



**Air Quality Permitting
Technical Memorandum**

Tier II Operating Permit No. 011-00027

**NONPAREIL CORP.
BLACKFOOT, IDAHO**

Prepared By:

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Permit Writer

Project No. T2-9811-169-2

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Permit Status:

FINAL PERMIT

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LIST OF ACRONYMS

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
BACT	Best Available Control Technology
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EF	emission factor
EPA	Environmental Protection Agency
gpm	gallons per minute
gr	grain (1 lb = 7,000 grains)
HAPS	hazardous air pollutants
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
MACT	Maximum Available Control Technology
MMBtu	million British thermal units
NESHAP	National Emission Standards For Hazardous Air Pollutants
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NSPS	New Source Performance Standards
O ₃	ozone
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
SCC	Source Classification Code
scf	standard cubic feet
SIP	State Implementation Plan
SO ₂	sulfur dioxide
TSP	total suspended particulates
T/yr	tons per year
VOC	volatile organic compound

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 404.04, *Rules for the Control of Air Pollution in Idaho (Rules)* for Tier II Operating Permits.

PROJECT DESCRIPTION

This project is for the issuance of a Tier II Operating Permit for Nonpareil located in Blackfoot, Idaho. The emissions sources of the facility are:

Table 1.1 Emissions Sources

Source				Control Device
Description	Model	Rating (MMBtu/hr)	Output (lb/hr)	
Processing east boiler	Erie City SA60H-21	40.5		
Processing west boiler	Erie City SA60H-21	40.5		
Starch dryer	Maxon 445	4.2	1,135	
Scratch mash dryers	Maxon 500	5.5	1,800	
Scratch mash material transfer				Scratch mash baghouse, Mikropulsaire, 36 bag, 2,500 cfm
Scratch mash air makeup	Hartzell	5		
Reblend room air makeup	Hartzell	1		
Building No. 3 air makeup	Hartzell	3		
Building No. 4 air makeup	Hartzell	10		
Processing peeler exhaust	Odenburg		5,000	
Flaker No. 1	Blau-Knox		1,250	
Flaker No. 2	Blau-Knox		1,250	
Flaker No. 3	Blau-Knox		1,000	
Flaker No. 4	Blau-Knox		1,000	
Flaker No. 5	Blau-Knox		1,000	
Grinding circuit No. 1 material transfer				Grinding circuit No. 1 baghouse, Mikropulsaire, 36 bag, 2,500 cfm
Starch plant material transfer				Starch plant baghouse, Mikropulsaire, 72 bag, 5,000 cfm
Grinding circuit No. 2 material transfer				Grinding circuit No. 2 baghouse, Mikropulsaire, 48 bag, 3,360 cfm
Flake material transfer		10.5		Flake baghouse, Mikropulsaire, 100 bag, 7,000 cfm
Dehydration north boiler	Highlander 250-3	10.5		
Dehydration south boiler	Highlander 200-111	8.4		
Dehydration air dryer No. 1, A stage	Proctor	6.4	1,000	
Dehydration air dryer No. 1, B & C stage	Proctor	2.8	1,000	
Dehydration air dryer No. 2, A stage	Proctor	6.4	1,000	
Dehydration air dryer No. 2, B & C stage	Proctor	2.8	1,000	
Dehydration air dryer No. 3, A stage	Proctor	6.4	1,000	
Dehydration air dryer No. 3, B & C stage	Proctor	2.8	1,000	
Dehydration air dryer No. 4, A stage	Proctor	4.77	750	
Dehydration air dryer No. 4, B stage	Proctor	0.33	750	
Dehydration air dryer No. 4, C stage	Proctor	0.3	750	
Dehydration air dryer No. 5, A stage	National	10.4	1,200	
Dehydration air dryer No. 5, B stage	National	3.2	1,200	
Dehydration air dryer No. 5, C stage	National	3.3	1,200	
Dehydration bin dryer, heat from steam	Nonpareil		1,000	

Wet area air makeup	Hartzell	3.5		
South dryer room air makeup	Hartzell	5		
South dryer room roof air makeup	Hartzell	5		
Inspection room roof air makeup	Hartzell	3.5		
Dehydration research dryer	Carrier	0.88	125	
Packaging material transfer				Packaging baghouse No. 1, Mikropulsaire, 9 bag, 630cfm
Packaging material transfer				Packaging baghouse No. 2, Mikropulsaire, 25 bag, 1,750 cfm
Crush room material transfer				Crush room baghouse No. 1, Mikropulsaire, 9 bag, 630 cfm
Crush room material transfer				Crush room baghouse No. 2, Mikropulsaire, 25 bag, 1,750 cfm
Dehydration steam peeler	Odenberg		5,000	

FACILITY DESCRIPTION

Nonpareil packs, processes, and dehydrates various potato products. The company has three plants: Idaho Potato Packers, Nonpareil Dehydrated, and Nonpareil Processing.

