THE AMALGAMATED SUGAR COMPANY
P. O. BOX 127 • TWIN FALLS, IDAHO 83303-0127 • PHONE (208) 733-4104

August 14, 2012

William Rogers, Regional Permit Program Coordinator
Air Quality Division
Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83706-1255

RE: Permit to Construct (PTC) Application
Sugar End & Energy Efficiency Improvements
The Amalgamated Sugar Company LLC (TASCO)
Twin Falls Facility (Facility ID No. 083-00001)

Dear Bill,

The Amalgamated Sugar Company LLC (TASCO) appreciated the opportunity to meet with you on July 16, 2012 to discuss proposed sugar end and energy efficiency improvements for the Twin Falls facility. This project primarily involves the installation of a third white vacuum pan and replacement of the existing No. 1 evaporator with a more efficient evaporator. In addition, the Twin Falls facility is proposing to "split" the sugar end to decrease internal recycling of materials. TASCO submits the attached PTC application for these improvements. The application is divided into the following sections:

- Section 1 – Application Forms
- Section 2 – Project Description
- Section 3 – Process Flow Diagram
- Section 4 – Applicable Requirements
- Section 5 – Emissions Estimates & Limitations
- Section 6 – Facility Classification
- Section 7 – Ambient Air Quality Impact Analysis

Based on a detailed analysis, overall projected emissions from the facility are expected to remain the same or decrease as a result of these improvements. For permitting purposes, however, the Twin Falls facility is requesting minor increases in carbon monoxide (CO) and volatile organic compound (VOC) emissions.

If there are any questions, feel free to contact either Gary Lowe at (208) 733-4104 or Dean C. DeLorey at (208) 383-6500.

Sincerely,

Gary Pool
The Amalgamated Sugar Company LLC
Plant Manager, Twin Falls Facility

DD/ss

Att:

Cc: IDEQ Twin Falls Regional Office – Bobby Dye
Boise Office – Joe Huff, Dean C. DeLorey, Bob Braun, John McCreedy
TF Office – Gary Lowe, Jorge DeVarona, Stan Case

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: The Amalgamated Sugar Company LLC

2. Existing facility identification number: 083-00001

☐ Check if new facility (not yet operating)

3. Brief project description: Sugar End & Energy Efficiency Improvements

Facility Information

4. Primary facility permitting contact name: Gary Pool — **Contact type:** Responsible official

Telephone number: (208) 733-4104 — **E-mail:** gpool@amalsugar.com

5. Alternate facility permitting contact name: Gary Lowe — **Alternate contact type:** Facility permitting contact

Telephone number: (208) 733-4104 — **E-mail:** glowe@amalsugar.com

6. Mailing address where permit will be sent (street/city/county/state/zip code):
P.O. Box 127
Twin Falls, ID 83303

7. Physical address of permitted facility (if different than mailing address) (street/city/county/state/zip code):
2320 Orchard Drive East
Twin Falls, Twin Falls County, ID 83301

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

9. NAICS codes: Primary NAICS: 311313 — Secondary NAICS:

10. Brief business description and principal product produced: Beet Sugar Manufacturing/Granulated Sugar

11. Identify any adjacent or contiguous facility this company owns and/or operates: None

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: Gary Pool — **Official's title:** Plant Manager

Official's address: P.O. Box 127 Twin Falls ID 83303

Telephone number: (208) 733-4104 — **E-mail:** gpool@amalsugar.com

Official's signature: Gary Pool — **Date:** August 14, 2012

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

Section 2 – Project Description

2.0 Introduction

The purpose of this project is to increase the daily sugar granulation capacity and improve the overall energy efficiency of the facility. This section provides a general overview of the facility, detailed description of the proposed improvements and related emissions sources.

2.1 General Facility Description

The Twin Falls processing facility processes sugar beets and intermediate products into refined granulated sugar and feed products for commercial and retail markets. The Twin Falls factory is located just south of Twin Falls, Idaho. The facility was originally constructed in 1917 and is owned by The Amalgamated Sugar Company LLC. The Twin Falls factory is a seasonal operation, and as such, has varying lengths of runs and overall annual throughput and production. The size and quality of the beet crop can vary significantly each year as a result of many factors including weather conditions and availability of irrigation water. The annual beet crop is harvested and processed during fall and winter, while sugar is granulated nearly year-around.

The Twin Falls facility consists of two main production lines, the Beet End and Sugar End. Both lines are housed in the main mill complex. Within the Beet End, sugar beets are processed to produce thick juice and byproducts including animal feed. Within the Sugar End, thick juice is processed to produce dry granulated sugar and molasses. The boiler house provides steam energy for the Beet and Sugar Ends to evaporate water, heat sugar juice and produce onsite power.

The Beet End processes consist of: 1) Beet cleaning to remove dirt, rocks and other foreign material; 2) Slicing and diffusion to extract raw sugar juices; 3) Juice purification to remove impurities; 4) Evaporation to concentrate purified sugar juices into thick juice which is transferred to the sugar end to make finished product and into storage tanks for processing later; and 5) Pulp drying. In addition to the boiler house, supporting equipment for the Beet End includes: pulp pressing, drying and pelletizing for animal feed and; lime and CO_2 production for the juice purification process.

Within the Sugar End, purified and concentrated thick juices are processed into dry granulated sugar and molasses. Granulated sugar is stored and then either shipped in bulk or packaged for customers. The Twin Falls facility also desugarizes molasses utilizing a chromatographic separator process and crystallization.

A general flow diagram of the entire process and supporting equipment is provided in Section 3.1 of this application.

During each year, there are three distinctive processing periods for the Twin Falls facility. During the Beet Campaign, the entire facility is in full operation including the beet end, sugar end and molasses separator. When all sugar beets are processed, the beet end is shut down and the sugar end and molasses separator continue to operate known as the Juice Run. During the Juice Run, the sugar end equipment is operated to process thick juice from storage or juice transferred from other facilities. The final operating period is known as the Separator Only Run at which time the molasses separator is operated without the sugar-end in operation.

For the purposes of this proposed project, the evaporation process, sugar end process and boiler house are further discussed.

2.1.1 Evaporation Process

The evaporation process within the beet end increases the sucrose concentration in purified sugar juices utilizing five multi-effect evaporators. Steam flow from the boilers (after reducing the pressure through the turbine generators) is used to boil thin juice in the first evaporator. The steam vapor from the water evaporated in the first evaporator is used to heat the partially concentrated juice in the second evaporator. This transfer of heat continues through five evaporators each at a lower pressure. Pressures are gradually reduced through each evaporator in series due to a barometric condenser which creates a vacuum on the fifth effect evaporator. This allows the juice to boil at the lower temperatures provided in each subsequent evaporator. After evaporation, the percentage of sucrose in the "thick juice" is 63-65 percent.

Steam vapor released from the evaporators is also used as a heat source for other process equipment throughout the plant. Within the beet end, steam vapors are primarily used to gradually heat sugar juices using indirect heaters. Within the sugar end, steam vapors from the evaporators are used for the vacuum pans, crystallizers and granulators.

The sugar end is capable of processing up to ~90 % of the thick juice from the beet end. The remaining thick juice is transferred to storage tanks for processing during the Juice Run.

2.1.2 Sugar End Process

Sugar is crystallized by low-temperature pan boiling utilizing steam vapors from the evaporators. Standard liquor produced from thick juice and raw sugars is boiled in vacuum pans until it becomes supersaturated. To begin crystal formation, the liquor is "seeded" with finely milled sugar. The seed crystals are carefully grown through control of the vacuum, temperature, feed liquor additions, and steam. When the crystals reach the desired size, the mixture of liquor and crystals, known as massecuite or fillmass, is discharged to the mixer. From the mixer, the massecuite is poured into high-speed centrifugals, in which the liquid is centrifuged into the outer shell, and the crystals are left in the inner centrifugal baskets. While spinning within the centrifugals sugar crystals are washed with hot water. The sugar crystals are then sent to drying granulator and a fluidized bed cooler which dries and cools the granulated sugar. After cooling, the sugar is stored in large silos for future packaging.

The liquid separated from the sugar crystals in the centrifugals is called syrup. This syrup serves as feed liquor for the "second boiling" and is transferred into a second set of vacuum pans. The crystallization/centrifugation process is repeated once again, resulting in the production of molasses.

Molasses from the third boiling or from storage tanks is desugarized using a chromatographic separator process. The products of the separator process are "extract" (the high sugar fraction), "raffinate" (the low sugar fraction) and betaine. Each of these products is concentrated using evaporators. Similar to thick juice, the extract can be stored in tanks or immediately processed in the sugar end. The concentrated raffinate (better known as concentrated separator byproduct or "CSB") is used as livestock feed in either a liquid form or added to pulp.

2.1.3 Boiler House

The boiler house, which provides steam to produce power and the first effect evaporator, consists of the following boilers:

- Foster Wheeler Boiler (S-B1) - Stoker coal firing, maximum rated capacity of 200,000 lbs steam per hour, equipped with a baghouse.

- B&W Boiler (S-B2) - Dual-fired with pulverized coal and/or natural gas, Maximum rated capacity of 200,000 lbs steam per hour, equipped with a baghouse and low NOx burners.

- Keeler Boiler (S-B3) – Natural gas firing, maximum rated capacity of 80,000 lbs steam per hour.

Daily boiler steam production rates vary depending on the three distinctive processing periods discussed above. The highest steam usage rates are required for the beet campaign while the lowest rates are required for the separator only run.

2.2 Project Description

The primary purpose of this project is to increase the average daily sugar production rate while maintaining or reducing overall boiler energy usage and steam production rates. There are three (3) phases involved with this project. The first phase involves the installation of a 3rd white pan and associated equipment within the sugar end to increase granulation capacity and reduce energy. For the second phase, the Twin Falls facility is proposing to replace the No.1 evaporator and other equipment to improve the overall efficiency of the facility during the beet processing period and juice runs. In the third phase, the sugar-end would be split so extract (from the molasses separator) can be crystallized without co-mingling syrups from thick juice. This will improve final product quality and decrease internal recycle of materials. Detailed process flow diagrams of the equipment changes are provided in Section 3.2 (Beet End) and Section 3.3 (Sugar End) of this application.

The 3rd white vacuum pan will be manufactured by Honiron. The new 1st effect evaporator will have a falling film plate pack heat exchanger that will increase its heating area. The plate pack is designed by GEA PHE Systems North America. The increased area will allow the shifting of vapors that boil the white pans from first and second effect vapors to the third effect vapor. This will save steam energy and with the new white pan, allow for increased sugar production. The goal of the project is to increase the efficiency of the sugar end equipment and average daily sugar production by approximately 10% to 22,000 cwt per day. Increasing the sugar production during the beet campaign will also reduce the number of juice run days required to process the juice produced during the Twin Falls beet campaign.

In addition, in order to improve the overall efficiency of the sugar end, the Twin Falls facility is also considering "splitting" extract processing separate from thick juice processing. This improvement would involve the installation of additional sugar end equipment (vacuum pans, crystallizer and centrifugals). Sugar produced from separating the extract is accounted for as part of the increased sugar production rates discussed above. The Twin Falls facility requests that IDEQ recognize this potential equipment change as part of the overall project.

As a result of the energy efficiency improvements, overall boiler steam usage rates and/or boiler emissions are designed to either remain the same or decrease compared to baseline operations. Sections 4 and 5 of this application provide a detailed discussion of baseline and future emissions estimates.

SECTION 3.1
GENERAL PROCESS FLOW DIAGRAM

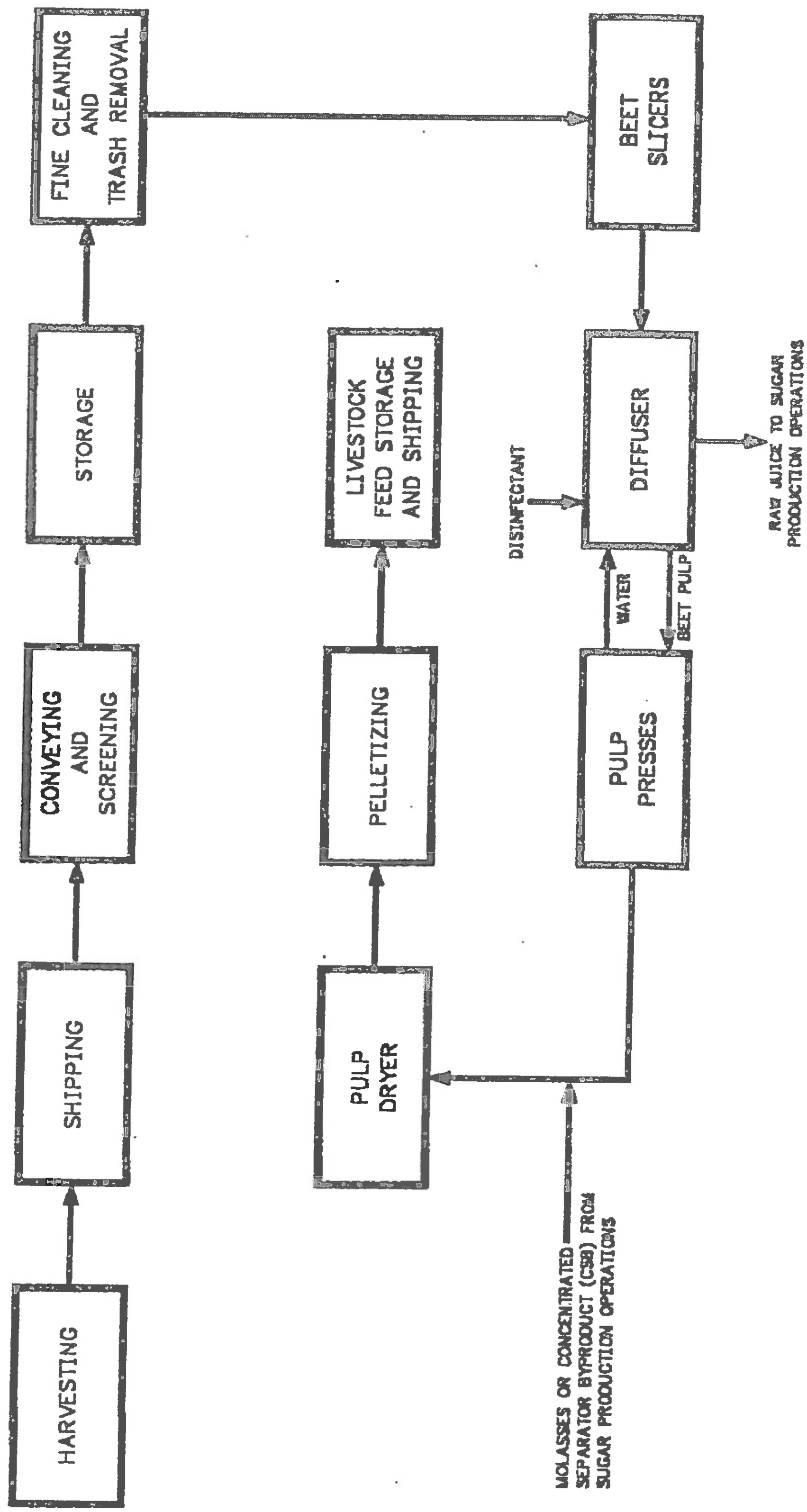


FIG. 1C-1. PREPROCESSING AND LIVESTOCK FEED PRODUCTION OPERATIONS AT A SUGAR BEET PROCESSING PLANT

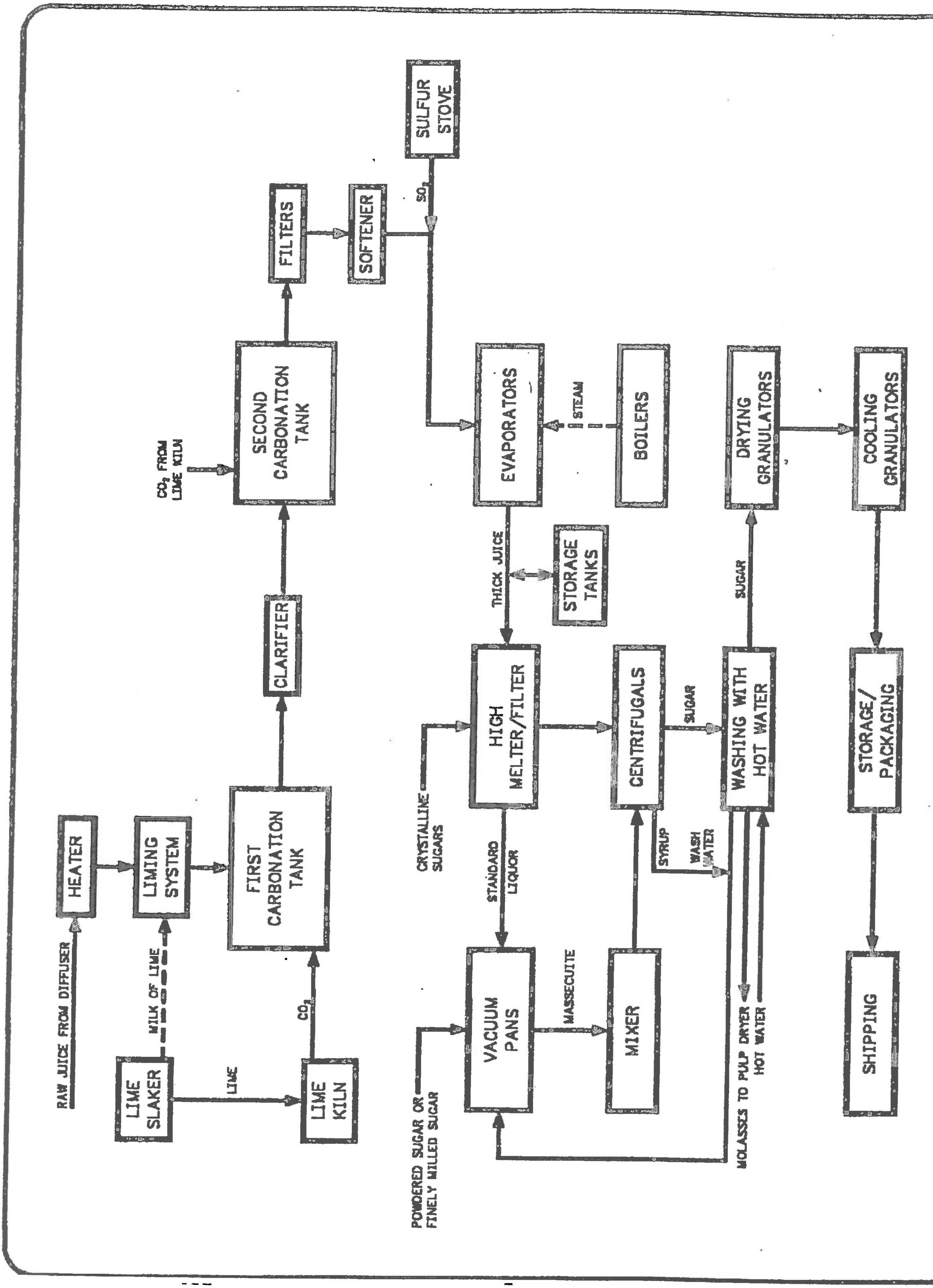
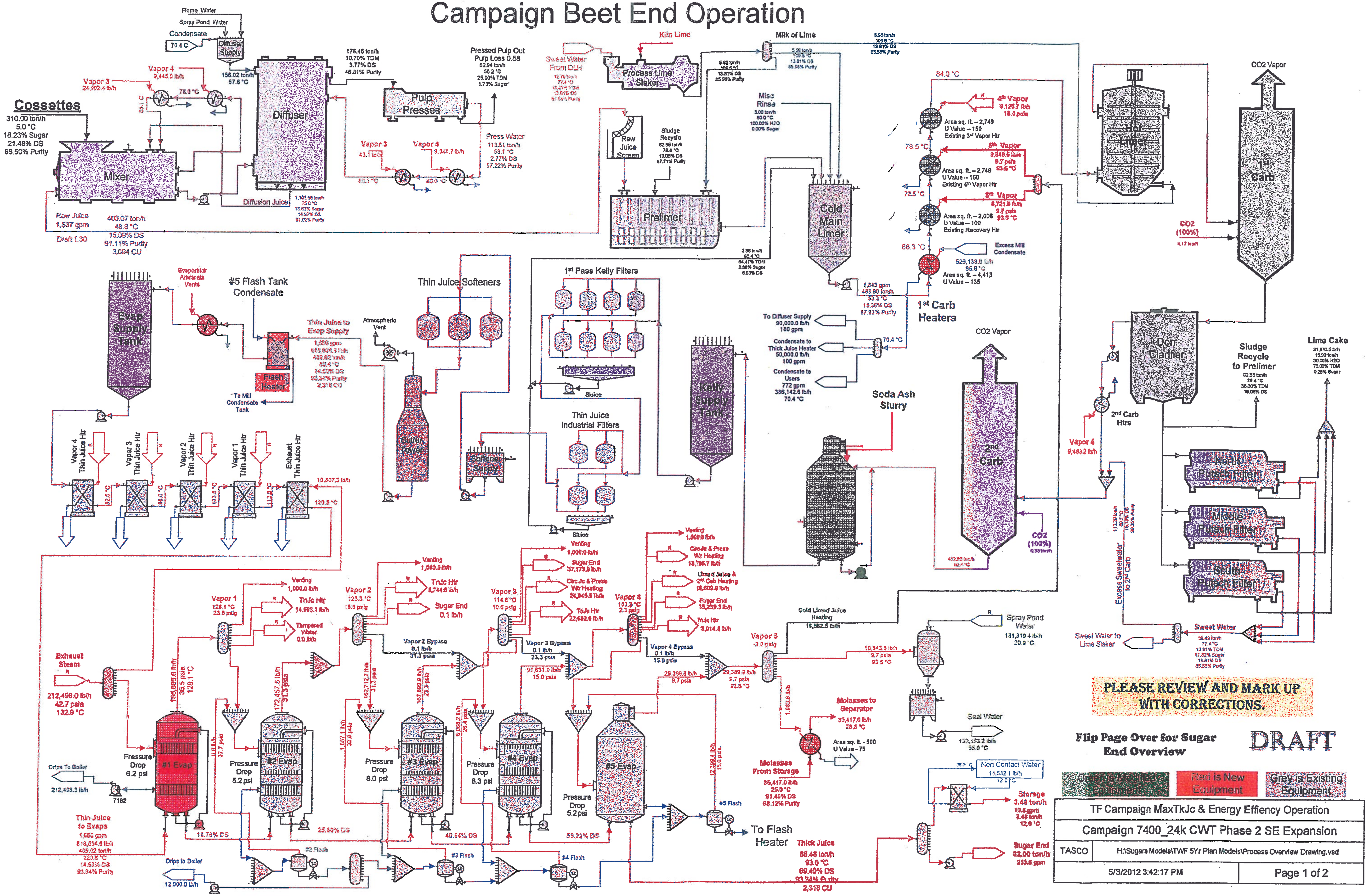


