive source7													
name of fugitive source8													
name of fugitive source9													
name of fugitive source10													
name of fugitive source11													
name of fugitive source12													
name of fugitive source13													
name of fugitive source14													
name of fugitive source15													
name of fugitive source16													
name of fugitive source17													
name of fugitive source18													
name of fugitive source19													
name of fugitive source20													
name of fugitive source21													
(insert more rows as needed)													
Total													

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION
Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of a new whey dryer.

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	**Stack ID**	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
TP Whey Dryer Burner 1	P-2	0.10	0.42	0.01	0.03	0.50	2.20	3.89	17.05	0.07	0.30	0.00	0.00
TP Whey Dryer Burner 2	P-3	0.10	0.42	0.01	0.03	0.50	2.20	3.89	17.05	0.07	0.30	0.00	0.00
TP Whey Dryer Scrubber	P-4	5.66	24.80										
TW Shaking Bed Baghouse	P-5	3.32	14.60										
1200 HP Cleaver Brooks Boiler	P-6	0.37	1.60	0.03	0.13	4.90	21.50	4.12	18.00	0.27	1.20	0.00	0.00
name of the emissions unit6													
name of the emissions unit7													
name of the emissions unit8													
name of the emissions unit9													
name of the emissions unit10													
name of the emissions unit11													
name of the emissions unit12													
name of the emissions unit13													
name of the emissions unit14													
name of the emissions unit15													
name of the emissions unit16													
name of the emissions unit17													
name of the emissions unit18													
name of the emissions unit19													
name of the emissions unit20													
name of the emissions unit21													
(insert more rows as needed)													
Total		9.54	41.84	0.04	0.20	5.90	25.90	11.90	52.10	0.41	1.60	0.00	0.00

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

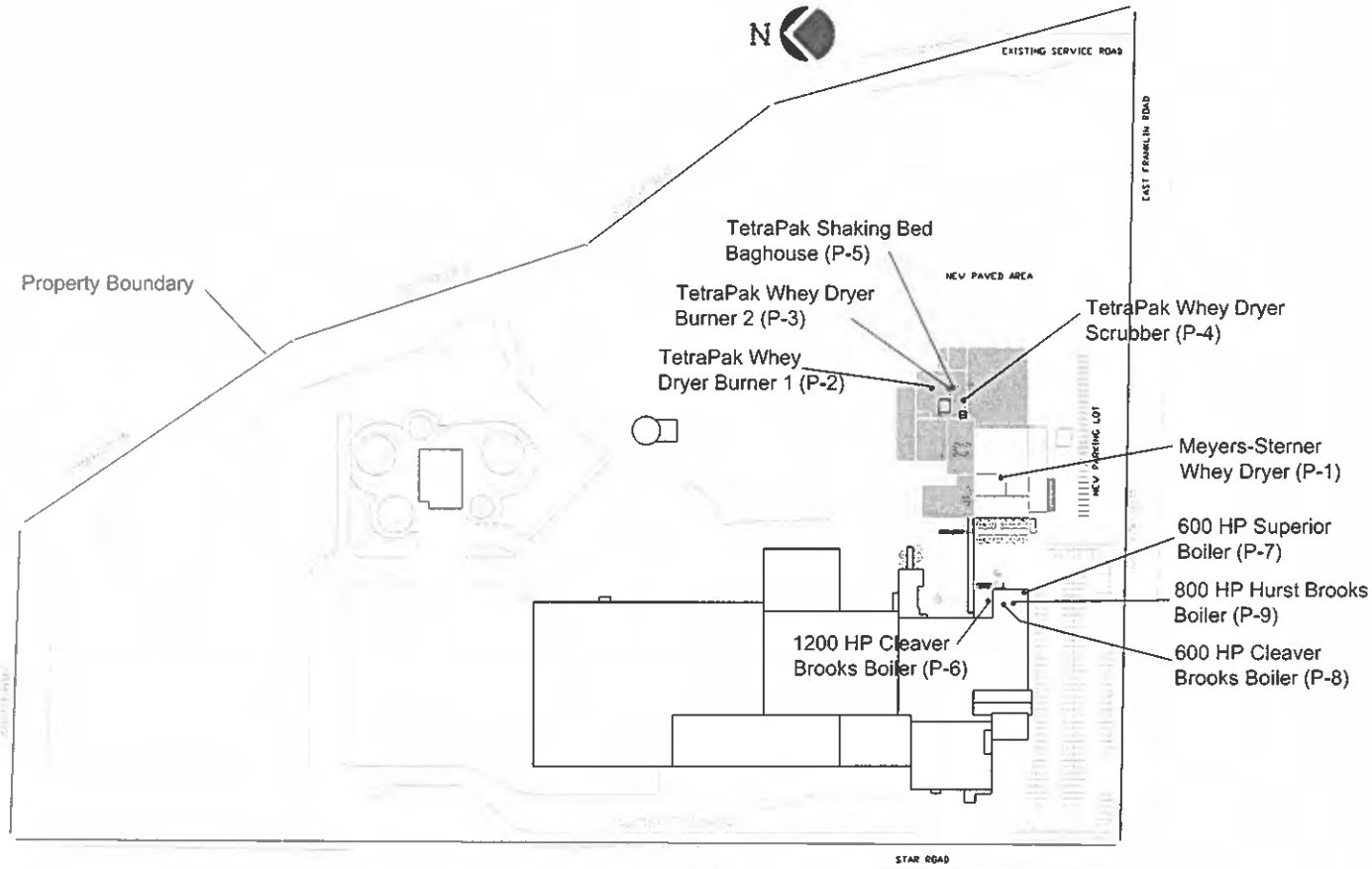
Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of a new whey dryer.