- Idaho Potato Packers - a fresh potato facility where potatoes are washed, sorted, sized, and packaged.
- Nonpareil Dehydrated - obtains potatoes from Idaho Potato Packers. Potatoes are peeled or not peeled, scrubbed, sorted, sliced or diced, wet sorted, blanched, and dried to form dehydrated potato pieces including slices, dices, strips, crush, and hash browns. Unacceptable wet and some unacceptable dried potatoes are taken to Nonpareil Processing.
- Nonpareil Processing - produces dehydrated potato flakes, flour, agglomerate, dried starch, and other flake and flour-based potato products. Potatoes are peeled or not peeled, scrubbed, sorted, slabbed, precooked or not precooked, cooled, cooked, riced, and dried. Dried product is broken up and ground to customer specifications, packaged or stored, then sold.

SUMMARY OF EVENTS

April 25, 1998 DEQ visited Nonpareil and obtained air emissions data.

May 27, 1998 DEQ determined Nonpareil to be a major source.

November 4, 1998 DEQ received Nonpareil's Tier I OP application.

January 4, 1999 DEQ determined this application incomplete.

February 23, 1999 DEQ received a Tier I OP application update.

April 22, 1999 DEQ determined the application to be incomplete.

July 1, 1999 DEQ received an extension request and granted an extension setting a new deadline of September 1, 1999 for submitting an application update.

September 17, 1999 DEQ received Nonpareil's Tier I OP application update.

November 16, 1999 DEQ determined this application complete.

November 7, 2000 DEQ engineering review of the application materials began.

February 8, 2001 DEQ received Nonpareil's request to obtain a Tier II synthetic minor operating permit.

March 7, 2002 Brett Suthers of Nonpareil informed Carole Zundel of DEQ by telephone that the two process boilers were not modified after purchase (letter to follow). Therefore, the determination could be made that NSPS is not applicable to those boilers.

April 29, 2002 DEQ issued a facility draft Tier II operating permit to Nonpareil.
May 13, 2002 DEQ received comments from Nonpareil regarding the draft Tier II permit.
June 6-July 5, 2002 Public comment period was held. No comments were received.

DISCUSSION

1. Emission Estimates and Related Permit Requirements

Appendix A and B of the permit contain tables showing permit limits and emissions estimates. Parking lots and roadways were not included as potential emissions sources. These emissions estimates were used to model the expected ambient concentrations of criteria pollutants and selected toxic pollutants. Emissions limits were written for the sources that emit PM₁₀ because the total Facility-wide emissions of PM₁₀ were modeled to be close to the NAAQS daily and annual standards.

The facility's emissions were estimated based on operation and controls identified in the application, with the exception of the emissions from No. 6 fuel combustion for the process boilers. The boilers are to be rendered inoperable for No. 6 fuel oil within 60 days after this permit is issued, and subsequently will be fueled exclusively on natural gas. In the application dated September 3, 1999, the facility stated that the fuel oil connections would be disconnected to help resolve the issues created by the original fuel oil line installation.

The emissions estimation methods, assumptions, and emissions factors are documented in the facility's application. Stack parameters are also listed in this description section. The emissions from natural gas combustion have been updated since the application was written to reflect the latest updated AP-42 emissions factors. A summary of the process PM₁₀ emissions calculations is included in Appendix A of this document.

Fuel-burning Equipment

Hours of operation or gas usage tracking are not required by the permit because the emissions were estimated at the maximum PTE based on current AP-42 emissions factors. As long as the equipment is not modified and natural gas is used exclusively, as is required by the permit, the estimated emissions will not exceed the permitted limits.

Each fuel-burning emissions unit was analyzed to estimate the grains of particulate emissions per cubic foot of airflow to compare the estimated grain-loading emissions to the IDAPA 58.01.01.677 limit of 0.015 gr/dscf. The largest emissions rate for all fuel-burning sources was 0.0037 gr/acf, which is 25% of the standard. It is estimated that the actual emissions rate would be less than the standard even after the correction to dry standard cubic feet and 3% oxygen.

East and West Processing Boilers

The boilers are to be rendered inoperable for fuel oil within 60 days after this permit is issued. This requirement is justified by the need to protect NAAQS.

Material Transfer Operations, Flakers, Peelers, and Dryers

Emissions rates from the processing lines are based on the facility's estimated maximum equipment process rate, and current AP-42 emissions factors (or other method if AP-42 emissions factors are not available). The rates are stated as dry potato material. In the application, the processing peeler and the dehydration steam peeler process rates are listed as raw potato material, but the emissions and the emissions factor are based on dry potato material. Therefore, the throughputs listed in Table 1.2 and in the permit are for dry potato material.