FIG. 1C-2. SUGAR PRODUCTION OPERATIONS AT A SUGARBEET PLANT

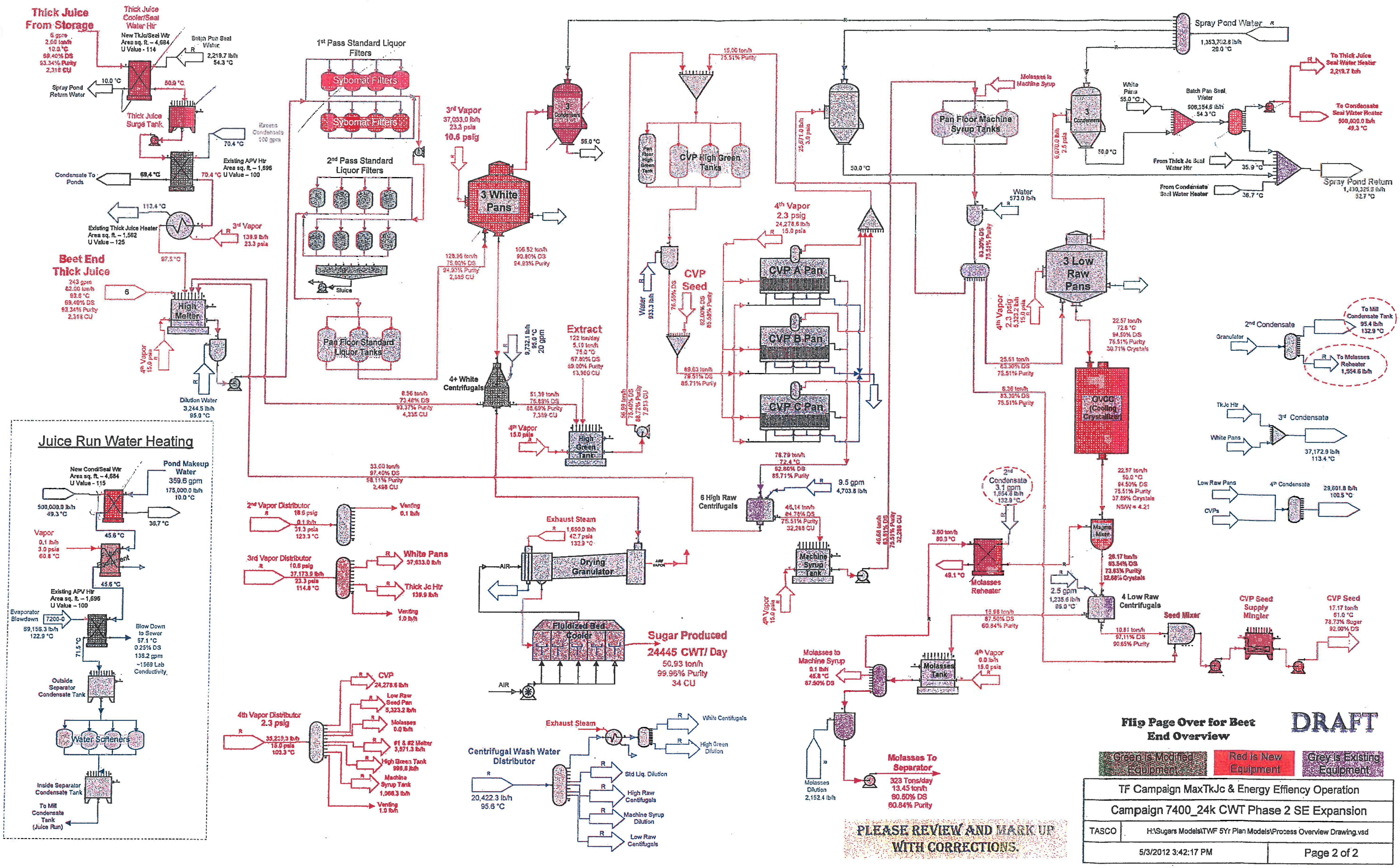
SECTION 3.2
BEET END PROCESS FLOW DIAGRAM

Campaign Beet End Operation

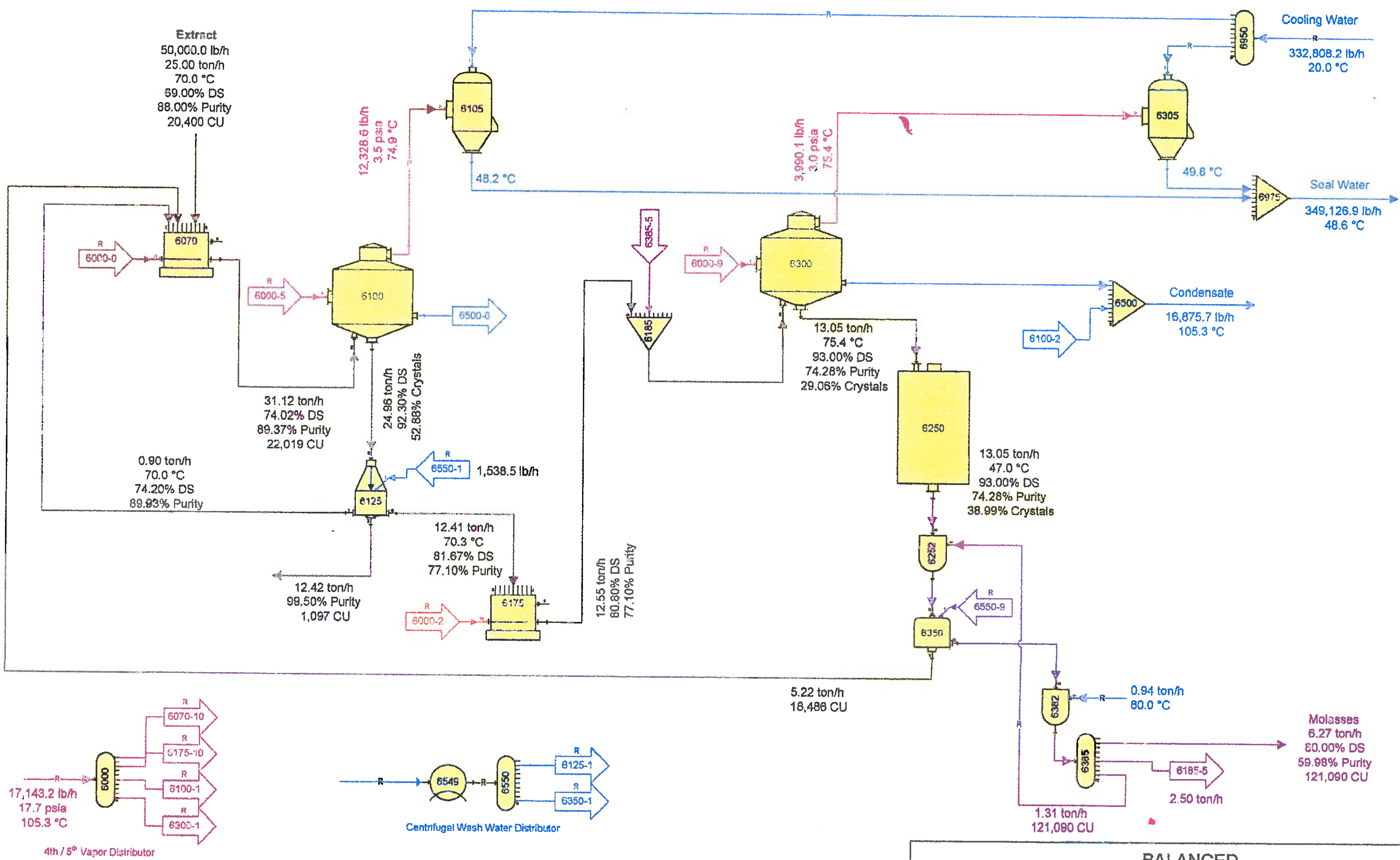


SECTION 3.3
SUGAR END PROCESS FLOW DIAGRAM

Campaign Sugar End Operation



Sugar End - Extract



BALANCED	
Sugars International LLC	Y:\Common\Sugars Models\TF SE Modification\Twin Falls Fctry Modified Sugar End-Btch 2 Boil_Rebuilt.vsd
8/6/2012 9:33:52 AM	1

Section 4 - Applicable Requirements

The Amalgamated Sugar Company LLC (TASCO) has conducted a detailed analysis of the Federal and Idaho state air permitting requirements for this project. The 3rd white pan, No. 1 evaporator, and equipment associated with "splitting" the sugar end are insignificant sources of emissions. Federal new source review (NSR) requirements also require an evaluation of facility wide emissions sources including the boilers, pulp dryers and lime kilns before and after the project. The boilers provide steam either directly or indirectly to the new equipment. The project has been specifically designed with energy efficiency improvements to maintain or reduce overall boiler steam production rates and associated boiler emissions. Beet slicing, pulp drying and lime kiln operations are not impacted by this project.

The following discussion primarily focusses on applicable permitting requirements and emissions associated with the new equipment. Specific emissions standards, monitoring and record keeping requirements for the boilers, pulp dryers, lime kilns and other emissions sources, are not discussed as part of this evaluation. Requirements for these existing emission sources are provided in the Tier I Operating Permit (T1-050415 issued on October 7, 2011).

The Twin Falls facility will continue to operate in accordance with the Tier 1 Operating Permit requirements. This project does not affect the Tier I permit emissions limitations and maximum hourly/daily capacities of the beet end, boiler house, pulp drying system and lime kiln operations. Emissions increases associated with this analysis are primarily a result of the net increase hours of operation between baseline operations and projected operations.

Federal Requirements

Title 40 CFR Part 52

The Amalgamated Sugar Company LLC (TASCO) has conducted a detailed applicability analysis of the PSD regulations for this project (40CFR 52.21). The Twin Falls facility is an existing major emissions source. Therefore, a "project", as defined by 52.21(b)(52) means a "physical change in, or change in the method of operation of, an existing major stationary source." The primary facility changes associated with this "project" are the installation of a 3rd white pan, replacement of the No. 1 evaporator, and equipment associated with splitting the sugar end (vacuum pans, crystallizer and centrifugals).

As per the PSD regulations, a project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases: 1) A significant emissions increase and 2) A significant net emissions increase. The regulations specify a two part test to make this determination. The first test is to determine if the project will cause a significant emissions increase as specified in 52.21(a)(2)(iv)(b) through (f). The second test, if required, is used to determine if the project will cause a significant net emissions increase, specified in 52.21(a)(2)(iv)(b) and 52.21 (b)(3). Future projected actual emissions (PAE) and baseline actual emissions (BAE) were compared to determine whether a significant emissions increase would occur in accordance with 40 CFR 52.21(a)(2)(iv)(c).

Baseline actual emissions for calculating the net emission increase for this request is defined in 40 CFR Part 52.21(b)(48)(ii). The Baseline actual emissions are defined as the average rate in tons per year, at which the emission units actually emitted the pollutant during a 24-month consecutive period. The 24 month period selected for this analysis is the average for the 2003 and 2004 beet campaigns (including juice runs and separator only).

Contemporaneous emissions changes have also been addressed. In August 2011, the Twin Falls facility began operation of a new sugar granulation system (two stage rotating drum dryer/cooler followed by a fluidized bed cooler). This new system replaced an outdated drying and cooling granulator system. A Permit to Construct was issued by IDEQ for the new system on October 25, 2010. As a result, contemporaneous emissions changes associated with these equipment changes are reflected in the net emissions calculations.

A summary of estimated facility wide baseline actual emissions, projected actual emissions and net emissions changes are provided in Table 1.

As shown in Table 1 for this permitting analysis projected actual PM_{10}, NO_x and SO_2 emissions decrease compared to baseline emissions. This is due to a small percentage increase in natural gas usage by the B&W and/or Keeler boilers. If natural gas prices are competitive compared with coal, future projected emissions will likely be lower than these estimates. Projected actual emissions for CO and VOC are slightly higher than the baseline emissions. These increases are due to a 198 day beet campaign requested for future operations compared to a 177 day baseline beet campaign. For CO, the Twin Falls facility is also requesting an additional 90 ton per year as a buffer for future operations. The requested net emissions increases for both CO and VOC are not significant. Requested annual limitations are also identified in Table 1 and further discussed in Section 5.6 of this application.

Supporting documentation, for the emissions data in Table 1, is provided in Sections 5.1 thru 5.5. These spreadsheets, which have also been provided electronically, include the emission estimates, emission factors and production data. For the purposes of this permit application, assume 100% of the PM_{10} is $PM_{2.5}$. Section 5.6 also provides greenhouse gas emission estimates.

Table 1. – Facility-Wide Baseline Actual Emissions (BAE) versus Predicted Actual Emissions (PAE)

Type of Emissions	$PM_{2.5}/PM_{10}$ (t/y)	NO_x (t/y)	SO_2 (t/y)	CO (t/y)	VOC (t/y)
Baseline Actual	352[a]	1228[a]	2219[a]	1902	60
Shutdown of Old Granulation System	-9	---	---	---	---
Operation of New Granulation System	+2	---	---	---	---
Other Emissions Changes	-1	-28	-112	+99	+8
Projected Actual	342	1200	2107	2001[a]	68[a]
Net Change	-10	-28	-112	99	8
PSD Significant Emission Rate	15	40	40	100	40
Significant	No	No	No	No	No

[a] Proposed limitations as per IDEQ PTC application requirements.

New Source Performance Standards (NSPS – 40 CFR Part 60)
The new equipment associated with this project is not subject to any NSPS requirement.

National Emissions Standards for Hazardous Air Pollutants (NESHAP Title 40 CFR Part 63)
The new equipment associated with is project is not subject NESHAP requirements.

Rules for the Control of Air Pollution in Idaho

This application has been prepared in accordance with procedures and requirements for permits to construct (IDAPA 58.01.01.200). The following is a summary of applicable permit application and emissions standard requirements for this project:

IDAPA 58.01.01.123 Certification of Documents
The required certification is provided in the cover letter of this document.

IDAPA 58.01.01.128 Confidential Information
The information submitted in the application is subject to public disclosure unless submitted under a secret trade claim.

IDAPA 58.01.01.156 Total Compliance
The facility understands that when more than one section of rules applies then all such rules must be met to be considered in compliance.

IDAPA 58.01.01.157 Test Methods and Procedures
The facility understands that source testing performed at the facility must be conducted in accordance with the requirements of Section 157.

IDAPA 58.01.01.201 Permit to Construct Required
The facility will obtain a permit to construct from the Department which satisfies the requirements of Sections 200 through 208.

IDAPA 58.01.01.203 Permit Requirements for New and Modified Stationary Sources
This permit application demonstrates that the project will comply with all applicable emissions standards, ambient air quality standards, and toxic air pollutant increments.

IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards
This permit application demonstrates preconstruction compliance with the Toxic Standards.

IDAPA 58.01.01.211 Conditions for Permits to Construct
The facility understands that the Department may impose any reasonable conditions in the permit and that the Department may cancel the permit if construction has not begun within two years of the date of issuance. The facility will notify the Department between 30 and 60 days prior to startup and the actual startup date will be submitted to the Department with 15 days after such date.

IDAPA 58.01.01.212 Obligation to Comply
The facility understands that the permit to construct will not relieve them of the responsibility to comply with all applicable regulations.

IDAPA 58.01.01.223 Exemption Criteria, Recordkeeping, and Reporting for Toxic Air Pollutant Emissions
Only trace levels of TAP's net increases are estimated to occur. The net changes in TAP's are based on the net difference between baseline and the future requested permitted operations. Based

on a review of the trace levels of TAP's emissions, the project would be exempt from PTC requirements as per IDAPA 58.01.01.223.04. As required in 58.01.01. 223.05 an annual report for the exemption analysis is due May 1st each year. The TAP Exemption Analysis has been completed and is included in Section 7 of this permit application.

<u>IDAPA 58.01.01.224 Permit to Construct Application Fee</u>
The facility has submitted a check for $1,000 for the processing of this application.