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - FUGITIVE SOURCES

1.	2.	3. Air Pollutant Maximum Change in Emissions Rate (lbs/hr or t/yr)											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	**Fugitive ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Fugitive Source(s)													
NA - No fugitive sources identified.													
name of fugitive source2													
name of fugitive source3													
name of fugitive source4													
name of fugitive source5													
name of fugitive source6													
name of fugitive source7													
name of fugitive source8													
name of fugitive source9													
name of fugitive source10													
name of fugitive source11													
name of fugitive source12													
name of fugitive source13													
name of fugitive source14													
name of fugitive source15													
name of fugitive source16													
name of fugitive source17													
name of fugitive source18													
name of fugitive source19													
name of fugitive source20													
name of fugitive source21													
(insert more rows as needed)													
Total													



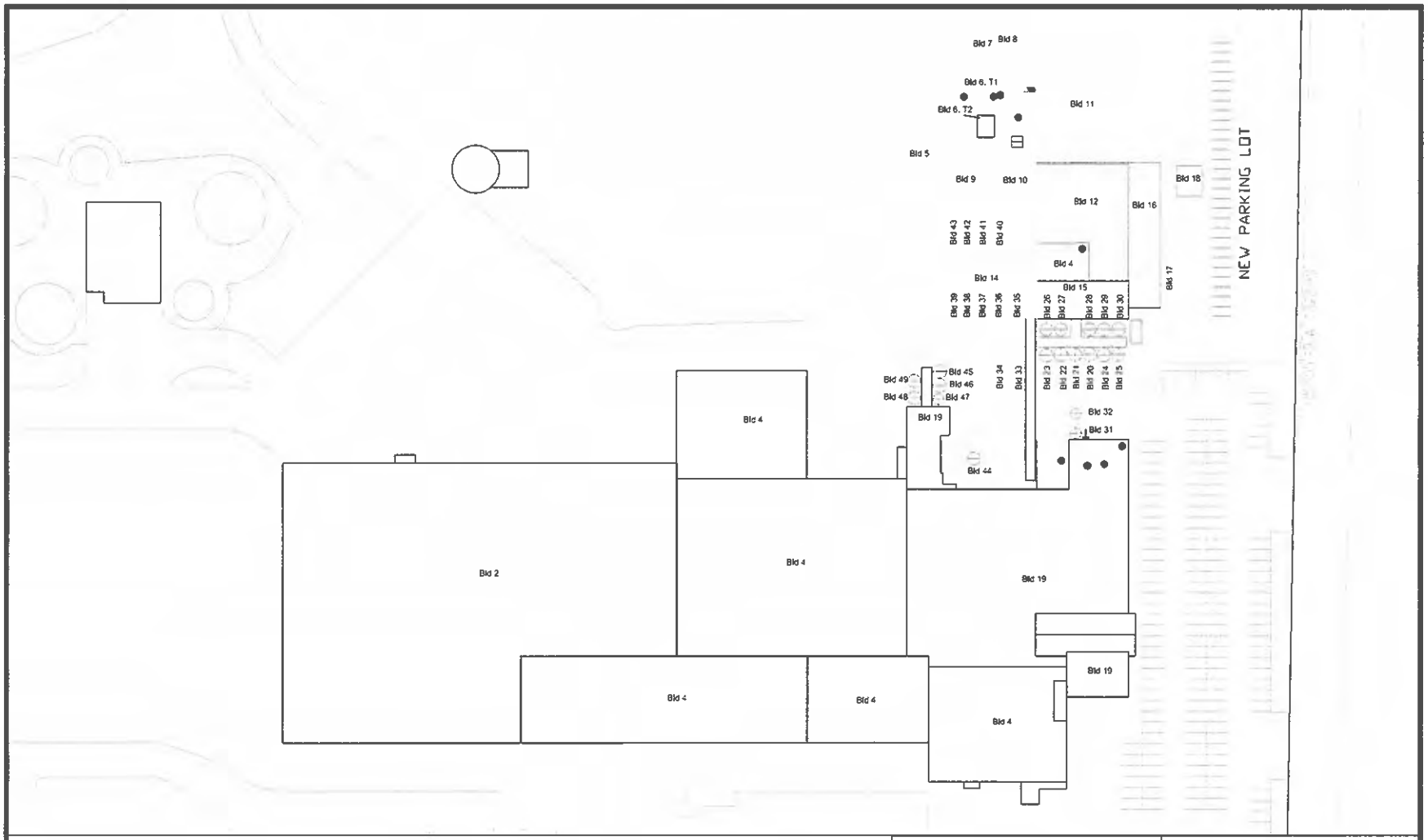
0 50 100 200
Scale
(feet)