Table 1.2 Maximum Dry Potato Material Process Rate for Each Process

Process	Process Rate (lb/hr)
Starch dryer	1,135
Scratch mash dryers	1,800
Processing peeler exhaust	5,000
Flaker No. 1	1,250
Flaker No. 2	1,250
Flaker No. 3	1,000
Flaker No. 4	1,000
Flaker No. 5	1,000
Dehydration air dryer No. 1, A stage	1,000
Dehydration air dryer No. 1, B & C stage	1,000
Dehydration air dryer No. 2, A stage	1,000
Dehydration air dryer No. 2, B & C stage	1,000
Dehydration air dryer No. 3, A stage	1,000
Dehydration air dryer No. 3, B & C stage	1,000
Dehydration air dryer No. 4, A stage	750
Dehydration air dryer No. 4, B stage	750
Dehydration air dryer No. 4, C stage	750
Dehydration air dryer No. 5, A stage	1,200
Dehydration air dryer No. 5, B stage	1,200
Dehydration air dryer No. 5, C stage	1,200
Dehydration bin dryer	1,000
Dehydration research dryer	125
Dehydration steam peeler	5,000

The permit limits each of these processes to the throughput identified in the permit, and requires tracking of the throughputs to verify that the emissions limits are not exceeded. In some cases, such as with the three-stage dryers, it may not be possible to measure the throughput at each stage. In these cases, the throughput of the beginning or end product can be measured, and the throughput of the intermediate stages estimated based on standard industry factors.

The PM₁₀ emissions limits for processes with both natural gas and potato material particulate emissions were combined into one number for simplicity. They were limited daily and annually, instead of hourly and annually because the PM₁₀ NAAQS standards are written as daily (24-hour) and annual limits. Also, the potato material throughput (used to determine compliance with the PM₁₀ emissions limits and the throughput limits) cannot be easily, nor does it need to be, tracked on an hourly basis.

The potato throughput is tracked daily but is not compiled into a single tracking log on a daily basis. The permit requires that the data be compiled monthly and annually.

Because the natural gas and potato particulate emissions estimates (for those sources that have both), were combined, an estimate of the natural gas emissions must be made in addition to the potato particulate emissions when calculating total PM₁₀ to compare with the permitted limit.

The particulate matter process weight limitations in IDAPA 58.01.01.701 and 702 apply to these processes. The estimated maximum potential emissions from each one of these sources are less than 1 lb/hr, except for the scratch mash dryers, which have a throughput of 1,800 lb/hr. The corresponding limit is 4.0 lb/hr. The estimated maximum potential PM₁₀ emissions is 2.56 lb/hr, including the PM₁₀ emissions from natural gas combustion. As long as the total particulate emission is approximately equivalent to the PM₁₀ fraction, the calculated emissions will not exceed the process weight rate limit.

The emissions from the multi-stage dryers were estimated using an emissions factor for rice drying from AP-42, Appendix B.1 9.9.1. Because there were no potato-specific emissions factors available, it was estimated that rice drying has similar PM₁₀ emissions. Because the factor was for the entire drying process, it was estimated that the emissions from each multi-stage dryer were equally distributed among each dryer's stacks.

Some of the material transfer operations' particulate emissions are controlled by baghouses. Emissions from the baghouses were estimated based on a manufacturer's guarantee of grains per cubic foot of air flow and are not based on the process rate.

The permit requires that the baghouses must be maintained in accordance with the provisions specified in the guarantee and must be used whenever the process is in operation.

An operations and maintenance manual is required for the baghouses because the emissions from those processes were estimated and modeled based on using the baghouses. The manufacturer's recommendation is based on certain operating parameters, which should be addressed in the manual.

The throughput for the flakers cannot be tracked individually, so tracking is to be done for all flakers combined. The emission estimates were modeled based on all emissions coming from one stack to demonstrate compliance with the NAAQS.

2. Modeling

A summary of the air quality modeling analysis is included as Appendix B of this technical memorandum.

3. Area Classification

Nonpareil is located in Bingham County, which is in AQCR 61. The area is unclassifiable for all federal and state criteria air pollutants.

4. Facility Classification

The facility is not a designated facility as defined in IDAPA 58.01.01.006.25. Upon issuance of a Tier II operating permit, Nonpareil will not be classified as a major facility as defined in IDAPA 58.01.01.008.10. This also referred to as a synthetic minor (SM) source because the potential to emit for all regulated air pollutants are below 100 T/yr.

5. Regulatory Review

This OP is subject to the following permitting requirements:

- | | | |
|----|---------------------------------|--|
| a. | <u>IDAPA 58.01.01.123</u> | Certification of Documents |
| b. | <u>IDAPA 58.01.01.130</u> | Excess Emissions |
| c. | <u>IDAPA 58.01.01.401</u> | Tier II Operating Permit |
| d. | <u>IDAPA 58.01.01.403</u> | Permit Requirements for Tier II Sources |
| e. | <u>IDAPA 58.01.01.404.01(c)</u> | Opportunity for Public Comment |
| f. | <u>IDAPA 58.01.01.404.04</u> | Authority to Revise or Renew Operating Permits |
| g. | <u>IDAPA 58.01.01.406</u> | Obligation to Comply |
| h. | <u>IDAPA 58.01.01.470</u> | Permit Application Fees for Tier II Permits |
| i. | <u>IDAPA 58.01.01.600</u> | Open Burning |
| j. | <u>IDAPA 58.01.01.625</u> | Visible Emission Limitation |
| k. | <u>IDAPA 58.01.01.650</u> | General Rules for the Control of Fugitive Dust |
| l. | <u>IDAPA 58.01.01.675</u> | Fuel-burning Equipment - Particulate Matter |
| m. | <u>IDAPA 58.01.01.710</u> | Particulate Matter - Process Equipment |
| n. | <u>IDAPA 58.01.01.775</u> | Odors |

The boilers at the facility were determined not to be affected by NSPS 40 CFR 60, Subpart Dc due to their dates of construction and the facility's statement that they have not been modified.