<u>IDAPA 58.01.01.225 Permit to Construct Processing Fee</u>
A processing fee of $1,000 is required for a new source or modification to an existing source with an increase of emissions of less than one (1) ton per year or 100 tons. The facility submitted payment for the Permit to Construct processing fee.

<u>IDAPA 58.01.01.226 Payment of Fees for Permits to Construct</u>
The facility understands that the permit will not be issued by the Department until it has received payment for the processing fee.

<u>IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants</u>
Except for CO, both short term and long term emissions rates are expected to remain the same or decrease as a result of this project. Future projected annual emissions may increase for CO, however short term CO emissions will remain the same or decrease. As a result, an ambient air quality impact analysis is not required for this project.

<u>IDAPA 58.01.01.578 Designation of Attainment, Unclassifiable, and Nonattainment Areas</u>
The Twin Falls facility is located in Twin Falls County which is currently classified as unclassifiable or attainment for criteria pollutants. The applicant acknowledges that DEQ annually reviews areas for classification.

<u>IDAPA 58.01.01.585 Toxic Air Pollutants Non-Carcinogenic Increments</u>

This rule does not apply. Short-term daily non-carcinogenic emissions are not expected to increase as a result of this project.

<u>IDAPA 58.01.01.586 Toxic Air Pollutants Carcinogenic Increments</u>
Due to increased hours of operation between baseline and future requested permitted operations, potential increases of formaldehyde and acetaldehyde were evaluated. Estimated emissions exceed their respective screening emission levels. See the ambient impact assessment in Section 7.0.

<u>IDAPA 58.01.01.590 New Source Performance Standards</u>
The new equipment associated with this project is not subject to any NSPS requirement.

IDAPA 58.01.01.591 National Emission Standards for Hazardous Air Pollutants
The new equipment associated with this project is not subject NESHAP requirements.

IDAPA 58.01.01.625 Visible Emissions
Based on observations of steam vents associated with this the new equipment there are no visible emissions from these sources since the steam vents are greater than 99% water vapor.

IDAPA 58.01.01.650 & 651 Rules for the Control of Fugitive Emissions & General Rules
The new equipment is not a source of fugitive dust.

IDAPA 58.01.01.675 & 676 Fuel Burning Equipment – Particulate Matter & Standards for New Source

The new equipment is not categorized as fuel burning equipment.

IDAPA 58.01.01.700--702 Particulate Matter – Process Weight Limitations
Particulate emissions from the evaporator steam vents are insignificant.

IDAPA 58.01.01.775 Rules for the Control of Odors
These improvements are not expected to increase or alter the generation of odors from the facility.

SUMMARY OF CRITERIA POLLUTANT ACTUAL FACILITY EMISSIONS

Baseline vs. Future

Twin Falls Facility

Year	PM10	SO2	CO	NO x	VOC	Production Summary							
						Days			Steam (klbs steam)				
						Beet	Juice	Sep. Only	Total	Coal	%	Gas	%
Baseline	352	2219	1902	1228	60	177	100	66	2,221,500	2,173,500	97.8%	48,000	2.2%
Future-2014	342	2107	1911	1200	68	198	82	60	2,221,500	2,073,500	93.3%	148,000	6.7%
Net	-10	-112	9	-28	8	21	-18	-6	0	-100,000		100,000	

[illegible]MARY OF BASELINE FACILITY WIDE CRITERIA POLLUTANT EMISSIONS (2003/2004)
[illegible] Falls Facility

8/10/2012
177.00 Beet run (days)
166.00 Juice & Sep.run (days)

Source	ID	PM max lbs/hr	PM avg lbs/h	PM year tns/yr	PM10 max lbs/hr	PM10 avg lbs/h	PM10 year tns/yr	SO2 max lbs/hr	SO2 avg lbs/h	SO2 year tns/yr	CO max lbs/hr	CO avg lbs/h	CO year tns/yr	NOx max lbs/hr	NOx avg lbs/h	NOx year tns/yr	VOC max lbs/hr	VOC avg lbs/h	VOC year tns/yr
Foster Wheeler Boiler	S-B1	28.6	21.3	93.2	28.6	21.3	93.2	344.0	255.8	1120.6	64.8	48.2	211.1	199.6	148.4	650.2	0.7	0.5	2.1
B&W Boiler	S-B2	60.6	30.3	132.6	60.6	30.3	132.6	474.0	235.5	1031.6	8.1	4.1	17.8	220.0	111.4	487.8	0.8	0.4	1.9
Keeler Boiler	S-B3	2.2	0.0	0.0	2.2	0.0	0.0	0.06	0.00	0.00	0.5	0.0	0.0	27.8	0.0	0.0	0.6	0.0	0.0
Pulp Dryer	S-D1	47.6	17.2	75.3	59.5	21.5	94.2	33.5	12.7	55.5	186.9	67.5	295.8	44.8	16.9	74.2	2.9	1.1	4.8
Pellet Cooler No. 1	S-D2	2.7	0.5	2.0	1.3	0.2	1.0												
Pellet Cooler No. 2	S-D3	2.7	0.46	2.0	1.33	0.23	1.02												
Pulp Dryer Material Handling	S-D4		0.26	1.16		0.26	1.16												
South Lime Kiln	S-K1		0.12	0.55		0.12	0.55		0.1	0.2		82.6	361.6		0.9	4.1		0.07	0.29
North Lime Kiln	S-K2		0.35	1.54		0.35	1.54		0.1	0.6		231.9	1015.7		2.6	11.5		0.19	0.82
Process Slaker	S-K4		0.27	1.19		0.27	1.19												
Material Handling & Crushing	S-K5		0.03	0.11		0.03	0.11												
Drying Granulator #1	S-W1	3.21	1.84	8.08	3.21	1.84	8.08												
Cooling Granulator #2	S-W2	0.55	0.32	1.38	0.55	0.32	1.38												
Main Mill	S-O5																23.7	11.5	50.3
Sulfur Stove	S-O6							2.6	2.4	10.5									
Coal Unloading	F-O1			5.28		0.60	2.64												
Coal Storage	F-O2			10.44		1.19	5.23												
Boiler Coal Loading	F-O3			2.11		0.24	1.06												
[illegible] Hauling	F-O4			4.69		0.54	2.35												
Boiler Railcar Unloading	F-B4			4.46		0.51	2.23												
Dryer Railcar Unloading	F-D5			0.53		0.06	0.26												
Dried Pulp Storage & Loadout	F-D6			4.56		0.52	2.29												
TOTAL	TOTAL	**148.1**	**72.9**	**351.2**	**157.3**	**80.4**	**352.0**	**854.2**	**506.6**	**2219.0**	**260.3**	**434.2**	**1902.0**	**492.2**	**280.3**	**1227.8**	**28.7**	**13.8**	**60.3**

SECTION 3B. PRODUCTION DATA - BOILER HOUSE

NO.		MATERIAL	UNITS	Max Hr	Avg Hr	ANNUAL
S-B1	FW BOILER	Steam - Beet	1000 lbs	200.0	184	776000
		Coal - Beet	Tons	11.6	10.7	45245
		Steam - Juice/Separator	1000 lbs	200.0	152	527000
		Coal - Juice	Tons	11.6	8.8	28093
S-B2	B&W BOILER	Steam (Coal)-Beet	1000 lbs	200.0	163	655500
		Coal (1)-Beet	Tons	13.4	11.0	46502
		Steam (Natural Gas)-Beet	1000 lbs	200.0	8.8	37500
		Natural Gas (1)-Beet	MMcf	0.286	0.012	50.7
		Steam (Coal)-Juice	1000 lbs	200.0	89	215000
		Coal (1)-Juice	Tons	13.4	6.0	14400
		Steam (Natural Gas)-Juice	1000 lbs	0.286	4.4	10500
		Natural Gas (1)-Juice	MMcf	0.286	0.006	14.2
S-B3	KEELER BOILER	Steam (Natural Gas)-Beet	1000 lbs	80		
		Natural Gas (1)-Beet	MMcf	0.10		
		Steam (Natural Gas)-Juice	1000 lbs	80.00		
		Natural Gas (1)-Juice	MMcf	0.1		
		Total Steam(klbs)				2221500
		Beet Steam (klbs)			66.13%	1469000
		Juice Steam(klbs)			33.87%	752500
		Coal Steam(klbs)			97.84%	2173500
		Gas Steam(klbs)			2.16%	48000

Beet run	**177 days**
Juice Run (testout/cleanup[5])	**100 days**
Separator Only	**66 days**

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-B1	FW BOILER	PM	1000 lbs	0.143	NSPS Limit - 40 CFR 60 Subpart D
	- STEAM(coal)	PM10	1000 lbs	0.143	Assume 100% of PM is PM10
		SO2	1000 lbs	1.720	NSPS Limit - 40 CFR 60 Subpart D
		CO	1000 lbs	0.324	AP-42, Table 1.1-3, 9/98
		NOx	1000 lbs	1.00	NSPS Limit - 40 CFR 60 Subpart D
		VOC	1000 lbs	0.0033	AP-42, Table 1.1-19, 9/98
S-B2	B&W BOILER	PM	1000 lbs	0.303	IDAPA 58.01.01.677
	- STEAM (coal)	PM10	1000 lbs	0.303	Assume 100% of PM is PM10
		SO2	1000 lbs	2.370	AP-42, Table 1.1-3,(7/98), 1% sulfur
		CO	1000 lbs	0.041	AP-42, Table 1.1-3, 9/98
		NOx	1000 lbs	1.10	Uncertified Source Test, Safety Factor 5%
		VOC	1000 lbs	0.0040	AP-42, Table 1.1-19, 9/98

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-B2	B&W BOILER	PM	1000 lbs	2.92E-02	IDAPA 58.01.01.677
		PM10	1000 lbs	2.92E-02	Assume 100% of PM is PM10
		SO2	1000 lbs	8.02E-04	AP-42, Table 1.4-2, (7/98)
		CO	1000 lbs	6.59E-03	2004 Nampa Stack Test
		NOx	1000 lbs	3.75E-01	AP-42, Table 1.4-1, 7/98
		VOC	1000 lbs	7.40E-03	AP-42, Table 1.4-2, 7/98
S-B3	KEELER BOILER	PM	1000 lbs	2.73E-02	IDAPA 58.01.01.677
	- STEAM (gas)	PM10	1000 lbs	2.73E-02	Assume 100% of PM is PM10
		SO2	1000 lbs	7.46E-04	AP-42, Table 1.4-2, 7/98
		CO	1000 lbs	6.59E-03	2004 Nampa Stack Test
		NOx	1000 lbs	3.48E-01	AP-42, Table 1.4-1, 7/98
		VOC	1000 lbs	7.40E-03	AP-42, Table 1.4-2, 7/98

SECTION 3D. EMISSIONS - BOILER HOUSE (beet)

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	FW BOILER (beet)	PM	28.6	26.3	55
	coal	PM10	28.6	26.3	55
		SO2	344.0	316.5	667
		CO	64.8	59.6	126
		NOx	200	184	387
		VOC	0.7	0.6	1.3
S-B2	B&W BOILER (beet)	PM	60.6	49.4	99
	coal	PM10	60.6	49.4	99
		SO2	474.0	386.3	777
		CO	8.1	6.6	13
		NOx	220	179	361
		VOC	0.8	0.7	1
S-B2	B&W BOILER (beet)	PM	5.8	0.3	0.5
	gas	PM10	5.8	0.3	0.5
		SO2	0.0	0.0	0.0
		CO	1.3	0.1	0.1
		NOx	75.6	3.3	7.1
		VOC	1.5	0.1	0.1
S-B3	KEELER BOILER (beet)	PM	2.3	0.0	0.0
	gas	PM10	2.3	0.0	0.0
		SO2	0.0	0.0	0.0
		CO	0.5	0.0	0.0
		NOx	30.2	0.0	0.0
		VOC	0.6	0.0	0.0

SECTION 3D. EMISSIONS - BOILER HOUSE (juice)

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	FW BOILER (juice & sep)	PM	28.6	21.7	37.7
	coal	PM10	28.6	21.7	37.7
		SO2	344.0	261.4	453.2
		CO	64.8	49.2	85.4
		NOx	199.6	151.7	263.0
		VOC	0.7	0.5	0.9
S-B2	B&W BOILER (juice & sep)	PM	60.6	27.0	32.6
	coal	PM10	60.6	27.0	32.6
		SO2	474.0	210.9	254.8
		CO	8.1	3.6	4.4
		NOx	220.0	97.9	118.3
		VOC	0.8	0.4	0.4
S-B2	B&W BOILER (juice & sep	PM	0.01	0.13	0.15
	gas	PM10	0.01	0.13	0.15
		SO2	0.000	0.001	0.001
		CO	0.00	0.03	0.03
		NOx	0.11	1.66	1.98
		VOC	0.002	0.03	0.04
S-B3	KEELER BOILER (juice & sep)	PM	2.3	0.00	0.00
	gas	PM10	2.3	0.00	0.00
		SO2	0.0	0.00	0.00
		CO	0.5	0.00	0.00
		NOx	30.2	0.00	0.00
		VOC	0.6	0.00	0.00

SECTION 3B. PRODUCTION DATA - PULP DRYING AND PELLETIZING

NO.	SOURCE	MATERIAL	UNITS	Max Hrly	Avg Hrly	ANNUAL
S-D1	PULP DRYER	Total Input (1)	Tons	70.0	52.2	221545
		Coal (2)	Tons	4.8	3.7	15862
		Natural Gas (2)	MMcf	0.020	0.020	2
S-D2	PELLET COOLER NO. 1	Pellets	Tons	8.3	3.0	12724
S-D3	PELLET COOLER NO. 2	Pellets	Tons	8.3	3.0	12724
S-D4	PULP DRYER MATERIAL HANDLING	Shreds/Pellets	Tons	(3)	(3)	61077

(1) Total input includes press pulp, coal, and additives.
(2) Production data assumes that coal and natural gas are used to dry pulp.
(3) Hourly value cannot be determined because of significant hourly variability.

SECTION 3C. EMISSION FACTORS - PULP DRYING AND PELLETIZING

NO.	SOURCE	POLLUTANT	EMISSION FACTOR UNIT	EMISSION FACTOR LB/UNIT	EMISSION FACTOR REFERENCE
S-D1	PULP DRYER -TOTAL INPUT	PM	Tons	0.68	IDAPA 58.01.01.703
		PM10	Tons	0.85	Assume PM10 is 125% of PM
		CO	Tons	2.67	Uncertified source test 20% safety factor
	- COAL	SO2	Tons	7.0	AP-42, Table 1.1-3 (September 1998), 1% sulfur
		NOx	Tons	9.35	Uncertified source test
		VOC	Tons	0.61	Uncertified source test

NO.	SOURCE	POLLUTANT	EMISSION FACTOR UNIT	EMISSION FACTOR LB/UNIT	EMISSION FACTOR REFERENCE
S-D2	PELLET COOLER NO.1 - PELLETS	PM	Tons	0.32	Oct 1999 Compliance Test - Nyssa Facility
		PM10	Tons	0.16	Assume PM10 is 50 % of PM
S-D3	PELLET COOLER NO. 2 - PELLETS	PM	Tons	0.32	Oct 1999 Compliance Test - Nyssa Facility
		PM10	Tons	0.16	Assume PM10 is 50 % of PM
S-D4	PULP DRYER MATERIAL HANDLING - PELLETS/SHREDS	PM	Tons	0.038	AP-42, Table 10.4-2, Engineering Estimate
		PM10	Tons	0.038	AP-42, Table 10.4-2, Engineering Estimate

SECTION 3D. EMISSIONS - PULP DRYING AND PELLETIZING

NO.	SOURCE	POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-D1	PULP DRYER	PM	48	35	75
		PM10	60	44	94
		CO	187	139	296
		SO2	34	26	56
		NOx	45	35	74
		VOC	2.9	2.3	4.8
S-D2	PELLET COOLER NO.1	PM	2.66	0.96	2.0
	- PELLETS	PM10	1.33	0.48	1.0
S-D3	PELLET COOLER NO.2	PM	2.66	0.96	2.0
	- PELLETS	PM10	1.33	0.48	1.0
S-D4	PULP DRYER MATERIAL	PM	(1)	(1)	1.2
	- PELLETS/SHREDS	PM10	(1)	(1)	1.2

SECTION 3B. PRODUCTION DATA - LIME KILN AND CO2 PRODUCTION

NO.	SOURCE	MATERIAL	UNITS	MAX HR.	MAX DAILY	ANNUAL
S-K1	SOUTH KILN	Lime Rock	Tons	(1)	74.0	13,032
		Coke/Coal	Tons	(1)	6.3	1,114
S-K2	NORTH KILN	Lime Rock	Tons	(1)	207.0	36,603
		Coke/Coal	Tons	(1)	17.6	3,115
S-K4	PROCESS SLAKER	CaO	Tons	(1)	160.0	28,309
S-K5	MATERIAL HANDLING/CRUSHING	Lime Rock & Coke	Tons	(1)	305.0	53,864

1) Hourly production data cannot be determined because this is a batch process with significant hourly variability.

SECTION 3C. EMISSION FACTORS - LIME KILN AND CO2 PRODUCTION

			EMISSION FACTOR		
NO.	SOURCE	POLLUTANT	UNIT	LB/UNIT	REFERENCE
S-K1	SOUTH KILN				
	- LIME ROCK	PM	Tons	0.084	EPA AP42 & Eng. Est.
		PM10	Tons	0.084	Assume 100% of PM is PM10
		CO	Tons	55.5	December 2003 Stack Test Nampa Facility
		NOx	Tons	0.630	EPA AP42 Table 1.2-1
	- COKE/COAL	SO2	Tons	0.40	EPA AP42 Table 1.4-2 & 99% removal
		VOC	Tons	0.52	Eng. est. based on 2005 TF stack tests
S-K2	NORTH KILN				
	-LIME ROCK	PM	Tons	0.084	EPA AP42 & Eng. Est.
		PM10	Tons	0.084	Assume 100% of PM is PM10
		CO	Tons	55.5	Uncertified Source Test, Mini-Cassia
		NOx	Tons	0.630	EPA AP42 Table 1.2-1
	- COKE/COAL	SO2	Tons	0.40	EPA AP42 Table 1.4-2 & 99% removal
		VOC	Tons	0.52	Eng. est. based on 2005 TF stack tests
S-K4	PROCESS				
	SLAKERS	PM	Tons	0.084	EPA AP-42,Table 11.17-2
	- CaO	PM10	Tons	0.084	Assume PM10 is 100% of PM
S-K5	MATERIAL HANDLING	PM	Tons	0.004	EPA AP-42,Table 11.9-4
	and CRUSHING	PM10	Tons	0.004	Assume PM10 is 100% of PM
	- CaO				

SECTION 3D. EMISSIONS - LIME KILN AND CO2 PRODUCTION

NO.	SOURCE	POLLUTANT	MAX LBS/HR.	MAX LBS/DAY	TONS/YR (1)
S-K1	SOUTH KILN	PM	(2)	6.22	0.55
		PM10	(2)	6.22	0.55
		SO2	(2)	2.52	0.22
		CO	(2)	4,107	362
		NOx	(2)	46.62	4.11
		VOC	(2)	3.30	0.29
S-K2	NORTH KILN	PM	(2)	17.39	1.54
		PM10	(2)	17.39	1.54
		SO2	(2)	7.04	0.6
		CO	(2)	11,489	1015.7
		NOx	(2)	130.41	11.53
		VOC	(2)	9.22	0.82
S-K4	PROCESS SLAKER	PM	(2)	13.44	1.19
		PM10	(2)	13.44	1.19
S-K5	MATERIAL HANDLING	PM	(2)	1.28	0.11
		PM10	(2)	1.28	0.11

(1) Annual production rates are based on 365 days of operation.
(2) Hourly production data cannot be determined, because of a batch process with significant hourly variability.