MSE Millennium Science & Engineering, Inc.
1555 Shoreline Drive, Suite 150
Boise, ID 83702
(208) 345-8292 (phone)
(208) 344-8007 (fax)

Plot Plan with Emission Source Locations

Sorrento Lactalis, Inc.
Nampa, Idaho

2-20-09 | Figure 2



0 50 100 200

Scale
(feet)

N

MSE Millennium Science & Engineering, Inc.

1555 Shoreline Drive, Suite 150
Boise, ID 83702
(208) 345-8292 (phone)
(208) 344-8007 (fax)

Building ID Map

Sorrento Lactalis, Inc.
Nampa, Idaho

2-20-09

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of new whey dryer.

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (µg/m3)**	**Significant Contribution Level (µg/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour	21.00	5	25.46	84.00	109.46	150	73%
	Annual	5.20	1	7.94	27.00	34.94	50	70%
SO_2	3-hr		25				1300	
	24-hr		5				365	
	Annual		1				80	
NO_2	Annual		1	34.72	32.00	66.72	100	67%
CO	1-hr		2000	308.80	10,200.00	10,508.80	40000	26%
	8-hr		500	137.90	3,400.00	3,537.90	10000	35%

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION
Revision 3
3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of new whey dryer.

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
name of the emissions unit1	P-1	541,134.35	4,827,988.12	766.27	23.77	0.97	344.26	18,000.00	11.58	vertical
name of the emissions unit2	P-2	541,176.73	4,828,021.83	766.27	41.45	0.46	389.26	6,161.00	17.71	vertical
name of the emissions unit3	P-3	541,176.62	4,828,013.32	766.27	41.45	0.46	389.26	6,161.00	17.71	vertical
name of the emissions unit4	P-4	541,170.88	4,828,006.32	766.27	41.45	1.58	313.15	73,358.00	17.74	vertical
name of the emissions unit5	P-5	541,177.09	4,828,011.44	766.27	41.45	1.12	325.37	38,171.00	18.32	vertical
name of the emissions unit6	P-6	541,074.79	4,827,993.88	766.27	11.58	0.91	435.93	14,062.00	10.10	vertical
name of the emissions unit7	P-7	541,079.05	4,827,976.82	766.27	10.67	0.66	408.15	6,747.00	9.26	vertical
name of the emissions unit8	P-8	541,073.21	4,827,986.51	766.27	9.45	0.61	408.15	6,583.00	10.64	vertical
name of the emissions unit9	P-9	541,073.71	4,827,981.79	766.27	11.58	0.76	408.15	9,030.00	9.34	vertical
name of the emissions unit10										
name of the emissions unit11										
name of the emissions unit12										
name of the emissions unit13										
name of the emissions unit14										
name of the emissions unit15										
name of the emissions unit16										
name of the emissions unit17										
name of the emissions unit18										
name of the emissions unit19										
name of the emissions unit20										
name of the emissions unit21										
(insert more rows as needed)										

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of new whey dryer.