Prevention of Significant Deterioration (PSD) was triggered when the process boilers were installed. The issue is currently under investigation by the DEQ program office.

6. Airs

AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

AIR PROGRAM	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A - Attainment U - Unclassifiable N - Nonattainment
POLLUTANT							
SO ₂	B						
NO _x	SM					SM	
CO	B						
PM ₁₀	B						
PT (Particulate)	B						
VOC	B						
THAP (Total HAPs)	B						
			APPLICABLE SUBPART				

AIRS/AFS CLASSIFICATION CODES:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

FEES

Nonpareil is subject to registration fees in accordance with IDAPA 58.01.01.525. This synthetic minor Tier II permit action does not require the permit application fee defined in IDAPA 58.01.01.470.

RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue a Tier II operating permit to Nonpareil. An opportunity for public comment on the air quality aspects of the proposed permit was provided in accordance with IDAPA 58.01.01.404.01.c.

CZ/sm

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cc: Sherry Davis, Technical Services
 Tiffany Floyd, Pocatello Regional Office
 Joan Lechtenberg, Air Quality Division

APPENDIX A
Nonpareil, Blackfoot
Emissions Estimates

Nonpareil Emissions Estimate Summary for Process PM-10
(Does not include N.G. emissions)

Emissions Unit Number	Emissions Unit Description	Emission Factor	Units	Reference	Maximum Throughput	Units	Potential Emissions (lb/hr)	Potential Emissions (T/yr)	Facility- Requested Emissions (T/yr)	Notes
1	Processing East Boiler									
2	Processing West Boiler									
3	Starch Dryer	0.59	lb/ton	AP-42 T 9.9.7-1	1135	lb/hr dry	0.33	1.47	1.46	
4	Scratch Mash Dryers	1400	lb/MMlb	Mass Balance	1800	lb/hr dry	2.52	11.04	11.03	
5	Scratch Mash Baghouse	2.85	lb/MMcf	Manufacturer's Guarantee	2500	cfm	0.43	1.87	1.89	
6	Scratch Mash Air Makeup									
7	Reblend Room Air Makeup									
8	Building No. 3 Air Makeup									
9	Building No. 4 Air Makeup									
10	Processing Peeler Exhaust	352	lb/MMlb	Mass Balance	5000	lb/hr dry	1.76	7.71	7.66	
11	Flaker No. 1	0.15	lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1250	lb/hr dry	0.19	0.821	0.82	
12	Flaker No. 2	0.15	lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1250	lb/hr dry	0.19	0.821	0.82	
13	Flaker No. 3	0.15	lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000	lb/hr dry	0.15	0.657	0.657	
14	Flaker No. 4	0.15	lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000	lb/hr dry	0.15	0.657	0.657	
15	Flaker No. 5	0.15	lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000	lb/hr dry	0.15	0.657	0.657	
16	Grinding Circuit No. 1 Baghouse	2.85	lb/MMcf	Manufacturer's Guarantee	2500	cfm	0.43	1.87	1.89	
17	Starch Plant Baghouse	2.85	lb/MMcf	Manufacturer's Guarantee	5000	cfm	0.86	3.74	3.75	
18	Grinding Circuit No. 2 Baghouse	2.85	lb/MMcf	Manufacturer's Guarantee	3360	cfm	0.57	2.52	2.5	
19	Flake Baghouse	2.85	lb/MMcf	Manufacturer's Guarantee	7000	cfm	1.20	5.24	5.2	
20	Dehydration North Boiler									
21	Dehydration South Boiler									
22	Dehydration Air Dryer No. 1 A Stage	0.15	lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000	lb/hr dry	0.08	0.329	0.33	Total emissions distributed evenly between two stacks
23	Dehydration Air Dryer No. 1 B & C Stage	0.15	lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000	lb/hr dry	0.08	0.329	0.33	Total emissions distributed evenly between two stacks

Nonpareil Emissions Estimate Summary for Process PM-10
(Does not include N.G. emissions)