SECTION 3B. PRODUCTION DATA - SUGAR WAREHOUSE AND HANDLING

NO.	SOURCE	MATERIAL	UNITS	Max hrly	Hourly	ANNUAL
S-W1	DRYING GRANULATOR	Sugar	Tons	45.8	37.9	230,777
S-W2	COOLING GRANULATOR	Sugar	Tons	45.8	37.9	230,777

SECTION 3C. EMISSION FACTORS - SUGAR WAREHOUSE AND HANDLING

			EMISSION FACTOR				
NO.	SOURCE	POLLUTANT	UNIT		UNIT	LB/UNIT	REFERENCE
S-W1	DRYING GRANULATOR - SUGAR						
		PM	lb	per	Tons	0.07	AP42 Table 9.10.1.2-1
		PM10	lb	per	Tons	0.07	Assume PM10 is 100% of PM
S-W2	COOLING GRANULATOR	PM	lb	per	Tons	0.012	2003 Compliance Test
		PM10	lb	per	Tons	0.012	Assume PM10 is 100% of PM

SECTION 3D. EMISSIONS - SUGAR WAREHOUSE AND HANDLING

NO.	SOURCE	POLLUTANT	Max lbs./hr.	Avg. lbs./hr.	TONS/YR
S-W1	DRYING GRANULATOR	PM	3.21	2.65	8.08
	- SUGAR (tons)	PM10	3.21	2.65	8.08
S-W2	NO. 1 COOLING GRANULATOR	PM	0.55	0.45	1.38
	- SUGAR	PM10	0.55	0.45	1.38

SECTION 3B. PRODUCTION DATA - OTHER SOURCES

NO.	SOURCE	MATERIAL	UNITS	Max Hrly	Avg Hrly	ANNUAL
S-O5	MAIN MILL	Thin Juice	1000 gal	85.6	78.0	363,362
S-O6	SULFUR STOVE (2)	Sulfur	Tons	0.028	0.028	230

SECTION 3C. EMISSION FACTORS - OTHER SOURCES

			EMISSION FACTOR		
NO.	SOURCE	POLLUTANT	UNIT	LB/UNIT	REFERENCE
S-O5	MAIN MILL	VOC	1000 gal	0.277	Nonvalidated Test Method
S-O6	SULFUR STOVE	SO2	Ton	91.60	Uncertified Stack Test

SECTION 3D. EMISSIONS - OTHER SOURCES

NO.	SOURCE	POLLUTANT	Max lbs/h	Max lbs/day	Tons/yr
S-O5	MAIN MILL	VOC	23.7	569.1	50.3
S-O6	SULFUR STOVE	SO2	2.6	61.6	10.5

Note: ANNUAL PRODUCTION BASED ON 365 DAYS OF OPERATION.

Beet Campaign	176.87	4245
Juice Run	165	3960
Total	341.87	8205

Fugitive Dust Emissions Estimates

Baseline Emissions

8/1/2012

		POLLUTANT	UNIT	Process Input	Emission Factor LB/UNIT	REFERENCE	Emission PM10 (tons/yr)
F-O1	Coal Unloading Railcar to Storage						
	Railcar unloading	PM	Tons	160,000	6.60E-02	AP-42 Table 11.9-4	5.28
	Railcar unloading	PM10	Tons	160,000	3.30E-02	50% of Total PM	2.64
						F-01 PM10 total	**2.64**
						F-01 PM total	5.28
F-O2	Coal Storage Area						
	Coal Handling (2 transfers)	PM	Tons	160,000	5.60E-02	AP-42 Table 11.9-4	4.48
		PM10	Tons	160,000	2.80E-02	50% of Total PM	2.24
	Vehicle Traffic	PM	Days	365	2.96	AP-42, Chapter 13.2.2-4	0.54
		PM10		365	1.48	50% of Total PM	0.27
	Active / Inactive Pile	PM	Days	365	29.7	AP-42 Table 11.9-4	5.42
		PM10		365	14.9	50% of Total PM	2.72
						F-02 PM10 total	**5.23**
						F-02 PM total	10.44
F-O3	Coal Loading Railcars						
	Coal loading to boilers & pulp dryer	PM	Tons	151,000	2.80E-02	AP-42 Table 11.9-4	2.11
	Coal loading to boilers & pulp dryer	PM10	Tons	151,000	1.40E-02	50% of Total PM	1.06
						F-B3 PM10 total	**1.06**
						F-B3 PM total	**2.11**
F-O4	Beet Hauling						
	Vehicle Traffic - Unloading	PM	Days	365	15.3	AP-42, Chapter 13.2.2-4	2.79
		PM10		365	7.65	50% of Total PM	1.40
	Vehicle Traffic - To Process	PM	Days	365	10.4	AP-42, Chapter 13.2.2-4	1.90
		PM10		365	5.20	50% of Total PM	0.95
						F-B4 PM10 total	**2.35**
F-B4	Boilerhouse Coal Unloading					**F-B4 PM total**	4.69
	Railcar Unloading	PM	Tons	135,000	6.60E-02	AP-42 Table 11.9-4 7/98	4.46
	Railcar Unloading	PM10	Tons	135,000	3.30E-02	50% of Total PM	2.23
						F-B4 PM10 total	**2.23**
						F-B4 PM total	4.46
F-D5	Dryer Coal Unloading						
	Railcar Unloading	PM	Tons	16,000	6.60E-02	AP-42 Table 11.9-4	0.53
	Railcar Unloading	PM10	Tons	16,000	3.30E-02	50% of Total PM	0.26
						F-D6 PM10 total	**0.26**
F-D6	Dried Pulp Storage & Loadout					**F-D6 PM total**	0.53
	Pellets and Shreds	PM	Tons	62,000	1.47E-01	AP-42 Table 10.4-2	4.56
	Pellets and Shreds	PM10	Tons	62,000	7.40E-02	50% of Total PM	2.29
						F-D7 PM10 total	**2.29**
						F-D7 PM total	4.56

SUMMARY OF CRITERIA POLLUTANT EMISSIONS - FUTURE with SUGAR END and ENERGY EFFICIENCY IMPROVEMENTS
Twin Falls Facility

198.00 Beet run (days)
142.00 Juice/Sep.run (days)

Source	ID	PM max lbs/hr	PM avg lbs/h	PM year tns/yr	PM10 max lbs/hr	PM10 avg lbs/h	PM10 year tns/yr	SO2 max lbs/hr	SO2 avg lbs/h	SO2 year tns/yr	CO max lbs/hr	CO avg lbs/h	CO year tns/yr	NOx max lbs/hr	NOx avg lbs/h	NOx year tns/yr	VOC max lbs/hr	VOC avg lbs/h	VOC year tns/yr
Foster Wheeler Boiler	S-B1	28.6	21.3	93.2	28.6	21.3	93.2	344.0	255.8	1120.6	58.2	43.3	189.6	199.6	148.4	650.2	0.7	0.5	2.1
B&W Boiler	S-B2	60.6	27.1	118.9	60.6	27.1	118.9	474.0	208.5	913.1	6.7	3.0	13.4	220.0	103.1	451.5	0.8	0.5	2.1
Keeler Boiler	S-B3	2.2	0.0	0.0	2.2	0.0	0.0	0.06	0.00	0.00	0.5	0.0	0.0	27.8	0.0	0.0	0.5	0.0	0.0
Pulp Dryer	S-D1	47.6	19.2	84.2	59.5	24.0	105.3	33.5	14.0	61.5	186.9	75.5	330.8	44.8	18.8	82.2	2.9	1.2	5.4
Pellet Cooler No. 1	S-D2	2.7	0.6	2.4	1.3	0.3	1.2												
Pellet Cooler No. 2	S-D3	2.7	0.56	2.4	1.33	0.28	1.22												
Pulp Dryer Material Handling	S-D4		0.31	1.35		0.31	1.35												
South Lime Kiln	S-K1		0.12	0.55		0.12	0.55		0.051	0.223		82.6	361.6		0.94	4.11		0.067	0.292
North Lime Kiln	S-K2		0.35	1.54		0.35	1.54		0.142	0.623		231.9	1015.7		2.63	11.53		0.186	0.816
Process Slaker	S-K4		0.27	1.19		0.27	1.19												
Material Handling & Crushing	S-K5		0.03	0.11		0.03	0.11												
Drying Granulator #1	S-W1	0.30	0.25	1.10	0.30	0.25	1.10												
Cooling Granulator #2	S-W2	0.30	0.25	1.10	0.30	0.25	1.10												
Main Mill	S-O5																24.3	13.2	57.7
Sulfur Stove	S-O6							2.6	2.6	11.2									
Coal Unloading	F-O1		1.21	5.28		0.60	2.64												
Coal Storage	F-O2		2.38	10.44		1.19	5.23												
[illegible]r Coal Loading	F-O3		0.48	2.10		0.24	1.05												
Beet Hauling	F-O4		1.07	4.69		0.54	2.35												
Boiler Railcar Unloading	F-B4		0.99	4.36		0.50	2.18												
Dryer Railcar Unloading	F-D5		0.14	0.59		0.07	0.30												
Dried Pulp Storage & Loadout	F-D6		1.04	4.56		0.52	2.29												
TOTAL	**TOTAL**	**144.9**	**77.7**	**340.1**	**154.1**	**78.3**	**342.8**	**854.2**	**481.1**	**2107.2**	**252.3**	**436.3**	**1911.1**	**492.2**	**273.9**	**1199.6**	**29.2**	**15.6**	**68.4**

SECTION 3B. PRODUCTION DATA - BOILER HOUSE

NO.		MATERIAL	UNITS	Max Hr	Avg Hr	ANNUAL
S-B1	FW BOILER	Steam - Beet	1000 lbs	200.0	170	776000
		Coal - Beet	Tons	11.6	9.9	45245
		Steam - Juice & Sep	1000 lbs	200.0	127	527000
		Coal - Juice & Sep	Tons	11.6	7.4	28093
S-B2	B&W BOILER	Steam (Coal)-Beet	1000 lbs	200.0	148	655500
		Coal (1)-Beet	Tons	13.4	9.9	46502
		Steam (Natural Gas)-Beet	1000 lbs	200.0	0	37500
		Natural Gas (1)-Beet	MMcf	0.270	0.286	51
		Steam (Coal)-Juice & Sep	1000 lbs	200.0	95	115000
		Coal (1)-Juice & Sep	Tons	13.4	6.4	14400
		Steam (Natural Gas)-Juice &	1000 lbs	200.0	95	110500
		Natural Gas (1)-Juice & Sep	MMcf	0.270	0.13	14
S-B3	KEELER BOILER	Steam (Natural Gas)-Beet	1000 lbs	80		
		Natural Gas (1)-Beet	MMcf	0.10		
		Steam (Natural Gas)-Juice &	1000 lbs	80.00		
		Natural Gas (1)-Juice & Sep	MMcf	0.1		
		Total Steam(klbs)				2221500
		Beet Steam (klbs)			66.13%	1469000
		Juice & Sep Steam(klbs)			33.87%	752500
		Coal Steam(klbs)			93.34%	2073500
		Gas Steam(klbs)			6.66%	148000

Note: Annual steam production estimated based on baseline opeartions. Future annual steam production estimates for the beet campaign, juice and separator only runs will vary based on several factors including the size of the beet crop.

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-B1	FW BOILER	PM	1000 lbs	0.143	NSPS Limit - 40 CFR 60 Subpart D
	- STEAM(coal)	PM10	1000 lbs	0.143	Assume 100% of PM is PM10
		SO2	1000 lbs	1.720	NSPS Limit - 40 CFR 60 Subpart D
		CO	1000 lbs	0.291	AP-42, Table 1.1-3, 9/98
		NOx	1000 lbs	1.00	NSPS Limit - 40 CFR 60 Subpart D
		VOC	1000 lbs	0.0033	AP-42, Table 1.1-19, 9/98
S-B2	B&W BOILER	PM	1000 lbs	0.303	IDAPA 58.01.01.677
	- STEAM (coal)	PM10	1000 lbs	0.303	Assume 100% of PM is PM10
		SO2	1000 lbs	2.370	AP-42, Table 1.1-3,(7/98), 1% sulfur
		CO	1000 lbs	0.033	AP-42, Table 1.1-3, 9/98
		NOx	1000 lbs	1.10	Uncertified Source Test, Safety Factor 5%
		VOC	1000 lbs	0.0040	AP-42, Table 1.1-19, 9/98

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-B2	B&W BOILER				
	- STEAM (gas)	PM	1000 lbs	2.92E-02	IDAPA 58.01.01.677
		PM10	1000 lbs	2.92E-02	Assume 100% of PM is PM10
		SO2	1000 lbs	8.02E-04	AP-42, Table 1.4-2, (7/98)
		CO	1000 lbs	6.59E-03	2004 Nampa Stack Test
		NOx	1000 lbs	3.75E-01	AP-42, Table 1.4-1, 7/98
		VOC	1000 lbs	7.40E-03	AP-42, Table 1.4-2, 7/98
S-B3	KEELER BOILER	PM	1000 lbs	2.73E-02	IDAPA 58.01.01.677
	- STEAM (gas)	PM10	1000 lbs	2.73E-02	Assume 100% of PM is PM10
		SO2	1000 lbs	7.46E-04	AP-42, Table 1.4-2, 7/98
		CO	1000 lbs	6.59E-03	2004 Nampa Stack Test
		NOx	1000 lbs	3.48E-01	AP-42, Table 1.4-1, 7/98
		VOC	1000 lbs	6.84E-03	AP-42, Table 1.4-2, 7/98

SECTION 3D. EMISSIONS - BOILER HOUSE (beet)

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	FW BOILER (beet)	PM	28.6	24.3	55
	coal	PM10	28.6	24.3	55
		SO2	344.0	292.4	667
		CO	58.2	49.5	113
		NOx	200	170	387
		VOC	0.7	0.6	1.3
S-B2	B&W BOILER (beet)	PM	60.6	44.8	99
	coal	PM10	60.6	44.8	99
		SO2	474.0	350.8	777
		CO	6.7	4.9	11
		NOx	220	163	361
		VOC	0.8	0.6	1
S-B2	B&W BOILER (beet)	PM	5.8	0.0	0.5
	gas	PM10	5.8	0.0	0.5
		SO2	0.2	0.0	0.0
		CO	1.3	0.0	0.1
		NOx	75.0	0.0	7.0
		VOC	1.5	0.0	0.1
S-B3	KEELER BOILER (beet)	PM	2.2	0.0	0.0
	gas	PM10	2.2	0.0	0.0
		SO2	0.1	0.0	0.0
		CO	0.5	0.0	0.0
		NOx	27.8	0.0	0.0
		VOC	0.5	0.0	0.0

SECTION 3D. EMISSIONS - BOILER HOUSE (juice)

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	FW BOILER (juice & sep)	PM	28.6	18.2	37.7
	coal	PM10	28.6	18.2	37.7
		SO2	344.0	218.4	453.2
		CO	58.2	37.0	76.7
		NOx	199.6	126.7	263.0
		VOC	0.7	0.4	0.9
S-B2	B&W BOILER (juice & sep)	PM	60.6	28.8	17.4
	coal	PM10	60.6	28.8	17.4
		SO2	474.0	225.2	136.3
		CO	6.7	3.2	1.9
		NOx	220.0	104.5	63.3
		VOC	0.8	0.4	0.2
S-B2	B&W BOILER (juice & sep)	PM	5.8	2.8	1.6
	gas	PM10	5.8	2.8	1.6
		SO2	0.2	0.1	0.0
		CO	1.3	0.6	0.4
		NOx	75.0	35.6	20.7
		VOC	1.5	0.7	0.4
S-B3	KEELER BOILER (juice & sep)	PM	2.2	0.0	0.0
	gas	PM10	2.2	0.0	0.0
		SO2	0.1	0.0	0.0
		CO	0.5	0.0	0.0
		NOx	27.8	0.0	0.0
		VOC	0.5	0.0	0.0

SECTION 3B. PRODUCTION DATA - PULP DRYING AND PELLETIZING

NO.	SOURCE	MATERIAL	UNITS	Max Hrly	Avg Hrly	ANNUAL
S-D1	PULP DRYER	Total Input (1)	Tons	70.0	52.1	247769
		Coal (2)	Tons	4.8	3.7	17582
		Natural Gas (2)	MMcf	0.020	0.020	2
S-D2	PELLET COOLER NO. 1	Pellets	Tons	8.3	3.2	15206
S-D3	PELLET COOLER NO. 2	Pellets	Tons	8.3	3.2	15206
S-D4	PULP DRYER MATERIAL HANDLING	Shreds/Pellets	Tons	(3)	(3)	71000

(1) Total input includes press pulp, coal, and additives.
(2) Production data assumes that coal and natural gas are used to dry pulp.
(3) Hourly value cannot be determined because of significant hourly variability.

SECTION 3C. EMISSION FACTORS - PULP DRYING AND PELLETIZING

NO.	SOURCE	POLLUTANT	EMISSION FACTOR UNIT	LB/UNIT	REFERENCE
S-D1	PULP DRYER	PM	Tons	0.68	IDAPA 58.01.01.703
	-TOTAL INPUT	PM10	Tons	0.85	Assume PM10 is 125% of PM
		CO	Tons	2.67	Uncertified source test 20% safety factor
	- COAL	SO2	Tons	7.0	AP-42, Table 1.1-3 (September 1998), 1% sulfur
		NOx	Tons	9.35	Uncertified source test
		VOC	Tons	0.61	Uncertified source test

NO.	SOURCE	POLLUTANT	UNIT	LB/UNIT	EMISSION FACTOR REFERENCE
S-D2	PELLET COOLER NO.1	PM	Tons	0.32	Oct 1999 Compliance Test - Nyssa Facility
	- PELLETS	PM10	Tons	0.16	Assume PM10 is 50 % of PM
S-D3	PELLET COOLER NO. 2	PM	Tons	0.32	Oct 1999 Compliance Test - Nyssa Facility
	- PELLETS	PM10	Tons	0.16	Assume PM10 is 50 % of PM
S-D4	PULP DRYER MATERIAL HANDLING	PM	Tons	0.038	AP-42, Table 10.4-2, Engineering Estimate
	- PELLETS/SHREDS	PM10	Tons	0.038	AP-42, Table 10.4-2, Engineering Estimate

SECTION 3D. EMISSIONS - PULP DRYING AND PELLETIZING

NO.	SOURCE	POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-D1	PULP DRYER	PM	48	35	84
		PM10	60	44	105
		CO	187	139	331
		SO2	34	26	62
		NOx	45	35	82
		VOC	2.9	2.3	5.4
S-D2	PELLET COOLER NO.1	PM	2.66	1.02	2.4
	- PELLETS	PM10	1.33	0.51	1.2
S-D3	PELLET COOLER NO.2	PM	2.66	1.02	2.4
	- PELLETS	PM10	1.33	0.51	1.2
S-D4	PULP DRYER MATERIAL	PM	(1)	(1)	1.3
	- PELLETS/SHREDS	PM10	(1)	(1)	1.3

SECTION 3B. PRODUCTION DATA - LIME KILN AND CO2 PRODUCTION

NO.	SOURCE	MATERIAL	UNITS	MAX HR.	MAX DAILY	ANNUAL
S-K1	SOUTH KILN	Lime Rock	Tons	(1)	74.0	13,032
		Coke/Coal	Tons	(1)	6.3	1,114
S-K2	NORTH KILN	Lime Rock	Tons	(1)	207.0	36,603
		Coke/Coal	Tons	(1)	17.6	3,115
S-K4	PROCESS SLAKER	CaO	Tons	(1)	160.0	28,309
S-K5	MATERIAL HANDLING/CRUSHING	Lime Rock & Coke	Tons	(1)	305.0	53,864

(1) Hourly production data cannot be determined because this is a batch process with significant hourly variability.