FUGITIVE SOURCE PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Release Height (m)**	**Easterly Length (m)**	**Northerly Length (m)**	**Angle from North (°)**	**Initial Vertical Dimension (m)**	**Initial Horizontal Dimension (m)**
Area Source(s)										
No fugitve sources identified										
name of the emissions unit2										
name of the emissions unit3										
name of the emissions unit4										
name of the emissions unit5										
name of the emissions unit6										
name of the emissions unit7										
name of the emissions unit8										
name of the emissions unit9										
name of the emissions unit10										
Volume Source(s)										
name of the emissions unit11										
name of the emissions unit12										
name of the emissions unit13										
name of the emissions unit14										
name of the emissions unit15										
name of the emissions unit16										
name of the emissions unit17										
name of the emissions unit18										
name of the emissions unit19										
(insert more rows as needed)										

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION
Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of new whey dryer.

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Bld 2	IR	IR	766.27	13.41	1	
Bld 4	IR	IR	766.27	9.14	1	
Bld 5	35.69	9.56	766.27	10.97	1	
Bld 6	23.00	24.49	765.49	39.32	2	T2: L=6.18 W=4.93 H=45.42
Bld 7	11.05	5.67	766.27	30.18	1	
Bld 8	11.05	8.66	766.27	18.59	1	
Bld 9	20.46	15.08	766.27	30.18	1	
Bld 10	26.58	13.44	766.27	11.89	1	
Bld 11	IR	IR	766.27	10.97	1	
Bld 12	IR	IR	766.27	9.14	1	
Bld 13	IR	IR	766.27	22.25	1	
Bld 14	IR	IR	766.27	10.97	1	
Bld 15	IR	IR	766.27	8.53	1	
Bld 16	41.06	9.26	766.27	5.79	1	
Bld 17	16.87	4.48	766.27	5.49	1	
Bld 18	8.81	7.47	766.27	1.83	1	
Bld 19	IR	IR	766.27	6.40	1	
Bld 20	Circle	D 3.82	765.66	24.38	1	
Bld 21	Circle	D 3.82	765.66	24.38	1	
Bld 22	Circle	D 3.82	765.66	24.38	1	
Bld 23	Circle	D 3.82	765.66	24.38	1	
Bld 24	Circle	D 3.82	765.66	24.38	1	
Bld 25	Circle	D 3.82	765.66	24.38	1	

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Sorrento Lactalis, Inc.
Facility Name:	
Facility ID No.:	P-000726
Brief Project Description:	Construction of new whey dryer.

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Bld 26	Circle	D3.82	765.66	24.38	1	
Bld 27	Circle	D3.82	765.66	24.38	1	
Bld 28	Circle	D3.66	765.66	24.38	1	
Bld 29	Circle	D3.66	765.66	24.38	1	
Bld 30	Circle	D3.66	765.66	24.38	1	
Bld 31	Circle	D3.05	765.66	12.19	1	
Bld 32	Circle	D3.05	765.66	12.19	1	
Bld 33	Circle	D3.66	765.66	24.38	1	
Bld 34	Circle	D3.66	765.66	24.38	1	
Bld 35	Circle	D3.66	765.66	24.38	1	
Bld 36	Circle	D3.65	765.66	24.38	1	
Bld 37	Circle	D3.66	765.66	24.38	1	
Bld 38	Circle	D2.90	765.66	18.29	1	
Bld 39	Circle	D2.90	765.66	18.29	1	
Bld 40	Circle	D3.66	765.64	24.38	1	
Bld 41	Circle	D3.66	765.65	24.38	1	
Bld 42	Circle	D3.66	765.65	24.38	1	
Bld 43	Circle	D3.66	765.64	24.38	1	
Bld 44	Circle	D3.66	765.66	12.19	1	
Bld 45	Circle	D3.81	765.66	18.29	1	
Bld 46	Circle	D3.81	765.66	18.29	1	
Bld 47	Circle	D3.20	765.66	12.19	1	
Bld 48	Circle	D3.81	765.66	18.29	1	
Bld 49	Circle	D3.66	765.66	18.29	1	