24	Dehydration Air Dryer No. 2 A Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000 lb/hr dry	0.08	0.329	0.33	Total emissions distributed evenly between two stacks
25	Dehydration Air Dryer No. 2 B & C Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000 lb/hr dry	0.08	0.329	0.33	Total emissions distributed evenly between two stacks
26	Dehydration Air Dryer No. 3 A Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000 lb/hr dry	0.08	0.329	0.33	Total emissions distributed evenly between two stacks
27	Dehydration Air Dryer No. 3 B & C Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1000 lb/hr dry	0.08	0.329	0.33	Total emissions distributed evenly between two stacks
28	Dehydration Air Dryer No. 4 A Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	750 lb/hr dry	0.04	0.164	0.17	Total emissions distributed evenly among three stacks
29	Dehydration Air Dryer No. 4 B Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	750 lb/hr dry	0.04	0.164	0.17	Total emissions distributed evenly among three stacks
30	Dehydration Air Dryer No. 4 C Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	750 lb/hr dry	0.04	0.164	0.17	Total emissions distributed evenly among three stacks
31	Dehydration Air Dryer No. 5 A Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1200 lb/hr dry	0.06	0.263	0.26	Total emissions distributed evenly among three stacks
32	Dehydration Air Dryer No. 5 B Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1200 lb/hr dry	0.06	0.263	0.26	Total emissions distributed evenly among three stacks
33	Dehydration Air Dryer No. 5 C Stage	0.15 lb/1000lb	AP-42 App. B.1 9.9.1 Rice Dryer	1200 lb/hr dry	0.06	0.263	0.26	Total emissions distributed evenly among three stacks
34	Dehydration Bin Dryer	0.75 lb/1000lb	AP-42 App. B.1 9.9.2 Cereal Dryer	1000 lb/hr dry	0.75	3.285	16.4	Requested emissions five times higher than calculated emissions. Calculated emissions were used in permit.

Nonpareil Emissions Estimate Summary for Process PM-10
 (Does not include N.G. emissions)

Emissions Unit Number	Emissions Unit Description	Emission Factor	Units	Reference	Maximum Throughput	Units	Potential Emissions (lb/hr)	Potential Emissions (T/yr)	Facility- Requested Emissions (T/yr)	Notes
35	Wet Area Air Makeup									
36	South Dryer Room Air Makeup									
37	South Dryer Room Roof Air Makeup									
38	Inspection Room Roof Air Makeup									
39	Dehydration Research Dryer	1.4	lb/1000lb	Material Balance	125	lb/hr dry	0.18	0.77	0.7665	Emission factor back-calculated.
40	Packaging Baghouse No. 1	2.85	lb/MMcf	Manufacturer's Guarantee	630	cfm	0.11	0.47	0.47	
41	Packaging Baghouse No. 2	2.85	lb/MMcf	Manufacturer's Guarantee	1750	cfm	0.30	1.31	1.3	
42	Crush Room Baghouse No. 1	2.85	lb/MMcf	Manufacturer's Guarantee	630	cfm	0.11	0.47	0.47	
43	Crush Room Baghouse No. 2	2.85	lb/MMcf	Manufacturer's Guarantee	1750	cfm	0.30	1.31	1.3	
44	Dehydration Steam Peeler	352	lb/MMlb	Mass Balance	5000	lb/hr dry	1.76	7.71	7.66	

APPENDIX B
Nonpareil, Blackfoot
Modeling

MEMORANDUM

TO: Carole Zundel, State Office of Technical Services
FROM: Yayi Dong, State Office of Technical Services
SUBJECT: Dispersion Modeling for a Tier II Operating Permit for Nonpareil, located in Blackfoot, Idaho.
DATE: May 24, 2002

1. SUMMARY:

This project is for the issuance of a Tier II operating permit for Nonpareil located in Blackfoot, Idaho. DEQ staff have performed ISC3 dispersion modeling, and modeling demonstrates compliance with all applicable standards. During the Tier II process DEQ must determine if the facility is in compliance with IDAPA 58.01.01.161. DEQ will ensure that any TAP "shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation." The toxics with emission levels above the screening emission level must be compared to the acceptable ambient concentration increment for non-carcinogens. To determine compliance with IDAPA 161, DEQ has determined that a cumulative risk of 1.0E-05 is acceptable for carcinogens. The analysis demonstrated compliance with all regulatory requirements and the quantities of TAPs emissions were determined to not unreasonably affect human or animal life or vegetation. DEQ modeler received a request of PM₁₀ emission changes on May 16, 2002, and have rerun the modeling with the requested changes. The requested changes include increase PM₁₀ emissions of unit 11 through unit 15 to 0.82 tons per year for each stack, and assumed these emissions were released from a single stack. The new results have shown no significant changes from the earlier results.

2. DISCUSSION:

2.1 Process Description

Nonpareil packs, processes, and dehydrates various potato products. The application includes forty-four sources which are located in the process plant, dehydrated plant, and starch plant in the facility. The sources are boilers, dryers, potato peelers, grinding circuits, crushing and packaging lines, etc. Emissions include nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter with a nominal diameter less than 10 micrometers (PM₁₀), sulfur oxides (SO_x), lead, and various toxic air pollutants. The emission rates are listed in the Table 1. The stack parameters of the sources are listed in the Table 2 and Table 3. In the modeling analysis, all NO_x and SO_x are treated as NO₂ and SO₂.