SECTION 3C. EMISSION FACTORS - LIME KILN AND CO2 PRODUCTION

			EMISSION FACTOR		
NO.	SOURCE	POLLUTANT	UNIT	LB/UNIT	REFERENCE
S-K1	SOUTH KILN				
	- LIME ROCK	PM	Tons	0.084	EPA AP42 & Eng. Estimate
		PM10	Tons	0.084	Assume 100% of PM is PM10
		CO	Tons	55.5	December 2003 Stack Test Nampa Facility
		NOx	Tons	0.630	EPA AP42 Table 1.2-1
	- COKE/COAL	SO2	Tons	0.40	EPA AP42 Table 1.4-2 & 99% removal
		VOC	Tons	0.52	Eng. est. based on 2005 TF stack tests
S-K2	NORTH KILN				
	-LIME ROCK	PM	Tons	0.084	EPA AP42 & Eng. Estimate
		PM10	Tons	0.084	Assume 100% of PM is PM10
		CO	Tons	55.5	Uncertified Source Test, Mini-Cassia
		NOx	Tons	0.630	EPA AP42 Table 1.2-1
	- COKE/COAL	SO2	Tons	0.40	EPA AP42 Table 1.4-2 & 99% removal
		VOC	Tons	0.52	Eng. est. based on 2005 TF stack tests
S-K4	PROCESS				
	SLAKERS	PM	Tons	0.084	EPA AP-42,Table 11.17-2
	- CaO	PM10	Tons	0.084	Assume PM10 is 100% of PM
S-K5	MATERIAL HANDLING	PM	Tons	0.004	EPA AP-42,Table 11.9-4
	and CRUSHING	PM10	Tons	0.004	Assume PM10 is 100% of PM
	- CaO				

SECTION 3D. EMISSIONS - LIME KILN AND CO2 PRODUCTION

NO.	SOURCE	POLLUTANT	MAX LBS/HR.	MAX LBS/DAY	TONS/YR (1)
S-K1	SOUTH KILN	PM	(2)	6.22	0.55
		PM10	(2)	6.22	0.55
		SO2	(2)	2.52	0.22
		CO	(2)	4,107	362
		NOx	(2)	46.62	4.11
		VOC	(2)	3.30	0.29
S-K2	NORTH KILN	PM	(2)	17.39	1.54
		PM10	(2)	17.39	1.54
		SO2	(2)	7.04	0.6
		CO	(2)	11,489	1015.7
		NOx	(2)	130.41	11.53
		VOC	(2)	9.22	0.82
S-K4	PROCESS SLAKER	PM	(2)	13.44	1.19
		PM10	(2)	13.44	1.19
S-K5	MATERIAL HANDLING	PM	(2)	1.28	0.11
		PM10	(2)	1.28	0.11

(1) Annual production rates are based on 198 days of operation.
(2) Hourly production data cannot be determined, because of a batch process with significant hourly variability.

SECTION 3B. PRODUCTION DATA - SUGAR WAREHOUSE AND HANDLING

NO.	SOURCE	MATERIAL	UNITS	Max hrly	Hourly	ANNUAL
S-W1	DRYING GRANULATOR	Sugar	Tons	55.0	45.8	400,000
S-W2	COOLING GRANULATOR	Sugar	Tons	55.0	45.8	400,000

SECTION 3C. EMISSION FACTORS - SUGAR WAREHOUSE AND HANDLING

			EMISSION FACTOR				
NO.	SOURCE	POLLUTANT	UNIT		UNIT	LB/UNIT	REFERENCE
S-W1	DRYING GRANULATOR - SUGAR	PM	lb	per	Tons	0.0055	BMA 0.003 gr/dscf estimate
		PM10	lb	per	Tons	0.0055	Assume PM10 is 100% of PM
S-W2	COOLING GRANULATOR	PM	lb	per	Tons	0.0055	BMA 0.003 gr/dscf estimate
		PM10	lb	per	Tons	0.0055	Assume PM10 is 100% of PM

SECTION 3D. EMISSIONS - SUGAR WAREHOUSE AND HANDLING

NO.	SOURCE	POLLUTANT	Max lbs./hr.	Avg. lbs./hr.	TONS/YR
S-W1	DRYING GRANULATOR	PM	0.30	0.25	1.10
	- SUGAR (tons)	PM10	0.30	0.25	1.10
S-W2	NO. 1 COOLING GRANULATOR	PM	0.30	0.25	1.10
	- SUGAR	PM10	0.30	0.25	1.10

SECTION 3B. PRODUCTION DATA - OTHER SOURCES

NO.	SOURCE	MATERIAL	UNITS	Max Hrly	Avg Hrly	ANNUAL
S-O5	MAIN MILL	Thin Juice	1000 gal	87.6	79.6	416,275
S-O6	SULFUR STOVE (2)	Sulfur	Tons	0.028	0.028	244

SECTION 3C. EMISSION FACTORS - OTHER SOURCES

			EMISSION FACTOR		
NO.	SOURCE	POLLUTANT	UNIT	LB/UNIT	REFERENCE
S-O5	MAIN MILL	VOC	1000 gal	0.277	Non Validated Source Test
S-O6	SULFUR STOVE	SO2	Ton	91.60	Uncertified Stack Test

SECTION 3D. EMISSIONS - OTHER SOURCES

NO.	SOURCE	POLLUTANT	Max lbs/h	Max lbs/day	Tons/yr
S-O5	MAIN MILL	VOC	24.3	582.4	57.7
S-O6	SULFUR STOVE	SO2	2.6	61.6	11.2

Note: ANNUAL PRODUCTION BASED ON 365 DAYS OF OPERATION.

Beet Campaign	198	4752
Juice Run	165	3960
Total	363	8712

Fugitive Dust Emissions Estimates

Future

8/1/2012

		POLLUTANT	UNIT	Process Input	Emissions Factor LB/UNIT	REFERENCE	Emission PM10 (tons/yr)
F-01	Coal Unloading Railcar to Storage						
	Railcar unloading	PM	Tons	160,000	6.60E-02	AP-42 Table 11.9-4	5.28
	Railcar unloading	PM10	Tons	160,000	3.30E-02	50% of Total PM	2.64
						F-01 PM10 total	**2.64**
						F-01 PM total	**5.28**
F-O2	Coal Storage Area						
	Coal Handling	PM	Tons	160,000	5.60E-02	AP-42 Table 11.9-4	4.48
		PM10	Tons	160,000	2.80E-02	50% of Total PM	2.24
	Vehicle Traffic	PM	Days	365	2.98	AP-42, Chapter 13.2.2-4	0.54
		PM10		365	1.49	50% of Total PM	0.27
	Active / Inactive Pile	PM	Days	365	29.7	AP-42 Table 11.9-4	5.42
		PM10		365	14.9	50% of Total PM	2.72
						F-02 PM10 total	**5.23**
						F-O2 PM total	**10.44**
F-O3	Coal Loading Railcars						
	Coal loading to boilers & pulp dryer	PM	Tons	150,000	2.80E-02	AP-42 Table 11.9-4	2.10
	Coal loading to boilers & pulp dryer	PM10	Tons	150,000	1.40E-02	50% of Total PM	1.05
						F-B3 PM10 total	**1.05**
						F-B3 PM total	**2.10**
F-O4	Beet Hauling						
	Vehicle Traffic - Unloading	PM	Days	365	15.30	AP-42, Chapter 13.2.2-4	2.79
		PM10		365	7.65	50% of Total PM	1.40
	Vehicle Traffic - To Process	PM	Days	365	10.40	AP-42, Chapter 13.2.2-4	1.90
		PM10		365	5.20	50% of Total PM	0.95
						F-B4 PM10 total	**2.35**
						F-B4 PM total	**4.69**
F	Boilerhouse Coal Unloading						
	Railcar Unloading	PM	Tons	132,000	6.60E-02	AP-42 Table 11.9-4 7/98	4.36
	Railcar Unloading	PM10	Tons	132,000	3.30E-02	50% of Total PM	2.18
						F-B4 PM10 total	**2.18**
						F-B4 PM total	**4.36**
F-D5	Dryer Coal Unloading						
	Railcar Unloading	PM	Tons	18,000	6.60E-02	AP-42 Table 11.9-4	0.59
	Railcar Unloading	PM10	Tons	18,000	3.30E-02	50% of Total PM	0.30
						F-D6 PM10 total	**0.30**
						F-D6 PM total	**0.59**
F-D6	Dried Pulp Storage & Loadout						
	Pellets and Shreds	PM	Tons	71,000	1.47E-01	AP-42 Table 10.4-2	4.56
	Pellets and Shreds	PM10	Tons	71,000	7.40E-02	50% of Total PM	2.29
						F-D7 PM10 total	**2.29**
						F-D7 PM total	**4.56**

GHG Baseline Emissions Summary
Twin Falls Facility

Source	CO2 (tons/y)	CH4 (tons/y)	N2O (tons/y)
Total - Boilers	293642	33	5
Total - Pulp Dryers	36530	4	1
Total - Lime Kilns	12112	1	0.2
Total	342284	38	6

Future Emissions Summary
Twin Falls Facility

Source	CO2 (tons/y)	CH4 (tons/y)	N2O (tons/y)
Total - Boilers	287542	31	5
Total - Pulp Dryers	40491	5	1
Total - Lime Kilns	12112	1	0.2
Total	340145	37	5

GHG Net Emissions Summary
Twin Falls Facility

Source	CO2 (tons/y)	CH4 (tons/y)	N2O (tons/y)
Total - Boilers	-6100	-1	0
Total - Pulp Dryers	3961	0	0.1
Total - Lime Kilns	0	0	0.0
Total	-2139	-1	-0.1

GHG Emissions Estimates

Baseline Period (Average 2003-2004)
The Amalgamated Sugar Co. LLC
Twin Falls Facility

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
FW Boiler	S-B1	1,303,000	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	173951
		1,303,000	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	20
		1,303,000	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	3
B&W Boiler	S-B2	870,500	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	116212
		870,500	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	13
		870,500	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	2
		48,000	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	3480
		48,000	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.07
		48,000	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.01

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Boilers	293642	33	5

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
Pulp Dryer	S-D1	15862	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	36530
		15862	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	4
		15862	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.6

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Pulp Dryers	36530	4	0.6

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
South Kiln	S-K1	1114	tons - coal/coke	CO_2	5728	lbs/ton	40CFR98 Subpart C Table C-1	3190
		1114	tons - coal/coke	CH_4	0.602	lbs/ton	40CFR98 Subpart C Table C-2	0
		1114	tons - coal/coke	N_2O	0.0878	lbs/ton	40CFR98 Subpart C Table C-2	0.05
North Kiln	S-K2	3115	tons - coal/coke	CO_2	5728	lbs/ton	40CFR98 Subpart C Table C-1	8921
		3115	tons - coal/coke	CH_4	0.602	lbs/ton	40CFR98 Subpart C Table C-2	0.9
		3115	tons - coal/coke	N_2O	0.0878	lbs/ton	40CFR98 Subpart C Table C-2	0.1

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Lime Kilns	12112	1	0.2

GHG Emissions Estimates

Projected
The Amalgamated Sugar Co. LLC
Twin Falls Facility

Source Name	Source ID	Annual	Units	Parameter	Factor	Emissions Units	Reference	Annual Emissions (tons/y)
FW Boiler	S-B1	1,303,000	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	173951
		1,303,000	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	20
		1,303,000	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	3
B&W Boiler	S-B2	770,500	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	102862
		770,500	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	12
		770,500	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	2
		148,000	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	10730
		148,000	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.21
		148,000	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.02

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Boilers	287542	31	5

Source Name	Source ID	Annual	Units	Parameter	Factor	Emissions Units	Reference	Annual Emissions (tons/y)
Pulp Dryer	S-D1	17582	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	40491
		17582	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	5
		17582	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.7

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Pulp Dryers	40491	5	1

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
South Kiln	S-K1	1114	tons - coal/coke	CO_2	5728	lbs/ton	40CFR98 Subpart C Table C-1	3190
		1114	tons - coal/coke	CH_4	0.602	lbs/ton	40CFR98 Subpart C Table C-2	0
		1114	tons - coal/coke	N_2O	0.0878	lbs/ton	40CFR98 Subpart C Table C-2	0.05
North Kiln	S-K2	3115	tons - coal/coke	CO_2	5728	lbs/ton	40CFR98 Subpart C Table C-1	8921
		3115	tons - coal/coke	CH_4	0.602	lbs/ton	40CFR98 Subpart C Table C-2	0.9
		3115	tons - coal/coke	N_2O	0.0878	lbs/ton	40CFR98 Subpart C Table C-2	0.1

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Lime Kilns	12112	1	0.2

TWIN FALLS
PARTICULATE MATTER EMISSION FACTORS
Updated July 2012

1. FW BOILER (S-B1) - coal

The emission factor for the Foster Wheeler boiler is based on the following:

i.) The permit listed particulate limit of 0.1 lb/MMBtu which was referenced from 40 CFR 60, Subpart D.

ii.) Steam heating value of steam of 1140 Btu/lb.

iii.) Boiler efficiency estimated at 80%.

(0.100 lbs/MMBtu)(1/0.80)(1.140 x 10^{-3}MMBtu/lb)(1000) = 0.143 lb/Klb steam

2. B&W BOILER (S-B2) - coal

The emission factor for the B&W boiler is based on the following:

i.) The particulate permit listed of 0.1 grains/dscf corrected to 8% O2 in IDAPA 58.01.01.677.

ii.) Steam heating value of 1070 Btu/lb.

iii.) Boiler efficiency estimated at 80%.

iv.) Maximum boiler capacity of 200,000 lb steam/hr, 268 MMBtu input/hr (based on steam heating value and efficiency).

Estimated stack gas flow at maximum steam rate was calculated, from 40 CFR 60 Appendix A Method 19, for subbituminous coal combustion, adjusted at 8% O2 is:
Fd = 9780 dscf/MMBtu [20.9/(20.9 - 8)] = 15,845 dscf/MMBtu at 8%O2

15,845 dscf/MMBtu x 268 MMBtu/hr x 1 hr/60 min = 70,774 dscfm

0.1 grains/dscf x 70,774 dscf/min x 60 min/hr x 1 lb/7000 grains = 60.7 lb/hr

Emission Factor = 60.7 lb/hr x 1 hr/200,000 lb steam = *0.303 lb/1000 lb steam*

3. **B&W BOILER (S-B2) - natural gas**

The permit limit based on IDAPA 58.01.01.677 for this boiler is 0.015 grains/dscf corrected at 3% O2.Maximum capacity of the boiler is 200,000 lbs steam/hr, 268 MMBtu input/hr and a maximum of 0.268 x 10^6 ft^3/hr. Assumed efficiency of the boiler is 80%. Maximum stack gas flow, from 40 CFR 60 Appendix A Method 19, for natural gas combustion, adjusted at 3% O2 is:

Fd = 8710 dscf/MMBtu {20.9/(20.9 - 3) = 10,170 dscf/MMBtu at 3%O2

10,170 dscf/MMBtu x 268 MMBtu/hr x 1 hr/60 min = 45,426 dscfm

0.015 grains/dscf x 45,426 dscf/min x 60 min/hr x 1 lb/7000 grains = 5.84 lb/hr

The emission factor is: (5.84 lbs)/(200 Klbs) = 0.0292 lbs/Klbs

4. **KEELER BOILER (S-B3) - natural gas**

The permit limit based on IDAPA 58.01.01.677 for this boiler is 0.015 grains/dscf corrected at 3% O2. Maximum capacity of the boiler is 80,000 lbs steam/hr, 100 MMBtu input/hr (calculation based on 995 Btu/lb steam) and a maximum of 0.0995 x 10^6 ft^3/hr. Assumed efficiency of the boiler is 80%. Maximum stack gas flow, from 40 CFR 60 Appendix A Method 19, for natural gas combustion, adjusted at 3% O2 is:

Fd = 8710 dscf/MMBtu {20.9/(20.9 - 3) = 10,170 dscf/MMBtu at 3%O2

10,170 dscf/MMBtu x 100 MMBtu/hr x 1 hr/60 min = 16,950 dscfm

0.015 grains/dscf x 16,950 dscf/min x 60 min/hr x 1 lb/7000 grains = 2.18 lb/hr

The emission factor is: (2.18 lb/hr) / (80 Klbs/h) = 0.0273 lbs/Klbs

5. **PULP DRYER (S-D1) - coal, pressed pulp and additives**

Applicable rule for particulate matter emissions (front half catch, only) for the Pulp Dryer is IDAPA 58.01.01.703, for process weight rates $P_W \geq 60{,}000$ lb/hr:

$$E \text{ (rate of emission)} = 23.84\,(P_W)^{0.11} - 40$$

From the production data, maximum total input is 70 tons/hr (140,000 lb/hr). The rate of emission for the Pulp Dryer will be, in lb/hr:

$$E \text{ (Pulp Dryer)} = 23.84\,(140{,}000)^{0.11} - 40 = 47.8 \text{ lb/hr}$$

The emission factor is:

EF (Pulp Dryer) = (47.8 lb/hr) (1hr/70 tons) = 0.683 lbs/ton input

6. PELLET COOLER #1 (S-D2)

The particulate matter emission factor is based on a compliance test for a pellet cooler cyclone stack at the Nyssa, Oregon facility, conducted in October 1999. The Nyssa test results are as follows:

EF = (0.93 lbs/h) (4.5 tons pellets/H) = 0.21 lbs PM/tons pellets

Assuming a 50% safety factor, the EF is conservatively estimated to be 0.32 lbs PM/ton pellets.

7. PELLET COOLER # 2 (S-D3)

Same as PELLET COOLER #1.

8. SOUTH COKE LIME KILN (S-K1) – lime rock

From AP-42, Table 8.15-1 (Fifth Edition, 1995) for lime manufacturing, for vertical kilns, uncontrolled process, particulate emission factor is 8 lb/ton lime produced. Divide by 2 to obtain the emission factor in lb/ton limerock feed to the kiln. PM emission factor for the coke lime kiln will be: 4 lb/ton limerock.

Assume:

1) 5% of the flue gas is going to the scrubber, 10% of the time and the scrubber efficiency is 80%;

2) 20% of the flue gas is vented through the bypass vent, 100% of the time; this flow is going through a gas washer of 80% efficiency;

3) The carbonation tanks are 100% efficient in scrubbing the particulate matter.

The new particulate matter emission factor will be:

(4 lb/ton limerock)[0.05 x (0.10)(1-0.80) + 0.20 x (1.0)] = 0.084 lb/ton lime rock

9. NORTH COKE LIME KILN (S-K2) – lime rock

Same as SOUTH LIME KILN.