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

AIR PERMIT APPLICATION

Revision 5
09/08/08

For each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION		
1. Company Name: Sorrento Lactalis, Inc.	2. Facility Name:	3. Facility ID No.: P-000726
4. Brief Project Description: Construction of new whey dryer.		

APPLICABILITY DETERMINATION	
5. Review current federal regulations and identify federal regulations that apply or appear to apply to the facility. You will list applicable regulations below in items 6-8.	☐ The facility is not subject to any federal regulations. If you checked this box, the form is now complete. ☒ Federal regulation(s) applies. Continue with item 6.
6. List applicable subpart(s) of the New Source Performance Standards (NSPS) (40 CFR part 60).	List of applicable subpart(s): Dc ☐ Not applicable.
7. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP), also called Maximum Achievable Control Technology (MACT), found in 40 CFR part 63.	List of applicable subpart(s): ☒ Not applicable.
8. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) found in 40 CFR part 61.	List of applicable subpart(s): ☒ Not applicable.
9. For each subpart identified above, conduct a complete regulatory analysis.	☒ Regulatory analysis complete. ☐ Not applicable. Explain why:
10. Will this facility be subject to compliance assurance monitoring (CAM) (40 CFR 64) as a result of this permitting action?	☒ NO, the facility is not subject to CAM at the time of this permitting action. Please explain why: Not a major source. ☐ YES If yes, please fill out DEQ Form CAM. ☐ Not applicable.
11. List applicable part(s) and subpart(s) of other federal regulations that are not included in items 7 through 9, and conduct a complete regulatory analysis.	List of all applicable part(s) and subpart(s): ☒ Not applicable.

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

Appendix 6

Pre-Permit Construction Approval Checklist

Department of Environmental Quality
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

AQ-CH-P004
Rev: 3
1/25/08

15- Day Pre-Permit Construction Approval Application Completeness Checklist

This checklist is designed to aid the applicant in submitting a complete pre-permit construction approval application.

I. Actions Needed Before Submitting Application

☒ Refer to the Rule. Read the Pre-Permit Construction requirements contained in IDAPA 58.01.01.213, Rules for the Control of Air Pollution in Idaho.

☒ Refer to DEQ's Pre-Permit Construction Approval Guidance Document. DEQ has developed a guidance document to aid applicants in submitting a complete pre-permit construction approval application. The guidance document is located on DEQ's website (go to http://www.deq.idaho.gov/air/permits_forms/permitting/ptc_prepermit_guidance.pdf

☒ Consult with DEQ Representatives. Schedule a meeting with DEQ to discuss application requirements before submitting the pre-permit construction approval application. The meeting can be in person or on the phone. Contact DEQ's Air Quality Permit Coordinator at (208) 373-0502 to schedule the meeting. Refer to IDAPA 58.01.01.213.01b.

☒ Schedule Informational Meeting. Schedule an informational meeting before submitting the pre-permit construction approval application for the purposes of satisfying IDAPA 58.01.01.213.02.a. The purpose for the informational meeting is to provide information about the proposed project to the general public. Refer to IDAPA 58.01.01.213.01.c.

☒ Submit Ambient Air Quality Modeling Protocol. It is required that an ambient air quality modeling protocol be submitted to DEQ at least two (2) weeks before the pre-permit construction approval application is submitted. Contact DEQ's Air Quality Modeling Coordinator at (208) 373-0502 for information about the protocol.

☒ Written DEQ Approved Protocol. Written DEQ approval of the modeling protocol must be received before the pre-permit construction approval application is submitted. Refer to IDAPA 58.01.01.213.01.c.

II. Application Content

Application content should be prepared using the checklist below. The checklist is based on the requirements contained in IDAPA 58.01.01.213 and DEQ's Pre-Permit Construction Approval Guidance Document.