Table 1: Emission Rates (lbs/hour)

Emission Unit	CO	NO _x	PM ₁₀	SO ₂	Lead	PAH ¹	Formaldehyde	Arsenic	Cadmium	Chromium	Nickel
1	3.34E+00	3.97E+00	3.02E-01	2.38E-02	1.99E-05	3.81E-07	2.98E-03	7.94E-06	4.37E-05	5.56E-05	8.34E-05
2	3.34E+00	3.97E+00	3.02E-01	2.38E-02	1.99E-05	3.81E-07	2.98E-03	7.94E-06	4.37E-05	5.56E-05	8.34E-05
3	3.46E-01	4.12E-01	3.66E-01	2.47E-03	2.06E-06	3.95E-06	3.09E-04	8.24E-07	4.53E-06	5.76E-06	8.85E-06
4	4.53E-01	5.39E-01	2.56E+00	3.24E-03	2.70E-06	5.18E-08	4.04E-04	1.08E-06	5.93E-06	7.55E-06	1.13E-05
5			1.29E-01								
6	4.12E-01	4.90E-01	3.73E-02	2.94E-03	2.45E-06	4.71E-08	3.68E-04	9.80E-07	5.39E-06	6.86E-06	1.03E-05
7	8.24E-02	9.80E-02	7.45E-03	5.88E-04	4.90E-07	9.41E-09	7.35E-05	1.96E-07	1.08E-06	1.37E-06	2.06E-06
8	2.47E-01	2.94E-01	2.24E-02	1.76E-03	1.47E-06	2.82E-08	2.21E-04	5.88E-07	3.24E-06	4.12E-06	6.18E-06
9	8.24E-01	9.80E-01	7.45E-02	5.88E-03	4.90E-06	9.41E-08	7.35E-04	1.96E-06	1.08E-05	1.37E-05	2.06E-05
10			1.80E-01								
11			1.87E-01								
12			1.87E-01								
13			1.87E-01								
14			1.87E-01								
15			1.87E-01								
16			1.29E-01								
17			2.58E-01								
18			1.73E-01								
19			3.81E-01								
20	8.65E-01	1.03E+00	7.82E-02	6.18E-03	5.15E-06	9.88E-08	7.72E-04	2.06E-06	1.13E-05	1.44E-05	2.16E-05
21	6.92E-01	8.24E-01	6.26E-02	4.94E-03	4.12E-06	7.91E-08	6.18E-04	1.65E-06	9.08E-06	1.15E-05	1.73E-05
22	5.27E-01	6.27E-01	1.23E-01	3.76E-03	3.14E-06	6.02E-08	4.71E-04	1.25E-06	6.90E-06	8.78E-06	1.32E-05
23	2.31E-01	2.75E-01	9.59E-02	1.65E-03	1.37E-06	2.84E-08	2.06E-04	5.49E-07	3.02E-06	3.84E-06	5.76E-06
24	5.27E-01	6.27E-01	1.23E-01	3.76E-03	3.14E-06	6.02E-08	4.71E-04	1.25E-06	6.90E-06	8.78E-06	1.32E-05
25	2.31E-01	2.75E-01	9.59E-02	1.65E-03	1.37E-06	2.84E-08	2.06E-04	5.49E-07	3.02E-06	3.84E-06	5.76E-06
26	5.27E-01	6.27E-01	1.23E-01	3.76E-03	3.14E-06	6.02E-08	4.71E-04	1.25E-06	6.90E-06	8.78E-06	1.32E-05
27	2.31E-01	2.75E-01	9.59E-02	1.65E-03	1.37E-06	2.84E-08	2.06E-04	5.49E-07	3.02E-06	3.84E-06	5.76E-06
28	3.93E-01	4.68E-01	7.30E-02	2.81E-03	2.34E-06	4.49E-08	3.51E-04	9.35E-07	5.14E-06	6.55E-06	9.82E-06
29	2.72E-02	3.24E-02	4.00E-02	1.94E-04	1.62E-07	3.11E-09	2.43E-05	6.47E-08	3.56E-07	4.53E-07	6.79E-07
30	2.47E-02	2.94E-02	3.97E-02	1.76E-04	1.47E-07	2.82E-09	2.21E-05	5.88E-08	3.24E-07	4.12E-07	6.18E-07
31	8.56E-01	1.02E+00	1.37E-01	6.12E-03	5.10E-06	9.78E-08	7.65E-04	2.04E-06	1.12E-05	1.43E-05	2.14E-05
32	2.64E-01	3.14E-01	6.38E-02	1.88E-03	1.57E-06	3.01E-08	2.35E-04	6.27E-07	3.45E-06	4.39E-06	6.59E-06
33	2.72E-01	3.24E-01	8.48E-02	1.94E-03	1.62E-06	3.11E-08	2.43E-04	6.47E-07	3.56E-06	4.53E-06	6.79E-06
34			7.50E-01								
35	2.88E-01	3.43E-01	2.61E-02	2.06E-03	1.72E-06	3.29E-08	2.57E-04	6.86E-07	3.77E-06	4.80E-06	7.21E-06
36	4.12E-01	4.90E-01	3.73E-02	2.94E-03	2.45E-06	4.71E-08	3.68E-04	9.80E-07	5.39E-06	6.86E-06	1.03E-05
37	4.12E-01	4.90E-01	3.73E-02	2.94E-03	2.45E-06	4.71E-08	3.68E-04	9.80E-07	5.39E-06	6.86E-06	1.03E-05
38	2.88E-01	3.43E-01	2.61E-02	2.06E-03	1.72E-06	3.29E-08	2.57E-04	6.86E-07	3.77E-06	4.80E-06	7.21E-06
39	7.25E-02	8.63E-02	1.82E-01	5.18E-04	4.31E-07	8.28E-09	6.47E-05	1.73E-07	9.49E-07	1.21E-06	1.81E-06
40			3.25E-02								
41			9.03E-02								
42			3.25E-02								
43			9.03E-02								
44			1.60E-01								
Total	1.82E+01	1.93E+01	6.50E+00	1.18E-01	9.63E-05	1.85E-06	1.44E-02	3.65E-05	2.12E-04	2.70E-04	4.04E-04