10. PROCESS SLAKER (S-K4)

From AP-42, Table 11.17-2 (February 1998) for lime manufacturing, for hydrators (atmospheric), particulate emission factor is 0.067 lb/ton of hydrated lime. Multiply by 1.25 to obtain the emission factor in lb/ton lime feed to the hydrator. PM emission factor for the coke lime kiln will be: 0.084 lb/ton lime.

12. DRYING GRANULATOR (S-W1) - BASELINE

Based on EPA AP42 Table 9.10.1.2-1 the filterable PM EF and condensable PM is 0.07 lbs per ton sugar output (0.064 + 0.0037 lbs/ton) for a sugar granulator with mechanical centrifugal & water sprays. Assume PM10 is 100% of the PM.

14. COOLING GRANULATOR (S-W2) - BASELINE

A certified source test was done on the cooling granulator stack at the Twin Falls facility in December 2003, to determine the particulate matter emissions. This testing was performed to demonstrate compliance with particulate emissions standards. This data will be used to estimate particulate matter emission factor for the cooling granulator, controlled by a scrubber. The emission factor is 0.010lb/ton sugar. Assuming a 20% safety factor the emission factor is 0.012 lb/ton sugar.

15. NEW DRYING AND COOLING GRANULATOR (S-W1) - PROJECTED

BMA vendor guarantee for the drying and cooling granulated baghouse is 0.003 gr/dscf. At a design air flow rate of 23,650 dscf/ minute this grain loading equates to 0.60 lbs per hour of PM_{10}. At a short term maximum production rate of 55 tons sugar per hour the process emissions rate for the new baghouse is estimated at 0.011 lbs per ton of sugar produced.

TWIN FALLS
SULFUR DIOXIDE (SO_2) EMISSION FACTORS
Update July 2012

1. FW BOILER (S-B1) - coal

The SO_2 emission factor for the Foster Wheeler boiler is based on the following:

i. 1.20 lbs SO_2/MMBtu in accordance with 40 CFR 60, Subpart D.

ii. Steam heating value of 1140 Btu/lb.

iii. Boiler efficiency of 80%.

$$(1.20\ \text{lbs/MMBtu})\ (1/0.80)\ (1.140 \times 10^{-3}\ \text{MMBtu/lb})\ (1000) = 1.72\ \text{lbs/1000 steam}$$

2. B&W BOILER (S-B2) - coal

From AP-42, Table 1.1-3 (September 1998) for subbituminous pulverized coal combustion, dry bottom, the SO_2 emission factor is 35 multiplied by 1 (1% S by weight, in the coal), or 35 lb/ton.

The heat content of coal is 9900 Btu/lb coal, heat content of steam is 1070 Btu/lb steam and efficiency of the boiler is 80%.

$$(35\ \text{lb/ton})\ (1/2000)\ (1/9900)\ (10^6/1\ \text{MMBtu}) = 1.77\ \text{lb/MMBtu}$$

$$(1.77\ \text{lb/MMBtu})\ (1/0.80)\ (1.070 \times 10^{-3}\ \text{MMBtu/lb})\ (1000) = 2.37\ \text{lbs/Klb steam}$$

3. B&W BOILER (S-B2) - natural gas

From AP-42, Table 1.4-2 (July 1998) for natural gas combustion, for utility boilers, SO_2 emission factor is 0.6 lb/10^6 ft^3.

Heat content of natural gas is 1000 Btu/ft^3, heat content of steam is 1070 Btu/lb steam and efficiency of the boiler is 80%.

$$(0.6\ \text{lb}/10^6\ \text{ft}^3)\ (1\ \text{ft}^3/1000\ \text{Btu})\ (10^6/\text{MMBtu}) = 0.0006\ \text{lb/MMBtu}$$

$$(0.0006\ \text{lb/MMBtu})\ (1/0.80)\ (1.070 \times 10^{-3}\ \text{MMBtu/lb steam})\ (1000) = 0.000802\ \text{lb}/10^3\ \text{lb steam}$$

4. KEELER BOILER (S-B3) - natural gas

From AP-42, Table 1.4-2 (July 1998) for natural gas combustion, for industrial boilers, SO_2 emission factor is 0.6 lb/10^6 ft^3.

Heat content of natural gas is 1000 Btu/ft^3, heat content of steam is 995 Btu/lb steam and efficiency of the boiler is 80%.

$$(0.6 \text{ lb}/10^6 \text{ ft}^3)\ (1 \text{ ft}^3/1000 \text{ Btu})\ (10^6/\text{MMBtu}) = 0.0006 \text{ lb/MMBtu}$$

$$(0.0006 \text{ lb/MMBtu})\ (1/0.80)\ (0.0995 \times 10^{-3} \text{ MMBtu/lb})\ (1000) = 0.000746 \text{ lb/Klb lb steam}$$

5. **DRYER DRUM (S-D1) - coal**

From AP-42, Table 1.1-3(September 1998) for subbituminous coal combustion, for pulverized coal, uncontrolled process SO_2 emission factor is 35, multiplied by 1 (1% S by weight, in the coal), 35 lb/ton. Assume an 80% SO_2 removal efficiency for the scrubbers. The SO_2 emission factor is:

$$35\ lb/ton\ \ coal \times (1 - 0.80) = 7.0\ lb/ton\ \ coal$$

6. **SOUTH LIME KILN (S-K1) – coke/coal**

The SO_2 EF is based on a mass balance approach, 1% fuel sulfur content and a 99 % removal efficiency for the bypass scrubber, gas washer, and carbonation tank juices as follows:

SO_2 EF = (1 lbs/100 lb coke) (1 mole S/32 lbs S) (1 mole SO_2/1 mole S)
(64 lbs SO_2/mole)(2000) = 40 lbs/ton coke

$$40 \text{ lb/ton coke} \times (1-.99) = 0.4 \text{ lb/ton coke}$$

7. **NORTH LIME KILN (S-K2) – coke/coal**

Same as SOUTH LIME KILN.

8. **SULFUR STOVE (S-O6)**

Preliminary uncertified SO_2 stack tests were conducted on B-side sulfur tower at the Nampa facility in July 1992. The purpose of the testing was to obtain a rough estimate of the SO_2 emissions from the sulfur towers since there are no EPA AP-42 emission factors for this emission source. EPA testing methods were generally followed during the test sampling. The sulfur stove can operate with or without a fan. SO_2 emissions were higher with the fan operating. As a worst-case scenario, the emission factor utilized is for a sulfur stove with a fan operating at all times. In addition, a safety factor was applied to the sulfur stove emission factor. The emission factor will be: 91.6 lbs SO_2/ton sulfur.

TWIN FALLS
CARBON MONOXIDE (CO) EMISSION FACTORS
Updated 2012

1. FW BOILER (S-B1) – coal

From AP-42, Table 1.1-3 (September 1998) for bituminous coal combustion, for spreader stoker, uncontrolled process CO emission factor is 5 lb/ton.

Heat content of coal is 11,000 Btu/lb coal, heat content of steam is 1140 Btu/lb steam and efficiency of the boiler is 80 %.

$$(5 \text{ lbs/ton})\ (1/2000 \text{ lbs})\ (1 \text{ lb}/11000 \text{ Btu})\ (10^6/1 \text{ MMBtu}) = 0.227 \text{ lb/MMBtu}$$

$$(0.227 \text{ lb/MMBtu})\ (1/0.80)\ (1.140 \times 10^{-3} \text{ MMBtu/lb})\ (1000) = 0.324 \text{ lb/Klb steam}$$

2. B&W BOILER (S-B2) - coal

From AP-42, Table 1.1-3 (September 1998) for subbituminous coal combustion, for pulverized coal fired, dry bottom, CO emission factor is 0.5 lb/ton.

Heat content of coal is 9900 Btu/lb coal, heat content of steam is 1070 Btu/lb steam and efficiency of the boiler is 80 %.

$$(0.6 \text{ lb/ton})\ (1/2000)\ (1/9900)\ (10^6/1 \text{ MMBtu}) = 0.0303 \text{ lb/MMBtu}$$

$$(0.0303 \text{ lb/MMBtu})\ (1/.80)\ (1.070 \times 10^{-3} \text{ MMBtu/lb})\ (1000) = 0.0405 \text{ lb/Klb steam}$$

3. B&W BOILER (S-B2) - natural gas

The emissions factor for CO is based on a stack test conducted on the Riley Boiler at the Nampa facility while firing natural gas in January 2004. Utilizing this information, the emission factor is 0.00659 lbs CO/Klbs steam.

4. KEELER BOILER (S-B3) - natural gas

The emissions factor for CO is based on a stack test conducted on the Riley Boiler at the Nampa facility while firing natural gas in January 2004. Utilizing this information, the emission factor is 0.00659 lbs CO/Klbs steam.

5. PULP DRYER (S-D1) - coal

Testing was done with a portable flue gas analyzer ECOM-S+, rented from Clean Air Engineering at Twin Falls, on 11/15/94. Portable flue gas analyzer is not recognized by DEQ as an approved test method. Therefore, this is considered to be uncertified testing data. However, this data is used to estimate CO emission factor for the dryers, since it is the only data available at this time. CO emission factor is 2.23 lb/ton input (see attached table). A safety factor of 20% has been used and the new emission factor is: (2.23 lb/ton input) x (1.20) = 2.67 lb/ton input.

6. SOUTH LIME KILN (S-K1) – coke/coal

The CO EF is based on stack tests conducted on a vertical shaft kiln at the Nampa facility in December 2003. Based on this information, the CO EF is 55.5 lbs per ton limerock.

7. NORTH LIME KILN (S-K2) – coke/coal

Same as the SOUTH LIME KILN.

TWIN FALLS
NITROGEN OXIDE (NO_x) EMISSION FACTORS
Updated July 2012

1. FW BOILER (S-B1) - coal

The emission factor for the Foster Wheeler boiler is based upon the following:

i. The permit limit based on 40 CFR 60, Subpart D is 0.7 lb/MMBtu.

ii. Steam heating value of 1140 Btu/lb.

iii. Boiler efficiency estimated at 80%.

(0.70 lbs/MMBtu) (1/0.8) (1.140 x 10^{-3} MMBtu/lb) (1000) = 0.998 lbs/Klbs steam

2. B&W BOILER (S-B2) - coal

The NO_x emission factor for the B&W boiler is based upon previous stack tests. Prior to the start of the 1994 campaign, the burners on the B&W Boiler at Twin Falls were replaced with Riley Low NO_x Controlled Combustion Venturi (CCV) Burners. NO_x emission testing was conducted at Twin Falls on the B&W Boiler stack. This testing was for information purposes only and should not be used for compliance demonstration. For the testing conducted at Twin Falls, EPA testing Method 7, (described in Federal Register Title 40, Part 60, Appendix A), was generally followed during the sampling. In order to collect the maximum number of samples, EPA Method 7 was either not strictly followed and/or slightly modified. Therefore this is considered as uncertified testing data. However, this data will be used to estimate NO_x emission factor for the B&W Boiler, since this is the only available data at this time. NO_x emission factor is 15.3 lb/ton coal. A safety factor of 5% was used and the new emission factor is: (15.3 lb/ton coal) x (1.05) = 16.07 lb/ton coal. Then,

(16.07 lbs/ton) (1/2000) (1/9900) (10^6/MMBtu) = 0.8 lb/MMBtu

(0.8 lb/MMBtu) (1/.080) (1.070 x 10^{-3} MMBtu/lb) (1000) = 1.1 lbs/Klbs steam

3. B&W BOILER (S-B2) - natural gas

From AP-42, Table 1.4-1 (7/98) for natural gas combustion, for large wall-fired boilers (Uncontrolled Pre-NSPS), NO_x emission factor is 280 lb/10^6 ft^3.

Heat content of natural gas is 1000 Btu/ft^3, heat content of steam is 1070 Btu/lb steam and efficiency of the boiler is 80%. Then,

$$(280\ lb/10^6\ SCF)*(SCF/1000\ Btu)*(10^6\ /MMBtu) = 0.28\ lb/MMBtu$$

$$(0.28\ lb/MMBtu)(1/0.80)(1.070 \times 10^{-3} MMBtu/lb)(1000) = 0.375\ lb/Klb\ steam$$

4. KEELER BOILER (S-B3) - natural gas

From AP-42, Table 1.4-1 (7/98) for natural gas combustion, for large wall-fired boilers (Uncontrolled Pre-NSPS), NO_x emission factor is 280 lb/10^6 ft^3. Heat content of natural gas is 1000 Btu/ft^3, heat content of steam is 995 Btu/lb steam and efficiency of the boiler is 80%.

$$(280\ lb/10^6\ SCF)*(SCF/1000\ Btu)*(10^6\ /MMBtu) = 0.28\ lb/MMBtu$$

$$(0.28\ lb/MMBtu)(1/0.80)(0.0995 \times 10^{-3} MMBtu/lb)(1000) = 0.348\ lb/Klb\ steam$$

5. DRYER DRUM (S-D1) - coal

NO_x emission testing was conducted at Twin Falls on the dryer stacks. This testing was for information purposes only and should not be used for compliance demonstration. For the testing conducted at Twin Falls, EPA testing Method 7, described in Federal Register Title 40, Part 60, Appendix A, was generally followed during the sampling. In order to collect the maximum number of samples, EPA Method 7 was either not strictly followed and/or slightly modified. Therefore this is considered as uncertified testing data. However, this data will be used to estimate NO_x emission factor for the dryer, since this is the only available data at this time. NO_x emission factor is 8.5 lb/ton coal. A safety factor of 10% will be used and the new emission factor is: (8.5 lb/ton coal) x (1.10) = 9.35 lb/ton coal

6. SOUTH LIME KILN (S-K1) – lime rock

The NO_x EF is based on an EPA AP42 emission factor for a spreader stoker boiler firing anthracite coal (9 lbs/ton coal).Converting the EF in terms of limerock the estimated NO_x EF is 0.63 lbs NO_x/ton limerock.

7. NORTH LIME KILN (S-K2) – lime rock

Same as SOUTH LIME KILN.

TWIN FALLS
VOLATILE ORGANIC COMPOUNDS (VOC) EMISSION FACTORS
Updated 2012

1. FW BOILER (S-B1) - coal

From AP-42, Table 1.1-19 (September 1998) for bituminous coal combustion, for spreader stoker, uncontrolled process VOC emission factor is 0.05 lb/ton.

Heat content of coal is 11,000 Btu/lb coal, heat content of steam is 1140 Btu/lb steam and efficiency of the boiler is 80%.

$$(0.05 \text{ lbs/ton})\ (1/2000 \text{ lbs})\ (1 \text{ lb}/11000 \text{ Btu})\ (10^6/1 \text{ MMBtu}) = 0.0023 \text{ lb/MMBtu}$$

$$(0.0023 \text{ lb/MMBtu})\ (1/0.80)\ (1.140 \times 10^{-3} \text{ MMBtu/lb})\ (1000) = 0.00328 \text{ lb}/10^3 \text{ lb steam}$$

2. B&W BOILER (S-B2) - coal

From AP-42, Table 1.1-19 (September 1998) for subbituminous coal combustion, for pulverized coal fired, dry bottom, VOC emission factor is 0.06 lb/ton.

Heat content of coal is 9900 Btu/lb coal, heat content of steam is 1070 Btu/lb steam and efficiency of the boiler is 80%.

$$(0.06 \text{ lbs/ton})\ (1/2000 \text{ lbs})\ (1 \text{ lb}/9900 \text{ Btu})\ (10^6 \text{Btu/MMBtu}) = 0.0030 \text{ lb/MMBtu}$$

$$(0.0030 \text{ lb/MMBtu})\ (1/0.80)\ (1.070 \times 10^{-3} \text{ MMBtu/lb})\ (1000) = 0.00401 \text{ lb}/10^3 \text{ lb steam}$$

3. B&W BOILER (S-B2) - natural gas

From AP-42, Table 1.4-2 (July 1998) for natural gas combustion, for utility boilers, VOC emission factor is 5.5 lb/10^6 ft^3.

Heat content of natural gas is 1000 Btu/ft^3 , heat content of steam is 1070 BtuU/lb steam and efficiency of the boiler is 80%.

$$(5.5 \text{ lb}/10^6 \text{ ft}^3)\ (1 \text{ ft}^3/1000 \text{ Btu})\ (10^6/\text{MMBtu}) = 0.0055 \text{ lb/MMBtu}$$

$$(0.0055 \text{ lb/MMBtu})\ (1/0.80)\ (1.070 \times 10^{-3} \text{ MMBtu/lb steam})\ (1000) = 0.00736 \text{ lb}/10^3 \text{ steam}$$

4. KEELER BOILER (S-B2) - natural gas

From AP-42, Table 1.4-2 (July 1998) for natural gas combustion, for industrial boilers, VOC emission factor is 5.5 lb/10^6 ft^3.

Heat content of natural gas is 1000 Btu/ft^3, heat content of steam is 995 Btu/lb steam and efficiency of the boiler is 80%.

$$(5.5 \text{ lb}/10^6 \text{ ft}^3)\ (1 \text{ ft}^3/1000 \text{ Btu})\ (10^6/\text{MMBtu}) = 0.0055 \text{ lb/MMBtu}$$

$$(0.0055 \text{ lb/MMBtu})\ (1/0.80)\ (0.0995 \times 10^{-3} \text{ MMBtu/lb steam})\ (1000) = 0.00684 \text{ lb}/10^3 \text{ steam}$$

4. DRYER DRUM (S-D1) – coal

The VOC emission factor was estimated based on total hydro carbon stack testing at the Nyssa facility and EPA AP42 assumptions. Total hydrocarbon measurements utilizing EPA Method 25A were conducted on a pulp dryer at the Nyssa facility in November 1998. The total hydrocarbon emission factor was:

0.42 lbs THC's/ton input

To determine the VOC emissions factor, methane needs to be deducted from the THC factor. Based on EPA AP42 data for, horizontal coffee bean roasters with thermal oxidizer controls, the methane fraction is ~95.9 % of the total VOC's. For the pulp dryers conservatively assume 90% then,

0.42(1-0.9) = 0.042 lbs VOC's/ton input

0.042 lbs VOC's/ton input(70 tons input/4.8 tons coal) = 0.61 lbs VOC's/ton coal

5. SOUTH LIME KILN (S-K1) – coke/coal

The VOC emissions factor is based on engineering stack tests at the twin Falls facility in 2005. Based on this information, the emission factor is 0.524 lbs per ton anthracite coal.

6. NORTH LIME KILN (S-K2) – coke/coal

Same as South Lime Kiln.

7. MAIN MILL VENTS (S-O5)

There are no EPA approved and field validated total VOC testing procedures for the main mill vents at sugar beet processing facilities. During the 2005 beet processing campaign, TASCO hired a third party consultant to conduct speciated VOC screening engineering stack tests on selected vents at the Mini Cassia and Twin Falls facilities. The 1st and 2nd carbonation tank vents were sampled at the Twin Falls facility in October 2005. A stack with several evaporator heater vents was sampled at the Mini Cassia facility in October 2005 and March 2006.

Although emissions data was collected, several noted interferences and inaccuracies with the test methods were encountered. Testing interferences, which affect the accuracy of the results, include high stack CO2 concentrations, high stack gas moisture levels and entrained moisture. High moisture levels greatly reduced the sample times and volumes, which limited the ability to collect accurate and representative data. In order to more accurately measure these sources, the interferences would need to be eliminated or develop alternative testing procedures.