☒ Pre-Permit Construction Eligibility and Proof of Eligibility. Pre-permit construction approval is available for minor sources and for minor modifications only. Emissions netting and emissions offsets are not allowed to be used. A certified proof of pre-permit construction eligibility must be submitted with the pre-permit construction approval application. Refer to IDAPA 58.01.01.213.01.

☒ Request to Construct Before Obtaining a Permit to Construct. A letter requesting the ability to construct before obtaining the required permit to construct must be submitted with the pre-permit construction approval application. Refer to IDAPA 58.01.01.213.01.c.

☒ Apply for a Permit to Construct. Submit a Permit to Construct application using forms available on DEQ's website at http://www.deq.idaho.gov/air/permits_forms/forms/ptc_general_application.pdf. Refer to IDAPA 58.01.01.213.01.a.

☒ Permit to Construct Application Fee. The permit to construct application fee must be submitted at the time the original pre-permit construction approval application is submitted. Refer to IDAPA 58.01.01.224.

☒ Notice of Informational Meeting. Within ten (10) days after the submittal of the pre-permit construction approval application, an information meeting must be held in at least one location in the region where the stationary source will be located. The information meeting must be made known by notice published at least ten (10) days before the information meeting in a newspaper of general circulation in the county in which the stationary source will be located. A copy of this notice, as published, must be submitted with the pre-permit construction approval application. Refer to IDAPA 58.01.01.213.02.a.

☒ Process Description(s). The process or processes for which pre-permit construction approval is requested must be described in sufficient detail and clarity such that a member of the general public not familiar with air quality can clearly understand the proposed project. A process flow diagram is required for each process for which pre-permit construction approval is requested. Refer to IDAPA 58.01.01.213.01.c.

☒ Equipment List. All equipment that will be used for which pre-permit construction approval is requested must be described in detail. Such description includes, but is not limited to, manufacturer, model number or other descriptor, serial number, maximum process rate, proposed process rate, maximum heat input capacity, stack height, stack diameter, stack gas flowrate, stack gas temperature, etc. All equipment that will be used for which pre-permit construction approval is requested must be clearly labeled on the process flow diagram. Refer to IDAPA 58.01.01.213.01.c.

☒ Scaled Plot Plan. It is recommended that a scaled plot plan be included in the pre-permit construction approval application and must clearly label the location of each proposed process and the equipment that will be used in the process.

☒ Proposed Emissions Limits and Modeled Ambient Concentration for All Regulated Air Pollutants. All proposed emission limits and modeled ambient concentrations for all regulated air pollutants must demonstrate compliance with all applicable air quality rules and regulations. Regulated air pollutants include criteria air pollutants (PM_{10}, SO_x, NO_2, O_3, CO, lead), toxic air pollutants listed pursuant to IDAPA 58.01.01.585 and 586, and hazardous air pollutants listed pursuant to Section 112 of the 1990 Clean Air Act Amendments (go to http://www.epa.gov/ttn/atw/188polls.html). Describe in detail how the proposed emissions limits and modeled ambient concentrations demonstrate compliance with each applicable air quality rule and regulation. It is requested that emissions calculations, assumptions, and documentation be submitted with sufficient detail so DEQ can verify the validity of the emissions estimates. Refer to IDAPA 58.01.01.213.01.c.

☒ Restrictions on a Source's Potential to Emit. Any proposed restriction on a source's potential to emit such that permitted emissions will be either below major source levels or below a significant increase must be described in detail in the pre-permit construction approval application. Refer to IDAPA 58.01.01.213.01.d.

☒ List all Applicable Air Quality Rules and Regulations. All applicable rules and regulations must be cited by the rule or regulation section/subpart that applies for each emissions unit. Refer to IDAPA 58.01.01.213.01.c.

☒ Certification of Pre-Permit Construction Approval Application. The pre-permit construction approval application must be signed by the Responsible Official and must contain a certification signed by the Responsible Official. The certification must state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. Refer to IDAPA 58.01.01.213.01.d and IDAPA 58.01.01.123.

☒ Submit the Pre-Construction Approval Application. Submit the pre-permit construction approval application to the following address:

Department of Environmental Quality
Air Quality Division
Stationary Source Program
1410 North Hilton
Boise, ID 83706-1255