1. Sum of: Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, & Indeno(1,2,3,-cd)pyrene; the impact from this sum is compared to the limit for benzo(a)pyrene.

Table 2. Stack Parameter, Point Sources

Emission Unit	Source Name	Source type	Stack Height(ft)	Stack Diameter (ft)	Temperature (°F)	Flow rate (acfm)
1	Processing East Boiler	Point	26.0	2.3	410.0	9,400
2	Processing West Boiler	Point	26.0	3.0	410.0	9,400
3	Starch Dryer	Point	28.0	2.0	92.0	5,600
4	Starch Match Dryer	Point	45.0	2.8	92.0	20,500
5	Starch Match Baghouse	Point	24.0	1.0	70.0	2,500
10	Processing Peeler Exhaust	Point	24.0	2.0	190.0	42
11	Flaker #1	Point	24.0	3.0	120.0	20,000
12	Flaker #2	Point	24.0	3.0	120.0	20,000
13	Flaker #3	Point	24.0	3.0	120.0	20,000
14	Flaker #4	Point	24.0	3.0	120.0	20,000
15	Flaker #5	Point	24.0	3.0	120.0	20,000
16	Grinding Circuit #1 Baghouse	Point	20.0	1.1	70.0	2,500
17	Starch Plant Baghouse	Point	20.0	1.3	70.0	5,000
18	Grinding Circuit #2 Baghouse	Point	16.5	1.1	70.0	3,360
19	Flaker Baghouse	Point	20.0	1.2	70.0	7,000
20	Dehy North Boiler	Point	28.0	1.6	380.0	2,430
21	Dehy South Boiler	Point	28.0	1.6	380.0	1,960
22	Dehy Air Dryer#1 A-stage	Point	36.0	3.0	187.0	12,000
23	Dehy Air Dryer#1 B-stage	Point	30.0	2.5	150.0	8,000
24	Dehy Air Dryer#2 A-stage	Point	36.0	3.0	187.0	12,000
25	Dehy Air Dryer#2 B-stage	Point	30.0	2.5	150.0	8,000
26	Dehy Air Dryer#3 A-stage	Point	36.0	3.0	187.0	12,000
27	Dehy Air Dryer#3 B-stage	Point	30.0	2.5	150.0	8,000
28	Dehy Air Dryer#4 A-stage	Point	23.0	2.5	160.0	10,000
29	Dehy Air Dryer#4 B-stage	Point	23.0	2.0	150.0	4,000
30	Dehy Air Dryer#4 C-stage	Point	23.0	1.8	130.0	2,000
31	Dehy Air Dryer#5 A-stage	Point	27.0	3.4	160.0	26,000
32	Dehy Air Dryer#5 B-stage	Point	27.0	2.6	150.0	11,000
33	Dehy Air Dryer#5 C-stage	Point	27.0	2.0	130.0	7,000
34	Dehy, BIN Dryer (2 Stacks)	Point	22.0	2x2=2.8	90.0	600/Stack
39	Dehy Research Dryer	Point	24.0	0.5	95.0	1,200
40	Packaging Baghouse #1	Point	20.0	0.5	70.0	630
41	Packaging Baghouse #2	Point	20.0	0.5	70.0	1,750
42	Crush Room Baghouse #1	Point	16.0	0.5	70.0	630
43	Crush Room Baghouse #2	Point	16.0	0.5	70.0	1,750
44	Dehy Steam Peeler	Point	24.0	2.0	190.0	52

Table 3. Stack Parameters Volume Sources¹

Emission Unit	Source Name	Source type	Source Height (m)	Initial Horizontal Dimension (m)	Initial Vertical Dimension(m)
6	Reblend Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00
7	Starch Match Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00
8	Building#3 Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00
9	Building#4 Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00
35	Wait Area Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00
36	S. Dryer Room 4&5 Roof Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00
37	S. Dryer Room 4&5 Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00
38	Inspection Room Roof Air Makeup	Volume	1.00E+01	7.70E+01	7.68E+00

1. All air makeup emissions are modeled as volume sources, the initial dimensions are calculated based on the approximate building sizes.