However, based on an analysis of this data and other information, TASCO will utilize the preliminary engineering stack testing to estimate VOC's from the main mill vents. The emission factor is as follows:

0.277 lbs VOC/ 1000 gals of juice

TWIN FALLS
FUGITIVE PARTICULATE MATTER EMISSION FACTORS
July 2012

A. BOILER HOUSE

F - B4 Coal Unloading Railcar to Storage

From AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Use the emission factor for train loading, batch or continuous drop. Since these factors can be site specific for location, use the emission factor for any location. The estimated PM emission factor for this activity is 0.066 lb/tons coal. Based on an engineering estimate, assume the PM_{10} emissions factor is 50% of the PM EF or 0.033 lbs/ton coal.

B. DRYER

S - D4 Pulp Dryer Material Handling Baghouse Emissions

The material handling transfer points are controlled by a baghouse. Assume the control efficiency of the baghouse with an estimated 99% control efficiency.

a) Shredded pulp transfer points:

Controlled - 1 - bottom of shredded pulp elevator
1 - transfer from conveyor to weightometer

From AP-42, Table 10.4-2 (1985) potential uncontrolled fugitive particulate emission factors for woodworking operations, for wood waste storage bin vent, the emission factor is 1.0 lb/ton. Assume 1.0 lb/ton dry pulp.

Assume 2% of the total dry pulp going to storage, represents the fines recirculated from A-D2/3 and the fines recirculated from the pellets screens.

The emission factor is:

(2 pts. controlled x 1 lb/ton)(1-0.99) x 1.02 = 0.02 lb/ton dry pulp

b) Pelletized pulp transfer points

Controlled- 1- bottom of pellet coolers conveyor
1- bottom of pellets elevator
1- top of pellets elevator

From AP-42, Table 10.4-2(1985), potential uncontrolled fugitive particulate emission factors for woodworking operations, for wood waste storage bin vent, the emission factor is 1.0 lb/ton. Assume 1.0 lb/ton pellets. Pellets have a binder (molasses, CSB or a combination of the two), therefore assume that the emission factor is only 10% of 1.0 lb/ton pellets.

(3 pts controlled x 0.1 lb/ton)(1-0.99) = 0.03 lb/ton pellets

Assume that the estimated amount of the pelletized pulp is 60% of the total dry pulp. The total emission factor is:

0.02 lb/ton dry pulp + (0.03 lb/ton pellets x 0.60 ton pellets/ton dry pulp) = 0.038 lb/ton dry pulp

Based on an engineering estimate, assume the PM_{10} emissions factor is 50% of the PM EF or 0.019 lbs/ton dried pulp.

F - D5 Pulp Dryer Coal Railcar Unloading

From AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Use the emission factor for train loading, batch or continuous drop. Since these factors can be site specific for location, use the emission factor for any location. The estimated PM emission factor for this activity is 0.066 lb/tons coal. Based on an engineering estimate, assume the PM_{10} emissions factor is 50% of the PM EF or 0.033 lbs/ton coal.

F - D6 Dried Pulp Storage & Load Out

A) Shredded Pulp Warehouse

Fugitive emissions are generated by:

1) One conveyor dumping in the warehouse

2) Loading trucks inside the building

3) 1 conveyor dumping in the warehouse

From AP-42, Table 10.4-2 (1985), potential uncontrolled fugitive particulate emission factors for woodworking operations, for wood waste storage bin vent, the emission factor is 1.0 lb/ton. Assume 1.0 lb/ton dry pulp.

Assume 90% control efficiency of the building. Assume 2% of the total dry pulp going to storage, represents the fines recirculated from A-D2/3 and the fines recirculated from the pellets screens.

Fugitive emission factor is:

(1 lb/ton dry pulp) x (1-0.90) x (1.02) = 0.102 lb/ton dry pulp

2) Loading trucks inside the building

From AP-42, Table 10.4-2, potential uncontrolled fugitive particulate emission factors for woodworking operations, for wood waste storage bin vent, the emission factor is 1.0 lb/ton. Assume 1.0 lb/ton dry pulp.

Assume all trucks are loaded inside the building and 90% is the control efficiency of the building. Assume that the estimated amount of the shredded pulp is 40% of the total dry pulp.

Fugitive emission factor is:

(1 lb/ton dry pulp) x (1-0.90) = 0.1 lb/ton dry pulp

The total emission factor for the fugitive emissions generated by the shredded, dry pulp, warehouse activities is:

(0.102 lb/ton dry pulp + 0.1 lb/ton dry pulp) x 40% (total dry pulp)
= 0.081 lb/ton dry pulp

B) Pulp Warehouse - Pellet Handling

Fugitive emissions are generated by:
1) 1 conveyor dumping in the warehouse

2) Loading trucks and railcars outside the building

3) 1 conveyor dumping in the warehouse

From AP-42, Table 10.4-2 (1985), potential uncontrolled fugitive particulate emission factors for woodworking operations, for wood waste storage bin vent, the emission factor is 1.0 lb/ton. Assume 1.0 lb/ton pellets. Pellets have a "molasses" binder, therefore assume that the emission factor is only 10% of 1.0 lb/ton pellets.

Assume 90% control efficiency of the building.

Fugitive emission factor is:

(1.0 lb/ton pellets) x 10% x (1-0.90) = 0.01 lb/ton pellets

2) Loading trucks and railcars outside the building

From AP-42, Table 10.4-2 (1985), potential uncontrolled fugitive particulate emission factors for woodworking operations, for wood waste storage bin vent, the emission factor is 1.0 lb/ton. Assume 1.0 lb/ton pellets. Pellets have a "molasses" binder, therefore assume that the emission factor is only 10% of 1.0 lb/ton pellets.

Assume 60% of the pellets are loaded by trucks outside the building and 40% of the pellets are loaded by railcars outside the building.

Assume that the estimated amount of the pelletized pulp is 60% of the total dry pulp.

The emission factor for the fugitive emissions generated by pelletized pulp, warehouse activities is:

(0.01 lb/ton pellets + 0.1 lb/ton pellets) x 60% = 0.066 lb/ton dry pulp

The total emission factor is:

0.081 lb/ton dry pulp + 0.066 lb/ton dry pulp = 0.147 lb/ton dry pulp

Based on an engineering estimate, assume the PM_{10} emissions factor is 50% of the PM EF or 0.0735 lbs/ton dried pulp.

C. LIME KILN

S - K5 Lime Kiln Material Handling Baghouse

The material transfer points are controlled by two baghouses. Assume the control efficiency of each baghouse 99%.

a) Coke/coal transfer points: total of 6 -
1 - coke bin
4 - conveyors to scale
1 - skip hoist

Assume coke/coal EF is 10% of coal emission factor. From EPA AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Use the emission factor for train loading, batch or continuous drop. Since these factors can be site specific for location, use the emission factor for any location. The estimated uncontrolled emission factor for this activity is 0.066 lb/ton coal.

The emission factor for coke/coal handling will be 0.0066 lb/ton coke.

b) Limerock transfer points: total of 5 - 1 - limerock bin
3 - conveyors to scale
1 - skip hoist

Assume lime rock EF is 10% of coal emission factor. From EPA AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Use the emission factor for train loading, batch or continuous drop. Since these factors can be site specific for location, use the emission factor for any location. The estimated emission factor for this activity is 0.066 lb/ton coal. The emission factor for lime rock handling will be 0.0066 lb/ton lime rock.

c) Burnt lime rock transfer points, total of 12

4 - bottom of the South kiln
4 - bottom of the North kiln
4 - conveyors to lime crusher

Assume lime rock EF is 10% of coal emission factor. From EPA AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Use the emission factor for train loading, batch or continuous drop. Since these factors can be site specific for location, use the emission factor for any location. The estimated emission factor for this activity is 0.066 lb/ton coal. The emission factor for lime rock handling will be 0.0066 lb/ton lime rock.

d) Lime transfer points : total of 11

2 - bottom of the crusher
1 - bottom of lime elevator
1 - top of the lime elevator
1 - top of the crushed lime bin #2
6 - lime conveyed to crushed lime bin #1

From AP-42 Table 11.17-4 (February 1998) emission factors for lime manufacturing, for crusher controlled with baghouse the emission factor is 0.00043 lb/ton lime produced. For the purposes of this calculation, the emission factor will be 0.001 lb/ton of lime produced. Divide by 2 to obtain factor per unit of lime rock feed to the kiln. The emission factor is 0.0005 lb/ton lime rock.

Assume tons coke/coal used in the lime kilns represents 9% of the total tons lime rock; assume that burnt lime and lime represents 56% of the total tons lime rock.

The total emission factor for S - K5 is:

(6 pts (0.0066 lb/ton coke)(0.09 coke/limerock) + 5 pts (0.0066 lb/ton limerock) + 12 pts (0.0066 lb/ton burnt lime)} (1-0.99) + 11 pts (0.0005 lb/ton lime)(0.56 lime/limerock) = 0.0042 lb/ton lime rock

D. OTHER SOURCES

F - O1 Coal Unloading Railcar to Storage

From AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Use the emission factor for train loading, batch or continuous drop. Since these factors can be site specific for location, use the emission factor for any location. The estimated emission factor for this activity is 0.066 lb/ton coal. Assume that fugitive emissions for bottom dump truck unloading are equivalent to railcar unloading emission factor. The estimated PM emission factor for this activity is 0.066 lb/tons coal. Based on an engineering estimate, assume the PM_{10} emissions factor is 50% of the PM EF or 0.033 lbs/ton coal.

F - O2 Coal Storage

The emissions for coal storage are the following:

1) F-02a - Front end loader to storage pile
2) F-02aa - Front end loader from storage pile
3) F-02b - Vehicle traffic to storage
4) F-02bb - Vehicle traffic from storage
5) F-02c - Active and inactive pile

1) F-02a - Front end loader to storage pile

From AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Assume that fugitive emissions for railcar loading are equivalent to front end loader material transfer emission factor. The estimated emission factor for this activity is 0.028 lb/tons coal.

2) F-02aa - Front end loader from storage pile

From AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Assume that fugitive emissions for railcar loading are equivalent to front end loader material transfer emission factor. The estimated emission factor for this activity is 0.028 lb/tons coal.

3) F-02b - Vehicle traffic to storage

From AP-42 Chapter 13.2.2-2(December 2003), Emissions Calculations for Unpaved Roads, the following empirical expression may be used to estimate the emissions, in lb/vehicle mile traveled (VMT):

E = k (5.9) (s/12) (S/30) (W/3)exp0.7 (w/4)exp0.5 {(P-p)/P} [lb/VMT]
k = particle size multiplier (dimensionless) = 0.8
s = silt content of road surface material (%) = 8.4
S = mean vehicle speed (mph) = 5
W = mean vehicle weight (ton) = 10
w = mean number of wheels = 4
P = number of travel days = 60
p = number of days with at least 0.01 in. ppt/year = 0

E = 0.8 (5.9) (8.4/12) (5/30) (10/3)exp0.7 (4/4)exp0.5 {(60-0)/60} = 1.28 lb/VMT

Vehicle miles traffic (VMT) for coal storage. Assume amount of coal stored 94,200 tons.
Total VMT : 200 ft/trip x 15,411 trips/year x 1 mile/5280 ft = 584 VMT/year

The total annual estimated emission rate for vehicle traffic to storage is:

1.28 lb/VMT x 584 VMT/year = 747.5 lb/year = 0.374 tons/year

4) F-02bb - Vehicle traffic from storage

From AP-42 Chapter 13.2.2-4 (February 2003), Emissions Calculations for Unpaved Roads, the following empirical expression may be used to estimate the emissions, in lb/vehicle mile traveled (VMT):

E = k (5.9) (s/12) (S/30) (W/3)exp0.7 (w/4)exp0.5 {(P-p)/P} [lb/VMT]

k = particle size multiplier (dimensionless) = 0.8
s = silt content of road surface material (%) = 8.4
S = mean vehicle speed (mph) = 5
W = mean vehicle weight (ton) = 5
w = mean number of wheels = 4
P = number of travel days = 60
p = number of days with at least 0.01 in. ppt/year = 16

E = 0.8 (5.9) (8.4/12) (5/30) (5/3)exp0.7 (4/4)exp0.5 {(60-16)/60} = 0.58 lb/VMT

Vehicle miles traffic (VMT) for coal storage. Assume amount of coal stored 45,000 tons.

Total VMT : 200 ft/trip x 15,411 trips/year x 1 mile/5280 ft = 584 VMT/year

The total annual estimated emission rate for vehicle traffic to storage is:

0.58 lb/VMT x 584 VMT/year = 338.7 lb/year = 0.17 tons/year

5) F-02c - Active and inactive pile

From AP-42 Chapter 11.9-3 (July 1998) Western Surface Coal Mining, the equation for uncontrolled open dust sources, the coal pile, is:

E = 1.6 (u)
E = emission factor, in lb/(acre)(hr)
u = wind speed (m/sec) = 10 mph = 4.5 m/sec
E = 1.6 (4.5) = 7.2 lb/(acre)(hr)

Assume the active coal pile size is 2.0 acres and that 75 days are required to stockpile. The pile is active at the end of the summer during stockpiling.

The total annual emissions from the active pile are:

7.2 lb/(acre)(hr) x 2.0 acre x 8.0 hr/day x 75 days x 1 ton/2000 lb = 4.3 tons/year

Assume the inactive pile is 10% of the active and that the pile is inactive for 65 days.

The total annual emissions from the inactive pile are:

7.2 lb/(acre)(hr) x 2.0 acre x 0.1 x 24 hr/d x 65 d x 1 ton/2000 lb = 1.12 tons/year

The PM total annual estimated emission rate for the active and inactive pile is:

4.3 tons/year + 1.12 tons/year = **5.42 tons/year**

Based on an engineering estimate, assume the PM_{10} emission rate is 50% of the PM EF or **2.71 tons/year.**

F - O3 Coal Loading in Railcars

From AP-42, Table 11.9-4 (July 1998), uncontrolled particulate emission factors for open dust sources at western surface coal mines. Assume that fugitive emissions for railcar loading are by batch drop material transfer. The estimated emission factor for this activity is 0.028 lb/tons coal. Based on an engineering estimate, assume the PM_{10} emissions factor is 50% of the PM EF or 0.014 lbs/ton coal.

F - O4 Beets Unloading, Storage and Beets Loading for Transport to the Process

a) Vehicle traffic to storage

From AP-42 Chapter 13.2.2-4 (February 2003), Emissions Calculations for Unpaved Roads, the following empirical expression may be used to estimate the emissions, in lb/vehicle mile traveled (VMT):

E = k (5.9) (s/12) (S/30) (W/3)exp0.7 (w/4)exp0.5 {(P-p)/P} [lb/VMT]

k = particle size multiplier (dimensionless)	= 0.8
s = silt content of road surface material (%)	= 17
S = mean vehicle speed (mph)	= 10
W = mean vehicle weight (ton)	= 16.5
w = mean number of wheels	= 10
P = number of travel days	= 60
p = number of days with at least 0.01 in. ppt/year	= 14

E = 0.8 (5.9) (17/12) (10/30) (16.5/3)exp0.7 (10/4)exp0.5 {(60-14)/60} = 8.91 lb/VMT

Vehicle miles traffic (VMT) for beets to the storage.

Assume amount of beets stored 128,000 tons. Assume average round trip is 1000 ft and the vehicle carrying capacity is 15 tons. Total VMT: 200,000 tons x 1 trip/15 tons x 1000 ft x 1 mile/5280 ft = 2,525 VMT/year

Assume 75% the control efficiency of the suppressant used (water mixed with concentrated separator by-product). The emission factor for vehicle traffic to storage is:

8.91 lb/VMT x 2,525 VMT/year x (1 - 0.75) = 5623 lb/year = 2.8 tons/year

a) Vehicle traffic from storage to process

From AP-42 Chapter 13.2.2-4 (February 2003), Emissions Calculations for Unpaved Roads, the following empirical expression may be used to estimate the emissions, in lb/vehicle mile traveled (VMT):

E = k (5.9) (s/12) (S/30) (W/3)exp0.7 (w/4)exp0.5 {(P-p)/P} [lb/VMT]

k = particle size multiplier (dimensionless)	= 0.8
s = silt content of road surface material (%)	= 17
S = mean vehicle speed (mph)	= 5
W = mean vehicle weight (ton)	= 30

w = mean number of wheels = 10
P = number of travel days = 30
p = number of days with at least 0.01 in. ppt/year = 7

E = 0.8 (5.9) (17/12) (5/30) (30/3) exp0.7 (10/4) exp0.5 {(30-7)/30} = 6.77 lb/VMT

Vehicle miles traffic (VMT) for beets from storage.

Assume amount of beets stored 200,000 tons. Assume average round trip is 2100 ft and the vehicle carrying capacity is 35 tons. Total VMT: 200,000 tons x 1 trip/35 tons x 2100 ft x 1 mile/5280 ft = 2,273 VMT/year

Assume 75% the control efficiency of the suppressant used (water with concentrated separator by-product). The total annual estimated emission rate for vehicle traffic to storage is:

6.77 lb/VMT x 2,273 VMT/year x (1 - 0.75) = 3848 lb/year = 1.92 tons/year

Total estimated annual PM emission rate for beets unloading, storage and loading for transport to the process is:

2.8 tons/year + 1.9 tons/year = 3.7 tons/year

Based on an engineering estimate, assume the total PM_{10} emissions rate is 50% of the PM EF or **1.9 tons/year**.

LIMITATIONS

The following annual emissions limitations, monitoring, and recordkeeping requirements are provided as per IDEQ PTC application requirements. The annual limitations are based on the 2003/2004 baseline emission calculations. The proposed draft permit language is based on requirements included in the No. 6 Evaporator PTC issued by IDEQ for the Mini Cassia facility on June 11, 2012 (Permit No. P-2011.0040).

2. FACILITY-WIDE LIMITS

Emission Limits

2.1 Annual Emission Limit

The annual facility-wide emissions (tons/year) shall not exceed the following:

PM_{10}	SO_2	NO_x	CO	VOC
352	2,219	1,228	2,001	68

Monitoring and Recordkeeping Requirements

2.2 Annual Emissions Monitoring

The permittee shall monitor the facility-wide emissions of PM, PM_{10}, $PM_{2.5}$, SO_2, NO_x, and CO each calendar year for a period of 10 years following the issuance of this permit in accordance with 40 CFR 52.21 (r)(6). Records of annual emissions shall be calculated and maintained in tons per year on a calendar year basis.

2.3 Annual Emissions Reporting

The permittee shall submit a report to DEQ if facility-wide annual emissions of PM, PM_{10}, $PM_{2.5}$, SO_2, NO_x, or CO exceed baseline actual emissions by a significant amount, and if such emissions differ from the preconstruction projection as determined in accordance with 40 CFR 52.21 (r)(6)(v). The report shall be submitted to DEQ within 60 days after the end of such year and shall contain the following:

- The name, address and telephone number of the major stationary source;
- The annual emissions as calculated pursuant to 40 CFR 52.21 (r)(6)(iii); and
- Any other information that the permittee wishes to include in the report (e.g., an explanation as to why the emissions differ from the preconstruction projection).

Section 6
Facility Classification
The Amalgamated Sugar Company LLC
Twin Falls Facility

As per IDEQ's Statement of Basis for the renewed Tier I Operating Permit issued on October 7, 2011:

"The Twin Falls Facility is classified as a major facility as defined in IDAPA 58.01.01.008.10, because the facility emits or has the potential to emit a regulated air pollutant in an amount greater than or equal to 100 T/yr, the facility emits or has the potential to emit a single regulated HAP greater than 10 T/yr, and the facility emits or has the potential to emit a combination of regulated HAP greater than 25 T/yr."

Main Mill Vents
Net Annual Emissions Increases
Annual Beet Slice Change to 1,400,000 tons/y
Twin Falls Facility

Source	Acetaldehyde	Formaldehyde
Emission Factor[1] (lbs/tons beets)	2.47E-03	2.27E-05
Annual Beet Slice Increase (10^6 ton/yr)	0.2	0.2
Annual Emissions Increase (tons/y)	2.47E-01	2.27E-03
Annualized Emissions Increase (lbs/h)[2]		
-Total	1.03E-01	9.46E-04
-1st Carb Tank Vent	4.01E-02	4.35E-04
-2nd Carb Tank Vent	6.18E-02	4.92E-04
-Evaporator Vent	1.03E-03	1.89E-05
Screening Levels (IDAPA 58.01.01.586)	3.00E-03	5.10E-04

[1] Engineering estimates and stack testing data.

[2] Assume 200 d/y beet campaign.

Acetaldehyde & Formaldehyde Air Quality Impact Analysis

for the

The Amalgamated Sugar Company LLC
Twin Falls, Idaho

July 27, 2012

1.0 INTRODUCTION

The Amalgamated Sugar Company LLC (TASCO) has conducted an ambient air quality impact analysis in support of the request to increase the annual beet slice at the Twin Falls facility. The analysis was performed to conservatively estimate air quality impacts for the net difference in slice from 1,200,000 tons per year to 1,400,000 tons per year.

The modeling analysis was performed using the air dispersion model "Breeze" developed by Trinity Consultants. The Breeze suite of programs combines into one program EPA's AERMOD and Building Profile Input Program (BPIP). The Breeze suite is also capable of importing digital elevation model (DEM) terrain files and graphically presenting contours as well as buildings, emission points and receptors.

2.0 INPUT PARAMETERS

Table 1 presents the emission rate changes for processing 200,000 tons of beets. Table 2 details the stack parameters including stack height and diameter, exhaust temperature and the exhaust flow rate. Since there are numerous evaporator vents, a combined surrogate vent was established. Stack parameters for this vent are based on data for a vent at the Mini-Cassia facility. Figure 1 illustrates the source and building locations.

3.0 MODEL

The Breeze Suite of programs operates using EPA's AERMOD model version 12060, BPIP Prime model version 04274 and AERMAP version 11103

4.0 METEOROLOGY

This analysis used meteorological data (met data) developed by Geomatrix of Lynwood, Washington using EPA's AERMET model (Version 06431). Upper air data was collected from the Boise, Idaho meteorology station #24131 while the surface air was collected at the Burley, Idaho met station #25867. Land use characteristics were processed in 12 sectors encompassing the Minidoka INEEL meteorological site using the AERMET user guide lookup tables. These files reflect meteorology of the area from January, 2000 to December31, 2004.

5.0 RECEPTOR GRID

The Dispersion model includes boundary receptors, three receptor grids, and as suggested by IDEQ, discrete receptors that were placed along the flow path of Rock Creek. Terrain elevations for the receptors were obtained from USGS digital elevation model (DEM) 7.5-minute TWINFALLS quadrangle. These data have a horizontal spatial resolution of 30 meters. The fence line receptors, discrete receptors and grid receptors are expressed in units of UTM (NAD27) coordinates and are depicted in Figure 2.

The full receptor grid consists of three separate receptor grids. Originally, receptors were placed every 200 meters on a 6.8 km by 5.8 km area grid, (1050 grid points) with the facility centrally located in the middle of the grid. Receptors were excluded within the facility boundaries. Fence (boundary) receptors were placed at the perimeter of the facility on a 50-meter spacing starting with the northwest corner of the property owned and controlled by TASCO (as suggested in IDEQ's Air Quality Modeling Guideline). Based upon the results of initial simulations, a refined 1.2 km by 3 km receptor grid (1525 grid points) with 50 meter spacing between receptors was placed around the facility concentrating on the east-west corridor along Orchard Drive East with a western most boundary at UTM 709,800 meters (approximately .25 miles west of the facility) and the southern most boundaries at UTM 4,711,200 meters (immediately south of Rock Creek). The placement of the smaller 50-meter grid pattern was determined by evaluating previous model output and prevailing wind patterns.

Although the farms south of Rock Creek are owned and operated by TASCO personnel, a third receptor grid (1.2 km by 3 km with 50-meter spacing between receptors) was placed over the Kimpton/Moore farm south of Rock Creek.

6.0 BACKGROUND CONCENTRATION

Background concentrations are not necessary for this impact analysis.

7.0 RESULTS

Table 3 presents the results of the analysis. The highest annual, model-predicted acetaldehyde concentration is 2.62E-02 ug/m^3 (5.82% of AAAC) and is located at UTM Coordinates 711,185 meters Easting by 4,712,016 meters Northing. The highest annual, model-predicted formaldehyde concentration is 2.40E-04 ug/m^3 (0.31% of AAAC) and is located at UTM Coordinates 711,185 meters Easting by 4,712,016 meters Northing. Figure 3 illustrates the location of the maximum model-predicted concentrations. The highest concentration occurs at the Northern property boundary.

8.0 CONCLUSIONS

An air quality impact analysis was conducted based on net annual emissions changes associated with processing 200,000 tons of beets per year.

As shown in Table 3, the analysis demonstrated that the model-predicted annual acetaldehyde and formaldehyde concentrations for the meteorological period between January 1, 2000 and December 31, 2004 are less than the Acceptable Annual Ambient Concentrations (AAAC) in Idaho's carcinogenic list in IDAPA 58.01.01.586.

Table 1. Modeled TAP's Emissions - Point Sources (lbs / hour)

Emission Source	**Source ID**	**Annualized Emissions (Lb/hr)**	
		Acetaldehyde	Formaldehyde
Total		1.03E-01	9.46E-04
1st Carbonation Tank	PK 1/2 A	4.01E-02	4.35E-04
2nd Carbonation Tank	PK 1/2 B	6.18E-02	4.92E-04
#1 Evaporator Vent	S-05	1.03E-03	1.89E-05

Table 2. Stack Data for Stationary Point Sources

Emission Source (Point)	Source ID	UTM X (m)	UTM Y (m)	Stack Height (ft)	Temperature (°F)	Exit Velocity (ft / min)	Stack Diameter (ft)
1st Carbonation Tank	PK 1/2 A	710,984	4,711,912	98	191	1110	2.94
2nd Carbonation Tank	PK 1/2 B	710,972	4,711,898	95	164	437	5
1st Evaporator Vent	S-05	710,984	4,711,890	60	203	3414	1.0

Table 3. Maximum Predicted Annual Concentration

Constituent	Annual (ug / m^3)	UTM X (m)	UTM Y (m)	AAAC's (ug / m^3)
Acetaldehyde	0.02619	711,185	4,712,016	0.45
Formaldehyde	0.00024	711,185	4,712,016	0.077

Figure 1. Facility Layout Showing Buildings, Tanks, and Stacks

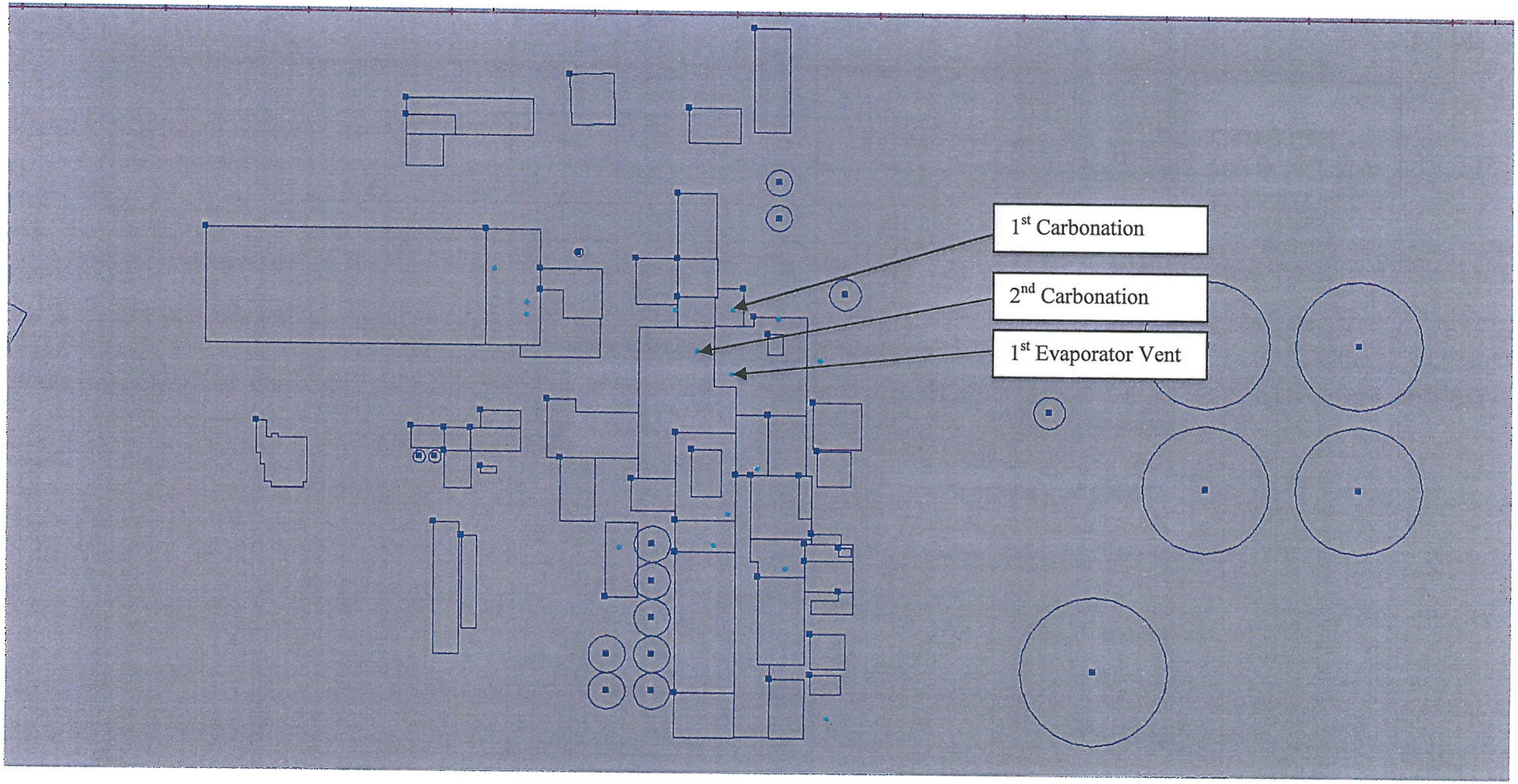


Figure 2. Fence Line and Receptor Grid

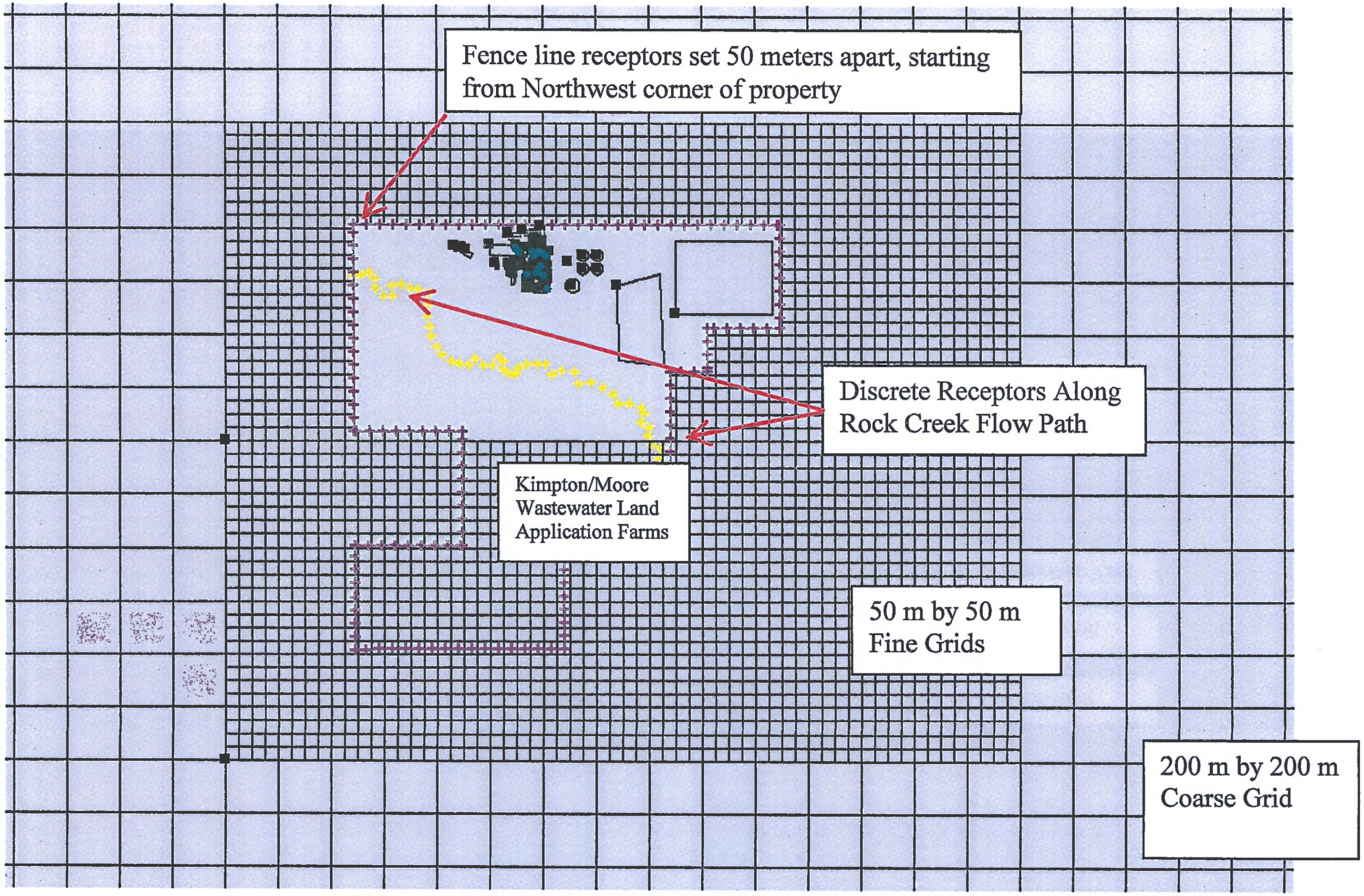
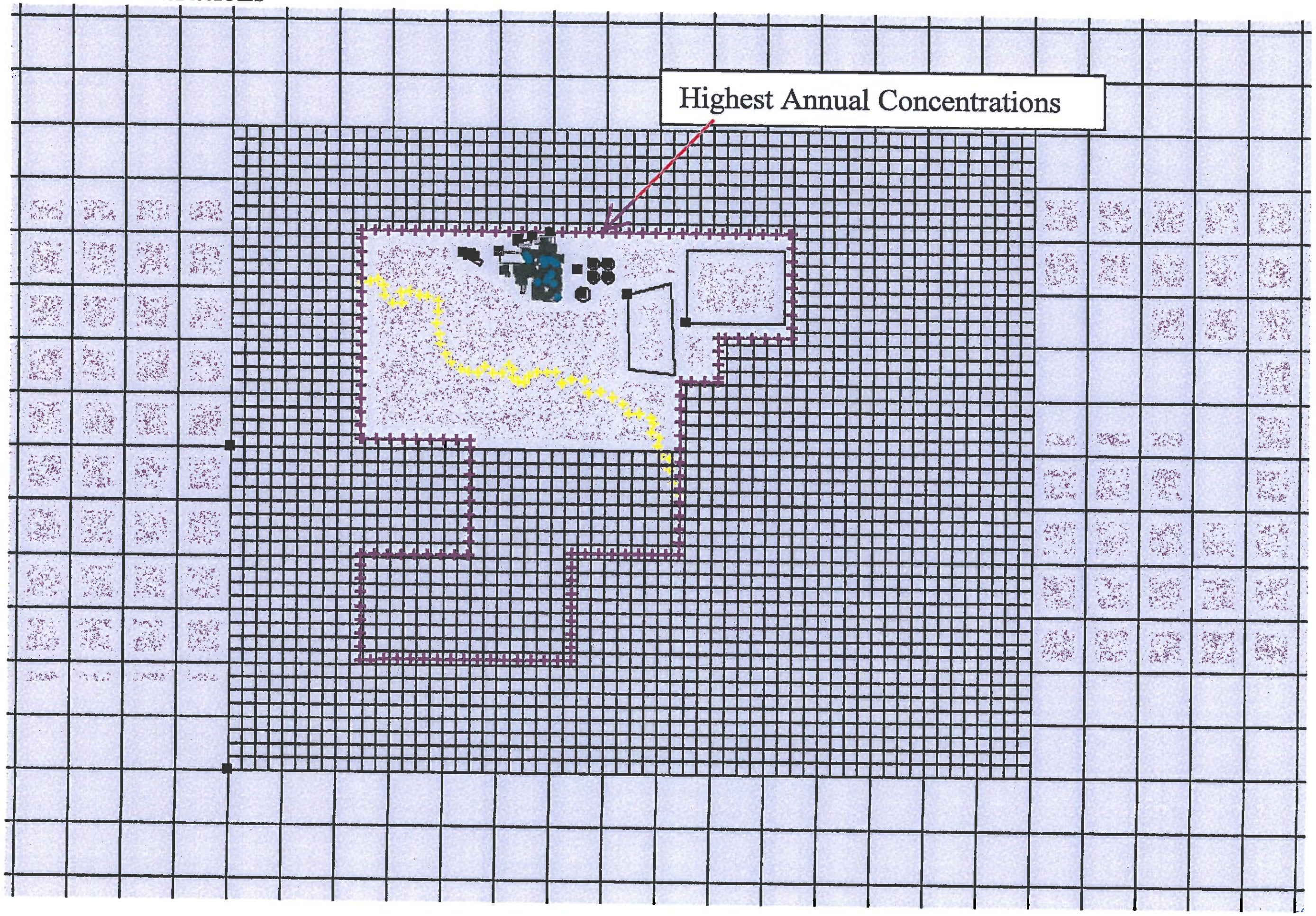


Figure 3. Location of Maximum Acetaldehyde and Formaldehyde Model Predicted Concentrations



THE AMALGAMATED SUGAR COMPANY

P. O. BOX 127 • TWIN FALLS, IDAHO 83303-0127 • PHONE (208) 733-4104

August 14, 2012

Idaho Department of Environmental Quality
Air Quality Permit to Construct Fees
Fiscal Office
1410 N. Hilton
Boise, ID 83706-1255

RE: Permit to Construct Application Fee
Sugar End and Energy Efficiency Improvements
The Amalgamated Sugar Company LLC (TASCO) Twin Falls Facility

Dear Sir or Madam:

Attached is the $1,000 application fee for the August 10, 2012 Permit to Construct Application for the Twin Falls facility.

If you have any questions please call Gary Pool at (208) 733-4104 or Dean DeLorey at (208) 383-6500.

Sincerely,

Gary Pool
Plant Manager
The Amalgamated Sugar Company LLC
Twin Falls Facility

DCD/ss

Enc.

cc: Boise – Dean C. DeLorey, Bob Braun
Twin Falls – Gary Lowe

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