2.2 Applicable Air Quality Impact Limits

Nonpareil is located in Bingham County, which is in AQCR 61. The area is unclassifiable for all federal and state criteria air pollutants. If the modeled increment(s) of any regulated pollutant(s) in IDAPA 58.01.01.006.93 (NO_x, SO₂, CO; and PM₁₀) is (are) higher than the significant contributions, the appropriate background concentration will be added to those ambient concentration increments to determine compliance with the National Ambient Air Quality Standards (NAAQS). The contributions of all existing sources are considered to be included in the background concentrations. The toxics with emission levels above the screening emission level must be compared to the acceptable ambient concentration increment for non-carcinogens. To determine compliance with IDAPA 161, DEQ has determined that a cumulative risk of 1.0E-05 is acceptable. Modeling was performed for natural gas combustion sources assuming the facility operated at its design capacity without burning oil.

2.3 Background Concentrations

Background concentrations determined by DEQ are used for the NAAQS analysis. The values used for the background concentrations are included in Table 4 and Table 5 in Section 2.4 of this memorandum.

2.4 Modeling Impact Assessment

Table 4 and Table 5 contain summaries of the modeling results. Five years (1987 to 1991) of meteorological data from Pocatello airport, ID, and upper air data from Salt Lake City, UT, were used. Environmental Protection Agency (EPA) default parameters for rural area were used. Receptors were set up according to DEQ modeling guidance. All regulated air pollutants and the TAPs that exceeded respective ELs were modeled. The analysis demonstrated compliance for all pollutants. The modeling was also performed for a scenario in which unit 11 through unit 15 were combined into a single unit, and the other stack parameters were kept same in order to simulate the situation when all flakers use only one stack. The modeling showed no significant changes from the original runs.

Table 4. Modeled maximum impact of criteria air pollutants

Pollutant	Average Period	Impact (µg/m ³) ²	Background Concentration (µg/m ³) ²	Total Concentration (µg/m ³) ²	NAAQS ¹ (µg/m ³) ²	Compliant Y or N?
NO ₂ ³	Annual	31.2	40	71.2	100	Y
SO ₂ ⁴	Annual	0.18	18.3	18	80	Y
	24-hour	0.87	120	121	365	Y
	3-hour	1.27	374	375	1,300	Y
CO ⁵	8-hour	117	5,130	5,247	10,000	Y
	1-hour	277	11,450	11,727	40,000	Y
PM ₁₀ ⁶	Annual	13.4	32.7	46.1	50	Y
	24-hour	53.6	86	139.6	150	Y
Lead ⁷	24-hour	5.60E-04	0.15	5.75E-04	1.5 ⁷ (quarterly standard)	Y ⁷ (lower than quarterly limit)

1. National Ambient Air Quality Standards

2. Microgram per cubic meter

3. Nitrogen dioxide

4. Sulfur dioxide

5. Carbon monoxide

6. Particulate matter with a nominal diameter less than 10 micrometers

7. IDAPA 58.01.01.577. The quarterly standard is 1.5 µg/m³, since the maximum 24-hour average is higher than the maximum quarterly average, the dispersion modeling demonstrates compliance.

Table 5. Modeled annual average concentrations of Toxic Air Pollutants Carcinogenic increments

TAP ¹	DEQ AACC ² ($\mu\text{g}/\text{m}^3$) ⁴	Modeled Annual Average Impact ($\mu\text{g}/\text{m}^3$) ⁷	URF ⁶	Risk
PAH ⁵	3.00E-04	0.00E+00 ⁷	3.300E-03	0.00E+00
Formaldehyde	7.70E-02	2.34E-02	1.300E-05	3.04E-07
Arsenic	2.30E-04	6.00E-05	4.300E-03	2.58E-07
Cadmium	5.60E-04	4.00E-04	1.800E-03	7.20E-07
Chromium	8.30E-05	4.40E-04	1.200E-02	5.28E-06
Nickel	4.20E-03	6.60E-04	4.200E-03	2.77E-06
Cumulative Risk ⁸				9.33E-06

1. Toxic air pollutants
2. Acceptable ambient concentration increment
3. Acceptable ambient concentration increment for carcinogens
4. Microgram per cubic meter
5. Sum of: Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, & Indeno(1,2,3,-cd)pyrene; the impact from this sum is held to the limit for benzo(a)pyrene.
6. Unit Risk Factor, from US Environmental Protection Agency, IDAPA 58.01.01.586
7. The modeled results are less than the detection limit
8. Cumulative Risk = sum of Risk, 1.0E-05 not to be exceeded

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